CDM a Joint Venture with SAIC & DSO

# Area IV Santa Susana Field Laboratory

## Environmental Impact Statement (Area IV SSFL EIS)

### Text



Subject: **Task Order: DE-AT30-08CC60021/ET17**
**Draft Gap Analysis Report**

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**Attachment A** Working Draft RFI Program Groups 5 and 7 Sampling Location Maps

## Abbreviations and Acronyms

| | |
|---|---|
| AEC | Atomic Energy Commission |
| AI | Atomic International |
| AOC | Area of Concern |
| ARAR | Applicable or Relevant and Appropriate Requirement |
| BAF | Bioaccumulation Factor |
| BBI | Brandies-Bardin Institute |
| BCG | Biota Concentration Guide |
| BCR | Biological Conditions Report |
| bgs | Below Ground Surface |
| CalEPA | California Environmental Protection Agency |
| CDM | CDM Federal Programs Corporation |
| CDPH | California Department of Public Health |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CMS | Corrective Measures Studies |
| COC | Contaminant of Concern |
| COI | Contaminant of Interest |
| COPC | Contaminant of Potential Concern |
| CPEC | Contaminant of Potential Ecological Concern |
| cpm | Counts Per Minute |
| CSM | Conceptual Site Model |
| CV | Coefficients of Variation |
| DCGL | Derived Concentration Guideline Level |
| DCGLW | Derived Concentration Guideline Level Average |
| DOD | Department of Defense |
| DOE | Department of Energy |
| DQO | Data Quality Objective |
| DTSC | Department of Toxic Substances Control |
| EA | Environmental Assessment |
| EPA | U.S. Environmental Protection Agency |
| ERA | Ecological Risk Assessment |
| ESL | Ecological Screening Level |
| ETEC | Energy Technology Engineering Center |
| EU | Exposure Unit |
| FONSI | Findings of No Significant Impact |
| FSDF | Former Sodium Disposal Facility |
| FUSRAP | Formerly Utilized Sites Remedial Action Program |
| GWS | Gamma Walkover Survey |
| HSA | Historical Site Assessment |
| Kcs | Chatsworth Formation |
| LBGR | Lower Bound of the Gray Region |
| LLD | Lower Limit of Detection |
| LMEC | Liquid Metal Engineering Center |
| MARSSIM | Multi-Agency Radiation Survey and Site Investigation Manual |

| | |
|---|---|
| MCLG | Maximum Contaminant Level Goal |
| MCL | Maximum Contaminant Level |
| MDA | Minimum Detectable Activity |
| MDC | Minimum Detectable Concentration |
| MDL | Method Detection Limit |
| mg/kg | Milligrams Per Kilogram |
| MPC | Maximum Permissible Concentration |
| MQO | Measurement Quality Objective |
| NAA | North American Aviation |
| NAD | North American Datum |
| NASA | National Aeronautics and Space Administration |
| NDPES | National Pollutant Discharge Elimination System |
| NEPA | National Environmental Policy Act |
| NESHAP | National Emission Standard for Hazardous Air Pollutants |
| NRWQC | National Recommended Water Quality Criteria |
| NSGW | Near-Surface Groundwater |
| OEHHA | Office of Environmental Health Hazard Assessment |
| OU | Operable Unit |
| PAH | Polynuclear Aromatic Hydrocarbon |
| PARCC | Precision, Accuracy, Representativeness, Comparability, and Completeness |
| PCB | Polychlorinated Biphenyl |
| pCi/g | Picocuries Per Gram |
| pCi/L | Picocuries Per Liter |
| PRG | Preliminary Remediation Goal |
| QA/QC | Quality Assurance/Quality Control |
| RAD | Radionuclide |
| RAGS | Risk Assessment Guidance for Superfund |
| RAIS | Risk Assessment Information System |
| RCRA | Resource Conservation and Recovery Act |
| REL | Reference Exposure Level |
| RFI | RCRA Facility Investigation |
| RIHL | Rockwell International Hot Laboratory |
| RMHF | Radioactive Materials Handling Facility |
| SAIC | Science Applications International Corporation |
| SAP | Sampling and Analysis Plan |
| SB | State Bill |
| SRAM | Standardized Risk Assessment Methodology Work Plan |
| SRC | Site Related Contaminant |
| SRE | Sodium Reactor Experiment |
| SSFL | Santa Susana Field Laboratory |
| SSL | Soil-to-groundwater Screening Level |
| SU | Survey Unit |
| SVOCs | Semi-Volatile Organic Compound |
| SWMU | Solid Waste Management Unit |
| TBC | To Be Considered |
| TIC | Tentatively Identified Compound |
| TOC | Total Organic Carbon |

| | |
|---|---|
| TRV | Toxicity Reference Value |
| Tsu | Santa Susana Formation |
| UTL95 | Upper Threshold Limit at 95% Confidence |
| VOC | Volatile Organic Compound |
| VSI | Visual Site Inspection |
| µCi/mL | Microcuries Per Milliliter |
| µg/L | Micrograms Per Liter |
| µg/m3 | Micrograms Per Cubic Meter |

## Glossary

Abiotic – nonliving, or not associated with living organisms.

Ambient – of the surrounding environment.

Analyte – a chemical for which a sample (e.g., water, soil) is tested.

Applicable or Relevant and Appropriate Requirements (ARARs) - requirements, including cleanup standards, standards of control, and other substantive environmental protection requirements and criteria for hazardous substances as specified under Federal and State law and regulations, that must be met when complying with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

Aquifer – rock or sediment in a formation or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Bio-uptake – The uptake of contaminants by plants and animals.

Biota – plants and animals in an environment.

Biotic – of or having to do with living organisms.

Categorical exclusion – as defined by NEPA, a categorical exclusion is a category of actions which do not individually or cumulatively have a significant effect on the human environment and for which neither an environmental assessment nor an environmental impact statement is required.

CERCLA process - The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process provides a comprehensive framework to deal with past or abandoned hazardous materials. CERCLA provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment that could endanger public health, welfare, or the environment. If a site meets the CERCLA requirements for designation, it is ranked along with other "Superfund" sites and listed on the National Priorities List. This ranking and listing is the U.S. Environmental Protection Agency's way of prioritizing sites for cleanup. The CERCLA process uses risk-based evaluations for cleaning up sites contaminated with hazardous materials.

Characterization – site or facility sampling and analysis activities to determine the extent and nature of pollutant releases. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Coefficient of Variation – a coefficient of variation ($C_V$) is a statistical measure of the dispersion of a data points around the mean in a probability distribution. It is defined as the ratio of the standard deviation ($\sigma$) to the mean ($\mu$): $C_V = \sigma / \mu$ and is used to compare the degree of variation from one data set to another.

Complete Exposure Pathway – see exposure pathway.

Confidence Level – the probability that the confidence interval used to estimate a population parameter from sample data will capture that population parameter (e.g., mean, median or percentile) in repeated sampling.

Congener - a member of the same kind, class, or group as another; also, an organism belonging to the same genus as another organism.

Contaminant of Concern – a chemical or radionuclide that is present in an environment where it does not belong or is present at levels that might cause harmful (adverse) health effects.

Data Quality Objective – qualitative and quantitative requirements to ensure that data of know, documented, and appropriate quality are obtained to support a decision. Developing DQOs is the first step in planning a site investigation before any data is collected.

Data Filters – Screening criteria (background, PRGs, MCLs, ESLs) used to assess overall usability of the data.

Data Sensitivity – sensitivity relates to using sampling and analysis methods that have detection limits below the selected action levels for any given analyte.

Decontamination – removal of harmful substances such as noxious chemicals or radioactive materials from exposed individuals, rooms and furnishings in buildings, or exterior environments.

Derived Concentration Guideline Level - a radionuclide-specific radioactivity level related to a concentration or dose or risk criterion. The DCGL is usually specified by a regulator.
Detection Limit - the lowest concentration of a chemical in a medium (e.g., soil, air, water) that can be distinguished reliably, through laboratory testing, from a concentration of zero.

Exposure Pathway – the route a substance takes from its source (where it began) to its end point (where it ends), and how people and/or organisms can come into contact with (or get exposed) it. An exposure pathway has five parts: a source of contamination; an environmental media and transport mechanism; a point of exposure; a route of exposure; and a receptor population. When all five parts are present, the exposure pathway is termed a completed exposure pathway. An incomplete exposure pathway is missing one or more parts of the pathway. Direct and indirect exposure pathways refer to the method in which a receptor is exposed to the contaminant; either direct (such as external gamma radiation) or indirectly (such as ingestion).

Direct Exposure Pathway – see exposure pathway.

Environmental assessment – a concise public document prepared by or for a Federal agency, required by NEPA, briefly providing sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact (FONSI). An environmental assessment includes brief discussions of the need for the proposal, possible

alternative actions, the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted.

Environmental Impact Statement (EIS) – an EIS is a detailed public document prepared by or for a Federal agency, required by NEPA. An environmental impact statement is a more in-depth and thorough environmental impacts evaluation of a proposed action and alternatives as compared to an environmental assessment. The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that NEPA policies and goals are infused into the ongoing programs and actions of the Federal Government. An EIS provides full and fair discussion of significant environmental impacts and is used to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. An EIS is used by Federal officials in conjunction with other relevant material to plan actions and make decisions.

Exposure Routes – ways in which human or environmental receptors may be exposed to contaminants, including inhalation, ingestion or direct (gamma) exposure.

Finding of No Significant Impact (FONSI) – a FONSI is a document prepared by a Federal agency briefly presenting the reasons why an action analyzed in an environmental assessment would not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared. It includes the environmental assessment or a summary of the environmental assessment.

Fugitive Dust – dust released when soil or other materials are disturbed. Fugitive dust is commonly released during construction operations or any operations where soil or materials are being moved.

Gamma Radiation - gamma radiation is high-energy, short wavelength electromagnetic radiation (a packet of energy) emitted from the nucleus of an atom. Gamma radiation frequently accompanies alpha and beta emissions and always accompanies fission. Gamma radiation is very penetrating and can travel several hundred feet in air. Gamma radiation requires a thick wall of concrete, lead, or steel to stop it.

Gross alpha/beta – the total radioactivity due to alpha or beta particle emissions as inferred form measurements on a dry sample.

Groundwater – water beneath the earth's surface located between soil particles and between rock surfaces. For the purposes of this data gap analysis, ecological risk will consider seeps and springs as part of the groundwater system; whereas, the human health risk scenarios only consider groundwater in deep and/or shallow aquifers.

Half-life - the amount of time it takes for half the atoms of a particular radioactive substance disintegrate to another nuclear form. Measured half-lives vary from a fraction of a second to billions of years.

Hydraulic conductivity – a coefficient of proportionality describing the rate at which water can move through a permeable medium.

Incomplete Exposure Pathway – see exposure pathway.

Indirect Exposure Pathway - see exposure pathway.

Linearity – following a straight line.

Long-lived Radionuclide – a radionuclide with a very long half-life, possibly extending to thousands of years.

Minimum Detectable Activity - The lowest radioactivity level that can be distinguished reliably from a radioactivity level of zero.

NEPA process – The National Environmental Policy Act process requires Federal agencies to evaluate environmental impacts as part of a decision making process for proposed agency actions. The agency evaluation may result in a categorical exclusion, or reported in an environmental assessment or an environmental impact statement.

Non-detects – an analyte concentration that falls below the laboratory reporting limit. The non-detect result means the analyte is not detected at or above the laboratory reported concentration (qualified with "U") or the laboratory reported estimated concentration (qualified with "UJ").

Null Hypothesis – an initial proposition or theory set forth as an explanation for a specified phenomenon or observation. Collected data are then used to prove or disprove the null hypothesis. In the statistical language of hypothesis testing, the baseline condition is called the null hypothesis.

Outlier – a data point that is not numerically similar to the other data points in a data set or that lies outside the range of most of the data.

Potentiometric surface – the surface to which water in an aquifer can rise by hydrostatic pressure.

Preliminary Remediation Goal – initial clean-up goals developed early in the cleanup selection process based on readily available information. The PRGs are modified to reflect results of the baseline risk assessment. They also are used during analysis of remedial alternatives in a CERCLA remedial investigation/feasibility study (RI/FS).

Probability Plots – the outcome of a technique that utilizes the entire range of input data to develop a probability distribution of exposure or risk rather than a single point value. The input data can be measured values and/or estimated distributions. Values for these input parameters are sampled thousands of times through a modeling or simulation process to develop a distribution of likely exposure or risk. Probabilistic models can be used to evaluate the impact of variability and uncertainty in the various input parameters, such as environmental exposure levels, fate and transport processes, etc.

Qualitative Study/Evaluation – an evaluation or study based on non-quantitative knowledge and facts. For example, knowledge of the locations of previous spills or processes that could result in environmental contamination is part of a qualitative study or evaluation. A qualitative study or evaluation guides where quantitative data should be obtained.

Quantitative Study/Evaluation – an evaluation or study based on numerical results such as concentrations of contaminants.

Radionuclide – any radioactive isotope (form) of any element.

Radionuclide of Potential Ecological Concern (RPEC) – a radionuclide that is present at levels that might cause harmful (adverse) effects in animals or plants.

Radionuclide Ratio Characterization – Determination/characterization of the percentage (ratio) of total radioactivity that is the result of a given radionuclide. The information will be used in risk assessments to determine the percentage of the gross alpha or gross beta activity that is the result of a specific radionuclide.

Radioactive Materials – materials that emit ionizing radiation.

Receptor – people or organisms that could come into contact with hazardous substances.

Risk - the expected frequency or probability of undesirable effects resulting from exposure to known or expected stressors.

Risk Assessment – a process which estimates the likelihood that exposed people may have health effects.

Risk-based evaluation – evaluations based on protecting human health and environmental quality taking into account the expected frequency or probability of undesirable effects resulting from exposure to chemical or radiological contaminants.

Risk-based cleanup criteria – remediation goals developed by determination of $1 \times 10^{-6}$ site specific point of departure as set out in the NCP and movement off the point of departure based on CERCLA criteria.

Risk range – the CERCLA carcinogenic risk range is the cumulative carcinogenic risk from $1 \times 10^{-6}$ to $1 \times 10^{-4}$ (i.e., one cancer in one million individuals exposed to one cancer in ten-thousand exposed individuals) based on the relative maximum exposure.

Sample Density – number of samples per unit of area, such as number of samples per acre.

Screening criteria – criteria that must be met to meet specified requirements.

Sediment – topsoil, sand, and minerals washed from the land into water, usually after rain or snow melt.

Seep – a small spring, pool, or other place where ground water trickled out of the earth.

Short-lived Decay product – degraded radioactive materials, often referred to as "daughters" or "progeny" with a very short half-life.

Soil Gas/Vapor – the gaseous elements and compounds (e.g., volatile organic compounds) in the small spaces between particles of soil that can be moved or driven out under pressure. Vapor is the gas driven off by substances that are solids or liquids at ordinary atmospheric pressures and temperatures.

Spring – a pool of water that forms where groundwater flow extends above the ground surface.

Surface water – water on the surface of the earth, such as lakes, rivers, streams, ponds, and springs.

Surface Soil – for purpose of this gap analysis and risk assessment, soil that is located vertically from 0 to 6 inches below the ground surface.

Subsurface Soil – for purpose of this dap analysis and risk assessment, soil that is located vertically at depths greater than 6 inches below the ground surface.

To-Be-Considered Guidelines -- guidance, advisories, or criteria that are not promulgated (and therefore cannot be considered ARARs), but that may be used to establish protective Superfund remedies.

Transport Mechanisms – methods by which contaminants may be moved through the environment, typically air, surface water, groundwater, and uptake by plants through the soil.

Type I Error – the statistical term for false rejection decision error, which occurs when a decision maker rejects the baseline condition (null hypothesis) when it actually is true.

Normal Distribution - a theoretical frequency distribution for a set of variable data points. Also called Gaussian distribution and generally represented by a bell-shaped curve symmetrical about the mean or average value.

Type II Error – the statistical term for false acceptance decision error which occurs when a decision maker accepts the baseline condition (null hypothesis) when it actually is false.

TRIAD Approach – an integrated approach of systematic planning, dynamic work plans, and real-time measurement technologies to plan and implement data collection and technical decision-making at hazardous waste sites. The triad approach focuses on overall decision quality as the overarching goal of project quality assurance, requiring careful identification and management of potential causes for errors in decision-making (i.e., sources of uncertainty).

Volumetric Sampling – an area or volume of soil is the unit of measure rather than a concentration measure. Normally an increment of surface area is used as the sampling unit and

is excavated to a designated depth. Results of volumetric sampling are reported as mass per unit area ($mg/m^2$) or mass per unit volume ($mg/m^3$).

# Executive Summary

This document presents the results of a data gap analysis conducted to determine whether existing data and information for Area IV of the Santa Susana Field Laboratory (SSFL) are adequate for the purpose of developing and evaluating risk-based cleanup alternatives in an Environmental Impact Statement (EIS). This data gap analysis addresses the media of surface and subsurface soil, gamma walkover surveys of soil, groundwater, groundwater seeps, soil vapor, surface water, sediment, biota, air, buildings, and bedrock. The data gap analysis addresses all of Area IV and evaluates adequacy of chemical and radionuclide data.

Area IV of the SSFL was used by the Department of Energy (DOE) and its predecessor agencies for nuclear energy development and liquid metals research and related activities. Although cleanup of portions of Area IV has occurred since the early 1960s, primary cleanup work was initiated in 1988 when DOE's nuclear energy research development mission ended at Area IV. Some responsibilities for investigation and cleanup of portions of Area IV have been assigned to the Boeing Company, as it was to its predecessor companies.

In 2003 DOE issued an Environmental Assessment (EA) to address the decommissioning and demolition of its remaining facilities within Area IV. The Findings of No Significant Impact were challenged in Federal Court and the U.S. District Court Northern California District judge ruled that DOE had failed to comply with the National Environmental Policy Act (NEPA) by not preparing an EIS. Based on the judge's ruling, DOE initiated steps for preparing the EIS, including development of this data gap study intended to support the EIS alternatives evaluation.

### Scope of Data Gaps Analysis

The data gap analysis involved the assessment of a GIS data base developed by Boeing for SSFL including Area IV for soil and groundwater, the stormwater compliance data, building survey data, prior gamma walkover survey data, and air quality data. It also included the review of numerous reports and documents providing historical and sampling information for Area IV. In all more than 30,000 analytical data records and 200 reports were reviewed.

The Boeing GIS data base was formatted to allow data queries by individual chemicals and radionuclides (termed contaminants of interest or COIs for this study) by media, screening criteria, location, and other factors. For soil, screening criteria included method detection limits for all COIs, preliminary remediation goals (PRGs) for human health, ecological screening levels (ESLs) for biota (also termed ecological receptors), and background concentrations for metals, dioxins, and radionuclides. The PRGs developed for the screening were based on unrestricted land uses that address open space and rural residential considerations. For water (groundwater and surface water) results, method detection limits, tap water maximum contaminant levels (MCLs), and ESLs formed the screening criteria.

The screening criteria were used to identify those data in the GIS data base that met the requirements for conducting human health and ecological risk assessments consistent with that used under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). To identify data that would indicate the presence of chemicals and radionuclides at concentrations above screening levels, analytical detection limits were checked versus PRGs, MCLs, ESLs, and background. Data with detection limits above the screening criteria became a potential data gap because they could not be used to define nature and extent of contamination at the location where the samples were collected.

The GIS data base was also queried to determine what chemicals and radionuclides had been detected in Area IV, the frequency of detection, and the number of samples exceeding the PRG, MCL, and ESL screening criteria. This evaluation of the data base was used to identify the initial list of COI for the evaluation of data needs for the EIS alternatives evaluation. The list of COIs was also screened to determine which of the identified chemicals and radionuclides posed the greatest toxicological risk based on either concentrations or inherent toxicity of the chemical or radionuclide.

The evaluation of the suitability of the radionuclide data was conducted under principles stated in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). The MARSSIM principles were developed to assist investigators and decision makers in determining the adequacy of radionuclide data for defining radionuclide contamination cleanups. To evaluate the spacial distribution of soil sample results, Area IV was separated into sixteen exposure units (EUs) per MARSSIM. Through the determination of process history as documented in numerous reports and the distribution of samples exhibiting soil contamination, the sixteen EUs were further subdivided into survey units (SU)s that formed the basis of determining soil sampling requirements for radionuclides.

To identify the data needed to conduct human health risk and ecological risk assessments consistent with CERCLA, three conceptual site models were developed. Two of the models addressed soil pathway risks to human and ecological receptors and the third model addressed the exposure transport and fate considerations for groundwater.

Regarding Area IV chemical contamination, investigation of some chemical use areas of Area IV are ongoing under the SSFL Resource Conservation Recovery Act (RCRA) compliance program. Four RCRA facility investigations (RFIs) are in various stages of implementation for portions of Area IV. Data collected under the RFIs that meet the objectives of the data gap study will be incorporated into this data gap analysis when available to address some of the data concerns identified as part of this effort. This data gap study was conducted independently of the RFI program and any data collected under the RFI will still be considered as a data gap until the data are demonstrated to meet the needs of the data gap study.

Upon completion of the Area IV data gap analysis, a field sampling investigation will be developed and implemented to collect data and information needed for the EIS. Data sampling objectives and requirements will be presented in a Field Sampling and Analysis Plan outlining how the data gaps will be addressed.

## Data Gap Findings

Table ES-1 provides a summary of the data gap analysis findings. The text that follows provides summary details of the data needs.

**Table ES-1 Summary of Data Gap Analysis Findings**

| Media Evaluated | Data Gap |
|---|---|
| Soil | Additional chemical and radionuclide data are required for determining risks to human health and ecological receptors. Data are also required for characterization and delineation of the extent of contamination for analysis of risk-based alternatives in the *SSFL Area IV EIS*. |
| Gamma Walkover Survey | The data gap proposal is to conduct a 100% gamma walkover survey of all accessible portions of Area IV, adjacent areas identified to be impacted, drainages down gradient of Area IV, and groundwater seeps. |
| Groundwater | Data are needed to define horizontal and vertical extent of contamination, both for areas where extent is not adequately defined and in areas with no groundwater sampling data. Data on the hydrologic properties of the aquifers are also needed for evaluation of alternatives in the EIS. |
| Groundwater Seeps | Radionuclide and chemical data are needed to understand the fate and transport of groundwater contaminants and assess human and ecological receptor exposure pathways. Seeps will be sampled if water is available during the field sampling program**.** Regardless of the presence of water during the field effort, a gamma walkover survey will be performed. |
| Soil Vapor | While additional data are not required for the EIS per se, additional soil gas data may be considered in the Field Sampling Program to optimize the location of groundwater monitoring wells and to support the human health and ecological risk assessments. |
| Surface Water | Surface water quality for Area IV is currently being assessed under the SSFL's National Pollutant Discharge Elimination System (NPDES) permit. For the most part, this data is adequate for EIS purposes. Surface water chemical and radionuclide data from ponds and drainages internal to Area IV are required for assessment of risk to ecological receptors. Surface water |

**Table ES-1 Summary of Data Gap Analysis Findings**

| Media Evaluated | Data Gap |
|---|---|
| | characterization and confirmation samples will be collected during field sampling, if it is present. |
| Sediment | Sediment chemical and radionuclide data from ponds and drainages internal to Area IV are required for assessment of surface soil risk to human health and risk to ecological receptors. |
| Ecological Receptors | Biological tissue chemical and radionuclide data are required for assessment of risk to ecological receptors. |
| Air | No data gaps for air were identified. |
| Buildings | Radionuclide data for building surfaces are incomplete. Additional data for buildings are required for human health risk assessment. |
| Bedrock | Chemical and radionuclide analytical data, including aquifer physical and natural chemistry data are required. |
| Background | Accepted background data for radionuclides are needed for surface, near surface soil, and subsurface soil; metals and dioxin in subsurface soil; and radionuclides, metals and dioxin in sediment, surface water, groundwater and bedrock. These data should be collected from media in both geologic formations found at the site. |

## Soil - Chemicals

The screening of the existing data was performed on an individual constituent (chemical and radionuclide) by constituent basis. Existing data for many constituents at each study location were found to be adequate for the purpose of use in either a risk assessment or defining contamination extent. However, because some individual constituents did not pass screening criteria, many of the locations evaluated required some additional sampling due to the "data gap" introduced by specific COIs. In addition, because there is limited subsurface soil data, defining vertical contamination depth is a gap for locations with identified surface soil contamination.

For chemicals, a statistical analysis was performed for each of the 16 EUs to determine the minimum number of samples required for a risk assessment consistent with CERCLA. The number of existing valid samples was subtracted from the required number, to determine the data gap (the number of additional samples required). To determine the nature of contamination for each EU, prior data and reports were reviewed to establish chemical use areas. To evaluate the data required to determine extent of contamination, the results of the prior investigation were plotted on site maps, color coded as to whether the results exceeded background or PRGs. The plots were reviewed to determine whether the area of contamination had been bounded by data meeting the criteria. Locations that were not bounded were targeted for

additional sampling. The data gap was determined to be the difference between the statistically determined requirement and the existing data that met screening criteria. Because this approach involved evaluating a large number of use areas, this approach resulted in identification of a greater number of samples than did the risk assessment approach.

The specific requirements for collecting samples to fill the data gap will be specified in the Field Sampling and Analysis Plan to be developed for the proposed field sampling investigation of Area IV. It is expected that as part of development of the Field Sampling and Analysis Plan, proposed sample locations and depths will be refined. Sample numbers are also expected to change as part of sampling investigation development as refinements between chemical use and SU data needs are identified, overlaps in data requirements between adjacent areas are determined, and the final evaluation of data to define extent of contamination is made.

### Soil – Radionuclides

The processes for screening of samples and data gap determination for radionuclides was similar to that of the soil chemical COIs, with the exception that MARSSIM principles were used to guide the effort. For surface soil, the MARRSIM delineation used the EUs and SUs as a basis for determining the number of required samples. Under MARSSIM, the total number of samples required per SU was statistically calculated based on SU classification. The screening of the existing data determined what portions of the existing data were usable to address the sample needs and the difference between the required data and available data became the data gap. To verify that the existing data were properly located for purposes of the EIS analyses, the distribution of the results was also reviewed. The MARSSIM analysis determined that approximately 600 samples would be required to define the extent of contamination for all SUs.

### SSFL Area IV Gamma Walkover Survey

Gamma walkover surveys (GWS) are a part of the MARSSIM recommended site investigation approach for radionuclides. The GWS involves passing over the ground an instrument capable of detecting gamma emissions from radioactive materials. A GWS is performed as a field screening tool to locate areas with radionuclide contamination above background levels that then can be target areas for soil sampling. Nearly 100% of the accessible portions of Area IV have been subject to some level of ground survey in support of building removals. However, several of the surveys were not performed to MARSSIM guidelines or using recommended detection instrumentation. As part of the evaluation of existing data, reports describing the prior GWS were reviewed for compliance with MARSSIM principles. Areas with completed and acceptable surveys were identified. The data gap analysis then focused on the location of process areas where radioactive materials were used that lacked or had insufficient coverage. To date, MARSSIM-compliant walkover surveys have been completed for a total of about 9 acres. Although MARSSIM guidelines specify 100% coverage of impacted areas only (impacted areas are defined as locations with known or suspected radionuclide contamination), due to a level of

uncertainty regarding past activities within Area IV overall, the recommendation from the data gap study is to perform a 100% GWS of all accessible portions of Area IV that lack MARSSIM compliant surveys.

### Groundwater

To determine groundwater COIs, existing groundwater data were sorted by detected COIs and screened against human health MCLs (background data for groundwater do not exist) and analytical detection limits compared to the MCLs. Based on the data base screening, tritium was the most frequently observed radionuclide and the solvents TCE, 1, 2-DCE, and 1,1-DCE the chemicals most frequently observed in groundwater.

The groundwater data gap evaluation then focused on the known extent of groundwater contamination, both vertically and horizontally. Included in this evaluation was a review of process and chemical use areas and locations where solvents were reported in soil gas. Locations where groundwater contamination extent did not appear to be bounded by the existing well network or where no wells are present to identify groundwater contamination were targeted as potential data gaps. Existing hydrolgeologic data were also reviewed for use in completing groundwater characterization for both nature and extent and for understanding aquifer properties necessary to evaluate groundwater cleanup alternatives in the EIS. Based on the reviews, the data gap analysis supported recommendations for site investigative well point, new monitoring wells, and collection of aquifer properties (bedrock and water chemistry) data. The data gap recommendation will be refined during development of the FSAP.

### Groundwater Seeps

Data collected at groundwater seeps can aid in determining the fate and transport of contaminants in groundwater and to assess the potential human health and ecological exposure pathways for the respective risk assessments. However, most seeps exhibit water during and immediately following the rainy season and thus data for seeps are limited. The requirement to sample seeps will be incorporated into the field sampling investigation designed to address the overall data gaps presented in this report. Therefore, all identified seep locations will be visited during the field program and sampled for radionuclide and chemical COIs should sufficient water be present. All seep locations will also be subject to a gamma walkover survey to assess the presence of any radionuclides above background.

### Soil Vapor

Concentrations of volatile chemicals in soil (termed soil vapor) can aid investigators in locating soil and groundwater contamination sources, and volatiles chemicals in soil are a risk assessment concern due to migration of the chemicals into indoor air space. Soil vapor data exist as part of the RCRA investigations of chemical release sites which also can be used to identify chemical release locations and sources for solvents in groundwater. Investigation of some chemical use areas continues under

the SSFL RCRA investigation study. Existing and new data will be reviewed during development of the proposed field sampling investigation to evaluate whether any additional soil gas data would be required for EIS risk assessment and cleanup alternative evaluation purposes.

### Surface Water

Surface water sampling for drainages discharging from Area IV is being conducted under the SSFL NPDES permit program. Data collected under the NPDES program is deemed sufficient for site characterization for the discharge points of Area IV. However, there are internal Area IV drainages leading to ponds in other SSFL areas with limited or no data becoming a data gap. If present during the field sampling program, surface water will be collected and analyzed for radionuclide and chemical COIs. Any body of water receiving runoff from Area IV will also be proposed for sampling under the field sampling investigation. Also, to collect data on the complete list of the data gap program COIs, NPDES monitoring points will also be sampled should sufficient rainfall occur during the field sampling investigation.

### Sediment

The extent of sediment contamination associated with NPDES-monitored drainages appears to be bounded by existing sample results. However, there are internal drainages within Area IV that lack sediment data. These drainages become a data gap and will require sampling for radionuclide and chemical COIs to address both human health (as surface soil) and ecological risks.

### Ecological Receptors

Similar to the approach applied to soils for the human health risk assessment data evaluation, the existing soil data base was reviewed for chemical and radionuclide data collected from soil, sediment, surface water, groundwater seep, sump soil, and soil gas. Three screens of the data were performed including comparisons of analytical detection limits with ESLs. Chemicals and radionuclides of potential ecological concern were identified by comparing maximum concentrations in the GIS data base with ESLs. The third screening involved the comparison of ESLs with human health PRGs. This was done to evaluate the applicability of the human health soil gap requirements in addressing the ecological risk assessment needs. This third evaluation determined that the soil sampling effort proposed for the human health risk assessment would be sufficient for use in the ecological risk assessment.

The evaluation of the other media for ERA purposes indicated chemical and radionuclide data are needed for on-site drainages (water and sediment) and ponds that received runoff leaving Area IV. Data for radionuclides are also needed from groundwater seeps downgradient from Area IV to assess this pathway and risk to ecological receptors.

Biological tissue data does not exist for Area IV. To address the ecological risk evaluation of COI uptake and bioaccumulation, the ecological data gap analysis identified a need to collect biological tissue samples. This includes the need to

analyze biota tissue samples with a full range of chemical and radionuclide COIs. A total of 10 samples per biological media are recommended. These include terrestrial and aquatic plant, terrestrial and aquatic invertebrate, fish, lizard and small mammal samples. As with the proposed soil and groundwater field sampling investigation to address their respective data gaps, the data requirements will be described in the Field Sampling and Analysis Plan.

### Air

The review of air monitoring data indicates that sufficient ambient data exist for Area IV. To assess risks for the EIS relative to decommissioning and demolishing of buildings and removal of soil, building data and soil data collected during the proposed field sampling investigation will be used. Therefore no additional air sampling is proposed at this time. This finding does not include the possible need to sample air in the breathing zone of site workers involved in the field sampling investigation.

### Buildings

Reports containing data for building radionuclide characterization were reviewed to evaluate the history of use and investigation of remaining site buildings. This review determined that a limited data gap exists. This data gap consists of a need for building surface contamination data (i.e., fixed point measurements, radiological scan surveys, and removable contamination data) for about 17 buildings or structures. In addition, isotopic ratios to be applied to contaminant levels as an integral part of the preparation of human health risk assessments are not generally available for remaining buildings. The buildings to be sampled and sampling protocols will be specified in the FSAP.

### Bedrock

The analysis of bedrock sample results in the database determined that very little bedrock data have been collected to date for chemical and radionuclide COI characterization. In addition, bedrock aquifer properties are needed for groundwater cleanup remedy evaluations. Therefore bedrock data are a data gap for completing Area IV site characterization. Bedrock samples will be required at locations where chemical and radionuclide vertical extent of contamination is needed and from borings for wells drilled into bedrock. The locations and evaluations of bedrock samples will be described in the Field Sampling and Analysis Plan.

### Background

Background values for metals and dioxin in soil have been agreed upon by regulatory agencies for SSFL, although there is not a similar set of background values for subsurface soil. The radionuclide background used for this data gap analysis was based on existing offsite surface soil data. These data may be useful for establishment of agreed upon future radionuclide background values. However, establishment of separate background values for each of the two geological formations is desirable and additional surface soil data may be useful for that purpose. Also, there currently is no

background data for radionuclides at depth for near surface and subsurface soils, sediment, rocks, surface water, and groundwater. Therefore, the data gaps include additional background sample analysis for radionuclides and chemicals for these matrices.

# Section 1
# Introduction

This Area IV Santa Susana Field Laboratory (SSFL) *Data Gap Analysis Report* was prepared by CDM, A Joint Venture (CDM) under U.S. Department of Energy (DOE) Contract No. DE-AM09-05SR22404, Task Order No. DE-AT30-08CC60021/ET17. Technical support was provided to CDM in the preparation of this report by Science Applications International Corporation (SAIC).

The primary objective of the Area IV SSFL data gap analysis is to identify the data necessary to evaluate a full range of risk-based alternatives in an Environmental Impact Statement (SSFL Area IV EIS) that will address the final decommissioning, demolition, and environmental cleanup of Area IV. Data requirements to conduct human health and ecological risk assessments will be addressed in a subsequent field investigation and sampling program. The scope of the data gap analysis incorporates all media: surface and subsurface soil, surface water, groundwater, air, biota (ecological), and structural (building) material.

## 1.1 Organization of Area IV SSFL *Data Gap Analysis Report*

This report contains the following sections and information describing the processes used to develop and evaluate the Area IV database for conducting human health and ecological risk assessments for ultimate evaluation of a range of cleanup alternatives in the SSFL Area IV EIS.

### Section 1 – Introduction

Section 1 of the *Data Gap Analysis Report* provides a description and history of the site; discusses stakeholders, regulatory drivers, objectives of the study; the overall approach to the gap analyses; and the organization of the document.

### Section 2 – Area IV Background and Description

Section 2 presents details on the location and physical setting of Area IV and summaries of past and ongoing investigations in Area IV. This section also describes the sources of data used in evaluating data adequacy for Area IV.

### Section 3 – Data Gap Analysis Methodology

Section 3 describes the methodology used to evaluate the existing database for adequacy and the overall Data Quality Objectives for the data gap study. This section includes human health and ecological conceptual site models and the origins of the screening criteria used in the initial evaluation of the data. It also defines the overall data gap approach, media evaluated, screening process, development of exposure units, and methods used to identify data gaps for each media.

### Section 4 – Data Gap Study Results

Section 4 presents the results of the data gap study by media: soil, groundwater, ecological receptors, buildings, and air.

### Section 5 – Summary and Conclusions

Section 5 summarizes the findings of the data gap analysis, identifies data needs, and introduces the sampling requirements for the proposed field sampling program.

### Section 6 – References

Section 6 presents the references used to develop this report.

### Appendix A – Area IV General Chemical Use Overview

Appendix A provides a summary of past and current Resource Conservation and Recovery Act (RCRA) (*42 U.S. Code [U.S.C.] 6901 et seq.*) facility investigations addressing chemical contamination associated with several of the current and past Area IV facilities. Appendix A Table A-1 was used to support an understanding of process history and current conditions relative to chemical contamination in Area IV.

### Appendix B – Historical Site Assessment Summary

Appendix B provides a summary of the historical use and current conditions of buildings and facilities that once were used in Area IV. This information was used to establish an understanding of the process history and likelihood of contamination at any of the 200 facilities that once were present in Area IV, particularly in relation to radionuclides.

### Appendix C – Radionuclide Background Sources

Appendix C provides a discussion of the natural and manmade sources of background radionuclides in Area IV. This information is used to support derived background screening values for radionuclides.

### Appendix D – Statistical Evaluation of Radiological Background Distribution

Appendix D provides Statistical P plots that demonstrate the distribution of background levels of radionuclides in Area IV. This information is used in support of derived background screening values for radionuclides.

### Appendix E – Ecological Risk Data Gap

Appendix E contains tables with parameter values for radionuclides used to determine the internal and external radiological dose to ecological receptors. These parameters are used to calculate ecological preliminary remediation goals (PRGs) for radionuclides, which are used as screening benchmarks. Appendix E also contains the results of screening of soil by depth versus ecological PRGs.

### Appendix F – Chemical Contaminant of Interest Distribution Maps

Appendix F provides chemical distribution maps for each contaminant of interest (COI) chemical class (e.g., metals, volatiles, PCBs, etc.) in each exposure unit. These maps were used to evaluate the required number of additional samples needed to characterize and delineate known or potentially contaminated soil in Area IV.

### Appendix G – MARSSIM Radionuclide Evaluation Results

Appendix G presents the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)-based statistical evaluation of Area IV. The MARSSIM provides the standard protocols for conducting radiological surveys as would be required for a final site status survey. This Appendix is being provided for informational purposes only and the findings do not represent what is necessary to conduct risk based evaluation of alternatives in the SSFL Area IV EIS.

### Appendix H – Update to PRGs

Appendix H provides the calculations used to update the EPA Region 9 generic risk-based PRGs to account for CalEPA toxicity values. In addition, residential PRGs were updated to incorporate the exposure pathway of ingestion of homegrown fruits and vegetables that was identified for residents in the site conceptual model (Section 3.0).

### Appendix I - Chemical Data Gap Analysis Results for Soil

Appendix I provides tables summarizing and detailing the results of the chemical data gap analysis for soil. The data gaps (or difference between the minimum number of samples required and sample results meeting screening criteria) required for a risk-based approach (evaluated at an exposure unit level) are shown in the tables for two exposure use scenarios (residential and rural residential) for two soil intervals (0 to 2 feet and 2 to 10 feet). The appendix also includes the data gap determined after review of contaminant distribution maps to identify the locations of additional samples needed to adequately characterize and determine the lateral and vertical extent of contamination for use in an EIS evaluation of alternatives.

## 1.2 Area IV SSFL Site Description and History

The SSFL is located in southeastern Ventura County, California, and consists of approximately 1,153 hectares (2,850 acres) near Simi Valley (**Figure 1-1**). The SSFL is separated into four administrative areas (**Figure 1-2**). The Boeing Company (Boeing) owns all of Area I, except for 42 acres that are owned by the National Aeronautics and Space Administration (NASA). Area II is owned by NASA and operated by Boeing; and Boeing owns and operates Areas III and IV (DTSC 2008). Areas I, II, and III were used by predecessors of Boeing, NASA, and the Department of Defense (DOD) for rocket engine and laser testing. Environmental contamination resulting from those activities is the responsibility of Boeing and NASA and is not part of the scope of the data gap analysis. A 90-acre portion of Area IV is leased by DOE and is the subject of this data gap study. The proposed SSFL Area IV EIS will address all 290 acres of Area IV and any adjacent areas impacted by Area IV activities.

Until its closure, DOE was responsible for operation of the Energy Technology Engineering Center (ETEC) located in Area IV. As ETEC did not have specific boundaries within Area IV, it represented a group of facilities owned by DOE and used for nuclear research and other experimental activities.

From the mid-1950s until the mid-1990s, DOE and its predecessor agencies were engaged in or sponsored nuclear operations including the development, fabrication, disassembly, and examination of nuclear reactors, reactor fuel, and other radioactive materials. Associated experiments included large-scale sodium metal testing for fast breeder reactor components. Nuclear operations at ETEC included 10 nuclear research reactors, 7 critical facilities, the Hot Laboratory, the Nuclear Materials Development Facility, the Radioactive Materials Handling Facility (RMHF), and various test and radioactive material storage areas. In addition to the handling and processing of radioactive materials, these DOE facilities also used non-radioactive chemicals and other hazardous materials (e.g., polychlorinated biphenyls [PCBs], solvents, and lead-based paints) in their operations.

All nuclear research in Area IV was terminated in 1988, when DOE shifted its focus at SSFL from research to decontamination and decommissioning activities. Decontamination and decommissioning of the sodium test facilities started in 1996, when DOE determined that the entire ETEC facility was surplus to its mission. At that time, DOE began formal closure of its facilities in Area IV and began cleanup activities in preparation for returning the property to Boeing. Under contract with DOE, Boeing is responsible for decontamination and demolition of the ETEC buildings.

Prior to 2000, DOE used its authorities under the Atomic Energy Act of 1954 to decontaminate and demolish DOE structures and facilities in Area IV, and used a categorical exclusion under the National Environmental Policy Act (NEPA) (*42 U.S. Code [U.S.C.] 4321] et seq.*) to address the environmental impacts of cleanup and removal of the structures. In 2000, DOE changed its policy regarding NEPA coverage of its actions and elected to prepare an Environmental Assessment (EA).

In January 2002, DOE issued the *Draft Environmental Assessment for Cleanup and Closure of the Energy Technology Engineering Center* (*ETEC EA*). DOE received comments on the *ETEC EA* from the U.S. Environmental Protection Agency (EPA), the State of California, local communities, and local citizens. Primary issues raised by the commentors were: the cleanup of Area IV should address Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (*42 U.S. Code [U.S.C.] 9601 et* seq.) risk-based considerations, Area IV had not been adequately characterized for purposes of remedy evaluation and selection, and DOE should prepare an EIS addressing environmental effects.

The DOE determined that the *ETEC EA* adequately addressed the environmental effects, prepared a Finding of No Significant Impact (FONSI) based on its analyses,

and issued the Final *ETEC EA* in March 2003. The DOE then reinitiated decontamination and demolition activities for the remaining facilities.

In October 2004, environmental groups and the City of Los Angeles challenged the FONSI in Federal court, and the court ruled in favor of the plaintiffs (DTSC 2008). In May 2007, the U.S. District Court of Northern California ruled that DOE's decision to issue a FONSI and conduct cleanup and closure on the basis of the *ETEC EA* was in violation of NEPA. In compliance with the judge's ruling, DOE initiated steps for preparing the SSFL Area IV EIS and elected to stop demolition of structures until completion of the EIS process. As part of this decision, DOE also elected to conduct a data gap analysis to evaluate the existing database and data necessary to address CERCLA risk-based considerations for evaluation of cleanup alternatives.

Although DOE has discontinued decontamination and demolition of the remaining facilities, it will continue surveillance, maintenance, monitoring and investigation activities, including investigation of soil and groundwater, as required under State of California Department of Toxic Substances Control (DTSC) regulations, until completion of the SSFL Area IV EIS.

## 1.3 Stakeholders

Stakeholders involved in the review of Area IV SSFL cleanup decisions, the cleanup approval process, or who have a strong interest in the outcome of the cleanup decision, include: Boeing, NASA, EPA, certain American Indian Tribes and Tribal organizations, the State of California, local communities, public interest groups, and individual members of the public.

### Boeing

Boeing owns the land on which the DOE facilities are situated. Following decontamination, demolition, and cleanup, surface use of the land will be returned to Boeing. Boeing's mission in Area IV is in its final months, and Boeing is in the planning process of removing unnecessary facilities. Following the overall cleanup of Area IV of the SSFL, Boeing has indicated plans to transfer the land to the State of California for use as open space.

### NASA

This agency is in the process of investigating and cleaning up contamination on land it owns in Areas I and II under RCRA and administered by DTSC. NASA, like Boeing, is in the final days of its mission at SSFL and is evaluating removal of unnecessary facilities.

### EPA

The EPA is the Federal agency responsible for enforcing Federal hazardous waste laws, including rules promulgated under CERCLA. In addition, EPA has primary responsibility for the review of NEPA decisions made by other Federal agencies, thereby giving it a role in review of DOE decisions related to Area IV of the SSFL.

Though it does not have lead regulatory authority over radiological cleanup at the site, in 1989 (at the request of local community members and elected officials), the EPA became involved in the investigation of radiological soil contamination at SSFL (DTSC 2008). In 2003, EPA evaluated the ETEC site in Area IV for inclusion on the National Priority or "Superfund" list and decided conditions did not warrant the action. However, in 2007, following another evaluation, EPA recommended to the Governor of California that the entire SSFL site be placed on the Superfund list. The final decision is still pending (DTSC 2008). In addition, the California Secretary for Environmental Protection has requested that the U.S. EPA take the lead role in the EPA/DOE radiological characterization survey, provide technical assistance to DTSC in radiological contamination evaluation at the site and in its comprehensive study to establish background values for chemical and radiological contaminants at the site, and other related activities (DTSC 2008).

Under Congressional HR 2764, DOE and EPA have been instructed to develop and implement a joint radionuclide investigation of Area IV. Both agencies are currently in technical discussions regarding the scope of the investigation and the roles of each agency in conducting the investigation.

## American Indian Tribes and Tribal Organizations

Tribes will be notified and consulted with as appropriate under applicable laws and regulations and in compliance with DOE's *American Indian & Alaska Native Tribal Government Policy*.

The Chumash Indians were the original inhabitants of Simi Valley, as long as 10,000 to 20,000 years ago (DTSC 2008). A number of sites in the area, including the Burro Flats Cave and surrounding property, have cultural significance to the Chumash and other Tribes. This site and others in the San Fernando Valley area are also of interest to Tribal groups such as the Native American Heritage Commission. Boeing is working with these organizations to identify cultural sites and concerns (Rowe 2008). In addition, Burro Flats has been placed in the Federal and California State historical registers by a number of documents (Rowe 2008). For example, on July 5, 1976, Burro Flats Painted Cave was registered with the California Office of Historic Preservation (CAOHP 2008).

## State of California

At present, Boeing and the State of California are conducting discussions regarding future land use and transfer of SSFL following cleanup. The State at present is the most likely recipient of the land following cleanup. The SSFL Area IV EIS will consider transfer of the land to the State as open space (parkland) as one of the remedial action scenarios.

### *California Department of Toxic Substances Control*

DTSC has regulatory authority over chemical waste investigations at SSFL including the authority to enforce the Federal RCRA requirements in California. It has the

responsibility for oversight and approval of RCRA-related cleanup actions, including those necessary for Area IV.

***California Department of Public Health***

The California Department of Public Health (CDPH) is the state agency with responsibility for oversight of radioactive material cleanup and monitoring at non-DOE facilities. California is an "Agreement State" and has assumed regulatory responsibility over certain byproduct, source, and small quantities of radioactive materials. This authority was conveyed to the State by the U.S. Nuclear Regulatory Commission (NRC) under Section 274b of the Atomic Energy Act of 1954, as amended, which also mandates that Agreement States administer radiation control programs that provide adequate protection of public health and safety in a manner compatible with NRC's regulatory programs. Because the predecessor company to Boeing licensed radioactive materials with the state, CDPH has been involved in oversight of cleanup actions. The DOE has requested CDPH concurrence on the release of former nuclear facilities in Area IV.

### Local Communities

Local communities in the vicinity of the site including Simi Valley, Chatsworth, Canoga Park, and West Hills have strong interests in the cleanup of Area IV. In addition to the condition of the land following cleanup, their concerns include risks during cleanup, including the transport of materials through their communities.

### Public Interest Groups

In addition to local citizenry and their elected officials, several local and national public interest groups have expressed an interest in issues related to the cleanup of Area IV, including, but not limited to: Cleanup Rocketdyne, Committee to Bridge the Gap, National Resources Defense Council, Rocketdyne Cleanup Coalition, Rocketdyne Watch, Save Open Space, and Southern California Federation of Scientists (DTSC 2008).

## 1.4 Regulatory and Legal Drivers

The investigation, decontamination, demolition, and cleanup of Area IV must comply with many Federal and state rules and regulations. The relationship of these rules and regulations, and the manner in which DOE complies with them, will be described in detail in the SSFL Area IV EIS. The following subsections summarize the basic relationship of applicable rules and regulations to the data gap analysis.

### 1.4.1 Atomic Energy Act

The Atomic Energy Act (42 *U.S. Code* [U.S.C.] 2011 *et seq.*) provides DOE with the authority for establishing a comprehensive health, safety, and environmental management program for its facilities. The DOE Orders relative to this act establish DOE's policies, programs, and procedures for the investigation, cleanup, and final transfer of excess DOE property.

### 1.4.2 Comprehensive Environmental Response, Compensation, and Liability Act

Administered by EPA, CERCLA provides broad Federal authority to directly respond to actual or threatened releases of hazardous substances that may endanger public health and the environment. The Act establishes policies and procedures for the cleanup of contaminated historic or inactive sites, or sites where contamination occurred prior to enactment of RCRA that require the application of risk-based cleanup criteria as the basis for conducting cleanup actions protective of human health and the environment. Federal agencies typically follow CERCLA when conducting cleanup activities. As agreed upon in a Memorandum of Agreement signed by EPA and DOE in May 1995, it is DOE's policy to conduct cleanup of its facilities in a manner consistent with CERCLA.

### 1.4.3 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act governs the management of chemicals from their creation through disposal and the cleanup of chemical (non-radioactive) contamination at active facilities. California DTSC has been granted authority by EPA to implement RCRA within the State. In August 2007, DTSC issued a Consent Order to DOE, Boeing, and NASA for investigation and cleanup of chemical contamination throughout the SSFL facility under RCRA. DOE managed RCRA-permitted facilities and is in the process of closing those facilities in accordance with RCRA. In addition, four RCRA groupings (Groups 5, 6, 7, and 8) in Area IV are part of the Consent Order and are under investigation by Boeing. Cleanup of chemical wastes associated with DOE facilities in Area IV will need to comply with California RCRA procedures.

### 1.4.4 California Radioactive Material Regulations

As an Agreement State under the provisions of the Atomic Energy Act, CDPH has oversight authority of the cleanup of radioactive materials. Cleanup and release of facilities with radioactively-contaminated materials must be performed in accordance with California regulatory standards. The DOE must consider these standards as part of the decontamination and decommissioning of Area IV facilities.

### 1.4.5 National Environmental Policy Act

This Act provides for the disclosure to the public of environmental effects resulting from a decision being made by a Federal agency. It requires public participation in the identification of alternatives to a proposed action, discussion of the effects, and evaluation of mitigation measures to reduce adverse effects. Alternative development, identification of a proposed action, and public involvement aspects of NEPA are similar to those of CERCLA. The EPA, through the Council for Environmental Quality, has authority for review of implementation of NEPA.

### 1.4.6 Clean Water Act

The Clean Water Act (*33 U.S. Code [U.S.C.] 1251 et seq.*) establishes criteria for the protection of surface water, groundwater, and drinking water, including criteria for

stormwater runoff. Cleanup of Area IV must consider water quality criteria. The CDPH is responsible for protection of drinking water supplies. The Los Angeles Regional Water Quality Control Board (Board) is responsible for regulating surface water discharges at the SSFL overall, including Area IV. Under the National Pollutant Discharge Elimination System (NDPES), the Board has set the maximum limits for contaminants in stormwater discharges from the SSFL, including monitoring and reporting requirements.

### 1.4.7 Safe Drinking Water Act

The Safe Drinking Water Act (*42 U.S. Code [U.S.C.] 300(f) et seq*.) establishes, among a number of requirements, Maximum Contaminant Levels (MCLs) for concentrations of organic and inorganic chemicals in drinking water. Because groundwater is a source of drinking water for many areas of the country, MCLs are a consideration for assessing groundwater quality relative to contaminant concentrations and CERCLA remedy evaluations.

### 1.4.8 EPA's Office of Radiation and Indoor Air

The EPA is the lead agency responsible for enforcing provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) related to radionuclides. Although Area IV is no longer used for nuclear research, decontamination, demolition, and cleanup of Area IV must be conducted in compliance with NESHAPs.

### 1.4.9 Endangered Species Act

The Endangered Species Act of 1973 (ESA) (*16 U.S. Code [U.S.C.]1531 et seq.)* protects endangered or threatened species through conservation of their ranges and the ecosystems on which they depend. Specifically, the ESA authorizes the listing of species as threatened or endangered and prohibits the taking, possession, sale, or transport of listed species without authorization. In addition, the ESA requires the federal government to establish critical habitats for all listed species. Critical habitats are those defined as being specific areas occupied by a species at the time it is listed that have an important resource or areas that could be essential for conservation. The site must be evaluated to determine if any endangered or threatened species are or could be present on the site or if any portion of the site has been designated as critical habitat for one or more listed species.

## 1.5 Relationship of NEPA and CERCLA

The National Environmental Policy Act was established to allow public review and input on any Federal decision that could affect the quality of the human and natural environments. In a NEPA document such as the one proposed for Area IV, impacts resulting from the proposed project, and alternatives to the proposed project, are analyzed in relation to the purpose and need for the project. This assessment focuses on the implementation, effectiveness at addressing the purpose and need, and the impacts of the project. The NEPA process includes an extensive public comment program that includes input during the scoping phase of the project, alternatives,

impacts, and final decision regarding the project. The *SSFL Area IV EIS* will also serve to address the components of a CERCLA feasibility study, as described below.

As stated earlier, CERCLA was established to address the cleanup of chemically-contaminated sites, particularly sites that did not have a solvent responsible party that could finance the cleanup. CERCLA establishes the process for cleanup from discovery, investigations, cleanup standard and remedy evaluation, identification and implementation of the protective cleanup action, and finally through Final Closeout reporting. The evaluation of remedy alternatives is similar in some aspects to a NEPA alternative assessment in terms of effectiveness and implementability although NEPA typically does not address the costs of a proposed project. CERCLA remedy alternative evaluations are focused on the protectiveness of the alternatives relative to cleanup standards, and impacts are addressed through compliance of the action with environmental regulations. The remedy evaluations are presented in a document called the feasibility study. Similar to NEPA, CERCLA incorporates a public involvement program during which the Proposed Plan (the description of the proposed cleanup action and alternatives) is presented to the public, giving them an opportunity to comment on the proposed CERCLA action.

A significant difference between the CERCLA feasibility study evaluation of a project and the NEPA impact analysis of a project is that NEPA requires a more detailed analysis of the effects of an action on the physical, natural, and human environments, including addressing socioeconomic effects. Although implementation of a CERCLA action must comply with rules and regulations, the NEPA document provides greater detail on how compliance is achieved including an evaluation of mitigation measures that would reduce environmental impacts.

## 1.6 Data Gap Study Objectives

The most important objective of the data gap study is the identification of radiological and chemical data necessary for the evaluation of a full range of cleanup alternatives in the *SSFL Area IV EIS.* The data gap study reflects concerns and comments received on the *ETEC EA*. These comments and their relevance to the data gap analysis are summarized below.

### 1.6.1 Risk-Based Decision

The cleanup alternatives evaluated in the *ETEC EA* were derived through a dose evaluation using 15 millirem/year and 0.05 millirem/year as the risk-based standard. Comments received on the *ETEC EA* indicated that DOE should be using a CERCLA-based risk evaluation incorporating media concentrations and the CERCLA $1 \times 10^{-4}$ to $1 \times 10^{-6}$ risk range, with $1 \times 10^{-6}$ being the departure point for cleanup decisions. DOE has agreed to change the risk basis for cleanup alternatives evaluation to reflect CERCLA. This requires media concentration data for surface soil, subsurface soil, bedrock, surface water, groundwater, air, building material, and biota. The purpose of the data gap analysis is to evaluate existing Area IV data for adequacy in performing a risk assessment consistent with CERCLA and to identify data that is

lacking. The DOE has determined that its cleanup of Area IV would address, among a range of alternatives, unrestricted reuse of property it once occupied. Therefore, existing data and new data must be compatible with unrestricted land use risk criteria.

### 1.6.2 Multi-Chemical/Radionuclide and Pathway Assessment

Commentors noted that the risk assessment needs to incorporate the potential risks of the combined exposure to chemicals and radionuclides via multiple exposure pathways. Pathways include contact with soil, soil consumption, inhalation of soil particles, consumption and use of groundwater, and consumption of fruits and vegetables grown at the site. The multi-chemical and multi-pathway assessment requires an evaluation of all chemicals and radionuclides of concern and all media.

### 1.6.3 Senate Bill 990 Consideration

California Senate Bill (SB) 990 prohibits the sale, lease, sublease, or transfer of land associated with the SSFL (including Area IV) until the Director of the DTSC certifies that the land has undergone complete remediation pursuant to the applicable standard. The standard identified in SB 990 is cleanup to agricultural land reuse. The SSFL Area IV EIS will evaluate a rural residential risk assessment scenario [incorporating locally grown fruits and vegetables as a portion of the resident's diet] to address this land use consideration. Therefore, soil, plant uptake, and animal tissue data are needed to assess that risk pathway.

### 1.6.4 Ecological Risk Concerns

Comments received on the *ETEC EA* stated that it did not address risk to ecological receptors and endangered species from decontamination and demolition activities. Baseline data for assessing the risk to ecological receptors in or using Area IV do not exist and thus become a data gap for the SSFL AREA IV EIS evaluations.

### 1.6.5 Groundwater

The alternatives considered in the *SSFL Area IV EIS* will be evaluated for effectiveness of cleanup and its impact on all Area IV media, including groundwater. Comments received by DOE indicate that groundwater may not be sufficiently characterized to support the evaluation of cleanup alternatives. Another objective of the data gap analysis is to review existing groundwater data for chemicals and radionuclides of concern and determine what additional data are necessary for cleanup evaluations in the *SSFL Area IV EIS*.

### 1.6.6 Building Materials

Commentors stated that risks of demolition and transport of buildings containing radionuclides were not adequately addressed in the *ETEC EA*. An additional objective of the data gap analysis is to review existing radiation level data for Area IV structures and to identify any additional information for buildings needed to address this potential risk in the *SSFL Area IV EIS*.

# 1.7 Data Gap Analysis Approach

Two approaches were used in the evaluation of data needs for determining the CERCLA risk assessment and remedy evaluation requirements for the *SSFL Area IV EIS*. These approaches are illustrated in **Exhibit 1-1**. The first approach involved identifying the data needed for identification of the nature and extent of contamination (i.e., identification of COIs, distribution of COIs, and volume of media affected) throughout Area IV and the data needed to evaluate remedial actions (e.g., groundwater properties) in the SSFL Area IV EIS. In addition to assessing adequacy of the data to perform a CERCLA risk assessment, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)[1] approach was followed to provide a statistical basis for radionuclide sample number and density. The evaluation of existing Area IV data and information for use in a CERCLA risk assessment was a multi-step process with some steps being implemented concurrently. The processes used to assess existing data adequacy and the data needed to conduct the CERCLA risk assessment evaluations in the *SSFL Area IV EIS* are summarized below.

## 1.7.1 Media of Interest

Throughout the body of this text, various media are discussed including, but not limited to: surface soil, shallow subsurface soil, subsurface soil, rock, weathered bedrock, sediment, sump media, seep water, stormwater, surface water, groundwater, terrestrial biota, aquatic biota, air, structural building materials, and building surfaces. The specific description and definition used is subject-specific and dependent on the target medium to be sampled, the exposure pathway, etc. For example, for human health risk analysis, Area IV (onsite) sediment is generally regarded indistinguishable from soil. This may not be the case for biota that may be more prone to exposure to temporary, seasonal, or highly localized sediment deposits in and surrounding Area IV.

## 1.7.2 Database Development

The Area IV data used to conduct the data gap analysis for soil and groundwater were provided by Boeing in an electronic database or in data reports. The data received from Boeing were reviewed for consistency and completeness of fields. Some reformatting of the data was necessary for use in the data gap analysis. Air and building data were compiled from reports. The data included results for samples analyzed for radionuclides and chemicals (inorganics and organics) collected from Area IV as part of investigation and cleanup activities.

## 1.7.3 Development of Screening Criteria

Following the reformatting of the database for consistency of fields, screening criteria were developed to determine the applicability of the data for human and ecological risk assessments. The purpose of the screening criteria was to identify portions of the

[1] The MARSSIM approach was developed to identify the data requirements supporting closure and transfer of a facility that used radioactive materials. The approach may over estimate the numbers of samples required for a CERCLA risk assessment. See Appendix G for further details.

existing data that would be directly applicable for defining nature and extent of contamination consistent with CERCLA risk assessment guidelines.

Human health and ecological conceptual site models were developed to identify pathways and receptors to be addressed in the risk assessments and for which screening criteria are needed. Screening criteria included human health PRGs developed by EPA (with some modifications to address California criteria), MCLs for drinking water, ecological screening values for biological resources, and background concentrations for radionuclides and inorganic chemicals.

Screening criteria for background came from two sources. Background concentrations for radionuclides were derived from the background database developed by Boeing [see Appendices C and D]. For the screening of radionuclides against background, the background dataset developed by Boeing was statistically evaluated to remove outliers and any samples collected within the SSFL and adjacent buffer zone. The remaining values were incorporated into the background dataset. Background for inorganics was derived from the *Soil Background Report for SSFL*, dated September 2005, that was approved by DTSC as Appendix D of the *Standard Risk Assessment Methodology (SRAM) Work Plan Revision 2, Final* (September 2005).

## 1.7.4 Screening of Database and Identification of Contaminants of Interest

The Area IV database contains thousands of records for a wide range of analytes (radionuclides, inorganic chemicals and metals, and organic chemicals). All analytes in the Area IV database and some analytes that may be present based on process knowledge (but are not explicitly named in the database) are identified initially in this data gap analysis as COIs. A COI is a chemical or radiological analyte that potentially could contribute to contamination of any identified medium regardless of whether it was actually detected. The SSFL Area IV EIS will utilize the existing COI data, and any data collected as a result of the pending field effort, to identify contaminants of potential concern (COPCs), eventually leading to a list of contaminants of concern (COCs) that will be the focus of risk assessments and the subject of the cleanup decision-making process. All potential chemicals and radionuclides were subjected to the review performed under this data gap analysis regardless of adverse human health or environmental exposure potential.

The next step of the data gap analysis was comparing the formatted Boeing data with the screening criteria. The first screening included all data for Area IV. The database was queried to identify all analytes that exceeded any of the screening criteria or background levels. Any analyte exceeding a screening criterion was considered a COI for further evaluation and investigation as part of the data gap analysis.

Part of the screening effort was an evaluation of detection limits for analytes reported in the database versus the screening criteria. Sample results for any analyte that was not detected at a level above its respective screening criteria was not considered valid for use in the data gap analysis. Therefore, any analyte with an elevated detection

limit above the screening level, the result was not used as evidence that the analyte was not present at the location sampled. Screening was performed for soil and groundwater data.

## 1.7.5 Soil Data Evaluation

### 1.7.5.1 Evaluation of the Distribution of Soil Contaminants of Interest

Area IV has been divided into 16 EUs ranging between 17 and 20 acres that were based on process history, land use, and other characteristics (**Figure 1-3**). The list of chemical and radionuclide COIs developed as part of the initial screening effort was used to identify the distribution of the COIs across Area IV based on the 16 exposure units. Sorting the database by EU and plotting the data aided in displaying the density of prior sampling and the locations where COIs exceeded screening criteria. This was the first step in identifying areas exhibiting contamination and the amount of available data defining the extent of contamination. This evaluation also included the relative depth at which the sample was collected (i.e., surface or subsurface).

### 1.7.5.2 MARSSIM-Based Approach and Limitations for Radionuclides in Soil

The MARSSIM provides detailed guidance for planning, implementing, and evaluating the results of environmental and facility radiological surveys that have been conducted to demonstrate compliance that remedial objectives have been met (DOE et al. 2000). The MARSSIM was designed to apply to final status surveys, but the principles may be adapted and used as guidance for application to site characterization surveys. MARSSIM principles were adapted and used in this gap analysis for evaluating soil, water, and building radiological data requirements necessary for the evaluation of risk-based alternatives in the SSFL Area IV EIS.

The exposure units described above were further subdivided into survey units (SUs) based on MARSSIM definitions for Class 1, Class 2, and/or Class 3 areas. The review of existing data and process history was used to support the classifications. A Class 1 designation was used for areas with the highest potential for exhibiting levels of contamination exceeding risk-based cleanup criteria based on existing data or known process history (i.e., known history of radioactive material use). A Class 2 designation was used for areas with potential process use, but with a lower potential to exhibit contamination above risk-based cleanup criteria. Finally, a Class 3 designation is used for areas that, based on land use records and environmental data, would have limited potential to exhibit soil or water contamination. See **Figure 1-4** for an example of SU delineation for one EU within Area IV.

The MARSSIM utilizes a graded approach that focuses on radiation surveys and volumetric sampling in the areas with the highest contamination potential. That is, radiation surveys are more intense and sample densities are highest when the potential for contamination is also the highest. Data quality objectives and statistical parameters (such as the standard deviation of residual concentrations) are used to determine the number of samples required for the investigation. MARSSIM then

suggests limits on the investigation area (e.g., in acres) over which the number of samples is applied to help focus the investigation.

Since MARSSIM was applied in this data gap analysis as a tool for the design of a characterization survey for the SSFL Area IV EIS, and not as a final status survey for property transfer determination, some modifications to the MARSSIM process were incorporated into the data gap evaluation. A characterization survey is a detailed radiological environmental investigation focused on determining whether cleanup may be necessary. The primary objectives of a characterization survey according to MARSSIM are to:

- determine the nature and extent of the contamination
- collect data to support evaluation of remedial alternatives and technologies
- support Remedial Investigation/Feasibility Study requirements (for CERCLA) or Facility Investigation/Corrective Measures Study requirements (for RCRA).

Therefore, the MARSSIM-recommended size limitations and resulting sample density were modified by using a sample density that is a factor of four lower for Class 1 and Class 2 areas than would be defined by MARSSIM by survey unit size limits for final status survey. This sample density was determined appropriate to collect the required data for conducting a risk assessment for a representative exposure area. This adaptation of MARSSIM allows the sample density to continue to be proportional to the potential for contamination and sufficiently conservative to address CERCLA risk assessment data needs requirements.

The data gap analysis assessed the quantity and quality of radiation surveys and sampling data in these SUs. Recommendations as a result of this gap analysis, collection of additional data, if any, for the evaluation of risk-based alternatives in the SSFL Area IV EIS have been identified.

The MARSSIM recommends gamma walkover surveys (GWS) for the purpose of delineation of the extent of contamination and identifying elevated areas of contamination for sampling. The GWS coverages recommended by MARSSIM include a target of 100 percent coverage for Class 1 areas and 10 to 100 percent for Class 2 areas. The MARSSIM does not identify a GWS density for Class 3 areas.

Existing site buildings were also subject by this approach per MARSSIM guidelines. Classification is possible based on process history alone (and some analytical data). For the purposes of the SSFL Area IV EIS, data for the buildings will be needed to analyze risks resulting from building demolition, soil excavation, and waste transportation. Building data needs were evaluated per MARSSIM guidelines, to the extent practicable.

The MARSSIM guidelines apply to surface media and are not necessarily intended for use with subsurface contamination (i.e., subsurface soils cannot be field screened

using standard GWS instrumentation because the overlying surface soil absorbs the subsurface emissions) (DOE et al. 2000). However, the MARSSIM SU classification can still be used for assessing the potential for contamination. Therefore, sampling requirements for subsurface soils were evaluated based on SU process history especially where existing data was limited.

## 1.7.6 Bedrock

The GIS database was reviewed for data providing information on chemicals and radionuclides in bedrock. Bedrock data were determined to be limited and thus evaluation of bedrock related to process areas and hydrogeologic properties was determined to be a data gap for purposes of defining nature and extent of contamination at SSFL Area IV.

## 1.7.7 Groundwater

Although the screening of the groundwater data was a process similar to that used for screening soil data (i.e., use of screening criteria including MCLs, tap water PRGs, and detection limits to identify COIs and usable data), a different process was used to determine the adequacy of the database for use in the cleanup alternative evaluation. The well network was evaluated in terms of distribution, defining plume extent and relationship to potential sources. Soil and soil gas data were considered as part of the groundwater contaminant source evaluation. The site hydrogeologic model developed by Boeing was reviewed and assessed in relation to the understanding of contaminant fate and transport mechanisms. Hydrogeologic information such as pump test data was also reviewed as part of the data assessment in order to determine groundwater remedy evaluation needs for the SSFL Area IV EIS.

## 1.7.8 Seeps

Groundwater seeps have been identified by prior investigators at locations downslope from Area IV. Some seeps have been sampled and data exists for water quality. The origin of the seeps as to whether they are expressions of shallow groundwater resulting from rainfall or are connected to deeper groundwater is not known. This data gap analysis involved a cursory review of the seep data and locations and seep definition remains a data gap concern. It is important to note that because the investigation record indicates that seeps are only present in the rainy season, sampling of seeps, like surface water, is an opportunistic activity. Other investigative measures, such as borings into bedrock, may be necessary to determine any connection between seeps and Area IV groundwater.

## 1.7.9 Surface Water and Sediment

The entire SSFL, including Area IV, is subject to the requirements of the Clean Water Act provisions to control stormwater releases that may contain water quality pollutants. The stormwater control program, governed by the NPDES permit process is administered by the Los Angeles RWQCB. The NPDES permit for SSFL has established discharge (water quality) limits that require monitoring and reporting to the RWQCB on a regular basis (quarterly and annually). This monitoring includes

water chemistry, organic and inorganic chemicals, and radionuclide testing of stormwater collected at each outfall location. Sampling is required whenever rain events produce greater than 0.1 inches of rain in a 24-hour period. Bioassessment tests are also required annually in accordance with permit requirements.

Sampling of storm water has occurred since 1976 when the first permit (CA001309) was issued. The permit has been updated and renewed several times, with the most recent revision in December 2007. Revisions have changed monitoring analytes and discharge limits. Therefore a significant amount of storm water quality data have been produced for Area IV.

A number of best management practices (BMPs) are utilized to control storm water pollutants and improve water quality. These include the use of hydromulching, placement of straw wattles, straw bales and silt fences, the use of gravity fed three stage filters (sand, granular activated carbon, and zeolite) and a pump and treat system. The BMPs vary by location and water quality control requirements. In addition, Boeing under RWQCB Order R4-2007-0056 is evaluating engineered natural treatments for remote outfalls.

Given that there are no perennial streams within Area IV and that flow in drainages only occurs during the rainy season and only after rainfall events of sufficient magnitude to produce runoff, surface water flows for Area IV typically reflect stormwater events. Thus, monitoring data reflect stormwater permit conditions and the timing of actual storm events.

As part of the data gap analysis, the stormwater NPDES data were reviewed for applicability in use for human health and ecological risk assessment purposes. In addition, the location and distribution of drainage sediment were evaluated for adequacy in defining location and extent of any sediment contamination. The conclusion of the stormwater analyses was to use the available monitoring data to evaluate human health and ecological concerns, and collect sediment data at locations with no data.

## 1.7.10 Air Data

Air monitoring for radioactive elements has been conducted at SSFL since the late 1950s. The extensive air database was reviewed for adequacy as part of the data gap analysis. However, it was concluded that because this data reflects historical air quality conditions and that the risk assessment will need to evaluate future actions, the risks to workers, the public, and ecological receptors during demolition will be assessed using soil particulate data and soil concentrations and not on the existing air quality database. Additional air monitoring data is not being proposed at this time.

## 1.7.11 Biota

The evaluation of the existing data and subsequent data collection requirements for assessing risks to ecological receptors differed from that of the human health risk evaluation. Area IV was not subdivided into EUs and data for the entire site was

considered to establish COIs for ecological receptors. An ecological receptor conceptual site model was developed to identify pathways and receptor species or categories to be addressed in the ecological risk assessment. Because biota samples have not been collected within Area IV, the assessment addressed the types of biota samples needed along with abiotic media quality data that would support a contaminant uptake model for the site. Data proposed for the ecological risk assessment would, in some cases, also be applicable for the human health rural residential land use assessment.

### 1.7.12 Building Data

Radiological characterization data from existing buildings were reviewed for completeness for both gross radiation surface measurements and volumetric samples for radionuclide ratio characterization. This review indicated that data for some remaining buildings will need to be collected to assess risks to site workers, the public, and ecological receptors during building demolition and waste transportation. This data gap analysis identified the buildings requiring additional surveys.

## 1.8 Relationship of the Data Gap Analysis and the RCRA Facility Investigation

Boeing, NASA, and DOE are under a consent order from DTSC to investigate all locations of SSFL, including Area IV, where chemicals regulated under RCRA may have been used, stored, treated, or disposed (collectively termed "chemical use areas" for the purposes of this data gap analysis). The entire SSFL has been divided into ten RCRA groups based on testing and experimental activities that occurred within those groupings. Each RCRA group is being subject to a separate RCRA Facility Investigation (RFI) for evaluation of the presence of chemical contamination in soil and groundwater. Area IV includes all or parts of RFI Groups 5, 6, 7, and 8.

The database used for this data gap analysis includes RFI data collected for Groups 6 and 8. Investigations of Groups 5 and 7 are ongoing. The data gap analysis findings reported in this document were developed independently of the current Group 5 and 7 RFI activities. That is, the review of prior chemical use history and the identification of COIs by location using the existing data was conducted without considering the approach presented in the Group 5 and 7 RFI work plans. During the data gap analysis, additional sampling needs were identified for chemical use areas based on the independent review of the samples proposed for collection in the work plans.

Following this independent review, the recommendations derived from the data gap analysis were compared with the sampling and analytical objectives for the Groups 5 and 7 RFI field sampling plans. In most instances the data gap findings agreed closely with the objectives of the RFI sampling program which included proposed RFI sampling locations, the basic RFI target analytes, and analytical protocols. However, the findings of the data gap analysis differed from the RFI objectives in two areas. The data gap analysis is focused on data required to perform a risk assessment consistent with CERCLA and the resultant COI list was larger than the RFI objectives;

therefore, not all of the analytes required for the risk assessment are being addressed under the RFI program. This was due in part to the RFI program screening of samples for the presence of petroleum hydrocarbons before analyzing the samples for petroleum chemical constituents. Soil screening data typically are not permissible in a risk assessment and the concentrations of the petroleum chemical constituents will need to be addressed.

Another difference between the data gap objectives and the RFI was in regards to a limited potential for subsurface soil and bedrock data to be collected under the RFI sampling program. Both types of data are important for the risk assessment, fate and transport, and alternatives evaluation in the SSFL Area IV EIS.

Although it was recognized in the data gap analysis process that the RFI sampling programs could meet some of the data needs for the EIS, the data gap findings and recommendations for additional sampling stated in this report has not been changed based on the RFI work. The samples identified as being required for the SSFL Area IV EIS will remain data gaps until either valid data (i.e., data meeting the requirements of the risk assessment) are produced by the RFI program or the samples are collected as part of the data gap field program. Prior to implementation of the data gap field program (introduced in the following subsection) data produced under the RFI sampling program will be closely reviewed for use in the risk assessment consistent with CERCLA. If determined to be applicable, then those data will not be recollected. However, it is expected that some RFI locations may require re-sampling so that the data gap and risk assessment objectives can be met.

## 1.9 Initial Field Sampling Program Definition

The overall objective of the data gap analysis is to identify COIs and approximate locations for a subsequent field sampling investigation that will address data needed for the EIS. Upon acceptance of DOE's data gap approach, the next step in this process will be to formalize the field sampling program through the development of a *Work Plan* that will include the *Field Sampling and Analysis Plan*, *Quality Assurance Project Plan*, and *Health and Safety Plan*. Although this *Data Gap Analysis Report* indicates the general locations for sample requirements, a large portion of the effort to develop the *Work Plan* will be the refinement and identification of specific locations for collection of samples for each media. Included in that effort will be the evaluation of the acceptability of the RFI data to determine that it addresses the data gap need.

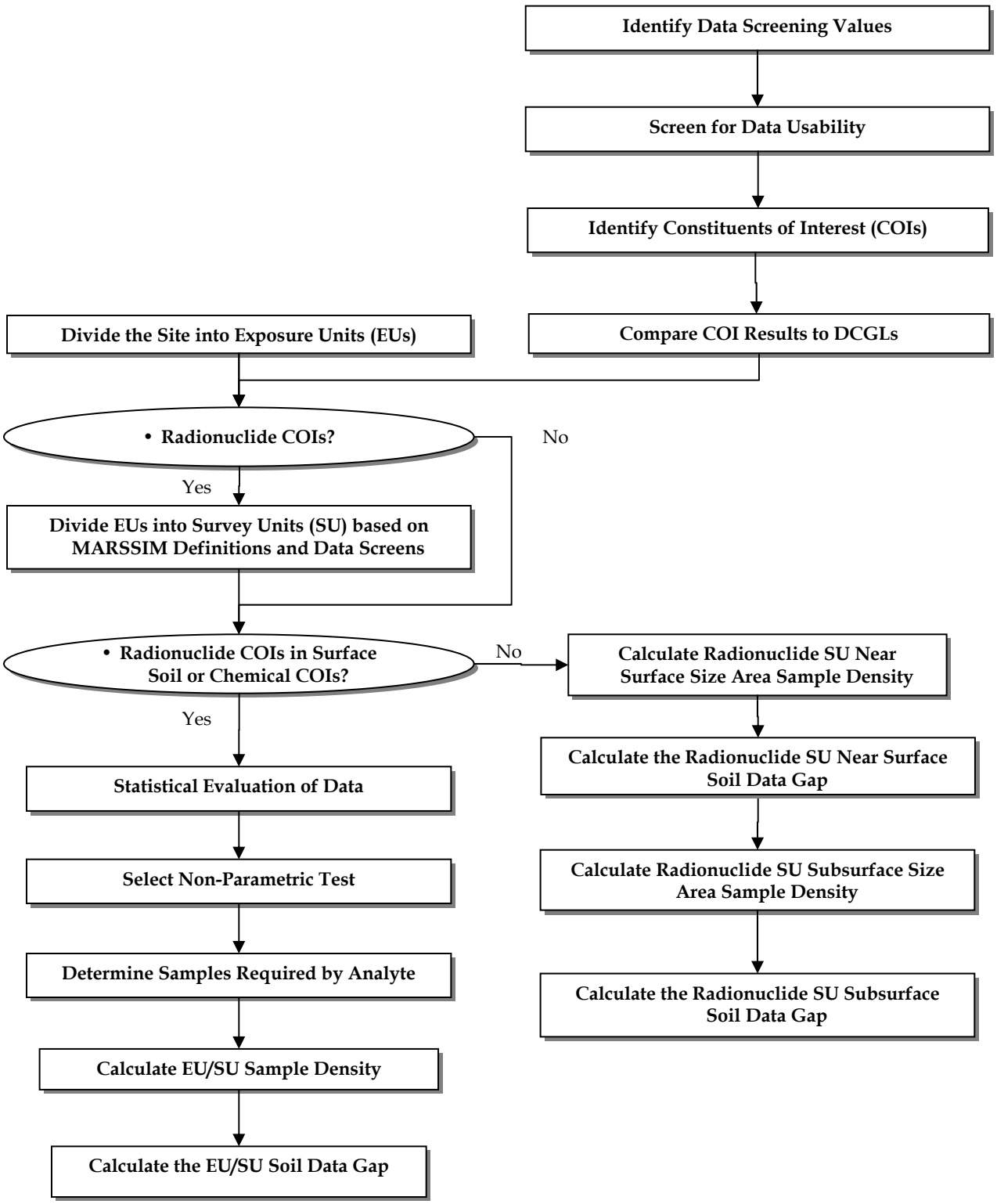
The evaluation of nature and extent of contamination at any site exhibiting contamination is typically an iterative process involving more than one sampling event. This process has been ongoing at the SSFL for more than 30 years and continues today under several RFI sampling programs. Although the goal of the data gap field sampling program is to collect final site characterization data for SSFL Area IV EIS purposes, elements of EPA's TRIAD approach to site investigation will be incorporated as applicable. The TRIAD method generally consists of systematic planning, dynamic work strategies, and real-time or rapid turnaround measurement systems. The approach allows for modifications of work plans during the course of

field investigations to address actual field conditions. By adapting sampling to respond to data as it is being collected, a single sampling event is much more likely to provide data that meet the objectives of conducting the risk-based alternatives evaluation in the EIS.

TRIAD methods will be considered for use in the field program during radiological walkover surveys and sampling of groundwater through well points. The walkover survey will be used to identify any locations with elevated radiological readings where soil sampling will be targeted. Well point results will be used to identify proposed locations for new monitoring wells or collection of groundwater samples from well points.

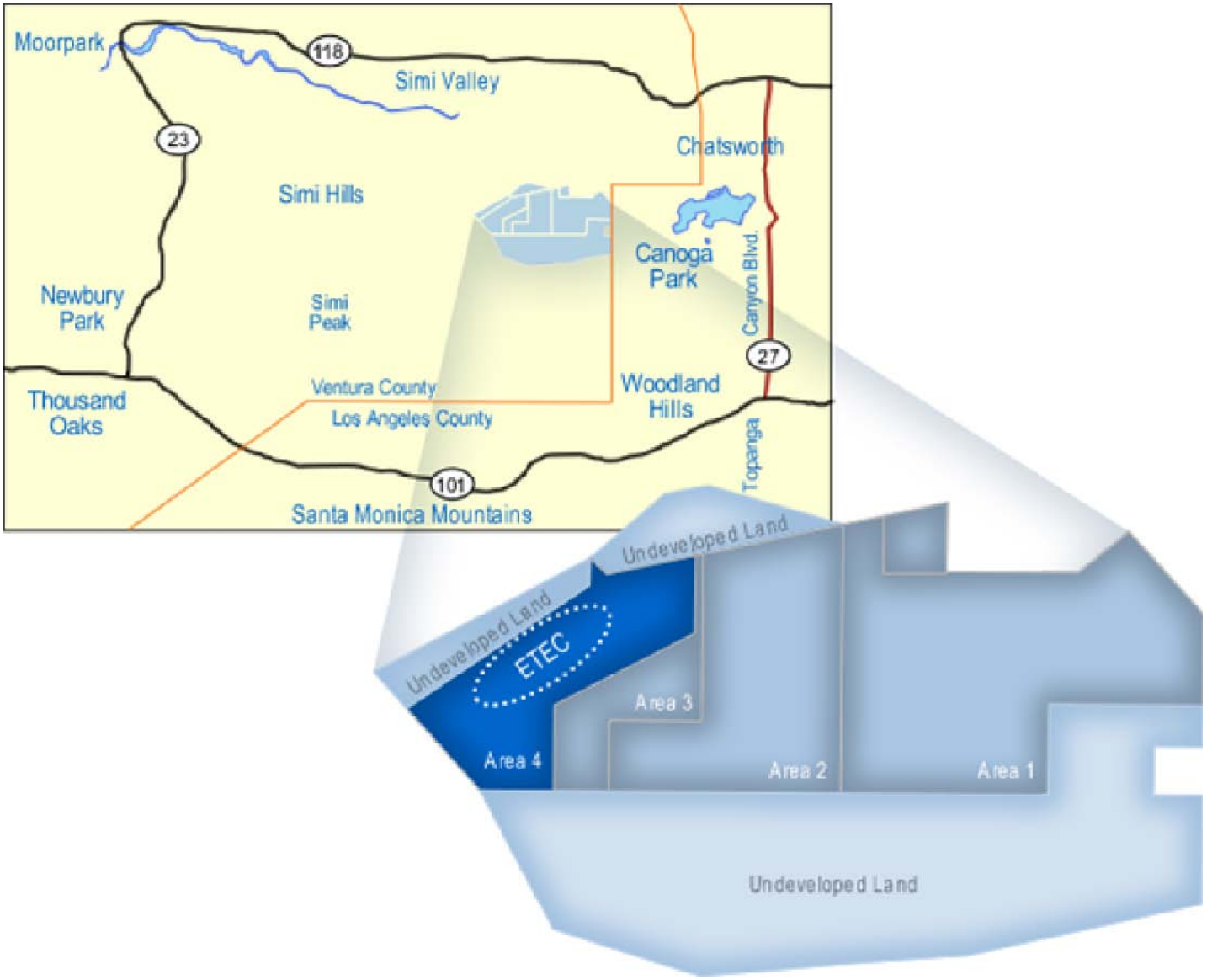
Upon completion of the field sampling investigation, the results will be combined with existing data to define the nature and extent for alternatives analysis in the SSFL Area IV EIS. The *Field Sampling Report* will describe the environmental conditions for Area IV and provide the results of the CERCLA baseline risk assessment combining radionuclide and chemical data.

## Data Gap Evaluation Process Summary for Soils




CDM

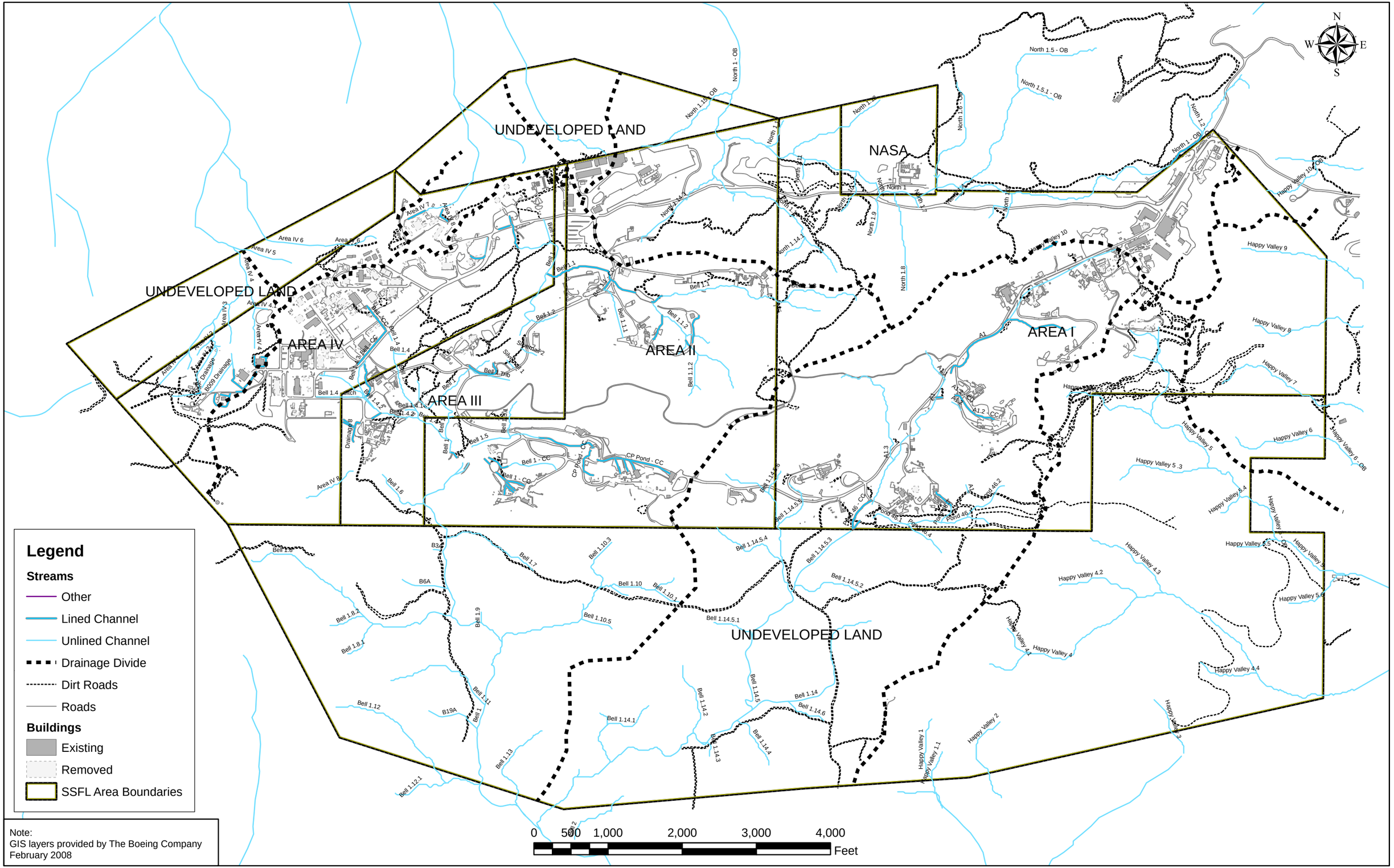
Exhibit 1-1
Data Gap Evaluation Process Summary for Soils




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

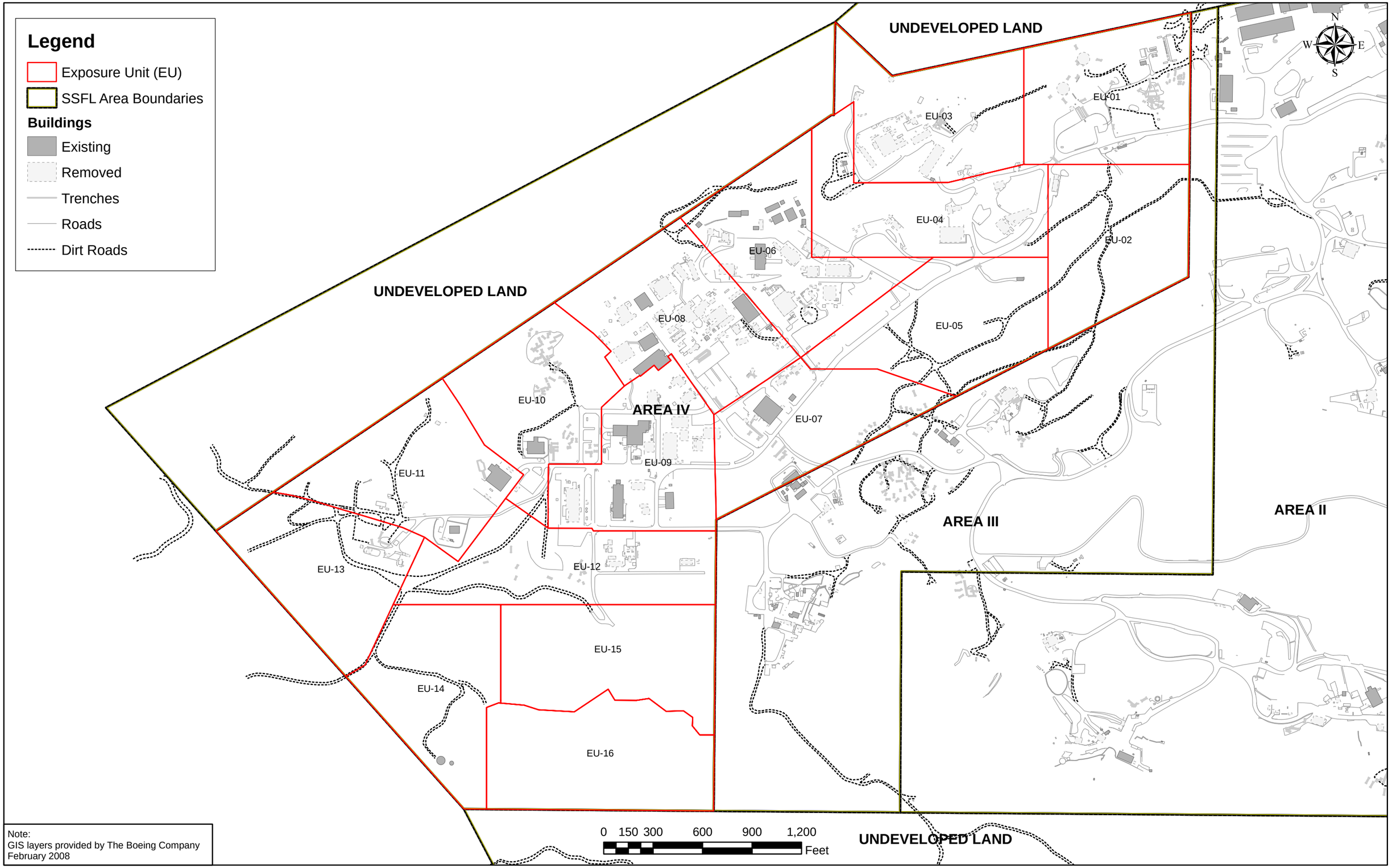
Figure 1-1
SSFL Location




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

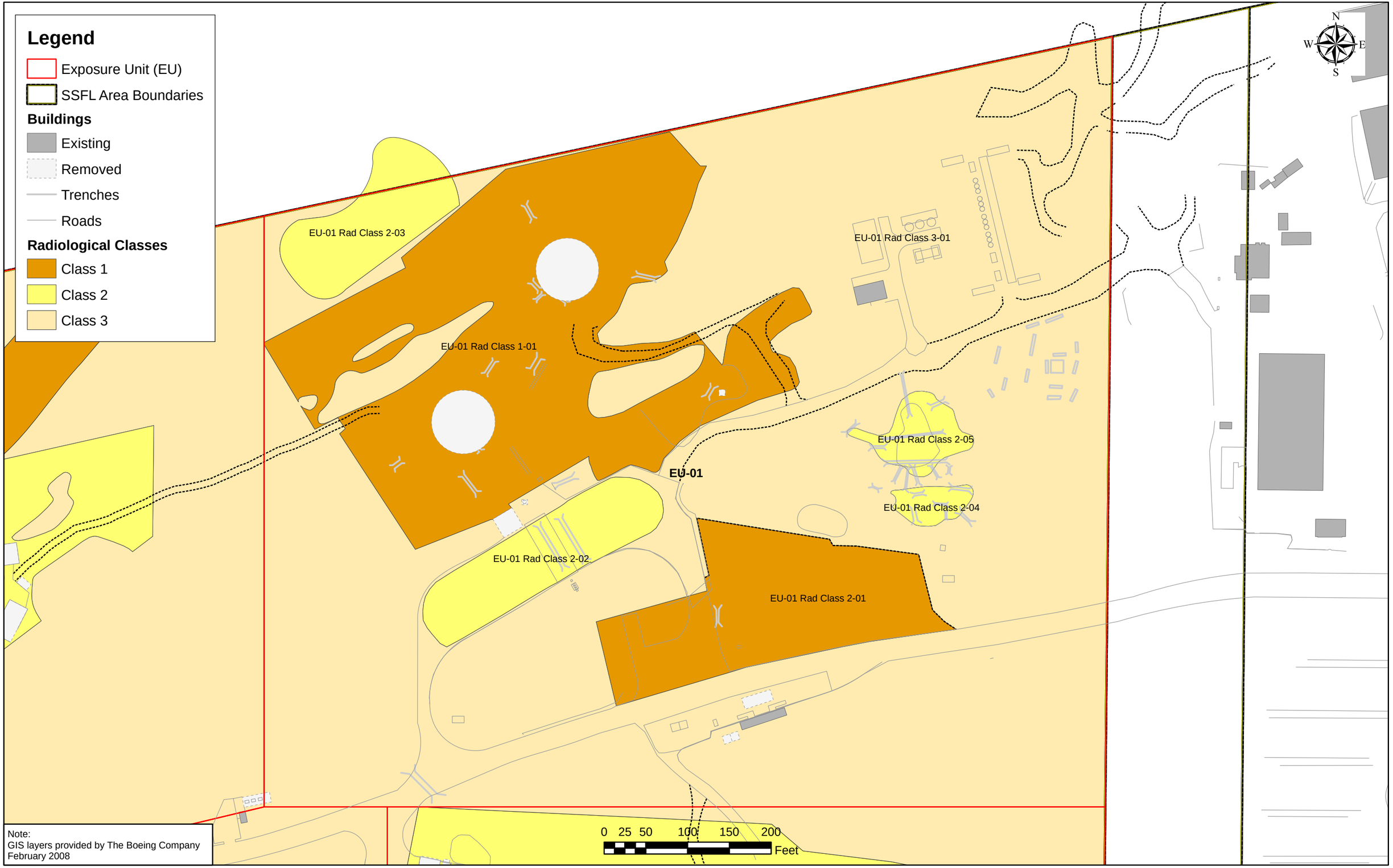
Figure 1-2
Santa Susana Field Laboratory Layout




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 1-3
Location of Area IV Exposure Units




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 1-4
Example Survey Unit Delineation

# Section 2
# Area IV Background and Description

## 2.1 Location

The SSFL is situated on a range of hills between the Simi and San Fernando Valleys in Ventura County, California, about 2 miles south of the City of Simi Valley, and about 30 miles northwest of Los Angeles (Figure 1-1**).** The SSFL is comprised of approximately 2,850 acres that has been divided into four administrative areas and surrounding undeveloped land. Area IV is the westernmost of the four Areas and consists of 117 hectares (290 acres). It is bound on the north and south by undeveloped land owned by Boeing and to the west by property owned by the Brandeis-Bardin Institute. Area IV is bound on the east by Area III of the SSFL (**Figure 2-1**).

## 2.2 Operational Background and Ownership

The SSFL has been in operation since 1947 when rocket testing activities were first conducted. Beginning in 1953, Area IV of the SSFL was used by the Atomic Energy Commission, the predecessor agency to the DOE, and various U.S. Government contractors for energy-related research and development. Originally owned by North American Aviation (NAA), Area IV was established for the purposes of nuclear energy research. A division of NAA, Atomic International (AI), conducted operations in Area IV. Work for DOE conducted by AI in Area IV consisted of two distinct types of research: civilian nuclear energy research, and research and testing of liquid metals in non-nuclear components.

The nuclear energy research activities became increasingly active from 1953 through the late 1960s. After that time, activities declined until 1988, when most nuclear operations ceased. The RMHF, Fuel Storage Facility, and Radiation Instrument Calibration Laboratory, remained active beyond 1988. Starting in the early the 1990s and continuing to the present, DOE has been performing decommissioning and decontamination activities of the nuclear facilities in Area IV.

The Government-owned, Liquid Metal Engineering Center (LMEC) was started in 1966 and operated by AI (later Rocketdyne) to conduct component testing for the Atomic Energy Commission's Liquid Metals Fast-Breeder Reactor Program. The components were generally pumps and sodium water heat exchangers, with the liquid metal typically being sodium.

In 1996, Boeing acquired the aerospace divisions of Rockwell. Currently, Area IV is owned by Boeing and portions are leased to DOE, which owned all of the building that comprised ETEC.

The many contractor and Government operations that have been active in Area IV are documented in reports generated under RCRA and the Historical Site Assessment (HSA; Sapere Consulting, Inc., 2005) performed by Boeing and DOE. Chemical use

and operations have been thoroughly described in reports and plans generated as part of the SSFL RCRA Program, including the *RCRA Facility Assessment (RFA) Report* (MWH 1994) and various *RCRA Facility Investigation (RFI) Reports* and work plans (Boeing 2008, Hill 2008, MWH 2004, MWH 2006, and MWH 2007). The chemical use and process information presented in the RFA and RFI documents are summarized in **Appendix A**. The radiological operations have been documented in the HSA. Chemical and radiological operational and process information derived from multiple sources of information to develop the HSA are summarized in **Appendix B**. The HSA provided a primary basis for the understanding of site process history and the identification of initial COIs based on the process history.

## 2.3 Physical Setting

The physical characteristics of the site are key elements potentially affecting the distribution and transport of contaminants through the environment. These characteristics, including topography, drainage, geology, hydrogeology, climate, and biological setting are described in this section.

### 2.3.1 Topography and Drainage

The SSFL is located on a ridge within the Transverse Ranges physiographic province. The facility is about 259 meters (850 feet) above the valleys to the north and south. While the laboratories and other facilities within Area IV are generally located on relatively flat ground, local relief can be up to 183 meters (600 feet).

In Area IV, the highest elevation (655 meters [2,150 feet] above mean sea level [MSL]) is along the southern boundary (Figure 2-1). Along the northwest boundary, the land slopes steeply away to undeveloped land. The relatively flat area in the southern part of Area IV is called "Burro Flats."

Drainage in the northern portion of Area IV flows north into Meier Canyon, Arroyo Simi, and then west to the Pacific Ocean. Drainage in the southern portion of Area IV flows to the southeast into Area III and then the Bell Creek drainage system. Bell Creek is a tributary of the Los Angeles River. The main northeast-southwest trending drainage divide in Area IV is shown on Figure 2-1. Given the topographic divide and topographical rises to the east and west of Area IV, there is no drainage directly to the west or east from Area IV.

Drainage within Area IV is through man-made and natural ditches and swales that lead to natural streambeds. The drainage from some operational areas is directed through various settling and process ponds. The locations of the NPDES outfalls within Area IV are also shown on Figure 2-1.

### 2.3.2 Geology and Hydrogeology

The most dominant geologic feature at the SSFL is fractured sedimentary rocks that dip to the northwest with beds exposed at the land surface in many areas. The rock is overlain by a thin discontinuous unconsolidated unit. The nonextensive thin veneer

contains water in some areas, and the fractured bedrock provides a complex hydrogeologic framework.

### 2.3.2.1 Geology

The SSFL is located in the Transverse Ranges of southern California. This area is under north-south compression. Geologic structures, such as faults and folds, strike predominantly east-west. The SSFL is located on the south flank of an approximately east-west striking, westward plunging syncline.

The geology of Area IV is presented in **Figure 2-2.** The primary geologic units underlying Area IV are the Quaternary alluvium and colluvium, the Triassic Santa Susana Formation, and the Cretaceous Chatsworth Formation. The Quaternary alluvium and colluvial deposits are not laterally continuous across the site. Where present they are relatively thin, approximately1.5 to 4.5 meters (5 to 15 feet) thick, and occur in topographic lows and along ephemeral drainages. Native soils are typically weathered Chatsworth Formation and consist of fine-grained silty sand.

The Santa Susana Formation outcrops at the extreme southwest edge of Area IV. This formation comprises a mudstone and fractured claystone, interbedded with sandstone and conglomerate. The unit underlies approximately 20 percent of Area IV.

The Chatsworth Formation is a deep sea turbidite consisting primarily of sandstone interbedded with lesser amounts of shale, siltstone, and conglomerate. Beds within the Chatsworth Formation strike about N70°E and dip 25° to 35° northwest.

The Burro Flats Fault places the Chatsworth Formation in structural contact with the Santa Susana Formation in Area IV. The Burro Flats Fault strikes predominantly east to west in the study area.

Area IV is primarily underlain by the Sandstone 2 Unit of the upper Chatsworth Formation. This unit is the younger part of the formation. The formation increases in age to the southwest. The stratigraphic sequence, in decreasing age, in the upper Chatsworth Formation is:

- Shale 2 at the base of the upper Chatsworth Formation consists of thin bedded shale, siltstone, and sandstone. There is a sandstone unit in the middle of Shale 2 that extends throughout the site and separates the upper and lower fine-grained units. Shale 2 ranges in thickness from 46 to 53 meters (150 to 175 feet) thick.

- Sandstone 2 includes three coarser-grained members separated by two finer-grained members. These members, in increasing age, are:

    - Silvernale member: primarily medium-grained sandstone with minor siltstone and sandstone units, 33.5 to 49 meters (110 to 160 feet) thick.

- SPA member: interbedded fine- and medium-grained sandstone, siltstone, and shale, 4.5 to 9 meters (15 to 30 feet) thick and poorly exposed. The surface trace of this member is approximately congruent with the Area IV west boundary line that trends northeast to southwest.

- Lower Burrow Flats member: primarily medium-grained sandstone that contains significant siltstone and shale interbeds, 91 to 113 meters (300 to 370 feet) thick.

- Expendable Launch Vehicle (ELV) member: fine-grained sandstone, siltstone, and shale; shale and siltstone make up more than 50 percent of the total thickness of the formation, 4.5 to 12 meters (15 to 40 feet).

- Upper Burro Flats member: primarily medium-grained sandstone with minor siltstone and shale interbeds, about 152 meters (500 feet) thick. The Lot bed is the single finer-grained unit defined in the Upper Burro Flats member.

- Shale 3 is the upper unit in the Chatsworth Formation and consists of interbedded medium-grained sandstone and finer-grained units comprised of thin-bedded fine- to medium-grained sandstone, siltstone, and shale. Near the western end of Area IV, the middle and upper finer-grained beds of Shale 3 are 38 meters (125 feet) and 23 meters (75 feet) thick, respectively (MWH 2007).

Fractures and joints are widespread in the Chatsworth Formation and are important conduits for groundwater and contaminant movement. Fractures are oriented parallel to bedding and dip 25° to 30° to the northwest and strike N70°E. Steeply dipping joints are also present in the formation, and some cut across bedding planes. The openings are well interconnected vertically and horizontally (Cherry et al. 2007).

### 2.3.2.2 Hydrogeology

Groundwater in Area IV occurs as "near surface groundwater" (NSGW) in the alluvium/colluvium and/or weathered bedrock, and as "Chatsworth Formation groundwater" in the unweathered bedrock. The depth to groundwater varies across Area IV, but is commonly reported to be in the range of approximately 8 to 23 meters (25 to 75 feet) below ground surface (BGS), except in the south-central portion of Area IV. The depth to water is typically greatest in the higher elevations and lower in the lower elevations. In the east-central part of Area IV, NSGW, where present, is vertically continuous with the Chatsworth Formation groundwater (MWH 2006). Depth to NSGW groundwater ranges from approximately 2 to 14 meters (7 to 45 feet).

The NSGW is discontinuous across the site and occurs as perched groundwater in some areas and in other areas is connected to groundwater in the underlying Chatsworth Formation**. Figure 2-3** illustrates the areas where the shallow water is perched and where shallow water is continuous with the bedrock groundwater. **Figure 2-4** presents the contoured potentiometric surface of the NSGW. The NSGW

gradient is to the southeast, which is the direction of the topographic gradient in this part of the site.

In other parts of Area IV, NSGW is typically perched at discrete locations. The largest perched NSGW measures approximately 366 meters by 122 meters (1,200 feet by 400 feet) and is located in the southwest end of Area IV. Depth to water ranges from 2 to 6 meters (7 to 21 feet). Groundwater flow is to the northeast, and the gradient is 0.11 feet/foot.

**Figure 2-5** presents the contoured potentiometric surface in May 2003 for the Chatsworth Formation. As shown in the figure, a groundwater divide trends southwest to northeast. East of the divide, the gradient is to the southeast toward the drainage ways. West of the divide, the gradient is to the west toward the valley. Groundwater elevations vary in the Chatsworth Formation due to steep topography, the occurrence of fine grained beds and deformation bands, and spatial variation in bulk hydraulic conductivity (MWH 2007a). Steep topography can reduce local recharge and host seeps and springs.

The downward vertical groundwater gradient can be inferred from the cross sections presented in **Figures 2-6 and 2-7** (between wells RD-55A and RD-55B on Figure 2-6 and the three-well cluster on Figure 2-7). As shown in the sections, the vertical gradients are downward. The section locations were chosen since the distribution of wells, water levels, and contaminant concentrations is the most comprehensive for the area. Downward vertical gradients are typically measured in other areas of Area IV also. Since a groundwater divide (potentiometric high) is mapped through Area IV, downward vertical gradients are expected.

The overview of the groundwater conceptual site model developed by Boeing states that recharge at the site is low with only 2 to 12 percent of annual rainfall (46 centimeters [18 inches]) infiltrating to the water table (Cherry et al. 2007). Also, site-wide recharge is estimated to be 2 centimeters (0.95 inches) per year (about 5 percent of 46 centimeters [18 inches]) using the chloride mass balance method (MWH 2007a).

In summary, the saturated zone is slowly recharged throughout Area IV, with higher recharge rates in areas that have shallow topographic gradient and undeveloped surfaces. After reaching the saturated zone, groundwater migrated under the prevailing gradients. Generally, on the western half of Area IV, groundwater moves downward and to the west-northwest, and on the eastern half of Area IV, groundwater moves downward and to the east-southeast. The migration of groundwater is slow, with interconnected fractures defining groundwater movement. The groundwater gradient is downward. In areas where the potentiometric surface intersects land surface and a pathway is available, groundwater can emerge at the surface as spring seeps.

## 2.3.3 Climate

The SSFL has a Mediterranean climate with monthly mean temperatures of 50 degrees Fahrenheit ($F^o$) during winter, to 70$^o$F during summer. The mean annual precipitation, as measured at a U.S. weather station located in the northeastern part of the SSFL, is 46 centimeters (18 inches). Ninety-five percent of the precipitation (mostly rain, but some snow) falls between November and April. From April to October, northwesterly winds, from 5 to 10 knots, occur in the afternoon (SAIC 1994).

## 2.3.4 Biological Setting

Surveys were conducted by MWH and AMEC on behalf of Boeing to identify sensitive biological resources at the SSFL. According to the *Biological Conditions Report* (BCR) (Ogden, 1998) and the Addendum to the BCR (MWH and AMEC, July 2003/September 2005), there are 16 habitat types, including marsh, woodland, grassland, and several scrub habitats. According to the surveys described in the BCR, the SSFL has several sources of water, open spaces and natural areas surrounding the facility, and varied habitat types supporting numerous and diverse plant and animal species.

During the surveys, several sensitive plant species were observed, including the Susana tarplant located throughout the facility; the southern California black walnut primarily located in the Burro Flats area and the west end of the SSFL; Braunton's milk vetch (*Astragalus brauntonii*) noted south of the Former Sodium Disposal Facility at the western edge of the property; and the Plummer's mariposa lily (*Calochortus plummerii*) located along the Happy Valley drainage at the SSFL property line and on the slopes adjacent to the drainage at the stream division. Several sensitive species of plants may be present at the SSFL, including two species of *Dudleya,* Lyon's pentachaeta (*Pentachaeta lyonii*), and the California orcutt grass (*Orcuttia californica*). The San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), a plant previously thought to be extinct, was identified in the vicinity of the SSFL.

Numerous species of birds, mammals, fish, reptiles, and amphibians were observed. The most frequently observed bird species include scrub jay (*Aphelocoma coerulescens*), yellow-rumped warbler (*Dendroica coronata*), turkey vulture (*Cathartes aura*), red shouldered hawk (*Buteo lineatus elegans*), northern flicker (*Colaptes auratus*), California quail (*Callipepla californica*), and red-winged blackbird (*Agelaius phoeniceus*). Mammal species present at the SSFL included mule deer (*Odocoileus hemionus*), bobcat (*Felis rufus*) and San Diego black-tailed jackrabbit (*Lepus californica bennettii*). Catfish (probably bullhead, *Ameirus* sp.) and goldfish (*Carassius auratus*) were observed in the ponds located on the SSFL property. Observed reptiles included western whiptail (*Cnemidophorus tigris multiscutatus*) and side-blotched lizard (*Uta stansburiana)* and observed amphibians included the California slender salamander (*Batrachoseps attenuatus*), Pacific tree frog (*Hyla regilla*), and California toad (*Bufo boreas haliophilus)*.

Several sensitive wildlife species or biological signs of their presence were observed at the SSFL, including the two-striped garter snake (*Thamnophis hammondi*), great blue heron (*Ardea herodias herodias*), loggerhead shrike (*Lanius ludovicianus*), and southern

California rufous-crowned sparrow (*Aimophila ruficeps canescens*). In addition, several raptors were observed flying above the SSFL and collectively are considered sensitive species for several reasons, including a lone sharp-shinned hawk (*Accipiter striatus velox*), a roosting Cooper's hawk pair (*Accipiter cooperii*), fledgling red-shouldered hawk (*Buteo lineatus elegans*), several red-tailed hawks (*Buteo jamaicencis*), and several roosting turkey vultures (*Cathartes aura*). Sensitive mammal species observed at the SSFL included the bobcat (*Felis rufus*), mule deer (*Odocoileus hemionus*), and the San Diego black-tailed jackrabbit (*Lepus californica bennettii*).

Several other sensitive bird, mammal, amphibian, and reptile species have been historically observed on the site, in the vicinity of the site, or may be present on the site given the suitable habitat types and prey species present at the SSFL and in the surrounding area. Birds potentially present at the SSFL include the golden eagle (*Aquila chrysaetos canadensis*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax trailii extimus*). Mammals potentially present at the SSFL include the ringtail cat (*Bassariscus astutus*), American badger (*Taxidea taxus jeffersoni*), mountain lion (*Felis concolor*), San Diego desert woodrat (*Neotoma lepida intermedia*), and dusky-footed woodrat (*Neotoma fuscipes*). An amphibian species potentially present at the SSFL is the arroyo southwestern toad (*Bufo microscaphus californicus*). Reptiles potentially present at the SSFL include the San Diego horned lizard (*Phrynosoma coronatum blainvillei*), coastal rosy boa (*Lichanura trivirgata roseofusca*), coast horned lizard (*Phrynosoma coronatum blainvillei*), southern rubber boa (*Charina bottae umbratica*), southern Pacific rattlesnake (*Crotalis viridis helleri*), and coast patch-nosed snake (*Salvadora hexalepis virgultea*). Other species that may be present at the SSFL include the Quino checkerspot butterfly (*Euphydryas editha quino*) and the San Diego fairy shrimp (*Branchinecta sandiegoensis*).

## 2.4 Sources of Data

The primary source of chemical and radionuclide data used in this data gap analysis was provided by Boeing in its GIS database. This database required reformatting for use in the data gap analysis.

The data and reports reviewed for the data gap analysis were those made available to the CDM Team prior to January 30, 2008. It is recognized that investigations of portions of Area IV are ongoing under the RCRA RFI for Groups 5 and 7. The results of those efforts will be considered during development of the field investigation that will result from the data gap analysis.

Numerous previous environmental investigations have been conducted at the SSFL, including Area IV. Many of these provided the data and information that was reviewed for this data gap analysis. Although they are not described in detail, the various investigations and their status (completed or ongoing) are listed on **Table 2-1**. Appendix A provides a summary of information taken from SSFL documents considered as part of the understanding of chemical usage by facility within Area IV, and Appendix B provides a summary of the HSA.

Much of the chemical analytical data reviewed and assessed as part of the data gap analysis were reported in various documents produced as part of the SSFL RCRA Program, including the *RCRA RFA Report* (1994) and the various *RCRA RFI Reports* and work plans. A summary review of the findings in these documents are included in Appendix A.

The radiological soil and groundwater data used in this analysis are from the Boeing GIS database. The HSA was used as the primary source for understanding Area IV process history. Appendix B provides a summary of the review of the HSA. In addition, documents listed in Table 2-1 were reviewed for facility status and process knowledge.

Stormwater data used in this assessment came from Annual Stormwater Reports to the RWQCB. Air sampling data for radionuclides, provided in the annual *Site Environmental Reports* formed the basis for the air quality data review.

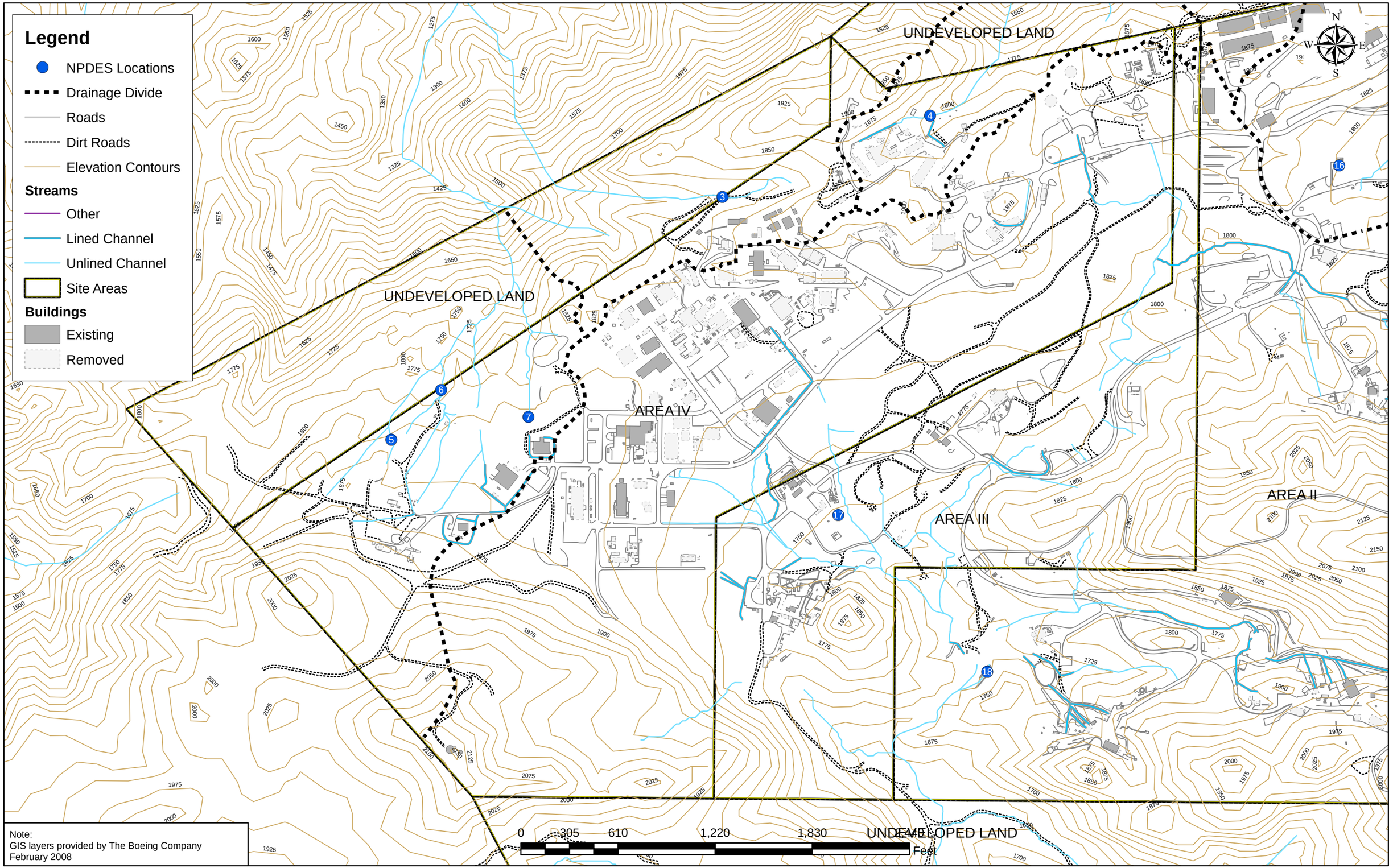
The requirements for conducting additional radioactivity surveys of buildings were assessed through the review of the HSA and the buildings remaining in Area IV.

To assess the requirements for GWSs, the following documents were reviewed.

- *Final Status Report: Characterization and Final Status Survey Radioactive Materials Handling Facility Perimeter*, Cabrera Services, March, 2006 (eight SUs located north and west of the RMHF);
- *Final Status Survey Report: Final Status Survey Post Historical Site Assessment Sites, Block 1*, Cabrera Services, March, 2007 (Sites 4023, 4028, 4030, 4363 and 4583, as noted in the report);
- *Characterization and Final Status Survey Report: Radioactive Materials Handling Facility Holdup Pond* (Site 4614);
- *Confirmatory Radiological Survey of the L-85 Reactor Facility, Final Report, Oak Ridge Associated Universities Radiological Site Assessment Program*, December, 1986;
- *Area 4064, Final Status Survey Report*, Release Date April 13, 1999;
- *Area IV Radiological Characterization Survey, Final Report, Volume I, Santa Susana Field Laboratory*, August 15, 1996; and
- *Historical Site Assessment of Area IV, Santa Susana Field Laboratory, Ventura County, California*, Sapere Consulting, Inc., and the Boeing Company, May 2005.
- *Building 4059 Final Status Survey Report (Phase A and Phase B), July 2005 with Revision February 2008 and associated Building 4059 Final Status Survey Procedure Procedure, September 2004;*

- *17th Street Drainage Final Status Survey Report, March 2000; and*
- *Verification Survey for the Land Area Formerly Supporting the Hot Laboratory (4020), December 2000 , in conjunction with Area 4020 MARSSIM Final Status Survey Report (includes Building 4468) (August 2000) and the Area 4020, Final Status Survey Procedure (August 1999)*

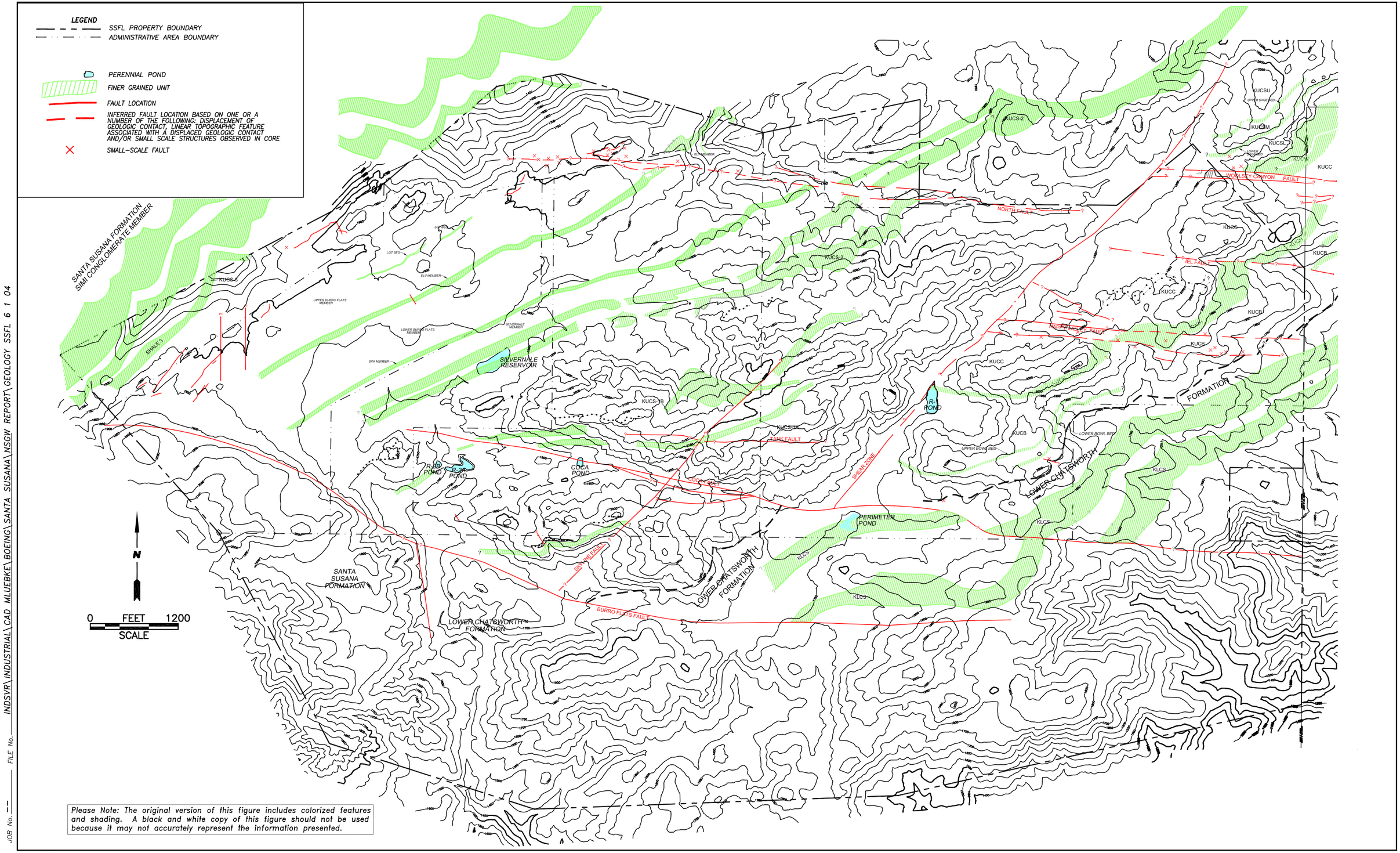
Chemical concentration data for biota tissue samples in the SSFL database were collected in 2000 to validate exposure models for higher trophic level receptors and to develop site-specific bioaccumulation factors (BAFs) for selected groups or types of ecological receptors. Site-specific BAFs were used to develop ecological screening levels (ESLs) for selected media. These tissue data are described and published in the *Standardized Risk Assessment Methodology Work Plan* (SRAM WP) (MWH 2005). The sampling and analysis plan (SAP) for the validation study describes the types of biota sampled, sample locations and the methods used to collect and analyze biota samples (Ogden 2000). Chemical concentration data for biota are available for SSFL locations outside of Area IV. Aquatic invertebrate (**Figure 2-8**), aquatic plant (**Figure 2-9**), fish (**Figure 2-10**), terrestrial invertebrate (**Figure 2-11**), terrestrial plant (**Figure 2-12**), and terrestrial vertebrate (**Figure 2-13**) samples were collected. No biota samples were collected from locations within Area IV of the SSFL, including background locations. Also, there are no concentration data for radionuclides in the existing biota sample database, however, there may be usable biota sample data existing in hardcopy reports and will be reviewed, evaluated and if deemed usable will be discussed in the field sampling plan.




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 2-1
SSFL Area IV Topography and Drainage




Please Note: The original version of this figure includes colorized features and shading. A black and white copy of this figure should not be used because it may not accurately represent the information presented.

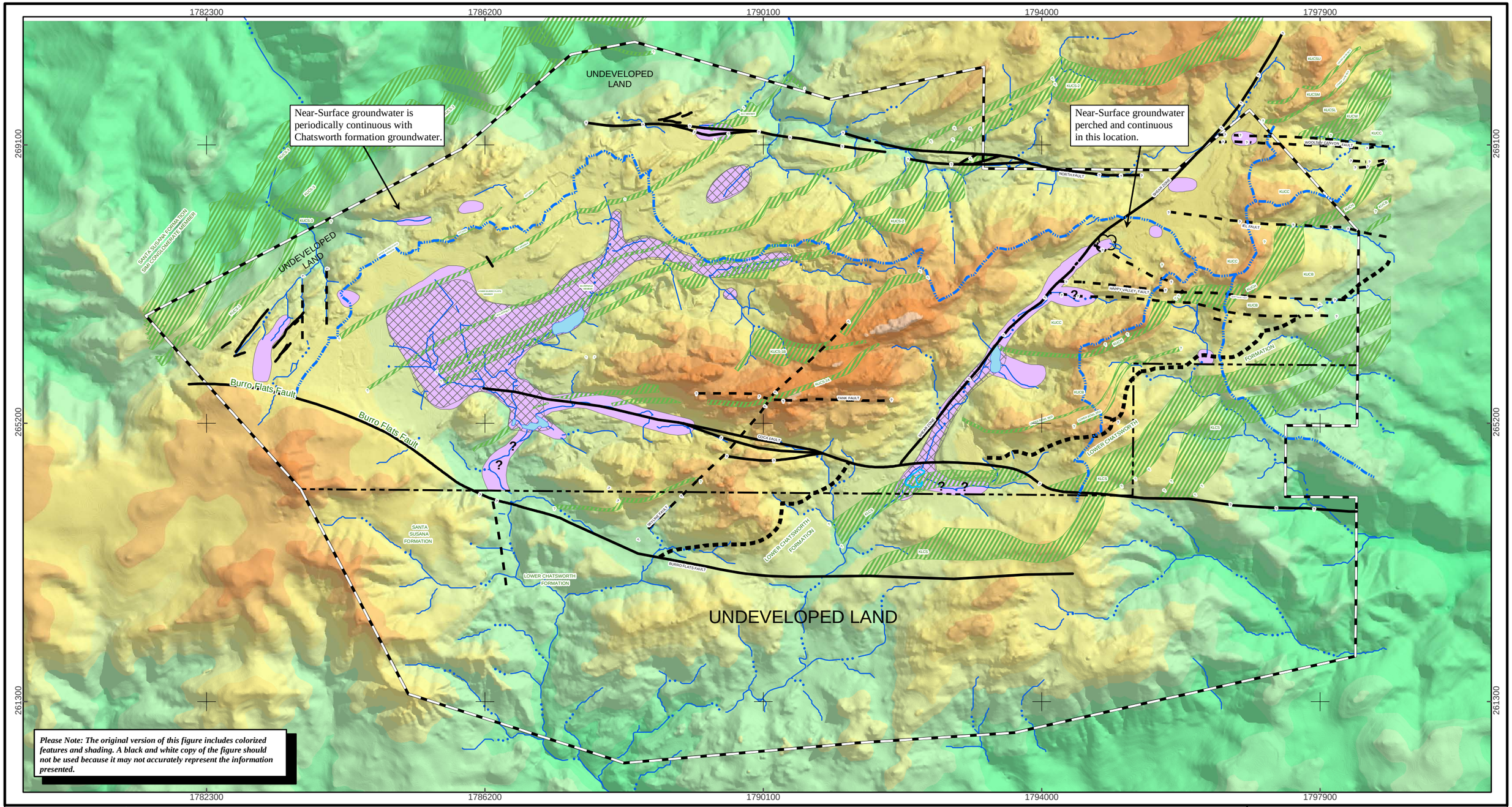
JOB No. --- FILE No. INDSVR\INDUSTRIAL\CAD_MLUEBKE\BOEING\SANTA_SUSANA\NSGW_REPORT\GEOLOGY SSFL 6 1 04

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Note: Original files obtained from the MWH - RCRA Facility Investigation Report Surficial Media Operable Unit 2004.

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 2-2
Geologic Map of The Chatsworth Formation at The SSFL




0 1,300 FEET

MAP COORDINATES IN STATE PLANE, NAD 27, ZONE V

**Legend**

- Surface Water Reclamation Ponds
- Near-Surface Groundwater Extent (March 2001)
- Near-Surface Groundwater Extent Continuous with Chatsworth Formation Groundwater
- Near-Surface Groundwater Perched and Continuous in this Location
- Surface Water Divide

**Base Map Legend**

- SSFL Property Boundary
- Administrative Area Boundary

**GEOLOGY LEGEND**

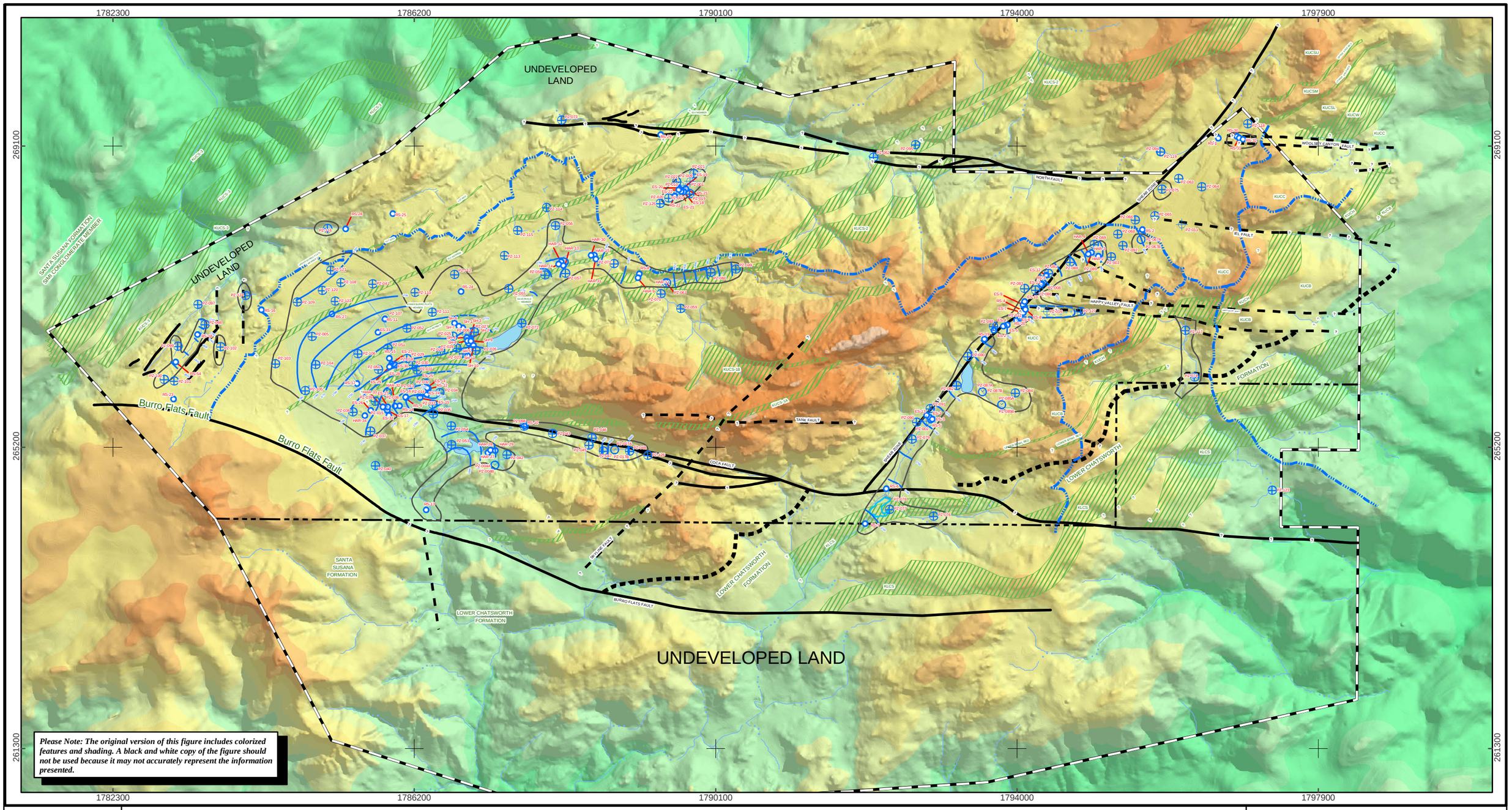
- Estimated Contact Line
- Faults
- Faults (Approximate)
- Shale Beds
- Creeks/Streams

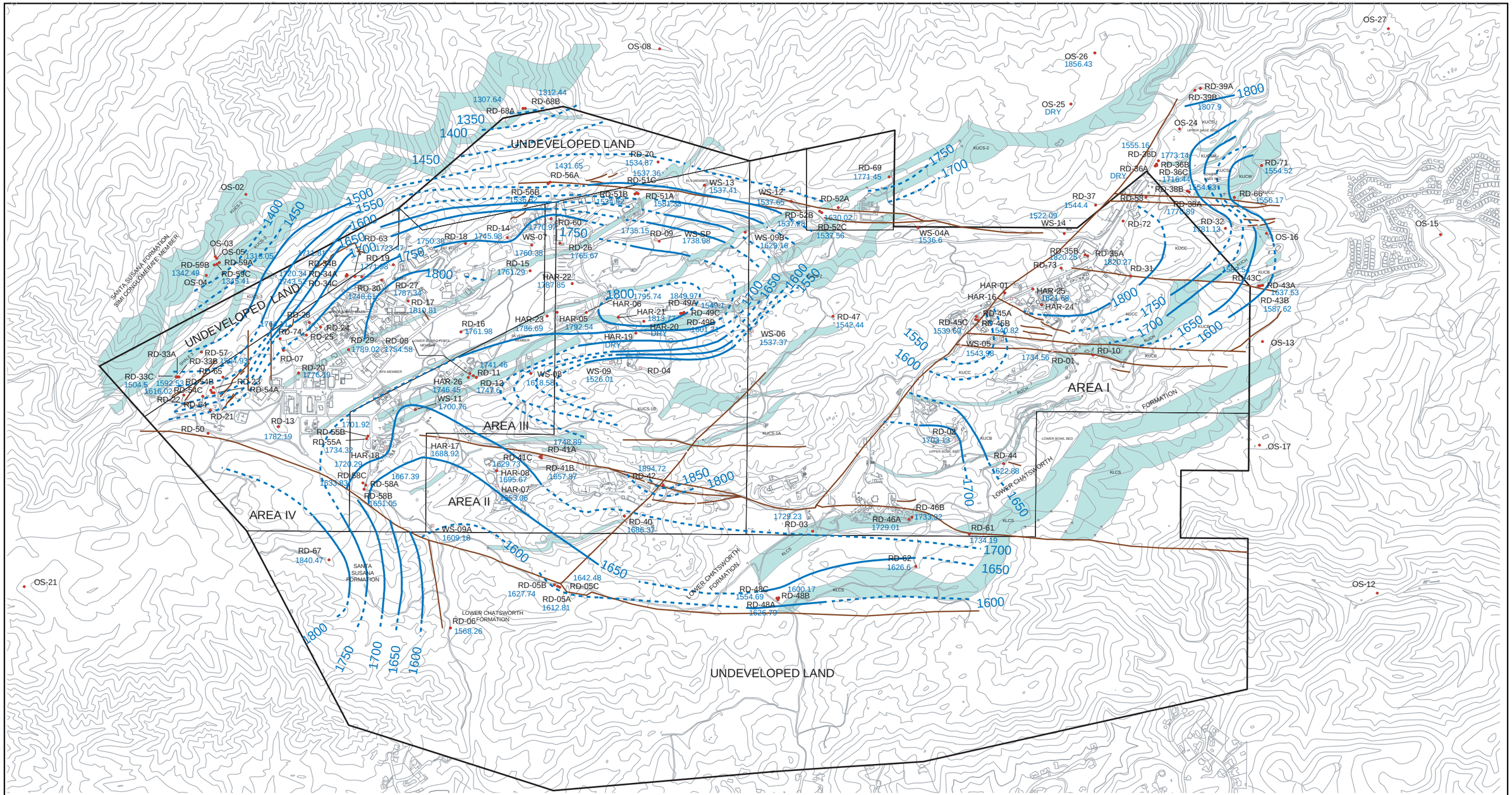
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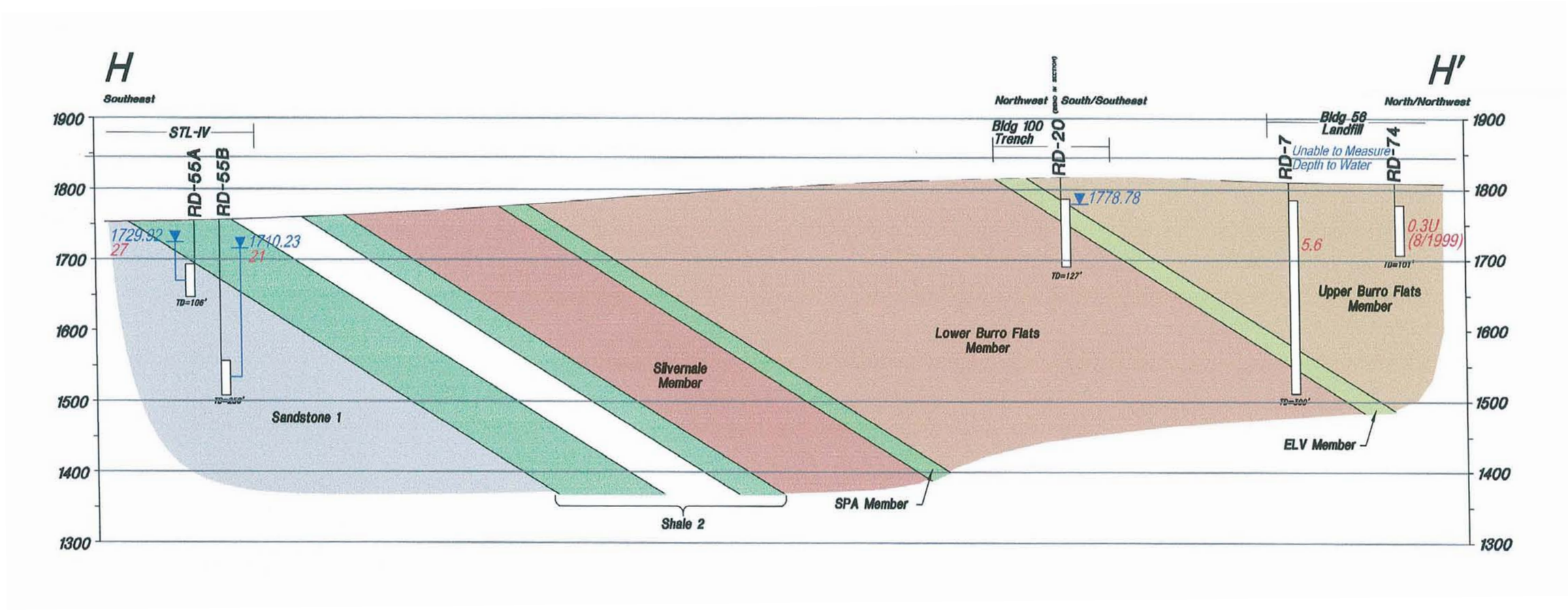
Note: Original files obtained from the MWH - Near Surface Groundwater Characterization Report 2003.

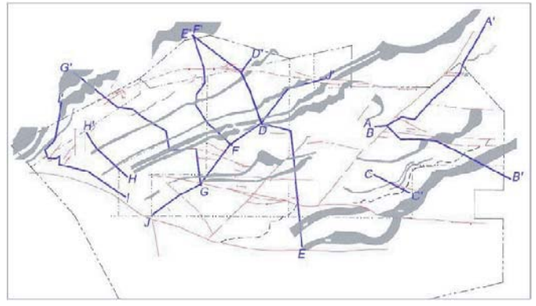
Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 2-3
Location of Perched and Continuous Near-Surface Groundwater


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TANK FAULT
NORTH FAULT
HAPPY VALLEY FAULT
WOOLSEY CANYON FAULT
IEL FAULT
SHEEP CANYON
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UNDEVELOPED LAND
AREA I
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AREA III
AREA IV
UNDEVELOPED LAND
UNDEVELOPED LAND
SANTA SUSANA FORMATION 3MM CONGLOMERATE MEMBER
SANTA SUSANA FORMATION
LOWER CHATSWORTH FORMATION
LOWER CHATSWORTH FORMATION
FORMATION
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SCALE

▼ Potentiometric Surface Elevation (August 2007)

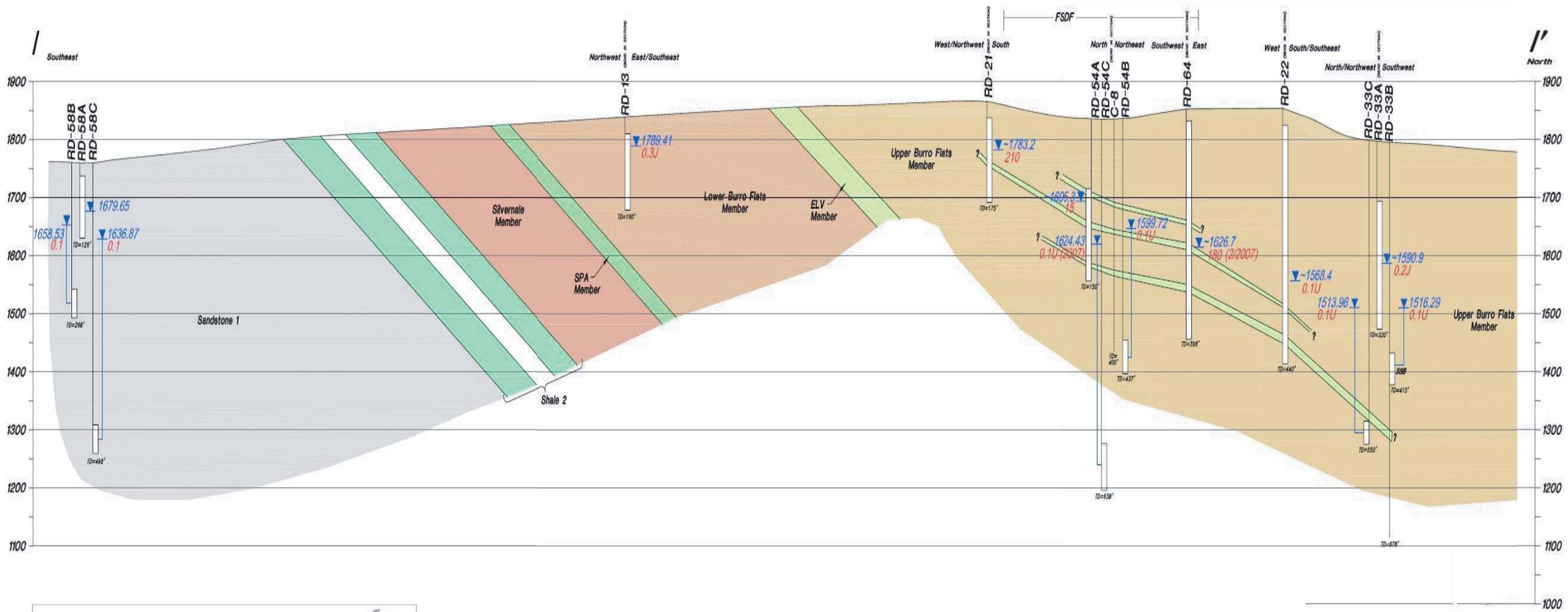
0.1 TCE Concentration (ug/L) - August 2007 Unless Otherwise Indicated

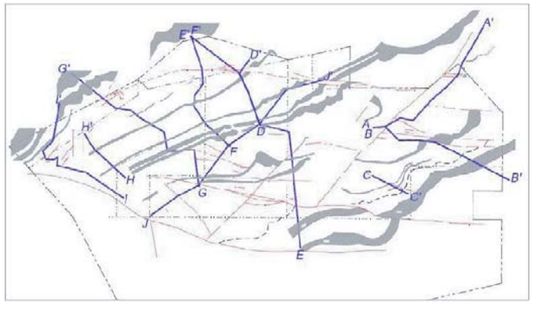
CDM

Note: Original files obtained from the MWH - Work Plan Sitewide Groundwater Characterization 2008.

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 2-6
Geologic Cross Section H-H'




0 FEET 200
SCALE

▼ Potentiometric Surface Elevation (August 2007)

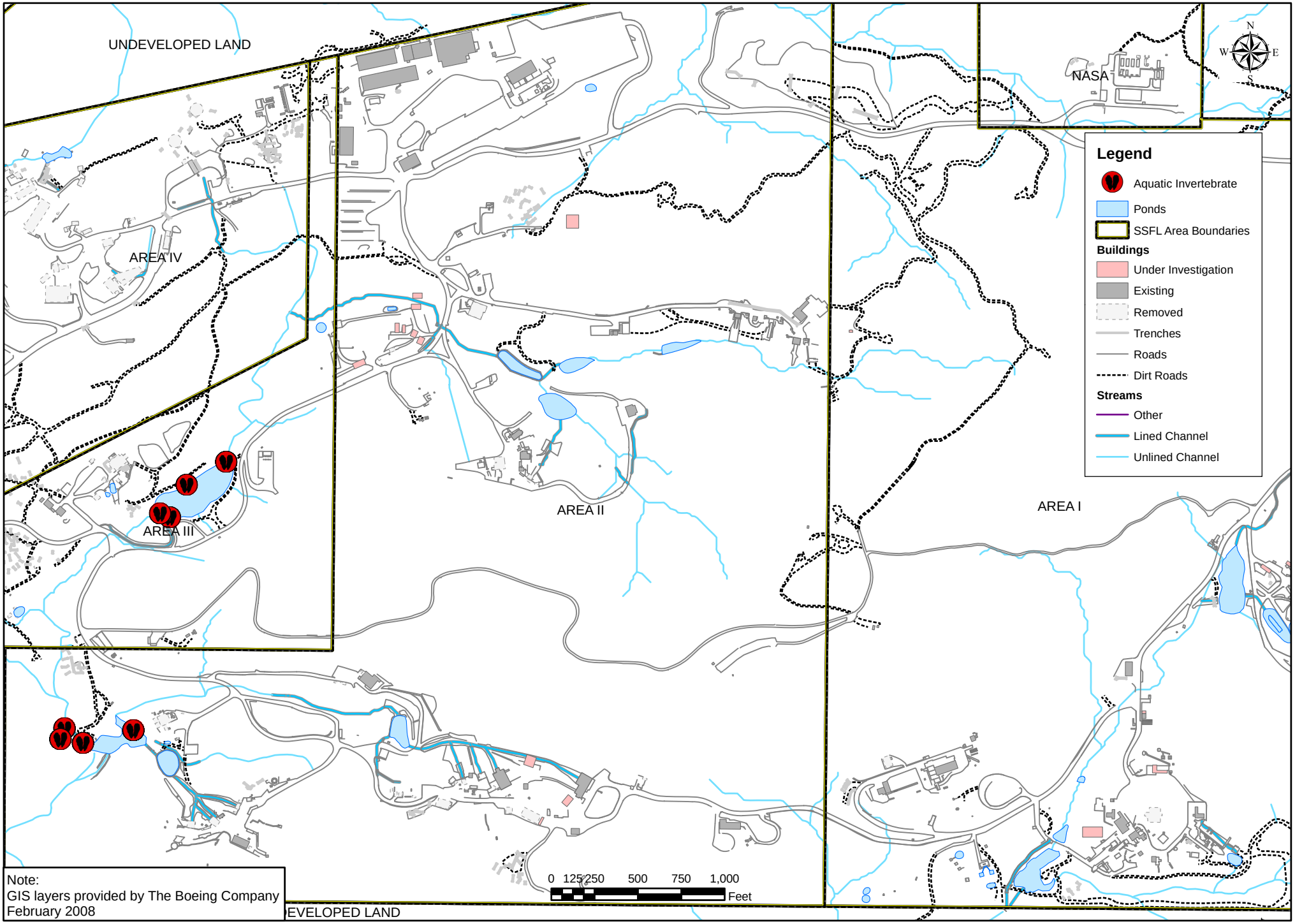
0.1 TCE Concentration (ug/L) - August 2007 Unless Otherwise Indicated

CDM

Note: Original files obtained from the MWH - Work Plan Sitewide Groundwater Characterization 2008.

Santa Susana Field Laboratory Area IV
Ventura County, California

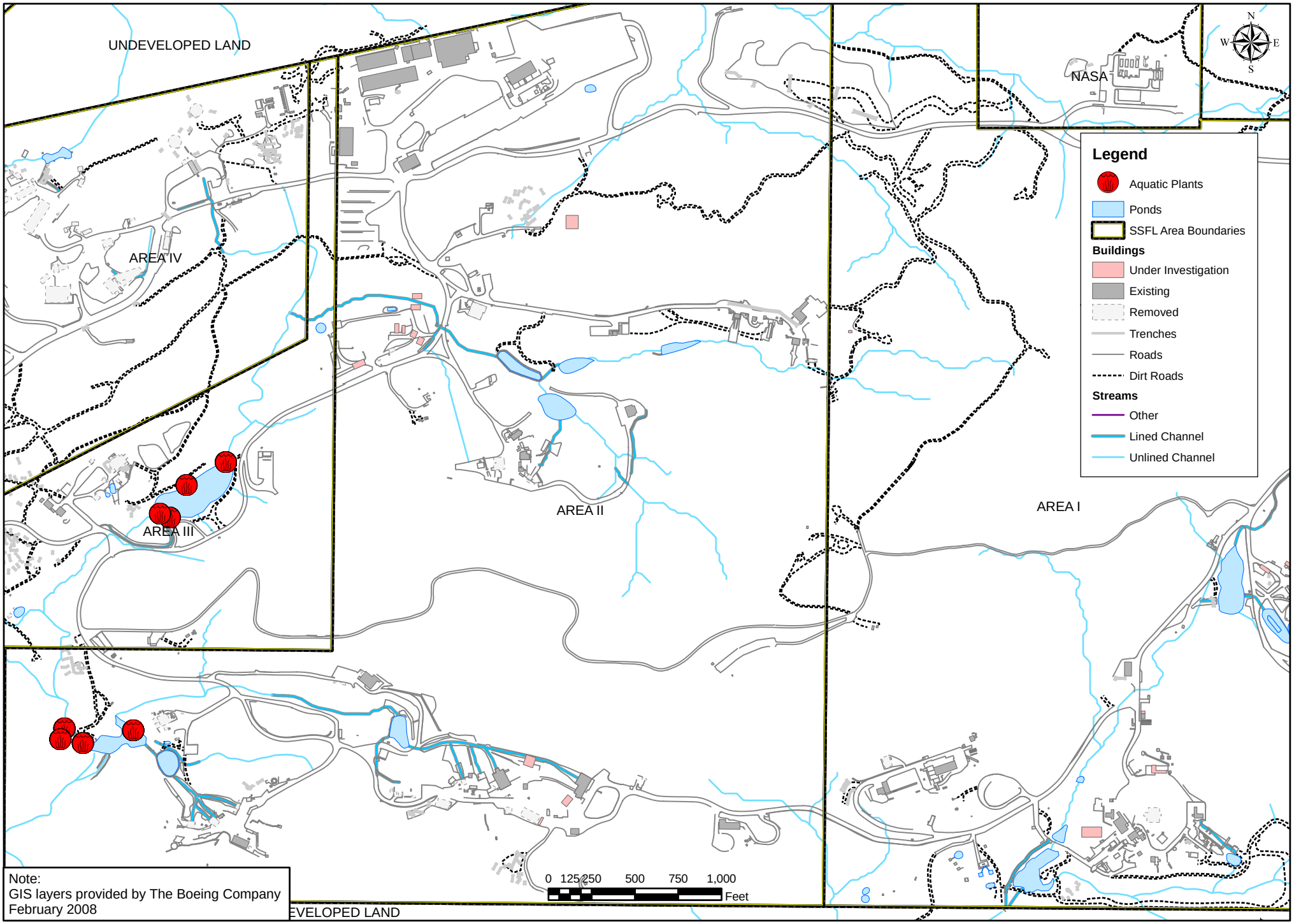
Figure 2-7
Geologic Cross Section I-I'




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

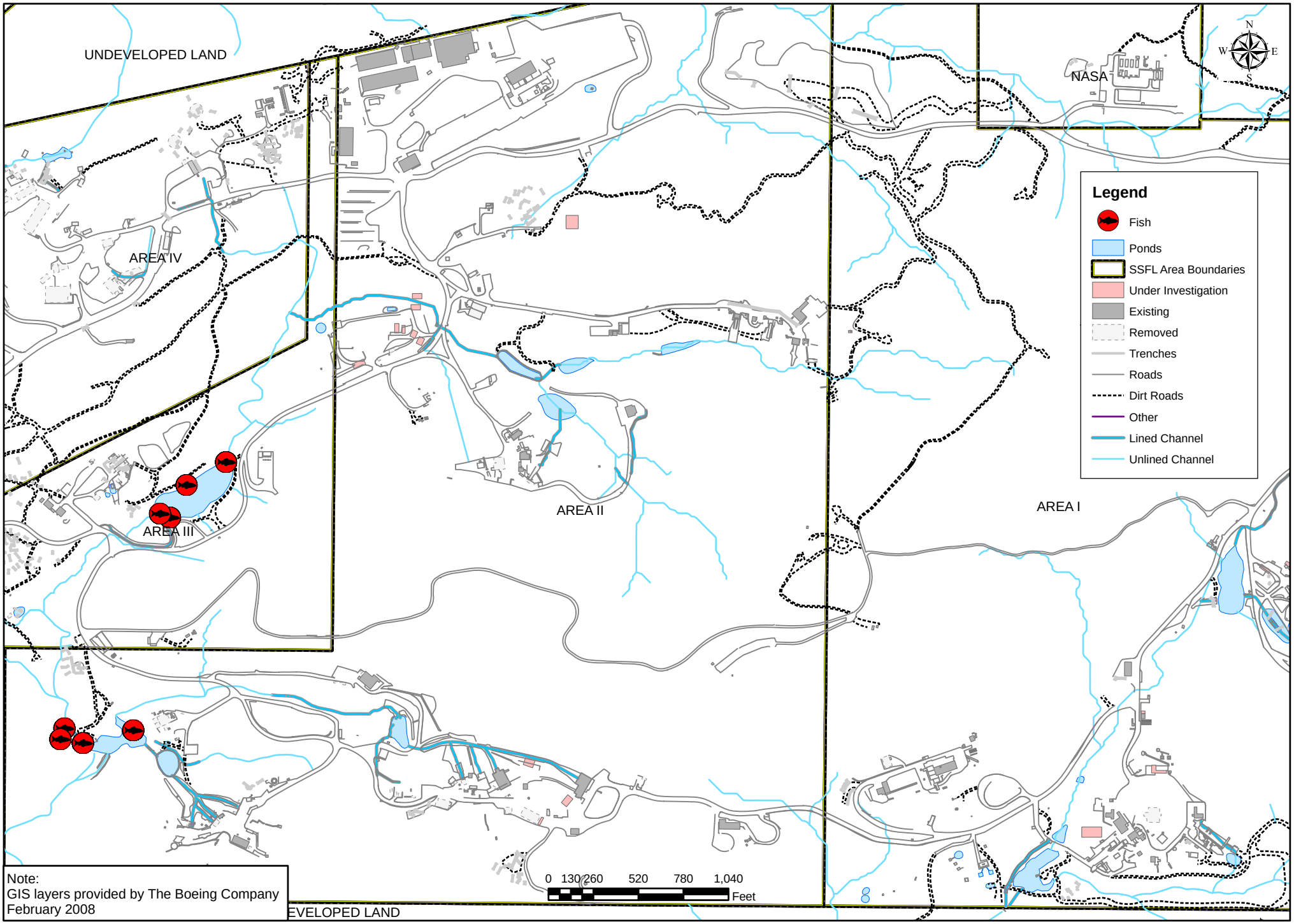
Figure 2-8
BAF Study Sampling Locations - Aquatic Invertebrate




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

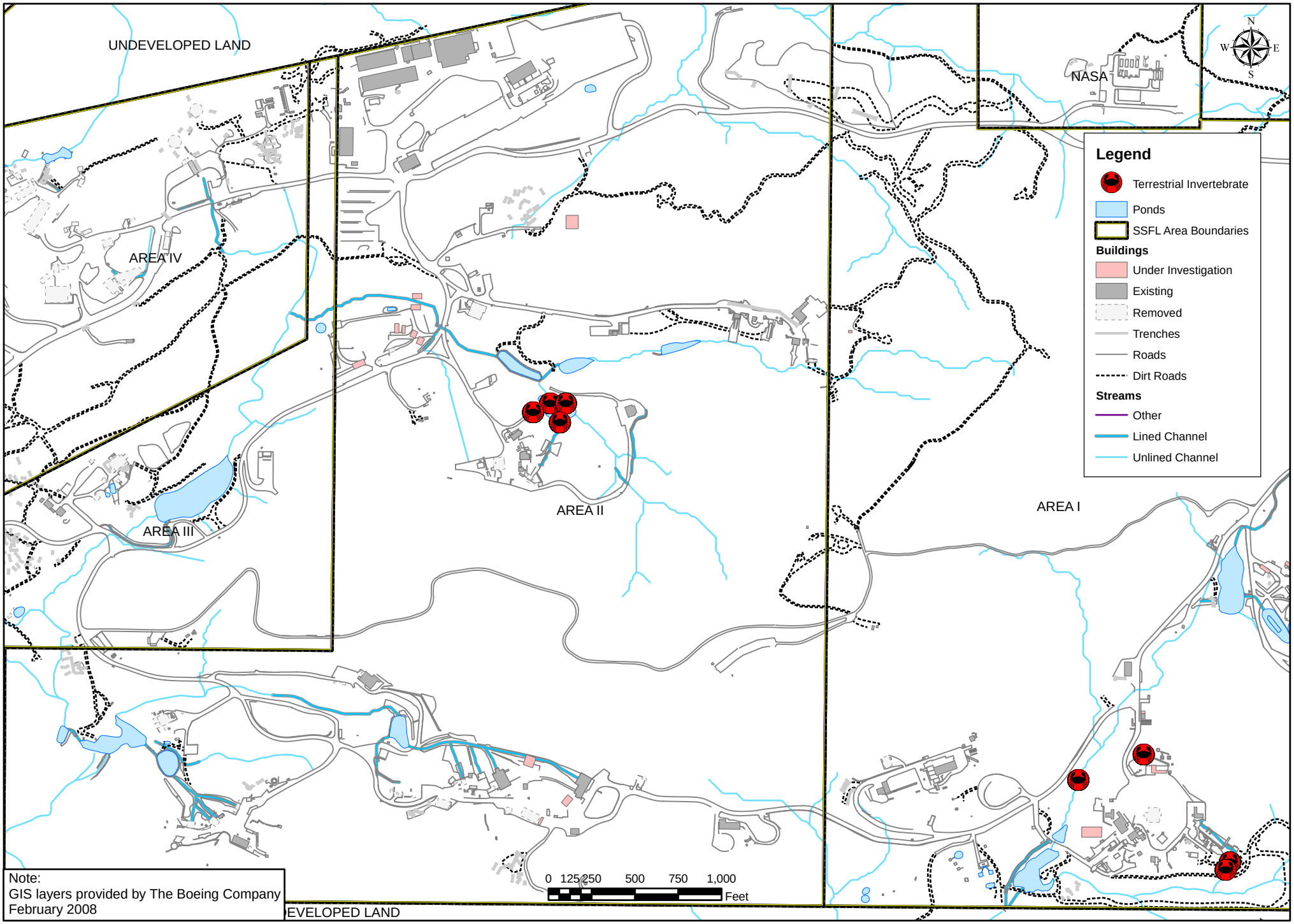
Figure 2-9
BAF Study Sampling Locations - Aquatic Plants




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

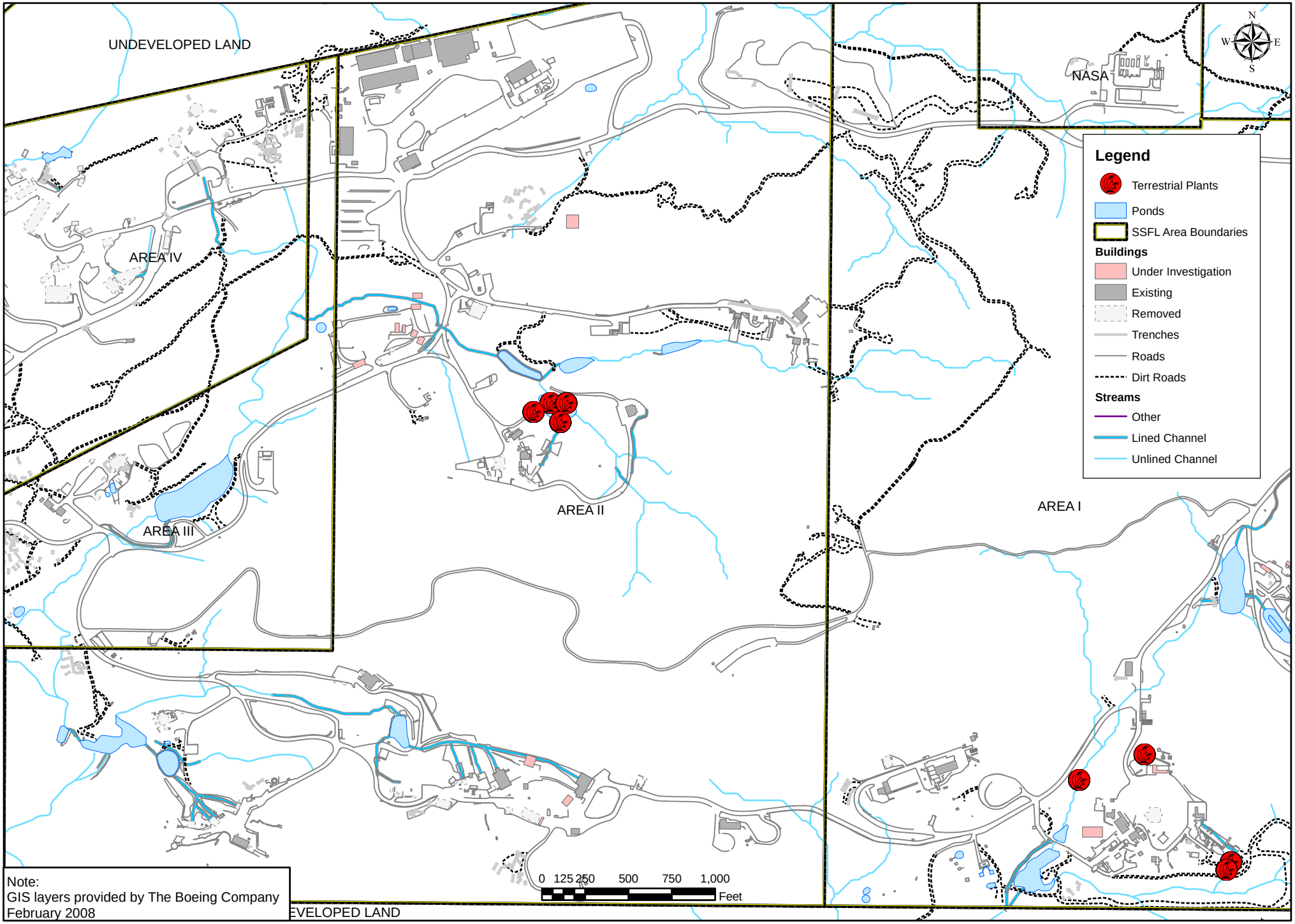
Figure 2-10
BAF Study Sampling Locations - Fish




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

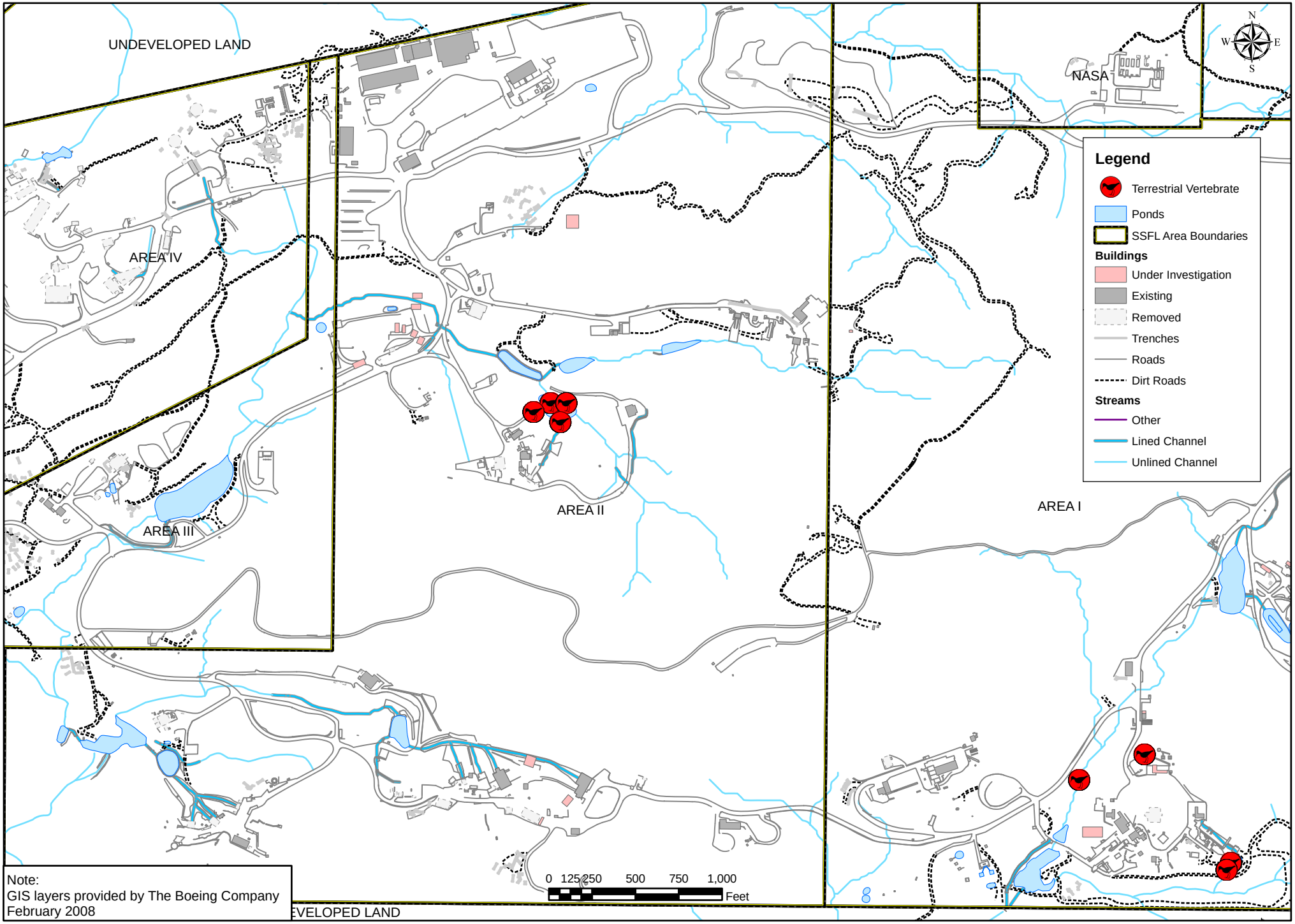
Figure 2-11
BAF Study Sampling Locations - Terrestrial Invertebrate




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 2-12
BAF Study Sampling Locations - Terrestrial Plants




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 2-13
BAF Study Sampling Locations - Terrestrial Vertebrate

**Table 2-1 SSFL Area IV Sources of Radionuclide Data**

| Study | Date | Status | Description |
|---|---|---|---|
| Radiological Survey Plan, Support of D&D Program Operations at T143 (SRE) | 1975 | Complete | Describes the requirements for radiological survey data of the SRE area. |
| STIR Facility D&D Final Report | 1976 | Complete | Decontamination and disposition activities, techniques used, specific problems and resolutions, as well as the radiological surveillance and survey results, summarized for facilities in Building 028, Shield Test Irradiation Reactor (STIR) facilities. |
| Final Radiation Survey – Building028 | 1976 | Complete | Results of the final radiation survey conducted at Building 028. |
| KEWB Facilities D&D Final Report | 1976 | Complete | Decontamination and disposition activities, techniques used, specific problems and resolutions, as well as the radiological surveillance and survey results, summarized for the KEWB facilities and Buildings 073, 643, 123, and 793. |
| SRE Activity Requirement No. 29, Final Closeout of the SRE Facility | 1977 | Complete | Describes the procedures for performing a comprehensive radiological survey of the SRE area. |
| SRE Site Survey Plan for Release to Unrestricted Use | 1978 | Complete | Describes the approach and methods for performing a radiological survey of the SRE area. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region I | 1978 | Complete | Results and analysis of the final radiological survey conducted in Region I (Building 724) of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region II | 1978 | Complete | Results and analysis of the final radiological survey conducted in Region II (Building 163, Box Shop) of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region IV | 1978 | Complete | Results and analysis of the final radiological survey conducted in Region IV (West Parking Lot) of the SRE. Data analysis indicates that Building 133 and adjacent area may be released to unrestricted use. The areas adjacent to T654 and T041 are conditionally released. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region V | 1978 | Complete | Results and analysis of the final radiological survey conducted in Region V (Gas Storage Vault) of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region VI | 1978 | Complete | Results and analysis of the final radiological survey conducted in Region VI (Water Tank Area) of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Report of Radiation Survey of the FCEL Reactor Facility | 1980 | Complete | Results and analysis of a radiological survey conducted in the FCEL facility after decontamination and dismantling activities. |
| Final Radiological Inspection of the Below-Grade Areas in the SRE Prior to Release for Unrestricted Use | 1981 | Complete | Describes the monitoring techniques, data collection, and analysis activities for radiological surveying of the below-grade areas of the SRE. |
| SRE Decommissioning Environmental Evaluation Report | 1982 | Complete | Summary of the radiological surveys of environmental media at the SRE site. |
| SRE Decommissioning Final Report | 1982 | Complete | Decontamination and disposition activities, techniques used, specific problems and resolutions, as well as the radiological surveillance and survey results, summarized for the SRE site. |
| Radiological Survey Results – Release to Unrestricted Use, SRE, Building 041 | 1982 | Complete | Results and analysis of the final radiological survey conducted in Building 041 of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE, Building 163 | 1982 | Complete | Results and analysis of the final radiological survey conducted in Building 163 of the SRE. Data analysis indicates that the area may be released to unrestricted use. |

**Table 2-1 SSFL Area IV Sources of Radionuclide Data (continued)**

| | | | |
|---|---|---|---|
| RMHF Leach Field Decontamination Final Report | 1982 | Complete | Decontamination and disposition activities, techniques used, specific problems and resolutions, as well as the radiological exposure results, summarized for facilities in the RMHF. |
| RMDF Lead Field Environmental Evaluation Report | 1982 | Complete | Description of environmental consequences of releasing the RMHF Leach Field to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region III | 1983 | Complete | Results and analysis of the final radiological survey conducted in Region III of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region VII | 1983 | Complete | Results and analysis of the final radiological survey conducted in Region VII of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region VIII | 1983 | Complete | Results and analysis of the final radiological survey conducted in Region VIII of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region IX | 1983 | Complete | Results and analysis of the final radiological survey conducted in Region IX of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE Region X | 1983 | Complete | Results and analysis of the final radiological survey conducted in Region X of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Radiological Survey Results – Release to Unrestricted Use, SRE, Building 143 | 1983 | Complete | Results and analysis of the final radiological survey conducted in Building 143 of the SRE. Data analysis indicates that the area may be released to unrestricted use. |
| Plutonium Concentrations in Soil Around Drain Lines at NMDF | 1985 | Complete | Results of soil sample analysis of plutonium concentrations from trenches where drain lines were removed at the NMDF. |
| Radiation Survey for Release for Unrestricted Use – L-85 Reactor Facility | 1985 | Complete | Results and analysis of a radiological survey conducted at throughout the L-85 Reactor Building (093) and associated buildings (083, 074, and 453). Data analysis indicates that the facilities may be released for unrestricted use. |
| Interim Storage Facility Decommissioning Final Report | 1985 | Complete | Decontamination, disposition, and decommissioning activities, techniques used, specific problems and resolutions, as well as the radiological surveillance and survey results, summarized for the Interim Storage Facility. |
| Final Radiation Survey of NMDF | 1986 | Complete | Results and analysis of the final radiological survey conducted at the NMDF after decontamination activities. |
| Radiological Survey of Building 005 | 1987 | Complete | Results and data analysis of a radiological survey conducted at Building 005 in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Radiological Survey of Buildings T373 and T375 | 1988 | Complete | Results and analysis of the final radiological survey conducted in Buildings T373 and T375. Data analysis indicates that the areas are not contaminated with residual radioactivity. |
| Radiological Survey of the Sodium Disposal Facility – T886 | 1988 | Complete | Results and data analysis of a radiological survey conducted at the Sodium Disposal Facility in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Radiological Survey of the Source and Special Nuclear Material Storage Vault – Building T064 | 1988 | Complete | Results and data analysis of a radiological survey conducted at Building 064 in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Radiological Survey of the Old Calibration Facility – Building T029 | 1988 | Complete | Results and data analysis of a radiological survey conducted at Building 029 in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |

**Table 2-1 SSFL Area IV Sources of Radionuclide Data (continued)**

| | | | |
|---|---|---|---|
| Radiological Survey of Shipping/Receiving and Old Accelerator Area – Buildings T641 and T030 | 1988 | Complete | Results and data analysis of a radiological survey conducted at Buildings 641 and 030 in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Radiological Survey of the ESG Salvage Yard (Old), Rocketdyne Barrel Storage Yard, and New Salvage Yard (T583) | 1988 | Complete | Results and data analysis of a radiological survey conducted at in three areas used for storing salvageable materials, parts, and containers in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Radiological Survey of the T513 Parking Lot; Old R/A Laundry Area; Plot 333; and Areas Between the SRE to RMDF, and KEWB to RMD | 1988 | Complete | Results and data analysis of a radiological survey conducted at in five areas (comprising 2.5-acres) used for supporting nuclear-related facilities, storing excess materials and components, parking lots, and access pathways in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Radiological Survey of Buildings TO19 and T013; An Area Northwest of T059, T019, TO13 and T012; And a Storage Yard West of Buildings T626 and T038 | 1988 | Complete | Results and data analysis of a radiological survey conducted at in four areas used for supporting the Systems for Nuclear Auxiliary Power (SNAP) program in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Radiological Survey of the T056 Landfill; Area from 23rd Street to Building T100; and an Area Across from Building T011 | 1988 | Complete | Results and data analysis of a radiological survey conducted at in three areas used for supporting nuclear-related facilities, storing excess materials and components, parking lots, and access pathways in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Radiological Survey of Buildings T049, T042, T027, T032, and T025 | 1988 | Complete | Results and data analysis of a radiological survey conducted at in five areas used for supporting the Systems for Nuclear Auxiliary Power (SNAP) program in order to identify areas requiring additional radiological inspection and/or remedial action. Describes the actions taken as a result of this survey. |
| Building 028 D&D Final Report | 1990 | Complete | After initial decontamination and decommissioning in 1976, a uranium oxide melting experiment contaminated portions of the facility. This report describes the decontamination and disposition activities in preparation for release of the site for unrestricted use. |
| Final Decontamination and Radiological Survey of Building 029 | 1990 | Complete | Results and analysis of the final radiological survey conducted at Building 029. Data indicates that the building is suitable for release without radiological restrictions. |
| Final Decontamination and Radiological Survey of the Building 064 Side Yard | 1990 | Complete | Results and analysis of the final radiological survey conducted at Building 064, the fenced-in yard, and a surrounding 2-acre area. Data analysis indicates that the Side Yard and other surveyed areas surrounding Building 064 are suitable for release without radiological restrictions. |
| Final Decontamination and Radiological Survey of the Old Conservation Yard | 1990 | Complete | Results and analysis of a comprehensive radiological survey conducted in a 5-acre area storage yard area, including the Old Conservation Yard. Data analysis indicates that the area may be released to without radiological restrictions. |
| Building 028 Radiological Survey Procedure | 1991 | Complete | Description of procedures to conduct the final radiological survey for Building 028. |
| Final Decontamination and Radiological Survey of Building 028 | 1991 | Complete | Results and analysis of the final radiological survey conducted at Building 028. Data indicates that the building is suitable for release without radiological restrictions. |
| Work Plan for Multi-Media Sampling | 1992-1994 | Complete | Conducted by McLaren Hart; included analysis of soil samples for metals. |
| Baseline Radiological Survey of the FSDF | 1992 | Complete | Results and analysis of a baseline beta and gamma radiological survey conducted at the FSDF. |

**Table 2-1 SSFL Area IV Sources of Radionuclide Data (continued)**

| | | | |
|---|---|---|---|
| Preliminary Beta/Gamma Radiological Survey and Data Analysis for the Sodium Disposal Facility Closure | 1992 | Complete | Describes the procedures for performing a baseline Beta/Gamma radiological survey of the FSDF. |
| Building 023 D&D Operations Final Report | 1993 | Complete | Decontamination and decommissioning activities, techniques used, specific problems and resolutions summarized for Building 023. |
| Building 023 Final Survey Procedure | 1993 | Complete | Description of procedures to conduct the final radiological survey for Building 023. |
| Building 064 D&D Operations Final Report | 1993 | Complete | Summary of decontamination and dismantlement activities conducted after 1990 at Building 064. |
| Building T064 Interior Final Survey Procedure | 1993 | Complete | Description of procedures to conduct radiological surveying of Building 064. |
| Radiological Assessment of the Building T064 Fenced-In Yard | 1993 | Complete | Results and analysis of radiological survey conducted in the fenced-in yard surrounding Building 064 to assess residual radioactivity. |
| Final Radiological Sampling and Gamma Survey Procedures To Follow Site Remediation of the FSDF | 1993 | Complete | Describes the procedures for performing a final radiological survey of the FSDF, following environmental remediation and closure. |
| RCRA Facility Assessment (RFA) | 1994 | Complete | Conducted by SAIC for the USEPA under the RCRA Corrective Action Program to assess if a release has occurred at SSFL. Resulted in the identification of 125 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs), 36 of which were located in Area IV. |
| Final Radiological Survey Report of Building 023 | 1994 | Complete | Results of the final radiological survey following decontamination and decommissioning activities, indicating that Building 023 may be released for use without radiological controls. |
| Final Radiological Survey Report of Building 064 Interior | 1994 | Complete | Results and analysis of the final radiological survey conducted at Building 064. Data analysis indicates that the building is suitable for use without radiological controls. |
| Post-Remediation Ambient Gamma Radiological Survey of the FSDF | 1994 | Complete | Results and analysis of ambient gamma exposure survey conducted at the FSDF. |
| RCRA Facility Assessment (RFA) | 1994 | Complete | Conducted by SAIC for the USEPA under the RCRA Corrective Action Program to assess if a release has occurred at SSFL. Resulted in the identification of 125 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs), 36 of which were located in Area IV. |
| RCRA Facility Investigation (RFI) | 1994 Started | Ongoing | Conducted by Ogden for the USEPA under the RCRA Corrective Action Program to investigate releases identified during the RFA. (Includes the identification of at least 10 additional SWMUs and AOCs.) |
| D&D Plan for Building 012 | 1995 | Complete | Description of the work plan for decontamination and disposition of Building 012. |
| Building 012 Final Survey Procedure | 1995 | Complete | Description of procedures for performing the final radiological survey of Building 012. |
| Building T363 Final Survey Procedure | 1995 | Complete | Describes the procedures for performing a final radiological survey of Building T363. |
| Technical Data Summary Construction, Testing and Sampling of Monitoring Wells | 1995 | Complete | Conducted by Groundwater Resource Consultants, Inc. Completed during 1993 and 1994. This report documents well construction details and hydraulic parameters of select wells across the SSFL. |
| RFI Work Plan Addendum | 1996 | Complete | Conducted by Ogden Environmental; included the collection of samples for metals analysis. |
| Final Radiological Survey Report for Building 012 | 1996 | Complete | Results of the final radiological survey following decomposition and disposition activities, indicating that Building 012 may be released without radiological restrictions. |

**Table 2-1 SSFL Area IV Sources of Radionuclide Data (continued)**

| | | | |
|---|---|---|---|
| Building 028 and STIR Facility D&D | 1996 | Complete | Description of decontamination and demolition activities, as well as survey results, for Building 028. |
| Final D&D Report for Building 029 | 1996 | Complete | Description of decontamination and disposition activities for Building 029. |
| Building 030 Final Radiological Survey Plan | 1996 | Complete | Description of procedures to conduct the final radiological survey of Building 030. |
| Sampling and Analysis Plan for T064 and Related Areas | 1996 | Complete | Description of the plan to determine the presence of significant radionuclides and define the extent of contamination in exterior areas. |
| Final Radiological Report for Building T363 | 1996 | Complete | Results and analysis of the final radiological survey conducted in Building T363. Data analysis indicates that the area may be released to unrestricted use. |
| Building T654 Supplemental Radiological Survey Plan | 1996 | Complete | Describes the procedures for performing a supplemental final radiological survey of the decommissioned Interim Storage Facility. |
| Area IV Radiological Characterization Survey – Final Report | 1996 | Complete | Results and data analysis of comprehensive radiological survey performed in previously unsurveyed portions of Area IV. |
| RFI Work Plan Addendum | 1996 | Complete | Conducted by Ogden Environmental; included the collection of samples for metals analysis. |
| D&D of Building 030 | 1997 | Complete | Description of decontamination and decommissioning activities conducted at Building 030. |
| Final Radiological Survey Report for Building 030 | 1997 | Complete | Results and analysis of the final radiological survey conducted at Building 029. Data indicates that the building is suitable for release without radiological restrictions. |
| Post-Remediation Soil Sampling and Analysis for the FSDF | 1997 | Complete | Results and analysis of soil and rock samples collected from the FSDF. Radionuclide concentrations in samples were compared to local background values. |
| Biological Conditions Report (BCR) | 1998 (updated 2005) | Complete | Report summarizing field surveys including the presence and distribution of vegetation communities, wildlife species detected, and locations of sensitive plant and animal species. (Prepared by Ogden Environmental as part of SRAM, updated by MWH Americas, Inc.) |
| Bell Canyon Residence Soil Sampling Work Plan | 1998 | Complete | Conducted by Ogden Environmental. Included sample collection and testing for metals, general minerals and dioxins. |
| Final Radiological Survey Data Package for Building 011 | 1998 | Complete | Radiation survey results of Building 011 conducted prior to demolition, as well as surveys performed on surfaces inaccessible during the original survey. |
| Bell Canyon Residence Soil Sampling Work Plan | 1998 | Complete | Conducted by Ogden Environmental. Included sample collection and testing for metals, general minerals and dioxins. |
| Building 064 Side Yard Core Sampling Plan | 1998 | Complete | Description of procedures to conduct a radiological soil contamination survey for the Building 64 Side Yard. |
| Bell Canyon Residence Soil Sampling Work Plan | 1998 | Complete | Conducted by Ogden Environmental. Included sample collection and testing for metals, general minerals and dioxins. |
| 17$^{th}$ Street Drainage Area, Final Status Survey Procedure | 1999 | Complete | Description of procedures to conduct the final radiological survey for the 17$^{th}$ Street Drainage Area. |
| 17$^{th}$ Street Drainage Area, Final Status Survey | 1999 | Complete | Results of the final radiological survey following decontamination activities, indicating that the 17$^{th}$ Street Drainage Area may be released for unrestricted use. |
| Final D&D Report for Building 4019 | 1999 | Complete | Decontamination and dismantling activities, techniques used, specific problems and resolutions summarized for Building 4019. |
| Building 4019 Final Status Survey Report | 1999 | Complete | Results of the final radiological survey following decontamination and dismantling activities, indicating that Building 4019 may be released for unrestricted use. |

**Table 2-1 SSFL Area IV Sources of Radionuclide Data (continued)**

| | | | |
|---|---|---|---|
| Area 4020 Final Status Survey Procedure | 1999 | Complete | Description of procedures to conduct the final radiological survey for Area 4020 (Hot Laboratory). |
| Building 4059, Phase I Final Status Survey Procedure | 1999 | Complete | Description of procedures to conduct Phase I of the final radiological survey of Building 4059. |
| Building 4059, Final Status Survey Report (Phase I) | 1999 | Complete | Results and analysis of Phase I of the final radiological survey conducted at Building 4059. Data indicates that the building is suitable for release for unrestricted use. |
| Final Report, D&D of Fuel Storage Facility, 4064 | 1999 | Complete | Summary of decontamination and dismantlement activities conducted at the former Fuel Storage Facility, including Building 4064, fenced-in area, the Side Yard and the Surroundings. |
| Area 4064, Final Status Survey Report | 1999 | Complete | Results and analysis of the final radiological survey conducted in Area 4064. Data analysis indicates that the area is suitable for release for unrestricted use. |
| Final Report D&D of Interim Storage Facility 4654 | 1999 | Complete | Updates the information regarding decontamination, disposition, and decommissioning activities, techniques used, specific problems and resolutions, as well as the radiological surveillance and survey results, at the Interim Storage Facility in the 1985 report. |
| Building T654 Supplemental Radiological Survey Report | 1999 | Complete | Results and analysis of the supplemental final radiological survey conducted in Building T654. |
| Building 4654 Supplemental Final Status Survey Report | 1999 | Complete | Results and analysis of the supplemental final radiological survey conducted in Building T654. Data analysis indicates that the area may be released for use without radiological restriction. |
| Final Report for D&D of FSDF | 1999 | Complete | Decontamination, disposition, and decommissioning activities, techniques used, specific problems and resolutions summarized for the FSDF. |
| Data Summary Monitor Well Drilling | 1999 | Complete | Conducted by Groundwater Resource Consultants, Inc. June 1997 through 1999. This report documents well construction details and hydraulic parameters of select wells across the SSFL |
| RFI Standardized Risk Assessment Methodology Work Plan (SRAM) | 2000 | Complete | Conducted by Ogden Environmental; describes methods to be used to conduct RFI risk assessment. |
| Validation Sampling and Analysis Plan | 2000 | Complete | Prepared by Ogden Environmental for ecological validation sampling to support ecological risk assessments at SSFL. Includes biota tissue and abiotic sampling to determine site specific bioaccumulation factors. |
| Operations Report for 17$^{th}$ Street Decontamination | 2000 | Complete | Summary of decontamination and survey activities for the 17$^{th}$ Street Drainage Area. |
| Area 4020 MARSSIM Final Status Survey Report | 2000 | Complete | Results of the MARSSIM final radiological survey following decontamination and decommissioning activities, indicating that Area 4020 may be released for unrestricted use. |
| RFI Standardized Risk Assessment Methodology Work Plan (SRAM) | 2000 | Complete | Conducted by Ogden Environmental; describes methods to be used to conduct RFI risk assessment. |
| Validation Sampling and Analysis Plan | 2000 | Complete | Prepared by Ogden Environmental for ecological validation sampling to support ecological risk assessments at SSFL. Includes biota tissue and abiotic sampling to determine site specific bioaccumulation factors. |
| Hot Laboratory D&D Final Report | 2001 | Complete | Decontamination and decommissioning activities, techniques used, specific problems and resolutions summarized for the Hot Laboratory. |
| Near Surface Groundwater Characterization Report | 2003 | Complete | Prepared by MWH for The Boeing Company. This document reports on the data that were collected and evaluations performed in an effort to characterize the occurrence and movement of groundwater found in the unconsolidated units and weathered bedrock across the SSFL. |
| Building 4059 Final Status Survey Procedure | 2004 | Complete | Description of procedures to conduct the final radiological survey of Building 4059. |

**Table 2-1 SSFL Area IV Sources of Radionuclide Data (continued)**

| | | | |
|---|---|---|---|
| Building 4133 Radiation Survey Report | 2004 | Complete | Describes the radiological survey design used on Building 4133, the HWMF, and its fenced yard, as well as summarizes the survey results. |
| Report of Results Phase I Northeast Investigation Area Groundwater Characterization | 2004 | Complete | Prepared by MWH for The Boeing Company and the U.S. Department of Energy. Volume I of III – Text, Tables, and Figures. This report documents the research on the hydrogeological characteristics of the Chatsworth Formation located at the northeast end of the SSFL (Area I). |
| Standardized Risk Assessment Methodology Work Plan (SRAM) (Revised) | 2005 | Complete | The SRAM Revision 2 was prepared by MWH Americas, Inc., describes the methods to be used to conduct human health and ecological risk assessments for chemical contamination of the Surficial Media Operable Unit (Surficial OU) and Chatsworth Formation OU (CFOU) at the Santa Susana Field Laboratory (SSFL). This document supercedes the original SRAM prepared by Ogden Environmental. This revision to the SRAM was requested by DTSC because it includes, expands on, and provides additional information to supplement the original SRAM. |
| Soil Background Report | 2005 | Ongoing | Prepared by MWH Americas, Inc. to aid site characterization and risk assessments for the ongoing RCRA Corrective Action Program at the SSFL and to guide RFI site characterization decisions. |
| Groundwater Comparison Data Set Report | 2005 | Complete | Prepared by MWH Americas, Inc. To be used as a conservative threshold to make decisions regarding the need to characterize groundwater concentrations or for risk assessment. The Groundwater Comparison Concentrations are considered to be at or below the maximum naturally occurring metals concentrations. |
| Building 4059 D&D Final Report | 2005 | Complete | Summary of decontamination and dismantlement activities conducted at Building 4059. |
| Standardized Risk Assessment Methodology Work Plan (SRAM) (Revised) | 2005 | Complete | The SRAM Revision 2 was prepared by MWH Americas, Inc., describes the methods to be used to conduct human health and ecological risk assessments for chemical contamination of the Surficial Media Operable Unit (Surficial OU) and Chatsworth Formation OU (CFOU) at the Santa Susana Field Laboratory (SSFL). This document supercedes the original SRAM prepared by Ogden Environmental. This revision to the SRAM was requested by DTSC because it includes, expands on, and provides additional information to supplement the original SRAM. |
| Soil Background Report | 2005 | Ongoing | Prepared by MWH Americas, Inc. to aid site characterization and risk assessments for the ongoing RCRA Corrective Action Program at the SSFL and to guide RFI site characterization decisions. |
| Groundwater Comparison Data Set Report | 2005 | Complete | Prepared by MWH Americas, Inc. To be used as a conservative threshold to make decisions regarding the need to characterize groundwater concentrations or for risk assessment. The Groundwater Comparison Concentrations are considered to be at or below the maximum naturally occurring metals concentrations. |
| Building 4059 Site Final Status Survey Report (Phase A and B) | 2006 | Complete | Results and analysis of Phases A and B of the final radiological survey conducted at Building 4059. Data indicates that the building is suitable for release for unrestricted use. |
| Final Status Survey Report: Characterization and Final Status Survey RMHF Perimeter | 2006 | Complete | Results and analysis of characterization and final status survey of the perimeter of the RMHF. |
| Group 6-Northeastern Portion of Area IV RCRA Investigation Report | 2006 | Complete | Prepared by MWH for The Boeing Company. Volume I – Text, Tables, and Figures. Prepared by MWH. Volume I – Text, Tables, and Figures. This report provides a characterization of the hydrogeology and contamination in the southwest portion of Area IV. |

**Table 2-1 SSFL Area IV Sources of Radionuclide Data (continued)**

| | | | |
|---|---|---|---|
| Final Status Survey Report: Final Status Survey Post Historical Site Assessment Sites, Block 1 | 2007 | Complete | Results of the characterization and final radiological survey following decontamination and decommissioning activities of five sites within Area IV (Block 1), including Buildings 4023, 4028, 4583, 4323, and 4030. The results of the exploratory data analysis performed on off-site laboratory data were presented. The survey results indicate release of all surveyed units to unrestricted use. |
| Sample and Analysis Plan for the Radiological Characterization and Confirmatory Survey of the SNAP Environmental Test Facility – Building 4024 | 2007 | Complete | Description of procedures for radiological characterization and confirmatory surveys for Building 4024 prior to decontamination activities. |
| Final Status Survey Plan for the SNAP Environmental Test Facility – Building 4024 | 2007 | Complete | Description of procedures to conduct the final radiological survey for Building 4024. |
| Characterization and Final Status Survey Report: RMHF Holdup Pond (Site 4614) | 2007 | Complete | Results and analysis of characterization and final status survey of the Holdup Pond of the RMHF. |
| Combined Summary Report: RMHF Building Surveys | 2007 | Complete | Results and analysis of the radiological surveys conducted in Buildings 4022, 4075, 4563, 4621, 4658, 4665, and 4688 of the RMHF. |
| Revised Source Zone Characterization at the Santa Susana Field Laboratory | 2007 | Complete | Prepared by Jennifer C. Hurley, Beth L. Parker, John A. Cherry, University of Waterloo, Department of Earth Sciences. This document reports on the sampling and analysis of rock core samples to determine source concentrations in the rock matrix. |
| Report on Annual Groundwater Monitoring, 2006 | 2007 | Complete | Summarizes groundwater radiochemistry data collected during quarterly monitoring and new well construction activities. Report produced by Haley & Aldrich, Inc. Results of Radiological Analyses can be found in Volume II, Appendix E. |
| Report on Annual Groundwater Monitoring, 2006 | 2007 | Complete | Prepared by Haley & Aldrich, Inc. for the Boeing Company and the U.S. Department of Energy. Volume I of II. |
| Data Gap Investigation for Radiological Constituents in Groundwater – Area IV, Boeing Santa Susana Field Laboratory, Ventura County, California | 2007 | Complete | Prepared by Haley & Aldrich, Inc. for the Boeing Company. Installation and sampling of thirteen wells (RD-85 through RD-97) in Area IV during 2004 through 2006. |
| Overview of the Site Conceptual Model for the Migration and Fate of Contaminants in Groundwater at the Santa Susana Field Laboratory | 2007 | Complete | Prepared by John Cherry, David McWhorter and Beth Parker, SSFL Groundwater Advisory Panel. The report provides an academic and applied summary of the distribution and movement of contaminants (mainly chlorinated VOCs) in the rock matrix |
| Group 4 – Southern Portion of Area II RCRA Facility Investigation Report | 2007 | Complete | Prepared by MWH. Volume I – Text, Tables, and Figures. The report presents as description of the hydrogeology and contamination in the south central part of the SSFL. |
| Group 8 – Western Portion of Area IV RCRA Facility Investigation Report | 2007 | Complete | Prepared by MWH. Volume I – Text, Tables, and Figures. This report provides a characterization of the hydrogeology and contamination in the southwest portion of Area IV. |
| Data Summary, Construction and Testing of Core Borings SB_TRI-01 and SB_TRIT-02, Boeing Santa Susan Field Laboratory, Ventura County, California | 2007 | Complete | Prepared by Haley & Aldrich, Inc. for the Boeing Company. Report regarding the installation and sampling of two coreholes drilled in the northwestern portion of Area IV to assess vertical distribution of tritium in core pore-water from the unsaturated and saturated Chatsworth Formation. |

**Table 2-1 SSFL Area IV Sources of Radionuclide Data (concluded)**

| | | | |
|---|---|---|---|
| Offsite Data Evaluation Report | 2007 | Complete | Prepared by MWH. This report provides an evaluation of constituents located in areas off of the SSFL. A regional geologic map is presented in the report. |
| Report of Radiological Characterization and Confirmatory Survey Results for the SNAP Environmental Test Facility – Building 4024 | 2008 | Complete | Results of the radiological characterization and confirmatory surveys of Building 4024, prior to decontamination activities. |
| Report of Radiological Characterization and Confirmatory Survey Results for the SNAP Environmental Test Facility – Building 4024: Appendix A Completed Data Packages | 2008 | Complete | Results of the final radiological survey following decontamination and decommissioning activities in Building 4024. |
| Work Plan<br>Site-Wide Groundwater Characterization | 2008 | Complete | Prepared by MWH. This plan provides methods and procedures that will be followed to characterize the groundwater across the SSFL. The plan also presents a reasonable summary of current known conditions. |
| Sampling and Analysis Plan for RFI Group 5 | 2008 | Ongoing | Prepared by CH2M Hill. This document is a working draft. The report provides a description of data gaps in RFI Group 5 and the methods and procedures that will be used to fill the gaps. |
| RFI Work Plan Addendum Amendment Radioactive Materials Handling Facility RFI Site (SWMU 7.6 and Area IV AOC) | 2008 | Ongoing | Prepared by MWH. Presents a data gap analysis and recommendations for sampling at the Radioactive Materials Handling Facility and other areas within Group 7. |
| Work Plan for Proposed Groundwater Monitor Well RD-98, Former Radioactive Materials Handling Facility Leach Field, Santa Susana Field Laboratory, Ventura County, California | 2008 | Ongoing | Work Plan for installation and sampling of new monitoring well RD-98 to evaluate potential groundwater impacts related to reported releases of radionuclides from the former RMHF leach field. |

# Section 3
# Data Gaps Analysis Method

## 3.1 Data Gap Analysis Approach

A multiple step approach was implemented in conducting the data gap analysis described in this document. The approach evaluated all areas and media of Area IV with respect to the potential risk to human health and ecological receptors. The basic steps are outlined below. The specifics on how the steps were used for each media are described in Section 3.2 through 3.13.

### 3.1.1 Establishment of Data Quality Objectives

Data Quality Objectives (DQO) establish the data collection and measurement purpose and criteria aimed at addressing the basic objectives of a study. The overall purpose of the SSFL Area IV EIS Data Gap Study is to define the type, location, and measurement limits of data necessary to conduct analyses of risk-based alternatives in the EIS. The DQO process was used in the gap analysis to define the data acceptability criteria, measurement objectives, and study area boundaries for data to be used in the EIS risk assessments. CERCLA guidance for conducting a risk assessment was followed to allow for a systematic approach to the data collection objectives and requirements.

### 3.1.2 Develop Conceptual Site Models

Separate conceptual site models (CSM) were developed to address human health and ecological receptors to soil and water contamination within Area IV. The CSMs were developed to address receptors and exposure pathways that will be assessed in the risk assessment. The CSMs were also used to identify the types of data that will need to be evaluated and collected (if determined to be a data gap) to conduct the risk assessments.

### 3.1.3 Database Formatting

The database provided by Boeing was developed from data and information collected by Boeing and several consultants during numerous studies. The samples reported in the database were analyzed by several laboratories. As a result, there were inconsistencies in data fields that required correction in order for data screening to occur.

The data were reviewed and consistency corrections made as necessary for the following fields: analyte name, CAS number, reporting unit (concentration), reporting limit, detection limit, or minimal detectable activity (as appropriate), sample location, sample depth, and sample type. In addition, data screening criteria, as described in the following section, were added to the database for the screening step.

### 3.1.4 Screening Criteria Development

Two basic screening criteria were developed for the identification of COIs for Area IV. These included background levels and human health and ecological risk criteria. Section 3.4 describes the process for developing the criteria.

### 3.1.5 Document Review for Chemical and Process History

Literally, hundreds of reports have been developed for Area IV by Boeing and its consultants that describe historical usages and the results of numerous sampling studies. Many of these reports were reviewed to ascertain knowledge of where chemicals and radioactive materials were used and potentially released into the environment. Table 2-1 lists and describes the reports that were reviewed in this step and Appendices A and B summarize the process history and uses of building in Area IV.

### 3.1.6 Database Screening

The data in the database were screened for two basic purposes. First to identify COIs, data were screened against background concentrations to identify contaminants (chemical and radionuclide) of anthropomorphic origin. That is, to identify COIs that are not of natural origin within Area IV. The development of background levels is described in Section 3.4.1. And second, to identify data that is usable in human health and ecological risk assessments, analytical detection limits were screened against background and risk criteria (PRGs, MCLs, ESLs). This screening step was used to ensure that the data can be definitely used to define the presence or absence of an analyte for risk assessment purposes. Data not meeting this criteria was not considered when the data gaps were determined.

### 3.1.7 Development of Exposure Units

Risk assessments require that sampling data be averages over an exposure unit representative of the most likely exposure scenario, for purposes of calculating risks by a known surface area. Chemical and process use information were used to subdivide Area IV into exposure units for the purpose of identifying what data (meeting data gap criteria) exist for the exposure unit and determining what additional data would be necessary for conducting the risk assessment and defining extent of contamination.

### 3.1.8 Determination of Risk Assessment Data Needs

Statistical algorithms were used to identify the quantity (numbers of samples) of data required for each exposure unit to conduct a risk assessment consistent with CERCLA requirements. This calculation was performed irrespective of the quantity of existing data.

### 3.1.9 Determination of Extent of Contamination Data Needs

The review of the chemical and process history was used to identify the COIs for each exposure unit. This review was performed to determine whether prior investigations

had included all potential COIs. The distribution and concentrations of COIs for each exposure unit, particularly those COIs that exceeded health or ecological risk criteria were reviewed to determine whether the existing data could be used to bound the horizontal and vertical extent of contamination. The data gap investigators used color coded maps to identify locations where additional data are warranted to define contaminant extent.

### 3.1.10 Determination of Data Gaps

The difference between the acceptable data produced from the database screening and the requirements for data to perform both a risk assessment and in defining extent of contamination becomes the "Data Gap". This exercise was performed independently by each exposure unit and separately for soil and groundwater data. The total number of samples required for each exposure unit was compared with the acceptable data and the location of that data to determine the data gap. The number of required samples by analyte (COI) was tabulated and is reported in Section 4 for each of the media areas evaluated.

### 3.1.11 Reconciliation with RCRA Facility Investigation Data

Following all ten steps described above and the determination of data gaps for each exposure unit, the data gap recommendations were compared with ongoing and proposed RCRA RFI plans to ascertain if some data collected under the RFI would also address the CERCLA risk assessment needs. Working Draft versions of sample location maps for the Groups 5 and 7 sampling programs are located in Attachment A of this Data Gaps report. Although many sample locations within RFI Groups 5 and 7 were determined to potentially meet the data gap need, collection of that data is still deemed a data gap until the data has been demonstrated to meet the need.

## 3.2 Data Quality Objectives for Data Gap Analysis

Section 3.2 describes the DQO process used for developing data screening criteria and data assessment protocols for conducting the Area IV data gap analysis. The DQO process followed the 7-step EPA process. Although many different kinds of data are required to complete the SSFL Area IV EIS (e.g., socioeconomic data, physical environment, biological species presence, etc.), the DQOs developed here pertain to the analytical chemical and radionuclide data that are required to complete a risk assessment consistent with CERCLA for current conditions. The process used herein was focused on data needs for the CERCLA risk assessments, which also depend on adequate knowledge of the nature and extent of contamination including the initial determination of the number and location of samples of relevant environmental media that may be needed to meet the DQOs.

For other EIS subject-matter areas (physical, social, biological environments), the data necessary to evaluate impacts will be obtained from existing publications containing the best available information and will not be collected specifically for the EIS unless not available. A separate "data gap" analysis for information required for the impact

analysis will be conducted separately from the chemical and radionuclide analysis to determine whether any specific study may be required.

### 3.2.1 Step 1—State the Problem

This first step in the DQO process is to state the problem clearly and concisely.

DOE is preparing an EIS for remediation of Area IV of the SSFL in response to a May 2007 decision by the U.S. District Court of Northern California. The court ruled that a 2003 DOE decision to prepare a FONSI and conduct remediation of Area IV on the basis of an EA, rather than prepare an EIS, violated NEPA. DOE is planning to complete remediation of Area IV to comply with applicable regulations and allow for an evaluation of a range of reasonable alternatives. Environmental data are required to evaluate nature and extent of contamination and to perform human health and ecological risk assessments to support remedial decisions. The data required include radiological and hazardous contaminants in Area IV, areas adjacent to Area IV affected by Area IV contamination, and surface water and groundwater protection in accordance with applicable requirements. The EIS will evaluate a range of reasonable alternatives, including the No Action alternative, which entails no additional remediation. Therefore, the EIS must include an evaluation of the current risk to human health and the environment (i.e., as determined by a risk assessment consistent with CERCLA guidelines). Environmental data used in the risk assessment must be of known quality and adequate for the purpose of risk determination. The data gap analysis must be designed and implemented to ultimately provide that data.

**Problem Statement:** The quality and quantity of existing data need to be reviewed in relation of its applicability for conducting human and ecological risk assessments. A data gap analysis must be conducted to identify any additional data necessary to evaluate risk-based alternatives in an EIS. If data are deemed inadequate, a field program must be designed to collect the required data. The data will be used to prepare an EIS for remediation of Area IV of the SSFL that includes risk assessments consistent with CERCLA and the evaluation of alternatives consistent with both CERCLA and NEPA.

### 3.2.2 Step 2 - Identify the Goal of the Study

The second step in the DQO process is to identify the principal study question and define alternative actions to make decision statements.

The principal study question for the data gap analysis is whether existing chemical and radionuclide data related to Area IV are adequate to support risk assessments consistent with CERCLA and cleanup remedy evaluations in the EIS. The central decision relates to the development and preparation of an EIS and evaluation of a range of reasonable cleanup alternatives.

The decisions needed to determine the adequacy of the data are:

- Are the existing chemical and radionuclide data of sufficient quantity and spatial distribution (vertical and lateral) to support human health and ecological risk assessments and the evaluation of alternatives in the EIS?

- Are the existing data of sufficient quality to support human health and ecological risk assessments?

- Does the existing site data adequately delineate nature and extent of contamination in all media as needed to evaluate cleanup alternatives in the EIS?

- Are current decommissioning and demolition (D&D) building survey data adequate to analyze alternatives in the EIS?

Alternative actions of the decision statements are:

**Decision Statement 1:** If the quantity of existing data in each media is sufficient to support a risk assessment to evaluate cleanup alternative for the EIS, then the risk assessment will be conducted using that data and no further action is required; otherwise, collect additional data per identified media.

**Decision Statement 2:** If the quality assurance and control (i.e., detection limits, and validation) of existing data is sufficient to support the risk assessment, then the risk assessment will be conducted using that data and no further action is required; otherwise, collect additional data per identified media.

**Decision Statement 3:** If the nature and extent of contamination is adequately delineated with existing data, including gamma walkover data, then no further data collection is required; otherwise, additional samples per media and/or gamma walkover data will be collected to adequately define the nature and extent of contamination.

**Decision Statement 4**: If current D&D building surveys are adequate to analyze impacts for the EIS, then no further data collection is required; otherwise, collect additional building survey data for EIS cleanup alternative analysis.

If the answer to any decision statement is no, then additional data may be necessary and the results of the data gap analysis can be used to define the type of additional data needed.

### 3.2.3 Step 3 - Identify Information Inputs

The objective of the third step in the DQO process is to identify the information needed to resolve the decision statements identified in Step 2. This data gaps analysis evaluates a variety of media in Area IV including soil, bedrock, sediment, groundwater (including seep water), surface water/stormwater, biota (terrestrial/aquatic), air, and building surface. To perform human health and ecological risk assessments and delineate the extent of contamination the following data and information needs to have been identified for Area IV:

- Existing available analytical and GIS data from previous site investigations:
  - Reported results and method detection limits (MDLs) for existing data to evaluate data sensitivity objectives
  - Reported background data for chemicals and radionuclides in soil, air, and groundwater
- Chemical and radionuclide COIs within Area IV based on existing data and historical process knowledge;
- Residential and rural residential PRGs/screening levels for chemical and radionuclide COIs
  - California EPA-modified EPA Region 9 chemical PRGs will be used for residential human health screening
  - Risk Assessment Information System (RAIS)/EPA Region 4 chemical PRGs for rural residential scenario human health screening incorporating fruits and vegetable consumption only and added to the Region 9 PRGs to develop a rural residential scenario PRGs
  - Default EPA radionuclide PRGs will be used for residential radiological human health screening
  - In some applications, PRGs will be compared with background concentrations and a derived concentration guideline level (DCGL) used in the screening process (see Section 3.2.6.1 for the definition of DCGL).
- Ecological PRGs will be used for radionuclides derived from *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota* (**DOE 2002**)
- ESLs will be used for screening chemical contaminants derived from a variety of sources
- Conceptual site model defining exposure pathways for potential receptors that will be evaluated during the risk assessments.

## 3.2.4 Step 4 - Define the Boundaries of the Study

The fourth step in the DQO process is to specify the study boundaries. The objective of this fourth step is to define the spatial and temporal boundaries that limit the scope of the analysis.

### 3.2.4.1 Spatial Boundary

For the purpose of the EIS and this data gap analysis, the spatial boundary is all of Area IV and any areas down gradient that may be impacted from migration of contaminants from Area IV. For soil (surface and subsurface) and surface water the

boundaries include Area IV shown in Figure 1-2, drainage leading into Areas II and III down gradient of Area IV, and the undeveloped land north and south of Area IV. Soil background boundaries are defined as the non-impacted Chatsworth and Santa Susana Formations. Groundwater boundaries include all of Area IV and extent of groundwater plumes originating in Area IV and extending into undeveloped land and Areas II and III. Background values for groundwater have not been defined.

### 3.2.4.2 Vertical Sub-Boundaries

The vertical boundaries for the soil risk exposure scenarios are as follows:

| | Human Health | | Ecological |
|---|---|---|---|
| **Zone** | **Radiological** | **Chemical** | **All** |
| Surface | 0 - 0.5 ft. | 0 – 2 ft. | 0 – 2 ft. |
| Near Surface | 0.5 – 2 ft. | not applicable | 2 – 4 ft. |
| Subsurface | 2 – 10 ft. | 2- 10 ft. | 4 – 6 ft. |

For delineating extent of soil contamination, the vertical boundary for soil is the depth to the top of uncontaminated soil in surface, near surface, subsurface soils, or bedrock as determined by sampling. Distinctions between surface soil, near surface soil, and subsurface soil are made because COIs and exposure pathways for receptors may be limited to these specific subsets of data. For example, exposure to radionuclides is primarily a concern in the surface soil samples (from 0 to 0.5 feet bgs) because this upper layer of soil provides some shielding from deeper soils. Shallow sub-surface soil (from 0.5 to 2 feet bgs) is distinguished because ecological receptors and human receptors primarily would be exposed to this upper layer of soil. The deeper sub-surface soil (2 to 10 feet bgs) represents the depth to which a resident or a construction worker could be exposed to the soil following or during regrading for development. Bedrock in the area is shallow – less than 5 feet bgs in areas; therefore, it may not be possible to collect soil samples to 10 feet bgs. Samples collected from depths below 10 feet bgs will not be used in the quantitative risk assessment; however, these samples will be examined to help ensure that no constituents are overlooked by not including these deeper samples.

For sediment, the boundary for ERA is the top 0.5 foot. Sediment data will be used as a soil exposure for human-health risk analysis, as well as a separate media for the ecological risk assessment.

For groundwater, the vertical boundaries will include shallow unconsolidated soil and bedrock regions. For shallow unconsolidated soil region for groundwater, the vertical boundary will be the depth to bedrock surface, or water table, whichever is shallower.

### 3.2.4.3 Horizontal Sub-Boundaries

For the purposes of the data gap analysis, the area within the administrative boundary of Area IV was divided into EUs. For purposes of soil and building

characterization, EUs were further sub-divided into Class 1, Class 2 or Class 3 Areas referred to as SUs. These spatial divisions were used to define the required data density using a statistical sampling approach for soil and buildings based on the guidance from Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). The Classes are defined in Section 3.6.3.

Consistent with the MARSSIM approach, both existing data and process history were used to classify each part of Area IV into MARSSIM classes. A three-step process was used to accomplish the classification:

- The refined Area IV data set was screened against PRGs and background concentrations, and the information graphically displayed;
- Knowledge of process areas and operational history was reviewed;
- The information from both previous steps was applied to the class definitions and SU boundaries were drawn accordingly (See Section 3.6.3).

For delineating extent of soil contamination, the horizontal boundary for soil is the boundary with uncontaminated soil in surface, near surface, subsurface soils, or bedrock as determined by sampling.

#### 3.2.4.4 Temporal Boundary

For areas that have been subject to soil removal actions, only post-remediation characterization results (or current conditions) were used as current characterization data for the data gap analysis. For the purposes of the data gap analysis, data that were available by January 28, 2008 were used in this assessment. It is recognized that Boeing is in the process of collecting additional data that will be evaluated for applicability to the data gap criteria, particularly as part of the design of the field sampling program.

### 3.2.5 Step 5 - Develop the Analytical Approach

The fifth step in the DQO process is to define the decision rules and develop an analytic approach that will guide analysis of the study results and drawing conclusions from the data.

For this evaluation, the gap in the existing data was evaluated for each potential COI on a constituent-by-constituent basis. Some groups of chemicals were evaluated as if they were a single chemical or representative group of chemicals, for instance, carcinogenic polycyclic aromatic hydrocarbons, dioxins/furans, and PCBs. These groups were evaluated using surrogate chemicals to represent the whole group. Justification for the choice of surrogate is provided in subsequent sections.

Similarly for radionuclides, some radionuclides can be measured by proxy by measuring a progeny radionuclide assumed to be in equilibrium. An example is the use of Actinium 228 ($^{228}$Ac) data obtained by gamma spectroscopy as a proxy for

Radium 228 ($^{228}Ra$) which has no measurable gamma emissions. Other proxies could be developed based on known ratios of related radionuclides, However, for purposes of the data gap analysis, it is assumed that known ratios other than by secular equilibrium do not exist from the current process knowledge. The data gap presented by the existing data was evaluated for each potential COI on a constituent by constituent basis. In some cases, some constituents were used as proxies for others. Those cases are defined in the following text as necessary.

## 3.2.6 Step 6 - Specify Performance for Acceptance Criteria

The sixth step in the DQO process is to specify error tolerances. The objective of this step is to evaluate the error tolerances that will be built into the design of characterization programs so that decision uncertainty is within tolerable limits. For purposes of the data gap analysis for soils, a MARSSIM statistical approach was used as a tool to define the sample density. Therefore, a DCGL based on an assumed cleanup criterion for soil, a null hypothesis, and confidence criteria are required. The confidence criteria can also be used to define an appropriate number of samples for risk analysis for other media.

### 3.2.6.1 Derived Concentration Guideline

For purposes of screening for data gap analysis for soil, an assumed remediation level defined by MARSSIM as the DCGL was set equal to the $1x10^{-6}$ PRG or twice the background screening value, whichever was greater. Screening against twice the background value was evaluated to assess the potential for cleaning up to background concentrations.

### 3.2.6.2 Null Hypothesis

By default, it was assumed that a soil concentration did not meet the DCGL unless there was a specified confidence that contaminant concentrations, averaged over the area of an exposure unit, would be lower than the DCGL.

### 3.2.6.3 Confidence Interval:

- alpha (false negative) = 5 percent
- beta (false positive) = 10 percent

The lower boundary of the gray region (LBGR) was set to be equal to half of the PRG. The LBGR defines the level at which the false positive evaluation is applied.

If the null hypothesis is proved false by the statistical test, it will be assumed that no further remediation would be recommended.

### 3.2.6.4 Statistical Test

The MARSSIM recommends the use of a Sign test (when no background comparison is made) or a Wilcoxon Rank Sum Test (when comparison to background is made) for determining the number of samples required to meet the statistical confidence

requirements. These statistical tests were used to estimate the number of samples required for each constituent to meet the confidence objectives.

### 3.2.6.5 Measurement Quality Objectives (MQOs)

Evaluation of Precision, Accuracy, Representativeness, Comparability and Completeness (PARCC parameters) and sensitivity (blanks) is necessary to assure quality of the data. For the COI screening and data gap analysis, an abbreviated screening assessment of only data representativeness and sensitivity was applied.

Data representativeness is the extent to which available data characterize potential exposure conditions for human or ecological receptors. Proper selection of sampling locations, consideration of potential hot spots, assessment of background concentrations, and collection of a sufficient number of samples help maximize data representativeness.

Existing data were collected over time by different contractors, and consistency in approaches was not evaluated regarding data recording and data sensitivity requirements. Therefore, some evaluation of the usability of existing datasets for the risk assessments based on sensitivity is required. The decision rules for data acceptance criteria are defined below. These acceptance criteria address the first two decision statements in Step 2.

Q1: Is a MDL available in the database? (The MDL for radionuclides was derived by dividing the MDA by 2 or multiplying the error value by 0.825.)

(N) If the answer is no, but the calculated MDL result was greater than either the PRG or background value, then the result was flagged as not meeting the objectives of the data gap analysis for data that could be used to define nature and extent of contamination.

(N) If the answer is no and the calculated MDL result is below the PRG or background value, then the result would meet the data gap objective and is usable.

(Y) If the answer is yes, a MDL is available, then go to Q2.

Q2: Is the result non-detect?

(Y) If the MDL is greater than the PRG or background value, then reject non-detect data as not usable for the data gap analysis.

(Y) If the MDL is less than the PRG or background, then accept non-detect data as an indication that the contaminant is not present at the sample location at a concentration of concern for the data gap study.

(N) If the contaminant is reported above the analytical detection limit, then use data for purposes of the data gap analysis.

Standard Quality Assurance Project Plan (QAPP) PARCC parameters requirements will be applied as MQOs for any new data that is collected. Required detection limits to the extent possible, should be equal to or less than equivalent to 1/10 the $1x10^{-6}$ rural residential PRG, but must at least meet the $1x10^{-6}$ rural residential PRG.

Acceptable historical data were used as reported without further validation. New data will be verified at 100 percent and validated at a Level IV for a minimum of 10 percent of samples collected. Problems identified in the 10 percent Level IV validation may require further review and validation of the remaining 90 percent to evaluate the extent of the problems.

Types of data needed:

- Results for radionuclides and chemicals in the defined boundaries of the study area, including background.
- Data necessary to define nature and extent of contamination and to evaluate soil and groundwater remedies.
- Reporting limits for chemicals and uncertainties for radionuclides.
- Method detection limits.

### 3.2.7 Step 7 - Develop the Plan for Obtaining Further Data

Additional samples will be collected if statistical and/or standard practice-based sample requirements are not met by the existing data. A Field Sampling and Analysis Plan (FSAP) will be developed to meet the need for additional site surveys and samples required to meet the DQOs. In addition to analyzing the data gap, Section 4.0 presents some additional information necessary to develop the FSAP.

## 3.3 Area IV Conceptual Site Models

Existing data meeting the data gap acceptability criteria and any new data proposed for collection are intended for use in evaluating the baseline risk and risk of implementing alternative cleanup actions to both human and ecological receptors. One tool used by risk assessors in determining the types of data necessary for risk assessments is the development of a conceptual site model (CSM). The CSM is a representation of ways that receptors might be exposed to contaminants present within Area IV or potentially released during site cleanup activities. The CSM describes potential sources of contamination, primary and secondary contaminated media, transport mechanisms, exposure route and receptors or receptor categories. Separate CSMs for Area IV were developed for human health risk and ecological risk, and each is described below.

### 3.3.1 Human Health Risk Assessment

The human health CSM describes potential exposure pathways associated with Area IV, including potential sources of contamination, transport mechanisms, exposure

routes, and potentially exposed populations. For this data gap analysis, adequacy of existing analytical data for the CERCLA-based human health risk assessment is evaluated by identifying whether additional data are needed to evaluate the potentially complete exposure pathways indicated in the CSM.

The human health CSM for Area IV is shown in **Figure 3-1**. The CSM follows the approach outlined in the *Standardized Risk Assessment Methodology Work Plan* (SRAM WP) for the SSFL (MWH 2005). Figure 3-1 depicts a diagrammatic representation of the CSM for Area IV, including contaminant sources, release mechanisms, direct and indirect exposure pathways, and potential current and future receptors. Spills and releases from reactors and support structures have resulted in chemical and radiological contamination of building surfaces, soil, ash, weathered bedrock, sediment, and groundwater in Area IV. Potential human receptors are populations potentially exposed to contaminants, either onsite or as a result of contaminant migration to offsite areas. Both current and future land use are evaluated in the selection of potential human receptors. Details of the human health CSM for Area IV are briefly described below.

### 3.3.1.1 Potential Receptors

***Onsite Human Receptors***

Current potential onsite human receptors include security, operations and maintenance personnel, and rarely, trespassers. Most of the Area IV buildings have been demolished; with minimal activity occurring in the remaining buildings. Use and inspections of the few remaining buildings by Boeing personnel are short and infrequent. Risks for these personnel should be covered by U.S. Department of Labor Occupational Safety and Health Administration (OSHA) protective standards; thus, these infrequent workers and security personnel are not considered further and are not shown on the CSM under the current scenario. In any case, industrial workers will be addressed in a potential future scenario.

Future potential receptors include onsite residents, industrial workers, construction workers and recreational visitors who might occupy the site in the event of a change in property use. Construction workers are assumed to be involved in demolition of the site as well as development of the site for its future use; thus, a separate demolition worker is not evaluated. Complete exposure pathways will be evaluated qualitatively for current receptors and quantitatively for future receptors.

Not all potential exposure pathways are complete or significant for every receptor. Some exposure pathways will be evaluated for chemicals only (e.g., dermal contact), while others pathways will be evaluated for radionuclides only (e.g., external gamma).

***Offsite Human Receptors***

The potential exists for offsite migration of site-related COIs with subsequent potential exposures by people during remedial actions. This potential will be qualitatively evaluated in the EIS.

### 3.3.1.2 Potential Exposure Pathways

Complete or potentially complete exposure pathways include:

- Incidental ingestion and dermal contact with soil (includes sediment and weathered bedrock) - all receptors.
- External gamma exposure associated with soil (includes sediment and weathered bedrock) (radionuclides only) - all receptors.
- Incidental ingestion and dermal contact with contaminants on building surfaces - construction worker or trespasser.
- External gamma exposure to radiation emitted from building surfaces (radionuclides only) - construction worker or trespasser.
- Inhalation of fugitive dust originating from soil - all receptors.
- Inhalation of fugitive dust originating from building surfaces - construction worker or trespasser.
- Inhalation of volatile compounds (volatilizing from soil and groundwater) to ambient air - all receptors.
- Inhalation of volatile compounds (volatilizing from soil and groundwater) to indoor air - resident or industrial worker.
- Ingestion of (drinking water source) and dermal contact (domestic use scenario) with groundwater – resident.
- Incidental ingestion of and dermal contact with groundwater (includes seeps and springs) - construction worker and trespasser.
- Indirect exposure to chemicals in soil and groundwater via uptake into edible plants (i.e., homegrown produce for a rural resident) – resident.

Potential exposure pathways for offsite residents that will be qualitatively discussed in the EIS include:

- inhalation of fugitive dust from soil or building materials during building demolition and transportation offsite for disposal.
- external gamma radiation emitted from building materials during transportation of materials offsite for disposal (radionuclides only).
- ingestion of (drinking water source) and dermal contact (domestic use scenario) with offsite migration of storm water.

- inhalation of volatile compounds (volatilizing from offsite migration groundwater) to indoor air.

Incomplete exposure pathways that will be qualitatively discussed in the risk assessment due to limited exposure duration or frequency include:

- direct contact with or ingestion of stormwater during stormwater runoff events.

***Soil Exposure Pathways***

For purposes of evaluating soil data needs for the human health risk assessment for Area IV, three soil-depth ranges are considered: surface soil (0 to 2 feet bgs), near surface (2 to 4 feet bgs, and subsurface soil (4 to 10 feet bgs). All receptors are potentially exposed to surface soil at Area IV via incidental ingestion, dermal contact, inhalation of fugitive dust and volatile chemicals and external gamma radiation. Since construction workers would excavate soil, they would be potentially exposed to subsurface soils in addition to the surface soils. Residents may also be exposed to a mixture of surface and near surface soils if Area IV were to be regraded for residential development and surface and subsurface soils are mixed.

***Air Exposure Pathways***

Inhalation of site-related compounds in air represents a potentially complete exposure pathway at the site. Two air exposure pathways are considered: inhalation of fugitive dust and inhalation of chemicals volatilizing from soil and groundwater. Fugitive dust results when chemicals present in soils may be pulled into the air through wind erosion or mechanical disturbances of the soil resulting in fugitive dust. Typically, only small soil particles are light enough to be carried up in the air column and transported significant distances. Particulates in air can be a source of exposure, and may impact distant soils, surface water, and biota due to particulate re-deposition. Inhalation of fugitive dust is a complete exposure pathway for trespassers and all future receptors. Trespassers are evaluated qualitatively for this exposure pathway, while other receptors are evaluated quantitatively.

Another potential inhalation pathway is through volatilization. Volatile compounds in soil and/or groundwater may volatilize and subsequently be released to ambient air and/or indoor air. Potential exposure to compounds volatilizing from soil, soil vapor, weathered bedrock, or groundwater to ambient (outside) air is considered a complete pathway for current trespassers and all future receptors, but only for chemicals that meet DTSC's definition of a volatile compound. Residential receptors and industrial workers may also be exposed via inhalation of volatile chemicals in soil, soil vapor, weathered bedrock, or groundwater which volatilize to indoor air. This exposure pathway is complete for future residents and industrial workers, but incomplete for recreational visitors since recreational visitors would not be expected to spend time indoors. Exposures to contaminants in air are evaluated using models that estimate air concentrations from source mediums.

***Building Exposure Pathways***
Building surfaces in Area IV may emit gamma radiation from surface contamination or activated building materials. Building surfaces could also be a source of inhalation exposure from fugitive dust and ingestion exposure from surface residues. The exposure pathways are complete for future construction workers during building demolition and for trespassers. Exposures are evaluated quantitatively for trespassers and construction workers.

***Groundwater Exposure Pathways***
Future residents could be exposed to contaminants in groundwater if homes are constructed in Area IV and water supply wells are installed to supply household water to these homes. Ingestion, dermal contact, and inhalation (during showering) of chemicals of concern in groundwater are considered potentially complete exposure pathways for the future resident.

Direct exposure to groundwater is an incomplete pathway for future industrial workers and recreational visitors, since neither would have access to water supply wells.

Construction workers may be exposed to groundwater during excavation activities in areas where shallow or perched groundwater exist. Incidental ingestion of and dermal contact with groundwater are considered potentially complete exposure pathways for future construction workers. In addition to the evaluation of potential future onsite groundwater use, future impacts to groundwater due to contaminant transport from surficial media (soil, weathered bedrock, surface water, near-surface groundwater) to the Chatsworth Formation groundwater, or transport of contaminants within the Chatsworth Formation, will be evaluated in the risk assessment.

Future residents, workers, and recreational visitors may be exposed to groundwater emanating at seeps, but only minimally. Seeps do not yield enough water sufficient for water supply use or recreational use. In addition, seep water may be representative of shallow groundwater in the area of the seep. Therefore, data collected from seeps and springs are included in the data gap analysis.

***Rural Residential Exposure Pathways***
If residences are constructed at Area IV in the future, it is possible that produce may be grown in impacted soil in backyard gardens. Gardens may also be irrigated with contaminated groundwater. Contaminants in soil or groundwater may then be incorporated into edible plant tissues via root uptake. This pathway is complete for future residents, but incomplete for future workers and recreational visitors. Ingestion of homegrown produce is evaluated based on models that estimate bio-uptake from source medium concentrations (i.e., soil and groundwater data).

## 3.3.2 Ecological Risk Assessment

The ecological CSM for Area IV is shown in **Figure 3-2**. Per the SRAM WP for the SSFL (MWH 2005), the CSM indicates the pathways (sources, retention or transport media, exposure media, and exposure routes) potentially resulting in exposure of ecological receptors of interest. These include terrestrial and aquatic plants and animals potentially occurring onsite and offsite for locations that may be site-influenced. These may include common species that represent important trophic levels or communities as well as uncommon or rare species that warrant special consideration. Special species include those listed or proposed for listing as Threatened or Endangered (per the Endangered Species Act) as well as State Species of Special Concern. Each of these categories of receptors will be evaluated in the ERA conducted for Area IV.

This Data Gap Analysis report includes an evaluation of the adequacy of the existing analytical data for the indicated exposure media and identifies the additional data needed to evaluate the potential exposure pathways indicated in Figure 3-2. The potential exposure pathways for ecological receptors at Area IV are briefly described below.

For purposes of evaluating data needs for the ERA at Area IV, three soil-depth ranges are considered: surface soil (0 to 2 feet bgs), near subsurface (2 to 4 feet bgs), and subsurface soil (4 to 6 feet bgs). All terrestrial receptors are potentially exposed to surface soil at Area IV and in adjacent areas as a result of erosion and stormwater runoff or groundwater discharging at seeps. Per the SRAM WP for the SSFL (MWH 2005), burrowing animals, such as the deer mouse, are potentially exposed to soil down to 6 feet bgs. Per the SRAM WP, terrestrial plants were to be evaluated qualitatively. The evaluation of the existing soil data uses ESLs that are based on multiple exposure pathways to animal receptors, including external radiation and incidental ingestion of soil. Soil screening levels for radionuclides also incorporate a term for inhalation of suspended soil particles. Air pathways (inhalation), while potentially complete for surface-dwelling terrestrial wildlife species, are not evaluated for chemicals, because they are considered less significant relative to other routes of exposure (MWH 2005, EPA 2005).

Surface water and groundwater, a potential source of offsite seep and surface water, are evaluated as potential exposure media for both terrestrial and aquatic ecological receptors. Terrestrial animals are potentially exposed to surface water and groundwater discharging at seeps primarily through ingestion. Per the SRAM WP (MWH 2005), dermal contact and inhalation of vapor from surface water by terrestrial animals are not evaluated. Surface water and groundwater data are also evaluated as potential sources of exposure to aquatic biota (animals and plants) living in permanent surface-water bodies located onsite and offsite, respectively. Sediment data from permanent surface-water bodies are also evaluated as a potential exposure medium for aquatic biota over multiple exposure routes and for terrestrial animals that may incidentally ingest sediment while foraging. Per the SRAM WP for the SSFL (MWH 2005), dermal contact with sediment by terrestrial animals is not evaluated.

Animal receptors are potentially exposed to chemicals and radionuclides present in the tissues of their plant and animal food as a result of uptake from abiotic media. The adequacy of existing Area IV analytical data for biotic tissues is evaluated in this *Data Gap Analysis Report* and the additional data needed to evaluate ingestion of plant and animal tissue, as appropriate for the representative species chosen for the Area IV ERA, are identified.

The exposure of ecological receptors to contaminated building surfaces at Area IV is not evaluated because it is judged to be inconsequential. Building surfaces are unlikely to be a source of contamination to terrestrial food webs and direct contact of terrestrial receptors with building surfaces is expected to be minimal.

## 3.4 Screening Criteria

Health-risk based screening values were identified to assist in the determination of COIs and acceptable data for use in risk assessments and for defining nature and extent of contamination. Comparison of observed concentrations with background values, regulatory standards, and screening criteria enables the list of detected chemicals at Area IV to be focused on the potential risk drivers for the reuse scenarios. Focusing on the risk drivers helps to locate potential source areas and identify areas requiring further characterization. Several screening values adopted for Area IV are described below.

### 3.4.1 Background

Certain chemicals and radionuclides occur naturally in the environment. In order to evaluate the concentration or activity present due to a particular source area, such as Area IV, it is necessary to know the naturally occurring ambient concentrations and activities (background concentrations activities) of these constituents. The selection of background screening levels for the chemical and radiological constituents used in this *Data Gaps Analysis Report* are discussed below.

#### 3.4.1.1 Chemical

Metals and polychlorinated dioxin and furan compounds (dioxin/furan) are found naturally in the environment at concentrations that vary regionally depending on specific environmental conditions such as geology. As part of the RCRA RFI at SSFL, a range of background concentrations for these constituents was determined and approved for use in that program by the California DTSC. The procedure for determining these background values are described in the *Soil Background Report Santa Susana Field Laboratory, Ventura County, California* (MWH 2005).

The background concentrations for metals and dioxin/furan determined for the RFI Program have been selected for use in the data gaps analysis for screening data. The information concerning potentially elevated metals and dioxin values in samples collected after the Topanga fire, were not used in the screening, because it was assumed that the ash layer produced by the fire was incorporated back into the soil

layer. The methods for determining the background concentrations, as described in the *Soil Background Report*, are summarized here.

The dataset used for background concentration determination was developed from six specific sampling events occurring from 1992 through 2005. Each of these sampling programs was conducted in accordance with DTSC-reviewed work plans. All samples were collected from a depth between 0 to 1 foot bgs. Samples were collected from areas unaffected from SSFL activities, and at locations approved by DTSC for use in the background data set. Because the studies from which data were selected were conducted over a number of years, analytical methods, lists of analytes and laboratory reporting limits varied from study to study. This resulted in a need to fill in the dataset with additional samples, sometimes collected at the same locations as previous samples, to assure a consistent list of analytes analyzed to the same reporting limits.

The RCRA Background Study was conducted such that it was compliant with both EPA and California DTSC guidelines and requirements for background studies. The EPA guidance (EPA 2002) states that background reference areas "should have the same physical, chemical, geological and biological characteristics as the site being investigated, but has not been impacted by activities on the site." To meet this requirement, the Background Study samples were selected from areas both within the undeveloped portions of the SSFL and the areas surrounding the SSFL. Only samples collected on geologic units that were found within the SSFL were included.

Due to wide variations of geologic units and soil types, as well as variations in vegetation, geomorphology and hydrology, a relatively large data set was used. Samples were collected from 29 widely-spaced locations up to 4.8 kilometers (3 miles) away from the SSFL (See Figures 2-1 and 2-2 in the *Soil Background Report*). A total of 41 metals analyses were selected from 21 locations within the SSFL and 8 locations outside of the SSFL. Seventeen dioxin analyses from 17 of the metals locations were used as the dataset for dioxin background.

The analyses were validated by chemists at AMEC Earth & Environmental and a limited number of analyses were also reviewed and validated by DTSC. All data were validated per EPA guidelines (EPA 1994a, EPA 1994b) per individual laboratory analytical methods, AMEC Standard Operating Procedures (SOPs) and validation procedures. The majority of the data were determined to be usable with the exception of 6 antinomy, 6 mercury and 9 selenium samples. In order to complete the dataset, these samples were re-collected and analyzed in the 2005 sampling event.

Data distribution statistics are summarized in the *Soil Background Report* (MWH 2005) per DTSC background policy. For those metals with low frequency of detection, probability plots were prepared with the non-detects eliminated, and with one-half of the detection limit used as the concentration. All data were within two orders of magnitude, and most were within one order of magnitude. Probability plots indicated coefficients of variation (CV) were less than one for most metals. Exceptions were

molybdenum (1.3) and antimony (1.1) and it was determined that these higher CVs were due to the influence of soil types and source rock variations. Significant non-detects influenced the distribution of antimony, boron, cadmium, fluoride, mercury, selenium, silver, and thallium. In general, the higher concentrations of most metals were associated with samples containing fine-grained (silt and clay) material or collected over geologic formations containing fine-grained rock (siltstone and shale).

The Background Study also evaluated the potential impact of wind-born contaminants from the SSFL. The upper populations or highest concentrations of metals showed no correlation with wind direction relative to the SSFL. There is also a lack of correlation of higher concentrations near specific potential sources (engine testing and thermal treatment areas) of airborne metals.

To represent the upper range of ambient metals concentrations, the highest single concentration was designated as the "comparison value." The comparison values are listed in **Table 3-1**.

The 17 dioxin analyses were handled similarly. For background determination, the dioxin congeners were evaluated individually, and not totaled. All the data were within two orders of magnitude, and the CVs for all but 8 congeners were less than 1. The variability is largely due to a high frequency of non-detects. No geographic distribution of higher dioxin concentrations, indicative of a wind-borne distribution from SSFL source areas, was identified. The congener comparison values are the highest detected concentration or the highest detection limit (for congeners with no detections). The background dioxin congener and toxicity equivalent (TEQ) values are shown on Table 3-1.

### 3.4.1.2 Radionuclides

Natural radionuclides in the environment are of two general classes: primordial and cosmogenic. The identification sources and global ranges of these are discussed in **Appendix C**. While above-ground nuclear testing represents a man-made, not natural, source of radionuclides, associated radionuclides are present in the environment in the absence of onsite operations. Contribution to background from nuclear testing is also discussed in Appendix C.

***Radionuclide Constituents – Method***

As discussed in Appendix C, a number of the radiological site related contaminants (SRCs) like radium, uranium, and thorium are present as natural constituents of nonsite-impacted environmental media. Other SRCs like $^{137}Cs$ and $^{90}Sr$ were produced during above-ground nuclear testing primarily dating back to the early 1960s and, while man-made, still comprise a fraction of the total *background* radioactivity in the environment. Background concentrations of these and other SRCs are estimated here to assure incremental lifetimes risk estimates for Area IV are attributable to site-related activities and not only to naturally-occurring constituents. Background concentrations are also subtracted during compliance testing under some radiological applicable or relevant and appropriate requirements (ARARs) and to-be-considered

(TBC) guidelines, such as with DOE Order 5400.5. Therefore, average concentrations and 95 percent upper tolerance levels (with 95 percent coverage; UTL95) are estimated for SRCs present in background.

Concentrations of primordial radionuclides are dependent on the geological formation in which the soil is found. In addition, concentrations of cosmogenic and fallout radionuclides may have been affected by the climate and topography of the area since they affect runoff, sedimentation and movement through soil. Therefore, it is desirable to develop background concentrations from unaffected locations that are in the same geologic formation and similar in climate and topography. Therefore, a background data set was developed using the data collected by prior investigators from the unaffected areas surrounding the site in the same geological zones. The background dataset was established using a series of data filters as described in **Appendix D.**

***Radiological Constituents – Results***

**Table 3-2** presents summary statistics for the SRCs $^{137}$Cs, $^{90}$Sr, $^{40}$K, $^{3}$H, $^{232}$Th, $^{226}$Ra, $^{230}$Th, $^{234}$U, $^{235}$U, $^{238}$U, $^{238}$Pu, and $^{239}$Pu, including the number of samples considered per analyte, maximum and average results, the coefficient of variation, and the proposed UTL95 screening value. The UTL95 was used as an estimate of the upper bound on the background population for screening purposes. A total of 112 samples from the Chatsworth Formation and 69 samples from the Santa Susana Formations survived the screening process to produce the tabulated results. **Figure 3-3** presents the sample locations from prior investigations that are included in the background screening value estimates. The Chatsworth and Santa Susana Formation footprints are presented for reference as are the SSFL boundaries. Not all SRCs were analyzed for all samples.

The thorium series contains the long-lived radionuclides $^{232}$Th, $^{228}$Ra, and $^{228}$Th. Offsite results are available for all three SRCs plus some results for associated short-lived decay products. The data analysis revealed $^{228}$Th as the most consistently reported SRC and the SRC whose results best approximate normality. Thorium-228 was therefore used as a proxy for all radionuclides in the decay series, presented in Table 3-2 as the parent nuclide of the series: $^{232}$Th. This assumption is reasonable for background conditions given the relatively short half-lives down the entire series, with maximums of only 5.75 years for $^{228}$Ra and 1.91 years for $^{228}$Th.

**Figure D-1** of **Appendix D** presents a series of probability plots for naturally-occurring SRCs and **Figure D-2** of Appendix D present plots for man-made SRCs. As many as three data series are presented: sample results associated with the Chatsworth Formation, the Santa Susana Formation, and sample results identified as outliers. Potential outliers were identified for five radionuclides (represented as red squares in the figures) and are discussed in Appendix D. Appendix D also discusses the differences in the Chatsworth Formation and Santa Susana Formation populations. Finally, an evaluation of deviations from linear is discussed in Appendix D.

In conclusion, presented results are generally consistent with expected conditions including normal-like distributions, relative concentrations consistent with naturally occurring decay series, and appropriateness of scale. The combined dataset produces generally conservative screening values for soils within the dominant onsite formation (the Chatsworth Formation) and is still reasonable if applied to the Santa Susan Formation. A combined dataset also simplifies the data screening and data gap analysis process, thus the combined Chatsworth Formation/Santa Susana Formation values presented in Table 3-2 are deemed appropriate for use in SSFL background screening and average background subtraction, if used. However, separate values may be developed should additional background samples be collected for use in the risk assessment.

#### 3.4.1.3 Ecological Background Data

Soil background concentration data described for the human health risk assessment were used to evaluate data requirements for the ERA based on Area IV concentration data. Per the methods described in Section 3.4.1.1 and 3.4.1.2, a review of the available data for SSFL Area IV found that approved background concentration data exists only for chemicals and radionuclides in surface soil (0 to 2 feet) and chemicals in groundwater (MWH 2005). These soil data may be employed as background data for the Area IV ERA. However, there are currently data gaps associated with radionuclide data for groundwater and chemical and radionuclide data for surface water, sediment, and biological tissues as samples have not been collected from appropriate locations for these data sets. Background sample locations and analyses required to address these data gaps for the ERA will be presented in the FSAP and will be selected in coordination with regulatory authorities, as necessary. Background data currently available are not used to eliminate chemicals or radionuclides from the ERA.

### 3.4.2 Human Health Risk-Based Preliminary Remedial Goals

As discussed in *Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)* (RAGS, Part B) and *Radiation Site Cleanup Regulations: Technical Support Document for the Development of Radiation Cleanup Levels for Soil* (EPA 402-R-96-011 A), chemical-specific PRGs are concentration goals for individual chemicals in specific media and land use combinations which are used by risk managers as long-term targets during the analysis and selection of remedial alternatives. They are based on readily available information and are preliminary in nature. They are revised as site-specific data become available. The chemical-specific PRGs discussed below are concentrations based on human health risk assessments.

#### 3.4.2.1 EPA Region 9 Residential PRGs for Chemical Contaminants

EPA Region 9 has established PRGs for chemical contaminants. PRGs are generic risk-based screening values to be used as guidelines for determining whether additional investigation is necessary. They can also be used as initial cleanup goals, if applicable. PRGs are not enforceable standards. These PRGs are calculated for cancer

risk levels of $1.0E^{-6}$ and hazard index (HI) levels of 1. EPA Region 9 PRGs are available for several media (soil, tap water, and ambient air). Tap water PRGs (and MCLs discussed in Section 3.4.4) were used for comparison to groundwater concentrations. Soil PRGs are also provided for both residential and industrial scenarios. Residential criteria were included as screening criteria for Area IV since EPA often requires a remedy to address a future residential scenario. Comparisons to criteria based on residential exposures will exaggerate any potential health threats for non-residential exposure that might currently occur at the facilities. Soil chemical PRGs are based on exposure to chemicals in soil via incidental ingestion, dermal contact and inhalation.

To address the fact that CalEPA has its own toxicity criteria for selected chemicals, the EPA Region 9 PRG list includes Cal-modified PRGs. These Cal-modified PRGs are applicable to Area IV. However, EPA Region 9 PRGs were last updated in October 2004. To account for updates in toxicity values, PRGs were recalculated using the formulas in the PRG user's guidance for chemicals with updated CalEPA cancer potency values dated January 25, 2008 and CalEPA's most recent list of reference exposure levels (RELs) accessed March 7, 2008. A more thorough explanation of how these values were updated is provided in **Appendix H**, Update to PRGs.

### 3.4.2.2 Rural Residential PRGs for Chemical Contaminants

As noted in the SRAM WP, the residential reuse scenario for Area IV needs to consider that rural residents may grow fruits and vegetables for local consumption. EPA Region 9 did not include this exposure pathway in the development of its PRGs. In order to address this pathway in the screening, agricultural land use PRGs from the RAIS, which were last updated in May 2007, were included in the screening process. These soil PRGs include the ingestion of fruits and vegetables exposure pathway and are calculated for cancer risk levels of 1.0E-6 and hazard levels of one using equations developed for assessment of sites on the Oak Ridge Reservation in Oak Ridge, Tennessee, and approved by EPA Region 4 assuming 25 percent of consumption from contaminated sources. Calculations of PRGs for soil contributing contaminants to home grown produce are back-calculated from PRGs estimated for fruits and vegetables. EPA Region 9 PRGs described in Section 3.4.2.1 were updated using the EPA Region 4 agricultural PRGs to account for exposure through ingestion of fruits and vegetables. A more thorough explanation of how these values were updated is provided in Appendix H, Update to PRGs.

### 3.4.2.3 Radiological PRGs

The radiological PRGs for the SSFL are based on default EPA methods presented on the following Web site:

http://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg_search,

and the CSM described in Section 3.3. Onsite human receptors potentially considered by the risk assessment include a rural residential (including resident gardener), industrial worker, construction worker, and a recreational visitor. However, because data gap analysis decisions will be made based on the most conservative (i.e., lowest)

PRGs, only the rural residential and non-gardening residential receptors are discussed here. Exposure pathways include inhalation or fugitive dust, incidental soil ingestion, and external gamma radiation exposure. Ingestion of homegrown fruit and vegetables are also considered by the resident gardener.

The PRGs are calculated at the so-called point of departure, representing the $10^{-6}$ threshold as the target. Toxicity values are based on the cancer risk coefficients presented in Federal Guidance Report No. 13[1] assuming short lived decay products are in equilibrium with the nearest long-lived parent. Default EPA inputs were used except it was assumed that the rural resident would consume approximately 25 percent of its fruit and vegetables grown onsite while the resident would not consume crops grown onsite. This assumption is consistent with the July 1992 State of California's Office of the Science Advisor default exposure scenarios. The particulate emission factor for Los Angeles was also used, selected from the on-line PRG search pull-down menu.

**Table 3-3** presents utilized toxicity values and calculated PRGs for residential receptors. The "+D" notation after certain radionuclides indicates the presence of short-lived decay products in equilibrium with the specified parent nuclide, where short-lived is defined as having a half-life less than six months. Results show that most often there is an indistinguishable difference in the gardening and non-gardening PRGs. This is because external gamma typically dominates results from other pathways. Exceptions are noted for radionuclides like $^{59}$Ni, $^{210}$Pb+D, and $^{90}$Sr+D that produce no or negligible gamma radiation.

## 3.4.3 Ecological PRGs (Radionuclides) and ESLs (Chemical)

To evaluate the quality and usability of historical data for assessing risk to ecological receptors in the SSFL Area IV EIS, PRGs (as defined above) are required for chemicals and radionuclides potentially occurring in four abiotic media: soil and water, including surface water and daylighting groundwater seeps, for terrestrial biota, and sediment and surface water for aquatic biota. Radionuclide PRGs are listed for terrestrial biota in **Table 3-4** and for aquatic biota in **Table 3-5.** As shown in the preliminary ecological CSM (Figure 3-2), terrestrial biota are potentially exposed directly and indirectly to chemicals and radionuclides in soil, groundwater discharged at the surface (i.e., seeps), and storm water present on Area IV and adjacent offsite locations. Aquatic biota are potentially exposed to chemicals and radionuclides that have migrated to surface water bodies by erosion and storm-water runoff, and in some cases, groundwater transport. The PRGs for soil are also used for biotic tissue samples where data allow.

[1] EPA (U.S. Environmental Protection Agency) 1999. *Cancer Slope Coefficients for Environmental Exposure to Radionuclides*, Federal Guidance Report No. 13, EPA 402-R-99-001, Air and Radiation, September.

### 3.4.3.1 Ecological PRGs for Radiological COIs

The process for the identification of ecological PRGs for radionuclides was derived from *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota* (DOE 2002). PRGs are either Biota Concentration Guides (BCGs) published in DOE (2002) or BCGs calculated using the equations provided therein. According to DOE (2002), BCGs are "appropriately conservative limiting concentrations of radionuclides in environmental media." The BCGs are based on threshold doses for the protection for ecological receptors of 1 rad/day for aquatic biota and terrestrial plants and 0.1 rad/day for terrestrial animals. These dose limits meet the requirements of DOE Order 5400.5, "*Radiation Protection of the Public and Environment*" (DOE 1990a), and DOE Order 5400.1, "*General Environmental Protection Program*" (DOE 1990b), and they equal the dose limits for protection of biota put forth by the NCRP (1991) and IAEA (1992). The smaller of the separate BCGs calculated for plants and animals for a given medium was selected as the PRG for that medium. The BCGs for animals were lower than the BCG for plants for all Area IV radionuclides.

The BCGs are calculated using conservative exposure assumptions and parameter values. DOE (2002) reports calculated BCGs for most of the SSFL Area IV radionuclides. For those radionuclides without reported values, BCGs are calculated using the equations in DOE (2002) and published exposure parameter values (see **Appendix E,** Ecological Risk – RAD Calculations). Sources of parameter values include DOE (2002) for metabolic parameters; Eckerman et al. (1988) for assimilation factors; Eckerman and Ryman (1993) for radionuclide half-lives and disintegration energies; Baes et al. (1984), EPA (1999), DOE (2002) for uptake factors, and Zach (1985) for inhalation-ingestion normalization factors. As appropriate for screening values, it was conservatively assumed that there is no biological decay in or loss of radionuclides from receptor tissues.

### 3.4.3.2 Ecological Screening Levels for Chemicals

Typically, site chemical data are compared to conservative ESLs to determine the potential for adverse effects to ecological receptors from direct exposure to site media. The ESLs are conservative levels that in most cases represent thresholds for ecologically significant adverse effects in selected ecological receptors. ESLs, from sources such as the EPA, are for the most part linked directly to toxicity to one or more organisms or receptor groups. In some cases, ESLs are general and do not represent a toxicity threshold, but instead, are recommended values to protect a specific land use, such as agriculture. Direct exposures to contaminants can include dermal absorption, inhalation, and ingestion of potentially toxic contaminants. Although inhalation can be a significant route of exposure for certain organisms, adequate means to independently assess this exposure route are generally unavailable. Therefore, direct exposures to chemical contaminants and the resulting ESLs were developed based primarily on ingestion and, in some cases, indirect measurements of dermal absorption. However, the SRAM WP (MWH 2005) presents ESLs for a small number of volatile organic compounds (VOCs) that were developed for use in the evaluation of the inhalation by burrowing mammals.

The selected preliminary ESLs are being used to evaluate the quality and usability of historical data and to determine that the laboratory detection limits are sufficiently low for the upcoming sampling efforts. Collectively, if deemed usable, the historical and newly collected data will be used for assessing risk to ecological receptors in the SSFL Area IV EIS.

Preliminary ESLs presented for each medium were identified through a literature survey, and represent conservative, generic criteria for the protection of plants, soil microorganisms, soil invertebrates, birds, and mammals. These do not consider bioaccumulation potential and the related possible adverse effects on upper trophic level biota. Several sources of ESLs were evaluated prior to selection of the final ESL for each chemical of concern.

The ESLs selected for use as ecological PRGs for surface water, sump water, and groundwater seep data include:

- SRAM surface water screening values (MWH 2005)
- EPA Region 3 BTAG Freshwater Screening Benchmarks (2006)
- EPA National Recommended Water Quality Criteria -- Criteria Continuous Concentration (2006)
- EPA Region 5 RCRA Ecological Screening Levels (2003)
- EPA Region 4 Waste Management Division Freshwater Surface Water Screening Values for Hazardous Waste Sites (2001)

The ESLs selected for use as PRGs for sediment data include:

- SRAM sediment screening values (MWH 2005)
- EPA Region 3 BTAG Freshwater Sediment Screening Benchmarks (2006)
- EPA Region 5 RCRA Ecological Screening Levels (2003)

The ESLs selected for use as PRGs for the soil (0 to 2, 2 to 4, and 4 to 6 feet depth intervals) and sump soil data include:

- SRAM soil, terrestrial mammal, terrestrial avian, terrestrial invertebrate screening values (MWH 2005)
- EPA Region 5 RCRA Ecological Screening Levels (2003)
- EPA Region 4 Recommended Ecological Screening Values for Soil (2001)
- Van den Berg, et al. (1998)

- EPA Region 3 BTAG (1995)

The ESLs selected for use as PRGs for soil gas include:

- SRAM terrestrial mammal inhalation screening values (MWH 2005)

As several ESLs have been selected for each medium, as noted above, a hierarchy for use was developed for the evaluation of the data. The SRAM WP was selected as the primary source for ESLs for each medium and receptor. If the SRAM WP presented one ESL for a particular medium, it was employed as the ESL. If the SRAM WP presented more than one ESL for a given medium, the lowest ESL was employed for use in the preliminary screening of the chemical data.

If the SRAM WP did not present an ESL for a given chemical, an EPA regional or national ESL was selected as a secondary ESL, with the following hierarchy employed. If only one EPA ESL was available from the above mentioned EPA sources for a medium, it was employed as the ESL. If more than one regional or national EPA value was available, the most recently updated regional or national value was selected as the ESL. For evaluation of surface water, groundwater seep, and sump water data, both EPA National Recommended Water Quality Criteria – Chronic (NRWQC) and Region 3 BTAG Freshwater Screening Benchmarks were updated in 2006. As they are the most recent sources of ESLs for those media, the lowest ESL between the two sources was selected for that chemical as the secondary ESL. For the evaluation of dioxin soil data, TCDD equivalents (Van den Berg, 1998) are to be calculated as ESLs.

### 3.4.4 Groundwater Maximum Contaminant Levels

Maximum contaminant levels are used as screening values for comparison with groundwater concentrations under the conservative assumption that groundwater at Area IV is used as drinking water. The MCLs developed by the EPA are health protective, Federally-enforceable National Primary Drinking Water Regulations for drinking water systems that are derived taking into account analytical and treatment limitations. For some chemicals, CalEPA has also established more stringent state-specific MCLs. The CalEPA MCLs were considered as screening criteria for Area IV.

The EPA also established non-enforceable criteria, maximum contaminant level goals (MCLGs) and Secondary MCLs. The MCLGs provide health-based guidance and are calculated such that non-carcinogenic health effects are set at a level believed to be safe and carcinogens are set at zero. Unlike the MCLs, The MCLGs do not consider feasibility. Secondary MCLs are based on aesthetics and palatability. The MCLGs and secondary MCLs were not included as screening criteria for Area IV.

## 3.5 Evaluated Media

Each of the site media (soil, groundwater, seeps, soil vapor, surface water, sediment, biota [ecological], air, and buildings) were evaluated with respect to the data required to perform human health and ecological risk assessments as well as characterization

for the EIS. The evaluation of each media considered in this data gap analysis is described below.

### 3.5.1 Soil

Area IV soil data were evaluated using a statistical approach to determine if there are a sufficient number of samples to characterize the soil and perform a human health risk assessment. These risk assessments require evaluation of exposure to specific depth intervals of soil. Therefore the data from different depth intervals were screened for each evaluation. In addition, the radiological data were evaluated as a separate depth interval recognizing the shielding ability of soil. The depth intervals used for each evaluation include:

- Human Health Risk Assessment (chemical data): 0 to 2 feet, and 2 to 10 feet, per standard EPA risk assessment procedures.

- Human Health Risk Assessment (radionuclide data): 0 to 0.5 feet, 0.5 to 2 feet, and 2 to 10 feet. These intervals mirror the protocols for chemical data but also address the shielding effects of shallow soil.

### 3.5.2 Groundwater

Data gaps related to groundwater media are being addressed as two media: near surface (or shallow) groundwater and the deep groundwater associated with bedrock (see Section 2.3.2.2). Analytical data gaps were identified through an evaluation of the sufficiency of existing data to define the lateral and horizontal extent of contamination. The usability of the data for risk assessments was evaluated and the availability of hydrologic data required to assess the CSM was also evaluated.

### 3.5.3 Seeps

Seep data were evaluated for use in the ERA with a focus on the terrestrial biota exposed via drinking water at seeps located within the buffer area and on nearby offsite slopes. If it is determined that surface water bodies are present outside the SSFL, the seep data will be used to evaluate risk to aquatic biota.

The seep analytical data were also evaluated with respect to groundwater characterization.

### 3.5.4 Soil Vapor

Soil vapor chemical data will be used to evaluate exposure to the deer mouse, a burrowing mammal and ecological receptor, via the inhalation pathway when the animal is in its burrow. Soil vapor data will also be used qualitatively to describe risk to humans under the residential risk scenario and to evaluate the extent of groundwater contamination.

### 3.5.5 Surface Water

Surface water data collected as part of the NPDES monitoring program were reviewed for applicability to the human health and ecological risk assessments. This review included the NPDES monitoring analyte list, analytical detection limits, discharge limits, frequency of exceedences by analyte, chronic and acute toxicity test results, and the NPDES sampling protocols. This review was performed to determine what additional sampling may be required.

Overall, surface water is very limited in Area IV due to the climate and presence along the top of a mountain ridge. There are no natural ponds in Area IV, and stormwater is present only during and immediately following storm events. The primary data for surface water is that collected for the NPDES compliance program. Surface water and sediment data for internal drainages is extremely limited becoming a data gap.

Given limited potential for exposure to stormwater, the human health risk assessment proposes to address surface water exposure in a qualitative manner. However, for the ecological risk assessment additional surface water and sediment data are needed as described in Section 4.0.

### 3.5.6 Sediment

Sediment is being evaluated for human health and ecological risk. Due to the offsite transport considerations associated with sediment, sediment from Area IV, as well as sediment found downstream of Area IV, is considered in the evaluation.

### 3.5.7 Biota (Ecological)

Whole-body tissue concentration data will be used in the ERA to assess risk to the sampled biota and their predators.

### 3.5.8 Air

The onsite human health risk assessment for radionuclides will model exposure from the inhalation pathway based on resuspension of particulates, per standard methods. Offsite exposure calculations in the EIS (e.g., from demolition or other construction-related activities) will be based on existing datasets such as those presented in NESHAP reports. Therefore, air data does not contribute to the data gap.

### 3.5.9 Building Surfaces

Remaining site buildings will be quantitatively addressed by the human health risk assessment in order to evaluate the No Action alternative, as is required under NEPA. The building surface data will also be used to evaluate the risks of building demolition and debris transport to be considered among the range of alternatives in the EIS. Therefore, the gap analysis assesses the adequacy of radiological building data quantity and quality both for the onsite risk assessment and offsite release estimates for the EIS and transportation and final disposition planning.

### 3.5.10 Walkover Radiation Surveys

Gamma walkover surveys are an integral part of the MARSSIM survey process for release of radiologically-contaminated sites. The GWS data are not used in risk calculations, rather they are used to support sample density and MARSSIM classification decisions and to identify small areas of elevated activity that would most likely be missed by sampling alone. The intent is to provide a high density of gamma radiation data in the areas with the highest potential for exceeding site criteria (e.g., MARSSIM Class 1), and to scale back on density requirements with decreasing likelihood of contamination with recommended walkover of 100 percent of Class 1 areas, 10 to 100 percent of Class 2 areas and judgmental (typically professional judgment in terms of defining sample number and density) for Class 3 areas.

### 3.5.11 Bedrock

Bedrock at the SSFL is shallow and in some areas is exposed at the surface. Bedrock in some instances can act as a barrier to contaminant migration or can harbor contaminants (i.e., be a media of concern). Physical properties of bedrock are important for evaluation of groundwater contaminant transport and fate mechanisms. Therefore, bedrock data will be an important evaluation factor for alternatives evaluation in the EIS.

## 3.6 Human Health Soil Media

**Exhibit 3-1** presents a flow diagram for the data gaps analysis process for soils to address data needs for a CERCLA risk assessment. Further details and rationale are presented in the following subsections.

### 3.6.1 Review of Existing Documents

The soil data gap analysis for human health was performed using available relevant documents for information on operational, process, and release history. In particular, documents which themselves were generated as part of regulatory programs and which included detailed review and summary of information from many historical documents. In particular documents generated under the SSFL RCRA Program were used for information pertaining to historical chemical use in Area IV and the HSA were used for information on Area IV radiological process history.

#### 3.6.1.1 Review of the RCRA Program Documents

The SSFL is regulated under RCRA and a great deal of environmental assessment and remedial work has been, and is currently being, completed in Area IV under various RCRA programs. This work, particularly the information compiled under the overall SFFL RCRA Corrective Action Program, was used in this data gaps analysis to provide the process-related information required for an analysis of the nature and extent of contamination.

The RCRA Corrective Action Program includes the RCRA Facility Assessment (RFA), the RCRA RFI, the RCRA Corrective Measures Studies (CMS), and the Corrective

Measures Implementation. The RFA Report (SAIC 1994), the RFI Program Report (MWH 2004), and various other RFI Program documents were reviewed for process history.

***RCRA Facility Assessment***
The RFA of the SSFL was completed by SAIC in 1994 for Rockwell International (SAIC 1994). The RFA included a preliminary review of relevant files, a visual site inspection (VSI), and sampling program. The preliminary review included files collected from EPA Region 9, the California Department of Health Services/DTSC, the Regional Water Quality Control Board of Los Angeles, the DOE, and the NRC. The VSI was conducted in 1990 to verify information found in the file review and determine if there was a release of hazardous waste from the Solid Waste Management Units (SWMUs) throughout the SSFL. Although all SWMUs were visited, some Areas of Concern (AOCs), such as leach fields, could not be located and were not visited. Sampling was conducted under a multi-media sampling program at the Brandies-Bardin Institute (BBI) and the Santa Monica Mountain Conservancy. The results of the RFA were presented in the 1994 *RFA Report*.

***RCRA Facility Investigation***
In 1999 the DTSC identified two Operable Units (OUs) at the SSFL – Surficial Media (soil, soil vapor, sediment, surface water, near-surface groundwater, air, biota, and weathered bedrock), and the Chatsworth Formation (Chatsworth Formation groundwater, and saturated and unsaturated competent bedrock). The ongoing RFI is being conducted to collect, evaluate and report data to identify potential releases from SWMUs and AOCs. The *RFI Program Report* (MWH 2004) stated that 135 SWMUs and AOCs had been identified at the SSFL and that 29 of these were either closed or being closed as part of other environmental programs and needed no further action as part of the RFI. The remaining 106 SWMUs and AOCs had been grouped into 51 RFI Sites. Thirty-two RFI sites and AOCs are completely, or partially, within SSFL Area IV. Descriptions of these SWMUs and AOCs and summary of their history and chemical use are found in Appendix A.

### 3.6.1.2 Review of Historical Site Assessment Document

The primary purpose of an HSA is to collect existing information concerning the site and its surroundings. The primary objectives of an HSA are to:

- Identify potential sources of contamination.
- Determine whether or not sites pose a threat to human health and the environment.
- Differentiate impacted from non-impacted areas.
- Provide input to scoping and characterization survey designs.
- Provide an assessment of the likelihood of contaminant migration.
- Identify additional potential radiation sites related to the site being investigated.

An HSA entitled *Historical Site Assessment of Area IV, Santa Susana Field Laboratory, Ventura County, California*, was prepared by Sapere Consulting, Inc. and Boeing for DOE in 2005. This HSA focused only on radionuclide contamination and was developed to summarize the operational history of Area IV for both the DOE and Boeing from a radiological perspective. The purpose was to identify areas of radiological operations, compile information on prior radiological cleanups and releases and to identify further actions needed to ensure that the radiological cleanup of Area IV is completed.

Nuclear-related operations were conducted at SSFL Area IV from 1953 until 1988, with non-nuclear operations continuing through 1998. The DOE has focused on completing radiological cleanup since 1989. Over the period of Area IV operations, buildings and land in the radiological areas have been decommissioned, and if necessary, remediated, surveyed, verified and released for reuse by the appropriate regulatory agency (i.e., the U.S. Energy Research and Development Administration (ERDA) a DOE predecessor agency, DOE, NRC and the California Department of Health Services (DHS)).

Buildings have been decommissioned and released and contaminated soil remediated using appropriate regulatory standards as authorized by Congress and the State of California. Based on this history, portions of Area IV have been identified as radiologically impacted or radiologically non-impacted, consistent with applicable California and Federal regulations, and based on MARSSIM guidance.

The DOE and Boeing evaluated 272 numbered structures (collectively referred to as "sites") and any other areas of radionuclide contamination that existed in Area IV since its establishment in 1953. This was to ensure all areas where any types of operations were performed in Area IV were evaluated for radiological impact. To evaluate each site, a site summary was prepared using operational records, incident reports, site maps, decommissioning reports and personnel interviews. The site summaries include information about historical and current use and information about the management and use of regulated radiological materials at the site. Based on the information presented in the site summaries, all sites were classified either as radiologically-impacted or non-impacted. Sites that had any indication of management or use of regulated radiological material were classified as impacted. A summary of the information contained in the site summaries is contained in Appendix B.

The information contained in the HSA was used as a basis for developing the process knowledge for classifying various areas of Area IV as Class 1, Class 2, and Class 3 as defined by MARSSIM and discussed below. Although Boeing and DOE concluded that some portions of Area IV were non-impacted, the approach used here was to assume that all portions of Area IV were impacted and are Class 3 at a minimum. The classifications assigned to different regions of Area IV in the HSA were not used as a basis for assigning classifications in this data gap analysis.

## 3.6.2 Selection of Exposure Units

For the determination of data gaps, Area IV was divided based on chemical and process use information into exposure unit areas of no greater than 20 acres. The 20-acre maximum (most of the units actually are approximately 17 acres) was chosen for planning purposes only as tool to evaluate existing data and total data requirements. This preliminary establishment of EUs allowed for averaging of data across a common area for the determination of data gaps. When the risk assessment is conducted, specific exposure areas will be defined based on land use, spatial distribution of the data including sample density and extent of contamination, and relevance to the exposure pathways being assessed for Area IV. Individual exposure areas evaluated in the human health risk assessment will likely be much smaller than 20 acres; however, based on the identified data gaps for Area IV, the delineation of these risk assessment exposure areas cannot be performed at this time.

Area IV was divided into the 16 EUs shown on **Figure 3-4** of size ranging between 17 and 20 acres. The EU boundaries were generally selected to respect existing site features (e.g., Area IV boundaries and roads) and former and current operational boundaries (process areas and RFI site boundaries) in order to group areas with similar process history and contamination potential that would present similar risk to Human receptors. Risks may also be calculated for specific RFI sites for chemicals and SUs for radionuclides within each exposure unit depending on the exposure model used.

## 3.6.3 Radionuclide Data Assessment

### 3.6.3.1 Definition of Survey Units

The MARSSIM provides detailed guidance for planning, implementing, and evaluating environmental and facility radiological surveys conducted to demonstrate that compliance with remedial objectives has been met (DOE et al. 2000). The MARSSIM is intended to apply to final status surveys, but the principles may be adapted and used as guidance for application to scoping surveys. MARSSIM principles were adapted and used in this gap analysis for evaluating soil, water, and building radiological data requirements necessary for the evaluation of risk-based alternatives in the SSFL Area IV EIS.

The MARSSIM approach is designed to place greater emphasis in areas with highest potential for contaminant impact. Areas that have no potential for contamination are generally classified as non-impacted. For the Area IV data gap analysis, a conservative assumption was made that all areas have some potential of residual contamination. Therefore, no part of Area IV has been classified as non-impacted (i.e., all current evidence indicates no potential for contamination).

Impacted areas are sub-divided into Class 1, Class 2 or Class 3 survey unit (SU) areas. The classes are defined below from least to most potential for impact by radionuclides. The definitions have been modified from the MARSSIM document to be inclusive of chemical contamination.

- Class 3 SUs are expected to contain minimal residual radioactivity from activities adjacent to the Class 3, or are expected to contain levels of residual radioactivity at a small fraction of the DCGL or PRG. This determination is based on site operating history and previous radiation surveys and chemical sampling programs. Class 3 SUs are limited to a maximum size of 20 acres. For purposes of this Data Gaps Analysis "a small fraction of the DCGL or PRG" was defined as 25 percent.

- Class 2 SUs are areas that have or have had (prior to remediation) a potential for radioactive or chemical contamination but are not expected to exceed the DCGL or PRG. Other site-specific justifications can be used to classify an area as Class 2. The maximum size of Class 2 SUs is 2 acres.

- Class 1 SUs have or have had (prior to remediation) a potential for radioactive or chemical contamination, or known contamination (based on previous radiation surveys and sampling). The maximum size of Class 1 SUs is 0.5 acres. For purposes of this data gap analysis "known contamination" was defined as greater than or equal to 100 percent of the DCGL or PRG.

Consistent with the MARSSIM approach, both existing data and process history were used to assign each part of Area IV to Class 1, 2, or 3 SU. A two-step process was used to accomplish the classification:

- The refined Area IV data set was screened against PRGs and background concentrations, and the information graphically displayed.

- Knowledge of process areas and operational history was applied and SU boundaries were drawn accordingly.

### 3.6.3.2 Application of Process Knowledge and Drawing of Survey Unit Boundaries (Radionuclides)

As expected, the available sample locations generally clustered in areas that had previously been investigated because there was a suspected release of contamination. Often these areas corresponded to RFI sites or are related to particular former radiological process areas. Some areas contained data points exceeding DCGLs for some analytes, and were therefore classified as Class 1 SUs. Other areas were classified as Class 1 solely based on the process history indicating the high potential for contamination or on areas that were know to have been remediated to other cleanup standards.

Few concentrations between 25 and 100 percent of the DCGLs were identified (or were in close proximity to other points which exceeded DCGLs and were therefore include in Class 1 SUs). Class 2 SUs were drawn in those areas where an isolated, or few data points, exceed DCGLs but where there were no known processes or releases. Conversely, known process areas where no data exceeded the DCGLs were also sometimes classified as Class 2.

Some areas, particularly in the southern part of Area IV, are undeveloped (no process areas) and have very few data points. These areas were assigned to Class 3. Any areas within individual EUs that were not assigned to Class 1 or Class 2 were assigned to Class 3 by default.

In drawing the EU and SU boundaries, RFI site boundaries, as defined by Boeing, were generally respected in the delineating boundaries. Thus two SUs of the same class may be contiguous but be considered separately for the data gap analysis because they are assigned to different EUs based on RFI site boundary conditions.

## 3.6.4 Screening of Refined Dataset

All analytical soil data were considered together for purposes of defining SUs, regardless of the soil depth interval. This was done because a positive detection at any soil depth could indicate the potential for an area to be impacted or contain residual contamination.

Each constituent was assigned a DCGL which was set equal to the $1E^{-6}$ PRG for screening purposes. This was done separately for the residential and rural residential PRGs. If a background screening value was available and was higher than the PRG, then the twice the background screening value was used as the DCGL. Twice the background was assumed in order to prevent the assumption that remediation of background will occur. Constituents with no PRG or background values, and therefore no DCGL, were not carried through the screening stage.

Non-detected results with MDLs greater than the DCGL were eliminated from consideration since they do meet the sensitivity objectives and do not provide information relative to risk assessment. However, it should be noted that if the DCGLs change, these data may become useable if they are less than the new DCGL.

All sample constituents were assigned to one of three groups:

- Concentrations less than 25 percent of the DCGL or non-detected
- Detected concentrations between 25 and 100 percent of the DCGL
- Detected concentrations greater than 100 percent of the DCGL

Each of the groups was assigned a color code and sample locations were displayed on the map of Area IV as shown in **Figure 3-5** for chemical analytes and in **Figure 3-6** for radionuclides.

## 3.6.5 Selection of Soil Contaminants of Interest

A multi-step screening process was followed to determine which chemicals and radionuclides detected in Area IV soil are COIs that need to be considered for the data gap analysis. The purpose of identifying the COIs is to focus the list of chemicals and radionuclides that are more likely to have a significant impact on current or future

human health and ecological exposures in Area IV. The COI list will then be used for determining the number and location of samples recommended to resolve data gaps identified by the spatial distribution of the COI samples. Note that COIs are not the same as COPCs, which will be determined in the quantitative risk assessment. Contaminants of concern (COCs) will be identified in the risk assessment as probable drivers for risk management of the site.

### 3.6.5.1 Results of Screening for Soil COI Identification

For COI screening, an abbreviated screening assessment of PARCC parameters and sensitivity (blanks) was conducted. Data representativeness is the extent to which available data characterize potential exposure conditions for human or ecological receptors. Proper selection of sampling locations, consideration of potential hot spots, assessment of background concentrations, and collection of a sufficient number of samples help maximize data representativeness. It is this aspect of data quality that is being addressed in this data gap analysis.

The potential COI list started with a list of all chemicals for which samples were analyzed in soil at Area IV. The potential COI list was then focused to finalize the COI list through the following steps:

**Step 1: Determine usable data.** Analytical data for Area IV were collected by a number of different consultants and analyzed by a number of analytical laboratories over several years. Sampling protocols and analytical methods vary and data quality is not consistent. In addition, acceptable laboratory methodologies and standards for detection limits have changed over time. The purpose of this step was to identify and remove data of insufficient quality or that was otherwise inappropriate for site characterization.

To accomplish the first data screen, pre-remediation soil data from remediated areas were removed from the dataset. Thus, all data in the dataset represents soil that has not been removed from Area IV. Tentatively identified chemicals (TIC) were also removed from the list because it is not clear whether a TIC compound is actually present. TICs are frequently identified for general classes of compounds and do not have specific toxicity data, and toxicity data are often not available for TICs. Chemicals reported as not being detected above MDLs were also removed from the list. Chemicals not detected, but on the initial COI list are presented in **Table 3-6. Table 3-7** lists chemicals detected in Area IV. (However, note that non-detected chemicals were retained for further uncertainty analysis regarding whether their detection limits were sufficient for risk determination. This will be addressed in the quantitative risk assessment.)

**Step 2: Determine whether the data are above background concentrations.** Detected inorganic compounds were compared to the background concentrations established for the SSFL (see Section 3.4.1) in the SSFL background study (MWH 2005). Inorganic compounds with concentrations that were less than established background values were attributed to background and removed from the COI list. **Table 3-8** lists the

number of samples for each chemical that is above background. Radionuclides with MDLs that were greater than the PRGs or background were also removed from the COI list.

**Step 3: Determine whether data are likely to be toxicologically significant.** Detected chemicals in soil were compared to EPA Region 9 PRGs as updated with OEHHA toxicity values and agricultural PRGs. As described in Section 3.4, these screening values were developed using target risk levels of $10^{-6}$ and target HI of 1. To address the potential for cumulative effects of chemicals, instead of screening directly against the PRGs, one-tenth of the screening criteria were used for the comparison. In effect, this procedure adjusts the target risk levels to $10^{-7}$ and the HI to 0.1 for each individual chemical. Chemicals with maximum concentrations less than one-tenth the PRGs were removed from the COI list. Table 3-8 lists the number of soil samples for each chemical above PRGs.

Chemicals without PRGs were further evaluated to check if toxicity criteria are available from the EPA or OEHHA toxicity databases. Toxicity criteria have not yet been established for all detected chemicals. Quantitative risks and hazards cannot be calculated in the absence of these toxicity criteria. As such, chemicals without available toxicity criteria were determined to be toxicologically insignificant or with unquantifiable risk and removed from the COI list. (Although chemicals without toxicity values were removed from the COI list, they will be evaluated further in the uncertainty analysis for the quantitative risk assessment.)

There were several inorganic elements that are generally recognized as non-toxic and are essential minerals and may not be addressed in the risk assessment. These elements include calcium, sodium, potassium, magnesium, chloride, and fluoride. Due to process history usage, potassium and sodium may be included as part of future investigations as an indicator of contamination.

Some essential minerals, such as iron and manganese, were not eliminated in this step. Such metals, though essential, can be associated with adverse effects and were retained unless eliminated in subsequent selection steps.

**Step 4: Assess detection frequency of data.** Chemicals that are detected very infrequently at Area IV are not likely, with few exceptions, to contribute significantly to overall risk. Some chemicals were reported in fewer than 5 percent of soil samples. These chemicals may not represent a significant release at Area IV, and may not, in some cases, be site-related. Thus, elimination of these chemicals focuses the COI list on potential significant releases. However, prior to eliminating infrequently detected chemicals, the following criteria must be met.

Infrequently detected chemicals in soil were not eliminated if they were: (1) known human carcinogens; (2) were detected at very high concentrations compared to minimum levels that could be associated with adverse effects (e.g., PRGs); and/or (3) were found in localized "hotspots." Hotspots are defined as relatively small areas with

chemical concentrations that are significantly higher than those in surrounding areas. In most, but not all, cases, hotspots correlate with source areas. In addition, chemicals were not eliminated if fewer than 20 samples were available for the area.

Chemicals that were infrequently detected in soil and do not fall into any of the above categories were eliminated from the COI list.

**Step 5: Group remaining chemicals.** For the purpose of determining the number of samples required per EU for the risk assessment and for ease of reference, the chemicals on the resultant COI list were then grouped into the following categories: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), inorganics, PCBs, and dioxins/furans. PCB-1242, PCB-1248, PCB-1254, and PCB-1260 were selected as surrogates to represent all PCBs, and TCDD (as expressed by dioxin TEQ), was selected as a surrogate to represent dioxin/furans congeners on the COI list. These surrogates are selected due to their representative toxicity of their respective groups of chemicals and their frequency of detection in Area IV.

The final list of soil COI and their groups is shown in **Table 3-9**.

### 3.6.5.2 Process History Confirmation of Chemical COIs

The list of chemical COIs generated through the screening process described above was reviewed for consistency with the types of chemicals used at the site. Classes of chemicals retained include solvents, polynuclear aromatic hydrocarbons (PAHs), fuel constituents (benzene, toluene, ethylbenzene, and xylenes), PCBs, dioxins, metals, and phthalates. With the exception of phthalates, Area IV processes or operations using each of these groups of chemicals were identified in the review of historical documents. Phthalates were retained because storage and landfill areas of the site may have been used for storage, handling or disposal of these chemicals without specific documentation.

Other process-related chemicals were identified as being used in specific EUs and chemical use areas. These chemicals include terphenyls, propellents, and energetics. The adequacy of the available data for determining if these chemicals have been released to the environment, and the extent of contamination, was considered in this data gaps analysis. These and other process-related chemicals are also being sampled for under the current RFI program.

### 3.6.5.3 Radionuclide Contaminants of Interest

Previous assessments of the site, such as the ETEC EA and the HSA, assumed a base list as the potential radionuclides of concern. This base list includes the radionuclides shown in **Table 3-10**.

Not all of these radionuclides were assumed to be final radionuclides of concern in the previous assessments. Some were eliminated based on not being detected at concentrations near the applicable limits assumed for those assessments. This data gap analysis will use this list as a starting point. However, several additional fission

products, activation products, and decay chain daughters have been added to the COI list based on process knowledge and professional judgment. These include the activation products $^{14}C$, neutron capture product $^{237}Np$ and fission products $^{99}Tc$ since these are known to be produced in reactors in significant quantities and have relatively long half-lives.

Radionuclides with half-lives of less than 1 year were eliminated, since it has been more than 20 years since nuclear operations have been conducted at SSFL Area IV causing less than 1 millionth of the original amount to still be present. Of these radionuclides listed above, only $^{54}Mn$ was eliminated by this rule.

The existing dataset was screened to determine if other radionuclides have been detected. The only additional radionuclides that were detected with half lives greater than 1 year were $^{125}Sb$, $^{155}Eu$, $^{243}Cm$ and the natural decay chain daughters of thorium and uranium isotopes. The radioisotopes $^{125}Sb$, $^{155}Eu$, and $^{243}Cm$ were added to the COI list but the natural decay chain daughter were not added since they are included in the +D slope factors and PRGs of their parents.

The final list of radionuclides of interest that will be used for screening of the existing database is shown in **Table 3-11**. Since many of these radionuclide have either had minimal or no sampling or have been analyzed with detection limits that do not meet the PRGs that will be used for screening, the data gap for risk assessment will be measured against the entire list. However, the COI list may be reduced to a smaller COC list after further sampling and prior to risk assessment by eliminating radionuclides that are not detected at levels greater than one-tenth of the screening levels or above background screening levels

## 3.6.6 Determination of Required Number of Samples

### 3.6.6.1 Radionuclide Sample Number for Risk Assessment and Delineation Based on MARSSIM

For radionuclides, the number of samples required in each SU was determined using MARSSIM statistical tables. This requires assumptions of the α and β values (defined in the project DQOs) and calculation of the standard deviation and relative shift of each of the COIs. The relative shift is the ratio of the gray region and the standard deviation. The gray region is where the consequences of decision errors are relatively minor: the upper bound of the gray region is defined as the DCGL, and the LBGR is a site-specific variable generally initially selected to equal one half the $DCGL_W$ and adjusted to provide an acceptable value for the relative shift. In the statistical approach the gray region defines the level above which there is confidence that the contamination is less than the DCGL and below which there is confidence that contamination is less than the DCGL.

The MARSSIM protocol results in a determination of the number of required samples to be collected in a Survey Unit, regardless of size. The protocol also establishes maximum sizes for the Class 1, 2, and 3 Survey Units. Since MARSSIM was applied in this data gap analysis as a tool for the design of a characterization survey for the

SSFL Area IV EIS, and not as a final status survey for property transfer determination, the MARSSIM-recommended size limitations and resulting sample density were modified by using a sample density that is a factor of four lower for Class 1 and Class 2 areas than would be otherwise defined by MARSSIM. This sample density was determined appropriate to collect the required data for conducting a risk assessment for a representative exposure area. This adaptation of MARSSIM allows the sample density to continue to be proportional to the potential for contamination and sufficiently conservative to address CERCLA risk assessment data needs requirements.

For this Data Gaps Analysis, the MARSSIM protocol was also modified to allow for Class 1 and Class 2 Survey Units of larger than the established sizes and the number of samples determined by the statistical analysis was prorated to obtain the equivalent number of sample density across the total area of each Class of survey unit. For example, if the statistical analysis determined that in a particular EU, 15 samples would be required for a Class 1 Survey Unit (2-acre size limit), and the total area of Class 1 Survey Units in that EU would be 4 acres, then the number of required samples is 30. This allowed for the sample density to be proportional to the potential for exceeding the DCGL. Areas with standard deviation closer to the DCGLs (a lower relative shift) will have a higher density of samples based on the MARSSIM recommended statistical tests (Sign Test for COIs with no background value and Wilcoxon Rank Sum Test for COIs with a background value).

The calculation of required number of samples was performed for each COI for each soil interval. The relative shift is dependent, in part, on the DCGL or background value. Therefore, the calculation was also performed for both the residential and rural residential PRGs.

Standard deviations were calculated using data from samples in each SU. If a constituent was not detected, the actual value was used unless the result was reported exactly equal to the MDA or exactly half the MDA, indicating the reported results were manipulated. In those cases, half the MDA was used in the calculations.

In some cases there were not enough samples (less than eight) from the SU to determine a statistically valid standard deviation. In those cases, the relative shift was set to 1.5 for that constituent. Similarly, when all the samples had the same result (usually due to the detection limit being reported) and the standard deviation is zero, the relative shift was set to 3.0. Also, in some cases, the number of samples was greater than eight, but the average of the samples was greater than the DCGL or the standard deviation was greater than the LBGR. In those cases, obtaining the number of samples necessary to prove the area meets the DCGL is not reasonable and the conclusion can already be drawn that remediation is required. Since further sampling will be required after remediation, in these cases, the relative shift was set to 1.5 just to make sure that enough samples are collected to adequately characterize the area for nature and extent of contamination.

The MARSSIM guidelines apply to surface media and are not necessarily intended for use with subsurface contamination (i.e., subsurface soils cannot be field screened using standard GWS instrumentation because the overlying surface soil absorbs the subsurface emissions) (DOE et al. 2000). However, the MARSSIM SU classification system can still be used for assessing the potential for contamination. Therefore, sampling requirements for subsurface soils were evaluated based on SU process history especially where existing data was limited.

#### 3.6.6.2 Chemicals Sample Number for Risk Assessment

For Chemicals, the number of samples required for Risk Assessment was determined through a process similar to that described above for Radionuclides. However, the statistical calculation was performed for each EU rather than for each SU since the SUs only apply to radionuclides. The same screening and statistical rules were applied except if a constituent was not detected, a value of one-half of the detection limit was used in the calculation of the standard deviation for chemical constituents.

#### 3.6.6.3 Determination of Sample Numbers for Extent Delineation

The objective of the Area IV data gap analysis was to identify additional site characterization data necessary to evaluate a full range of risk-based remedial alternatives in an EIS. Through the RFI program many areas with documented soil chemical contamination have been identified as requiring clean-up. In addition, the RCRA program has identified Chemical Use Areas within many SWMUs and AOCs that need further characterization. As part of the data gap analysis, maps of EUs, showing detections above the DCGL of chemical COIs, by chemical group, were created from information in the database. Maps were developed for both the 0 to 2-feet and 2 to 10-feet depth intervals. These maps are compiled in **Appendix F**.

The existing analytical information in each Chemical Use Area was evaluated to determine if sufficient information exists for the evaluation of risk-based alternatives in the EIS. The analysis considered whether the areas have been previously characterized, and if areas of known contamination are adequately delineated. An evaluation of the distribution of existing sample locations coupled with the contaminant concentrations was used to determine a preliminary estimate of how many additional samples, if any, are required to characterize the soil or delineate the extent (laterally and vertically) of soil contamination in order to provide a cost estimate in the EIS. The analyses required for additional samples were also considered and evaluated.

### 3.6.7 Calculation of the Soil Sample Analytical Data Gaps

The analytical data gap is the difference between the required number of samples as determined using the MARSSIM approach for radionuclides and statistical approach for chemicals and the number of valid analyses already in the database. The analytical data gaps for soils were determined for each constituent in each soil depth interval with respect to each PRG (rural and residential). If additional samples, beyond those required for the risk assessment, are required to sufficiently delineate or characterize

suspected or identified contamination for chemicals, the sampling requirements are included in the data gap.

### 3.6.8 Gamma Walkover Survey Data Gap Analysis Methodology

A large number of radiological surveys have been performed over the last two decades within Area IV of SSFL to document achievement of remedial goals in various portions of the site. Independent third parties such as the staffs of California regulatory agencies and of the Oak Ridge Institute for Science and Education have also performed independent verification surveys to reconfirm results for many of the original surveys. For soils (i.e., unconsolidated materials), surveys have included soil sampling and analysis, assessment of ambient gamma radiation levels and gamma walkover (or "walk about") surveys.

Soil sampling efforts document the average concentrations of site contaminants. Gamma walkover surveys, by contrast, assist in assuring that soil sampling results are representative and that unidentified areas of residual contamination exceeding cleanup goals do not exist. Documentation of gamma walkover surveys was reviewed as an integral part of this data gap analysis to assure that survey information is comprehensive and fully defensible.

Gamma walkover surveys are utilized to identify areas in which gamma radioactivity is elevated when compared to normal site background radioactivity. These elevated areas are subsequently subjected to sampling and laboratory analysis to assure that small areas of elevated radioactivity are fully investigated and appropriately remediated. Failure of gamma walkover surveys to appropriately detect elevated concentrations of site contaminants could lead to residual contamination exceeding criteria. As such, the data gap review of gamma walkover survey reports was based upon availability of information to:

- Document that instrument scan minimum detectable concentrations were able to detect contamination at cleanup levels and, to the extent practicable, at 10 to 50 percent of such levels. (This standard includes assessment of instrument MDCs, survey procedures which were implemented and action levels used to enable the appropriate identification of areas of elevated activity.)

- Independently confirm that appropriate instrument quality assurance/quality control procedures were implemented as necessary to assure that data obtained were of defined quality.

- Clearly delineate the area(s) previously subject to gamma walkover surveys and, as related, provide assurances that all portions of a given area have been subject to the appropriate investigations.

- Assure the availability to decision makers of detailed survey data files.

The MARSSIM provides a nationally consistent consensus graded approach to conducting radiation surveys and investigations at potentially contaminated sites.

Gamma walkover surveys are an integral part of the graded approach with the highest data density collected in the areas most likely to contain contamination.

Surveys implemented prior to the development of MARSSIM must be individually assessed to evaluate their acceptability for use. The data gap analysis focuses on the usability of these data for identifying gross surface contamination or small areas of elevated activity within the context of MARSSIM. Because these data are not used in the risk calculations, not all radionuclides emit gamma radiation that is distinguishable from background, and because it is assumed unlikely that contamination exists in large areas but in small hot spots, all available GWS data will be considered by the data gap analysis. However, data obtained that is not compliant with MARSSIM guidance will require resurvey using MARSSIM compliant protocols and equipment.

## 3.7 Groundwater

Groundwater occurs in overburden and bedrock in Area IV. The units were distinguished during the data gap analysis since health effects and, ultimately, remedial action alternatives can differ for each unit. For example, VOCs in shallow groundwater in the overburden will likely have more of an impact on vapor intrusion than VOCs at depth in the bedrock. Also, contamination in the overburden may be addressed with one remediation technology, but the same technology may not be applicable to address the same contaminant type in bedrock.

### 3.7.1 Identification of Groundwater COIs

Groundwater COIs were identified by screening reported groundwater concentrations of all detected constituents against one-tenth the EPA Region 9 PRGs and one-tenth the MCLs. All groundwater data from wells located in Area IV were considered. However, since groundwater constituents may migrate beyond Area IV, which contrasts with soil where negligible lateral migration occurs, data from wells located beyond the Area IV boundary were also included. Wells located at a distance of 500 feet from the Area IV boundary (plus the more distal wells to the northwest) were included in the screening. Any constituent that exceeded its respective PRG or MCL screening value was identified as a COI. If a COI was identified at a well beyond Area IV, other site data (e.g., potentiometric surfaces) were evaluated to determine if the COI was applicable to Area IV. Some wells (e.g., RD-58B in Area III) beyond Area IV were linked to identified COIs, but no COIs were eliminated based on the review of other site data. The groundwater COI list is presented in **Table 3-12**. The screening values and the maximum detected concentrations are also posted in the table.

### 3.7.2 Statistical Evaluation of COI Distribution

Statistics were prepared for each COI. The statistical parameters are

- Frequency of detection

- Maximum concentration detected
- Well identifier for maximum concentration
- Minimum concentration detected
- Frequency of exceedance of the PRG
- Frequency of exceedance of the MCL

These statistics were evaluated to identify the most ubiquitous COIs, which were then used to assess the extent of contamination.

## 3.7.3 Characterization of Groundwater and Contaminant Migration

Groundwater and contaminant migration were evaluated using two approaches. First, historical reports were reviewed to evaluate the completeness of the groundwater CSM. Second, COI data from the Area IV database were evaluated in graphical and tabular format to determine if additional conclusions could be drawn regarding contaminant and groundwater migration.

### 3.7.3.1 Review of Groundwater CSM

Many field activities have been conducted and reports prepared to develop a CSM for the SSFL. Significant research on fractured rock hydrogeology has been conducted at the SSFL and is reported on to describe the CSM (Cherry et al. 2007). Many other historical reports were also reviewed to assist in evaluating the Area IV hydrogeology and contaminant transport.

### 3.7.3.2 Data Evaluation

The database was used to determine if additional data gap information could be gained regarding the CSM. Data were compared in tabular and graphical form. The data were used to determine if detected concentrations in one medium would suggest that another medium should be evaluated. Also, contaminant types were evaluated; the data were used to assess if a detected concentration of a contaminant type would suggest a related contaminant should be evaluated.

## 3.7.4 Evaluation of Efficacy of Groundwater Monitoring Network

The evaluation of the conceptual model and data was used to estimate if the monitoring well network was sufficient to characterize Area IV. In general, the following three categories were used to evaluate the efficacy of the monitoring well network:

- Are monitoring wells installed in locations and at depths to properly delineate plumes of detected groundwater contamination?

- Are monitoring wells located in areas of elevated soil contamination sufficient to evaluate groundwater impacts due to soil?

- Do soil vapor concentrations suggest elevated VOC concentrations in uncharacterized groundwater?

While evaluating the data to determine if the network is sufficient, the CSM was also evaluated to determine if site information supported the proposed model. The results of this evaluation is presented in Section 4.

## 3.8 Surface Water and Sediment

Surface water and sediment data collected as part of the NPDES monitoring program and other investigations were reviewed in relation to the needs to assess exposure for human health and ecological risk assessment. Given the nature of the NPDES data that considers water quality standards protective of human health, and given the ephemeral nature of stormwater flows, the NPDES data were deemed adequate to address human health assessment. No additional water quality data is proposed for human health risk characterization.

Also related to human health risk evaluation, the dry drainage sediment will be considered as part of the surface soil exposure as part of the evaluating risk. That is, the sediment data will be combined with soil data for the exposure unit in calculating risk. A review of the distribution of the sediment data for Area IV indicates that it will be adequate for incorporation into the human health risk assessment. No additional sediment data was deemed necessary for that purpose.

Regarding ecological receptors, the review of NPDES program analytes and the ecological COIs indicates that additional water quality data may be necessary for certain Area IV COIs. Also, a review of the distribution of sediment data has identified some locations within Area IV where additional sediment data may be warranted.

## 3.9 Radiological Air Data Analysis Methodology and Conclusions

Radiological air data were reviewed from annual Site Environmental Reports from 1991 to 2006; predecessor environmental surveys and environmental monitoring reports from 1955 to 1990; and NESHAP reports for DOE operations in SSFL Area IV from 1991 to 2006. These data are comprised of both effluent air data reflecting the emissions to the environment from a given facility and ambient air sampling information from monitoring stations established in designated locations. Gross alpha/beta and radionucide data have been reported. Section 4 presents the data reviewed as part of this effort.

Rather than using existing air data for the site, the risk assessment supporting the EIS alternatives analyses will fully consider the inhalation pathway for radionuclides

based on their concentration in site soils and the levels of contamination that exist on building surfaces. In addition, the existing NESHAPs data addresses potential exposures to offsite receptors for the range of operational conditions encountered over a period of many years.

# 3.10 Ecological Receptors

## 3.10.1 Data Relevant to the Ecological Risk Assessment

From the current database, soil (including soil data from 0 to 2 feet, 2 to 4 feet, 4 to 6 feet, and sump soil), surface water (including groundwater seep and sump water), sediment, and soil gas data will be used in the development of the ERA. Some data in the database are not necessary for the ERA (e.g., groundwater data not related to seeps).

As described in Section 3.4.3, the selected preliminary chemical ESLs were used to evaluate the quality and usability of historical data and to determine that the laboratory detection limits from those data were sufficiently low for the upcoming sampling efforts. If the laboratory detection limits for a chemical from a medium were higher than the lowest ESL for that chemical in that medium, then the results for that chemical in that medium were not deemed usable for purposes of assessing risk to ecological receptors. Collectively, the historical data that are deemed usable and data to be collected as a result of this data gaps analysis will be used for assessing risk to ecological receptors in the *SSFL Area IV EIS*.

## 3.10.2 Selection of Preliminary CPECs

As discussed in the SRAM WP (MWH 2005), preliminary chemical and radiological CPECs were selected for each medium based on the usable historical data. Following the initial screening of the usable historical chemical and radionuclide data, chemicals and radionuclides not detected above laboratory detection limits in a given medium were not retained as preliminary CPECs for that medium. If the maximum detected concentration of a chemical in a given medium was below the lowest ESL, then the chemical or radionuclide was not retained as a preliminary CPEC in that medium.

Chemicals detected in a given medium that were without a primary ESL from the SRAM WP or a secondary ESL from EPA were retained as CPECs for that medium. If the maximum detected concentration of a chemical in a given medium was above the lowest ESL, then the chemical was retained as a preliminary CPEC in that medium. Following the methods described in Section 3.1 of the SRAM WP (MWH 2005), benzene, toluene, ethylbenzene, xylenes, naphthalene, and 2-methylnaphthalene were selected as preliminary CPECs when TPH fraction C8-C11 was selected as a CPEC. PAHs were selected as CPECs when either TPH fraction C11-C14, C14-C20, or C20-C30 was selected as a CPEC. Finally, all 12 PCB congeners described in Section 2.7 of the SRAM WP (MWH 2005) were selected as CPECs when any PCB was selected as a CPEC. However, the selected list of CPECs included in this report is likely to be amended in the ERA following the collection and evaluation of additional chemical

and radionuclide data for each medium anticipated as a result of this data gap analysis. Results of the CPEC determination are provided in Section 4.7.

## 3.11 Building Data Gaps Analysis Methodology

The review of building radiological survey information indicates that gross alpha and beta measurements and volumetric samples of activated materials have been collected for some buildings. The associated gross alpha and beta measurements have included smear surveys to assess the quantity of removable contamination as well as scans and fixed point measurements. Building data is being evaluated based on its usage for a number of distinct purposes to include: (1) evaluation of risks associated with radiation exposure to building occupants for the No Action Alternative; (2) estimation of the source term and volumes for contaminated building materials that would require packaging, transportation, and disposal, and the assessment of the risks including the potential risk to members of the public associated with transportation of the waste as well as to demolition workers; (3) decision-making relative to disposition decisions to assure disposal of building wastes that is both cost effective and compliant with all regulatory requirements; and (4) development of radiation safety procedures and estimation of the costs associated with such requirements. (Such safety procedures are necessary to assure that building demolition is fully compliant with requirements, including those associated with maintaining radiation exposures to demolition workers and members of the public at levels which are "as low as reasonably achievable".) Assessment of building data gaps uses professional judgment to evaluate the available radiological contamination information for existing structures relative to the data required to meet each of the above stated needs.

## 3.12 Soil Vapor

The presence of volatile chemicals in soil vapor is a concern for ecological receptors, human health during excavation (inhalation), and indoor air contamination for structures overlying contaminated soil. Soil vapor is also useful in locating contaminant sources in soil and for tracing volatile chemical migration in groundwater.

### 3.12.1 Review the Existing Data

Soil gas samples were collected from 259 locations at depths ranging from 1 foot bgs to 27 feet bgs in 1993, 1997, 1999, 2000, 2001, 2002, 2003, 2006 and 2007. Soil vapor sample locations were located near previous buildings and known source areas. Not all chemicals were analyzed at the same locations. A breakdown of samples by depth is provided in **Table 3-13**. Because the primary exposure pathway for soil vapor is migration to indoor air, the shallower soil gas samples (0 to 5 feet bgs) will be used in the calculation of exposure point concentrations in the quantitative risk assessment analysis. However, soil gas from deeper samples could in theory represent a source of VOCs at shallow depths, so these deeper soil gas samples are also presented. These statistics help ensure that no detected constituent was overlooked in the shallower data.

Chemicals detected in soil vapor are summarized in **Table 3-13**. All detections were detected in soil vapor samples collected from depths ranging from 3 to 15 feet bgs. Detections of 1,2-dichloroethane (1,2-DCA), tetrachlorothene (PCE), trichloroethene (TCE), and vinyl chloride were above CHHSLs, indicating that these chemicals are potential chemicals of interest in soil vapor at Area IV.

Detection limits were compared to CHHSLs for shallow soil gas (less than 1.5 meters bgs) under residential land use in Table 3-13. Exceedances were detected in EU-01, EU-06, EU-09, and EU-11. Based on this comparison, the detection limits for 1,2-DCA, benzene, and carbon tetrachloride were all above CHHSLs. Therefore, although Table 3-13 shows that benzene and carbon tetrachloride were not detected above detections limits, these chemicals may exist at Area IV at concentrations greater than the CHHSL. Detection limits for PCE, TCE, and vinyl chloride were above CHHSLs for some samples.

## 3.12.2 Identification of Soil Vapor Data Gaps

Soil vapor data have been collected in 12 of the 16 EUs defined for Area IV. There are four exposure units (EU-02, EU-014, EU-15, and EU-16) where no soil vapor data were collected. Historically there have been no buildings in EU-14, EU-15, and EU-16. At one time there was a building in the upper northwest portion of EU-02.

The existing soil gas data was not used to evaluate data gaps in the same manner as soil and groundwater data were. Soil gas sampling is typically used by investigators as a survey and screening tool to locate volatile chemical releases and plumes. The soil gas data were use in this study to assist in understanding of chemical use area data, areas of soil contamination, and possible sources of groundwater contamination. Therefore, the soil gas data were not reviewed in terms of specific requirements to collect additional soil gas data. There is a potential that as the field sampling program is developed, that data gap investigators may identify additional soil gas sampling needs to assist in contaminant source and extent delineation. In accordance with DTSC guidance (2005), if buildings are not located near (within 100 feet) areas of concern, the indoor air inhalation pathway is incomplete and need not be considered. However, soil gas sampling requirements may need to be revisited if future development proposes future buildings near areas of concern.

## 3.13 Bedrock

A review of the database and documents prepared for the numerous investigations performed within Area IV indicate that data that can be used to characterize bedrock for the presence of chemical and radionuclide COIs is extremely limited and inadequate for the purpose of defining nature and extent of contamination. Therefore, characterization data for bedrock is a data gap for the field sampling investigation. As part of development of the field sampling investigation, process information and COI data will be used to identify locations where data for vertical extent is important and where bedrock should be sampled. In addition, bedrock

samples will be targeted at monitoring well locations both for chemical and physical property analyses.

## Data Gap Evaluation Process for Soils

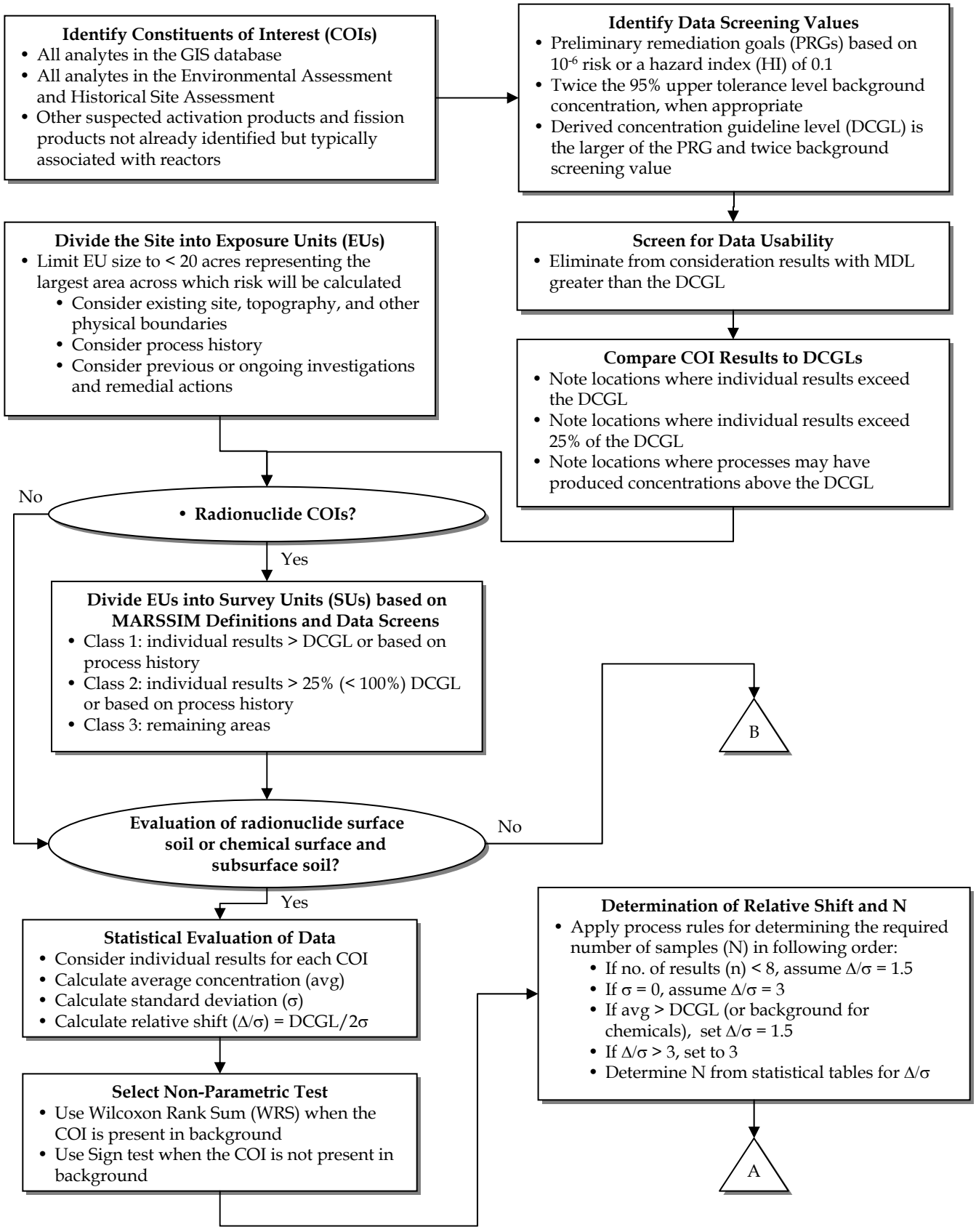



Exhibit 3-1a
Data Gap Evaluation Process for Soils

CDM

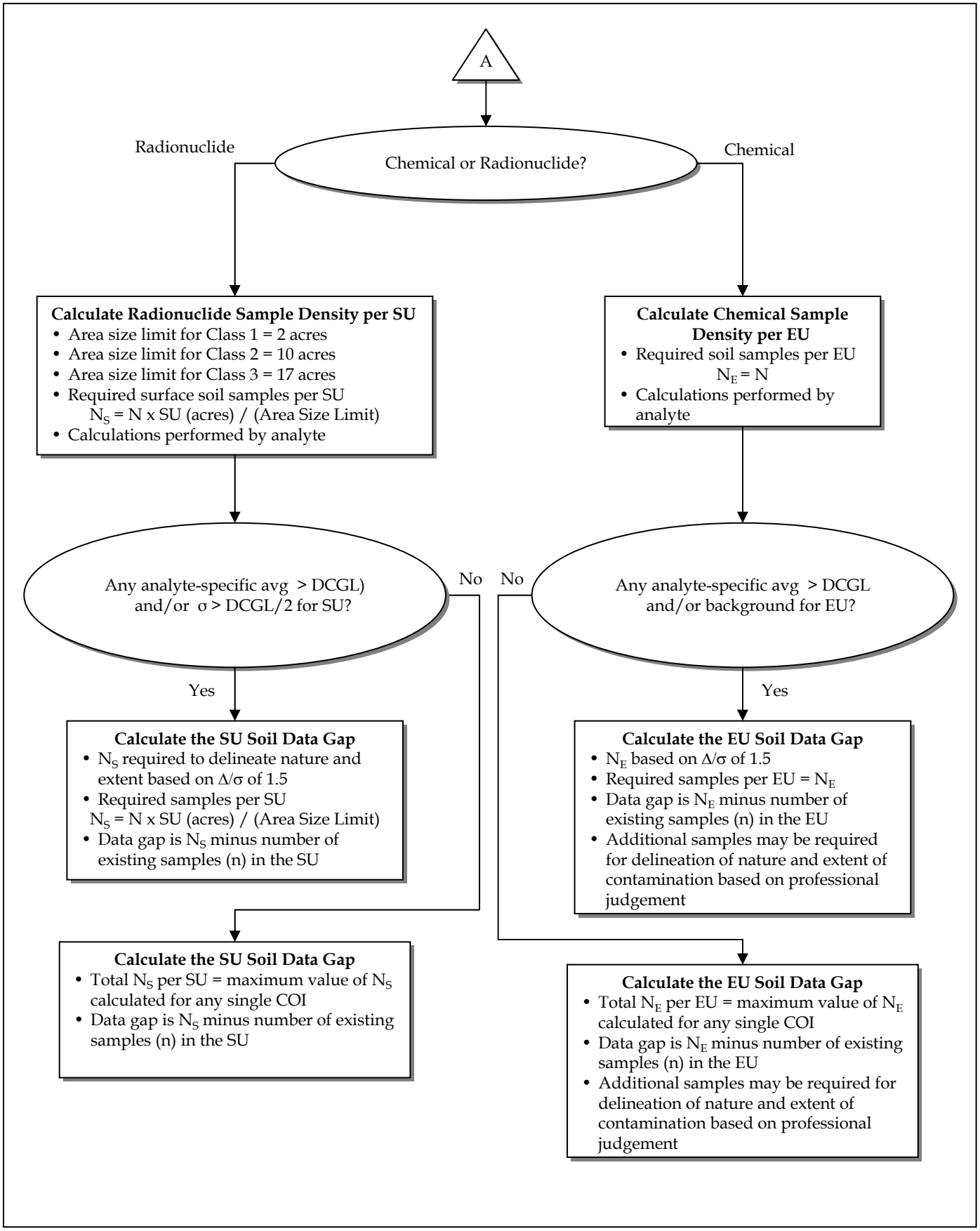



Exhibit 3-1b
Data Gap Evaluation Process for Soils

CDM

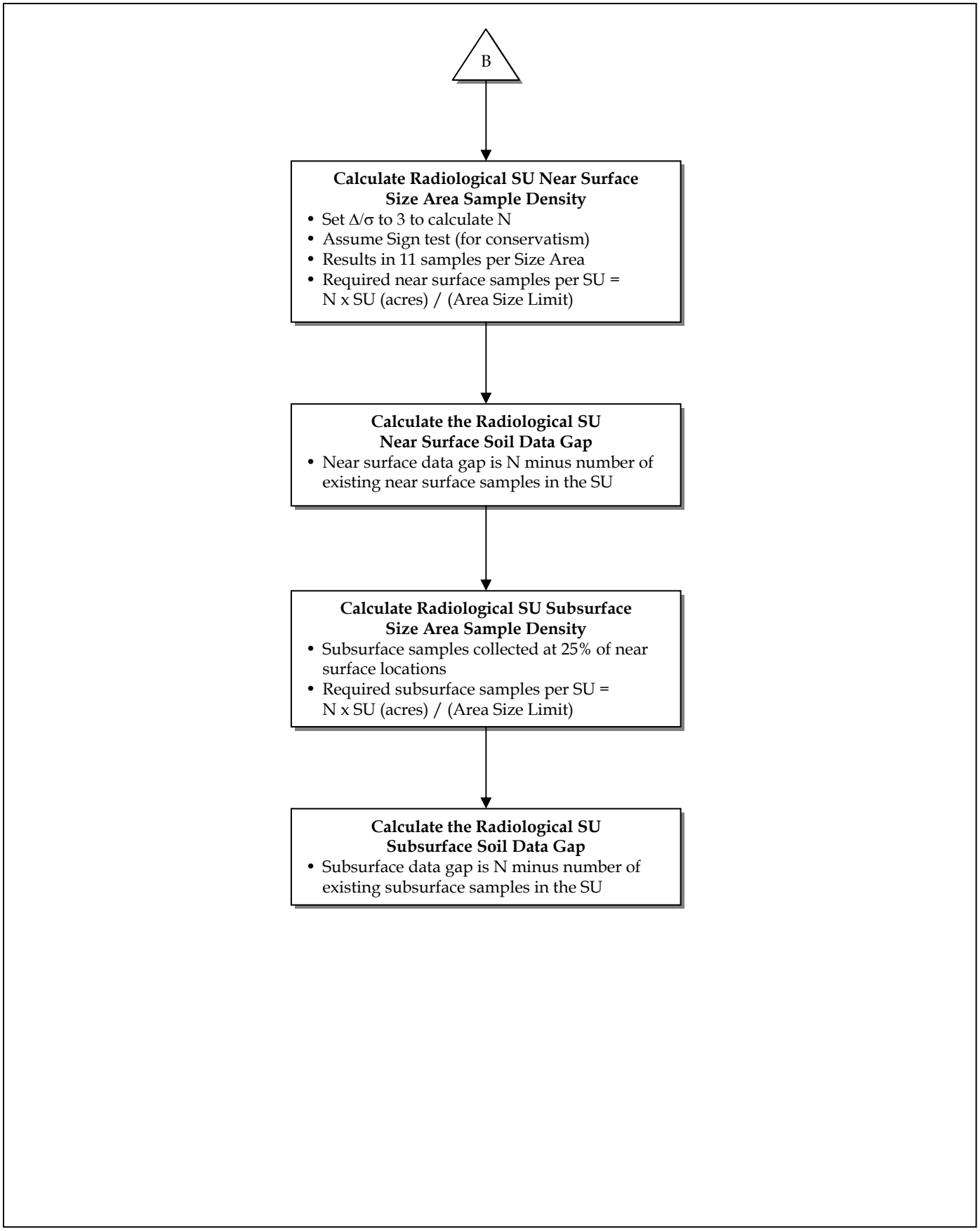
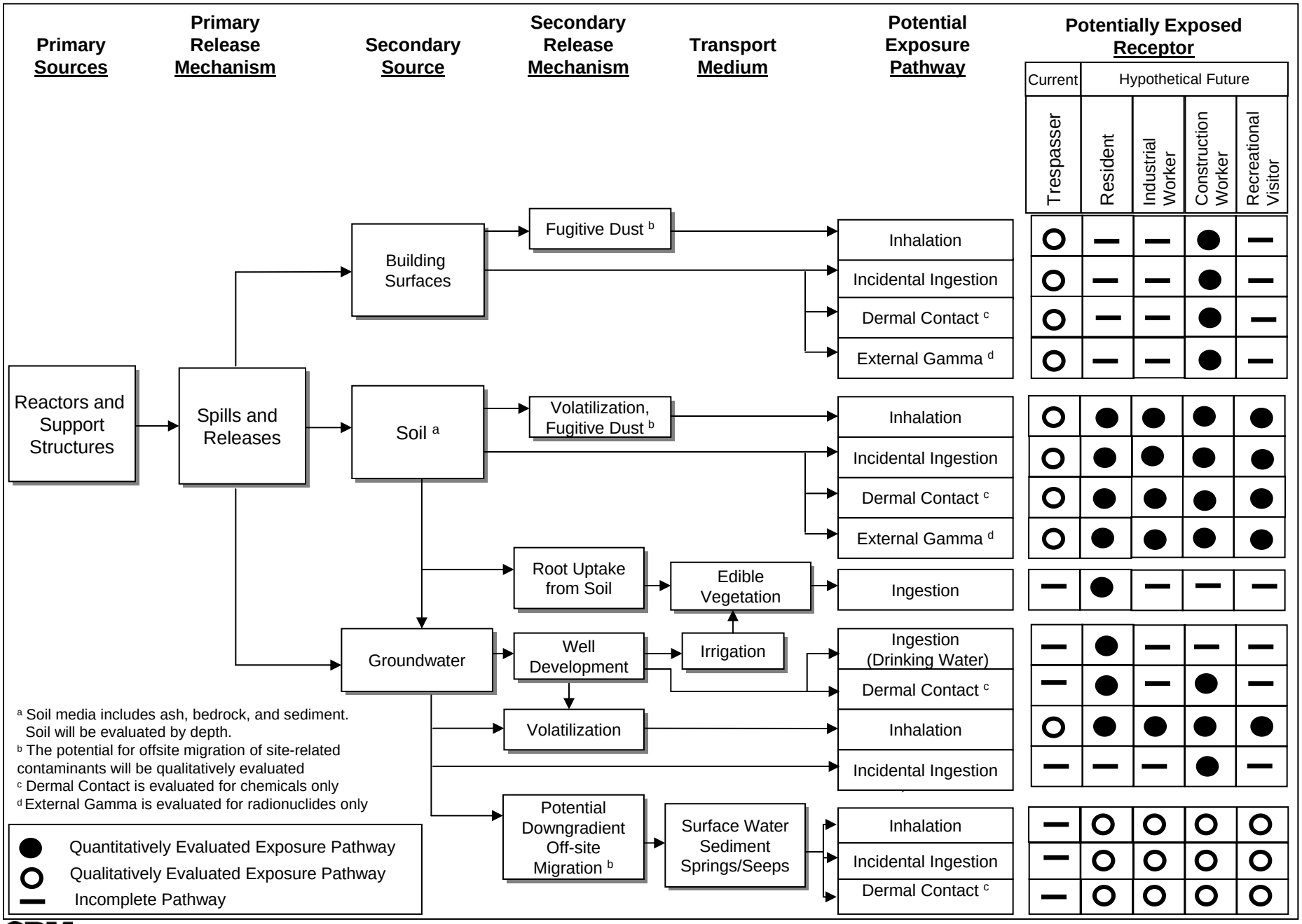



Exhibit 3-1c
Data Gap Evaluation Process for Soils

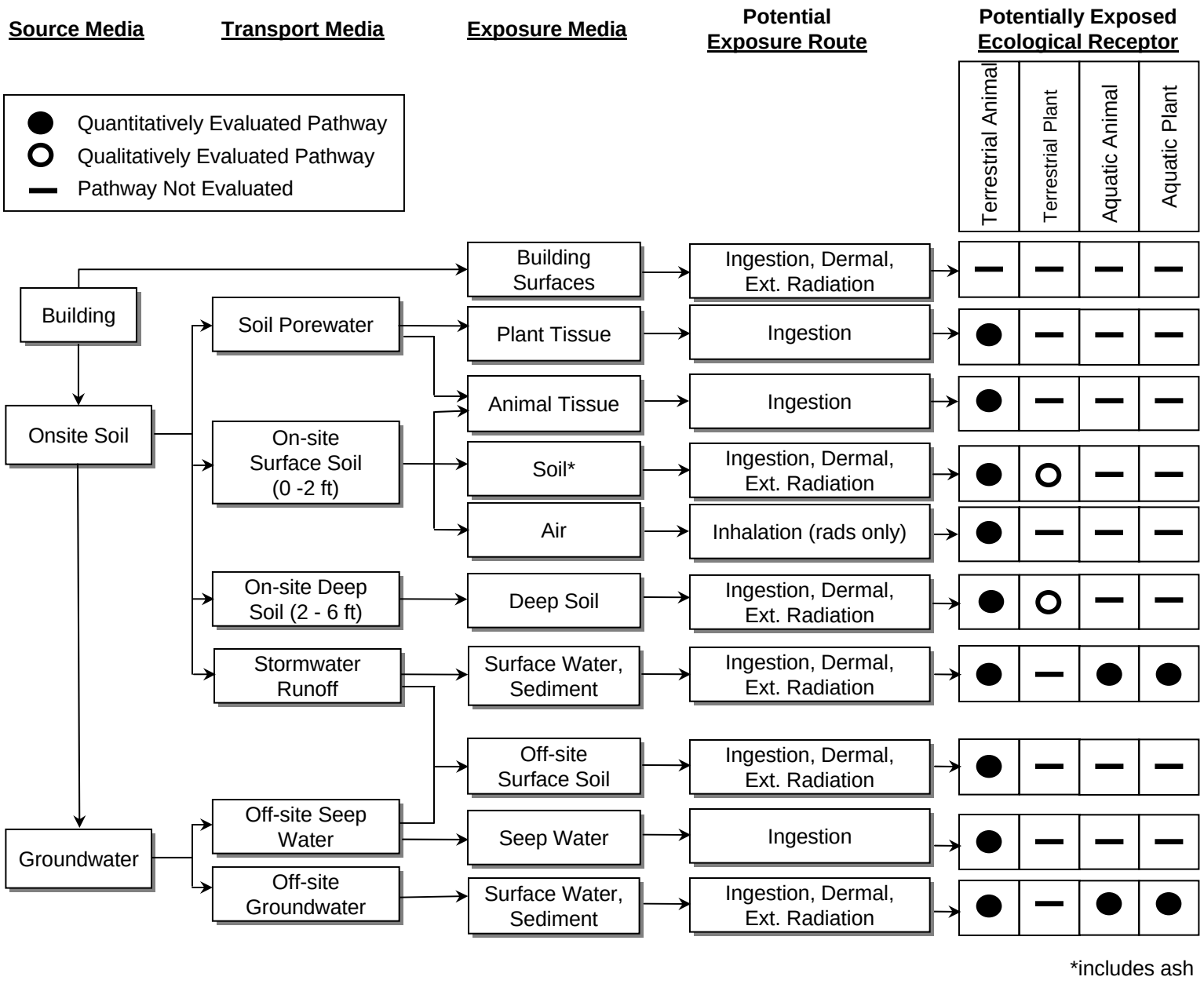
CDM




CDM

**Santa Susana Field Laboratory Area IV**
**Ventura County, California**

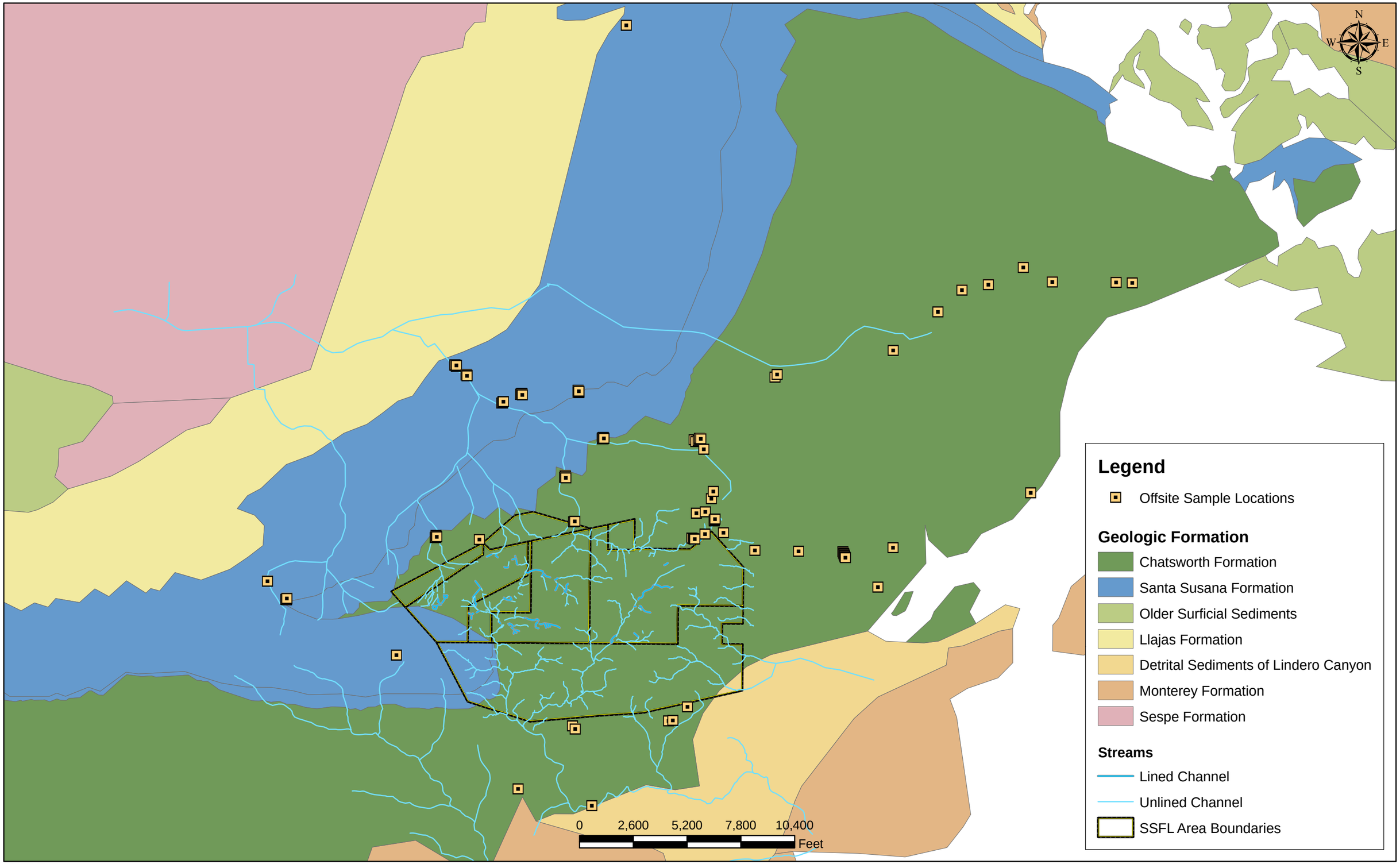
**Figure 3-1**
**Site Conceptual Exposure Model for Human Health**




CDM

**Santa Susana Field Laboratory Area IV**
**Ventura County, California**

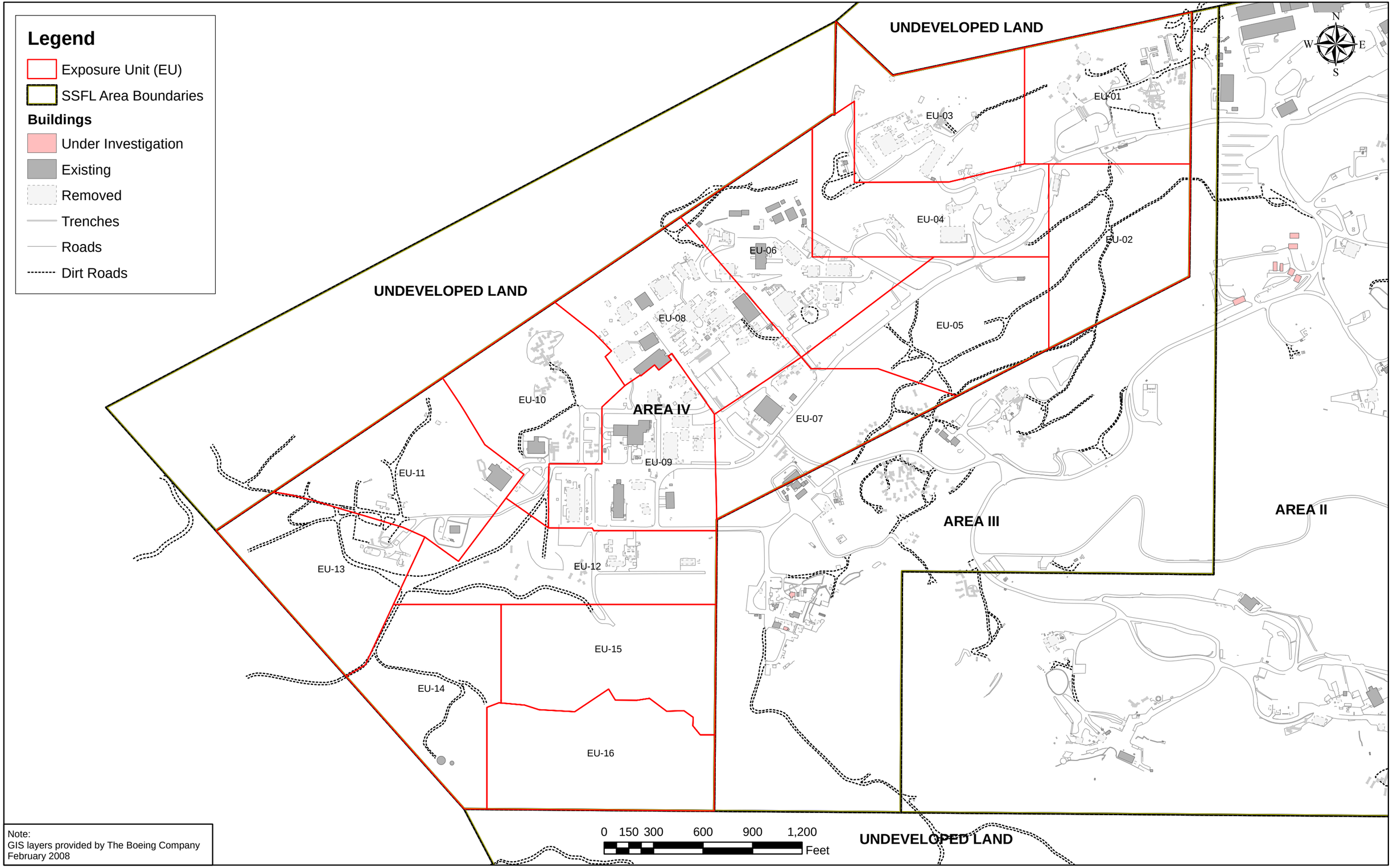
**Figure 3-2**
**SSFL Area IV Preliminary Conceptual Model for Ecological Receptors**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

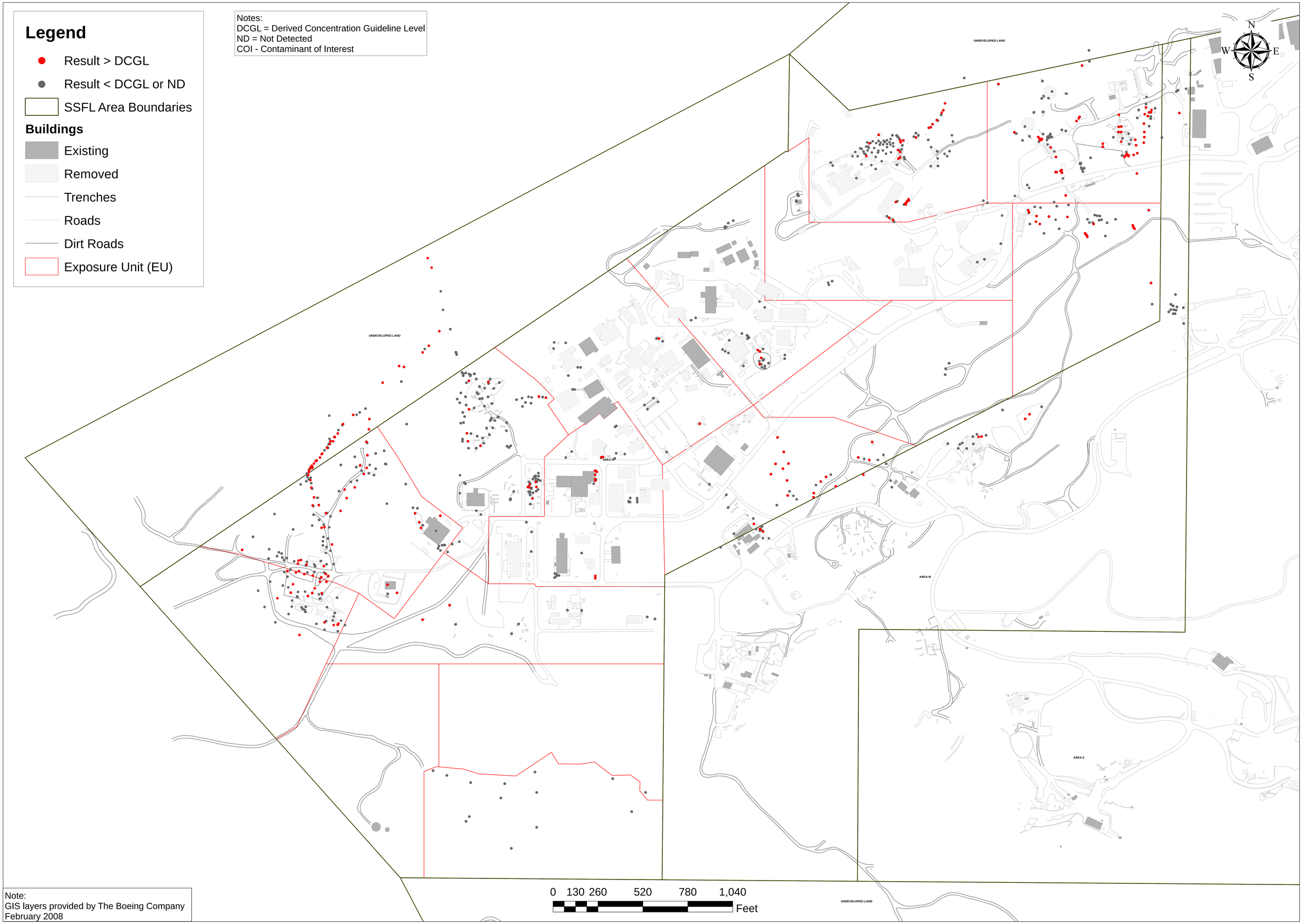
Figure 3-3
Location of Samples Included in Radiological Background Screening




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 3-4
Location of Area IV Exposure Units




Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 3-5
Location of Existing Chemical COI Samples

DRAFT - FOR PUBLIC REVIEW AND COMMENT

## Legend

- Result > DCGL
- Result > 25% and < 100% DCGL
- Result < 25% of DCGL or ND
- SSFL Area Boundaries

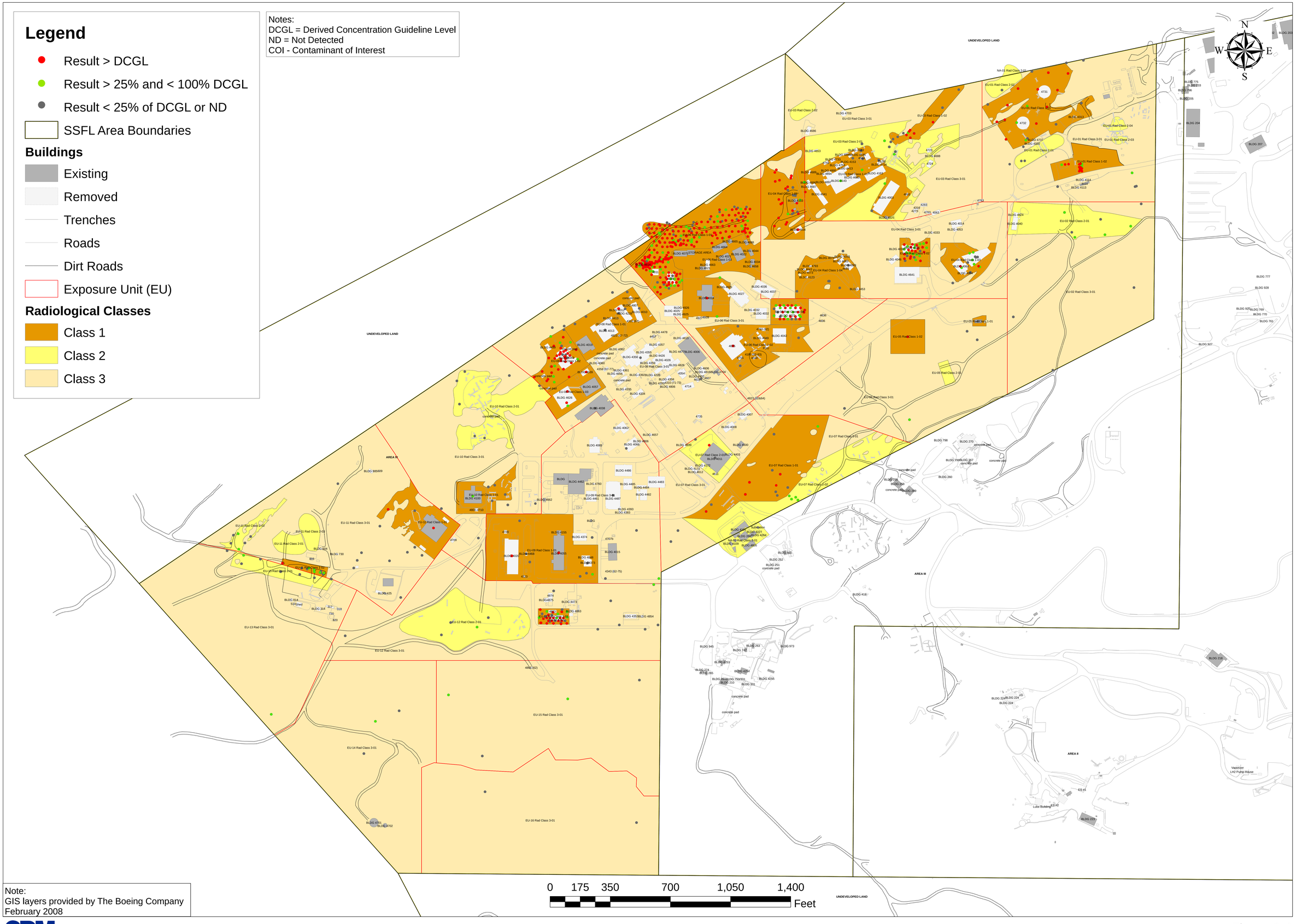
**Buildings**

- Existing
- Removed
- Trenches
- Roads
- Dirt Roads
- Exposure Unit (EU)

**Radiological Classes**

- Class 1
- Class 2
- Class 3

Notes:
DCGL = Derived Concentration Guideline Level
ND = Not Detected
COI - Contaminant of Interest




Note:
GIS layers provided by The Boeing Company
February 2008

CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 3-6
Location of Existing Radiological Samples

## Table 3-1
## SSFL Area IV Soil Background Comparison Values for Metals and Dioxins

| Group | Analyte | CAS Number | Concentration | Units |
|---|---|---|---|---|
| Inorganic | Aluminum | 7429-90-5 | 20000 | mg/kg |
| Inorganic | Antimony | 7440-36-0 | 8.7 | mg/kg |
| Inorganic | Arsenic | 7440-38-2 | 15 | mg/kg |
| Inorganic | Barium | 7440-39-3 | 140 | mg/kg |
| Inorganic | Beryllium | 7440-41-7 | 1.1 | mg/kg |
| Inorganic | Boron | 7440-42-8 | 9.7 | mg/kg |
| Inorganic | Cadmium | 7440-43-9 | 1 | mg/kg |
| Inorganic | Chromium | 7440-47-3 | 37 | mg/kg |
| Inorganic | Cobalt | 7440-48-4 | 21 | mg/kg |
| Inorganic | Copper | 7440-50-8 | 29 | mg/kg |
| Inorganic | Iron | 7439-89-6 | 28000 | mg/kg |
| Inorganic | Lead | 7439-92-1 | 34 | mg/kg |
| Inorganic | Lithium | 7439-93-2 | 37 | mg/kg |
| Inorganic | Manganese | 7439-96-5 | 495 | mg/kg |
| Inorganic | Mercury | 7487-94-6 | 0.09 | mg/kg |
| Inorganic | Molybdenum | 7439-98-7 | 5.3 | mg/kg |
| Inorganic | Nickel | 7440-02-0 | 29 | mg/kg |
| Inorganic | Potassium | 7440-09-7 | 6400 | mg/kg |
| Inorganic | Selenium | 7782-49-2 | 0.544 | mg/kg |
| Inorganic | Silver | 7440-22-4 | 0.79 | mg/kg |
| Inorganic | Sodium | 7440-23-5 | 110 | mg/kg |
| Inorganic | Thallium | 7440-28-0 | 0.46 | mg/kg |
| Inorganic | Vanadium | 7440-62-2 | 62 | mg/kg |
| Inorganic | Zinc | 7440-66-6 | 110 | mg/kg |
| Inorganic | Zirconium | 7440-67-7 | 8.6 | mg/kg |
| Dioxins | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | 25 | ng/kg |
| Dioxins | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 35822-46-9 | 130 | ng/kg |
| Dioxins | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | 1.9 | ng/kg |
| Dioxins | 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | 7.3 | ng/kg |
| Dioxins | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 39227-28-6 | 3.4 | ng/kg |
| Dioxins | 1,2,3,6,7,8-Hexachlorodibenzofuran | 57117-44-9 | 3 | ng/kg |
| Dioxins | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 57653-85-7 | 9.5 | ng/kg |
| Dioxins | 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | 4.3 | ng/kg |
| Dioxins | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 19408-74-3 | 11 | ng/kg |
| Dioxins | 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | 4.9 | ng/kg |
| Dioxins | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 40321-76-4 | 1.8 | ng/kg |
| Dioxins | 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | 4.5 | ng/kg |
| Dioxins | 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | 6.4 | ng/kg |
| Dioxins | Octachlorodibenzofuran | 39001-02-0 | 8.1 | ng/kg |
| Dioxins | Octachlorodibenzo-p-dioxin | 3268-87-9 | 140 | ng/kg |

Notes:
CAS: Chemical Abstracts Service
mg/kg: milligrams per kilogram
ng/kg: nanograms per kilogram

## Table 3-2
## SSFL Off-site Radionuclide Data Summary Statistics and Screening Levels

| Parameter | Radionuclide | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $^{137}$Cs | $^{90}$Sr | $^{40}$K | $^{3}$H | $^{232}$Th[a] | $^{226}$Ra | $^{230}$Th | $^{234}$U | $^{235}$U | $^{238}$U | $^{238}$Pu | $^{239}$Pu |
| **Chatsworth Formation** | | | | | | | | | | | | |
| No. of Measurements | 96 | 60 | 41 | 15 | 45 | 31 | 35 | 34 | 40 | 40 | 30 | 1 |
| Max. Result (pCi/g) | 0.42 | 0.14 | 27.7 | 0.16 | 2.04 | 2.44 | 1.63 | 1.50 | 0.10 | 1.60 | 0.050 | 0.060 |
| Avg. Result (pCi/g) | 0.100 | 0.046 | 22.2 | 0.11 | 0.81 | 1.41 | 0.55 | 0.72 | 0.046 | 0.75 | 0.020 | NA |
| σ (pCi/g) | 0.093 | 0.031 | 2.00 | 0.053 | 0.43 | 0.58 | 0.48 | 0.26 | 0.024 | 0.32 | 0.016 | NA |
| Coefficient of Variance[b] | 0.93 | 0.67 | 0.09 | 0.50 | 0.53 | 0.41 | 0.88 | 0.37 | 0.52 | 0.43 | 0.81 | NA |
| Upper Tolerance Level (pCi/g)[c] | 0.28 | 0.11 | 26 | 0.24 | 1.7 | 2.7 | 1.6 | 1.3 | 0.10 | 1.4 | 0.060 | NA |
| **Santa Susana Formation** | | | | | | | | | | | | |
| No. of Measurements | 62 | 28 | 27 | 13 | 29 | 12 | 17 | 17 | 29 | 29 | 18 | 16 |
| Max. Result (pCi/g) | 0.22 | 0.060 | 29.5 | 0.24 | 1.60 | 0.65 | 1.10 | 0.98 | 0.10 | 1.33 | 0.031 | 0.018 |
| Avg. Result (pCi/g) | 0.07 | 0.016 | 26.9 | 0.047 | 0.97 | 0.62 | 0.94 | 0.79 | 0.049 | 0.84 | 0.012 | 0.0081 |
| σ (pCi/g) | 0.05 | 0.015 | 1.60 | 0.053 | 0.19 | 0.028 | 0.23 | 0.09 | 0.017 | 0.21 | 0.016 | 0.0061 |
| Coefficient of Variance | 0.76 | 0.91 | 0.06 | 1.14 | 0.20 | 0.04 | 0.24 | 0.12 | 0.34 | 0.25 | 1.36 | 0.75 |
| Upper Tolerance Level (pCi/g) | 0.17 | 0.05 | 30 | 0.19 | 1.4 | 0.70 | 1.5 | 1.0 | 0.09 | 1.3 | 0.050 | 0.023 |
| **Combined Off-site Soil Data** | | | | | | | | | | | | |
| No. of Measurements | 158 | 88 | 68 | 28 | 74 | 43 | 52 | 51 | 69 | 69 | 48 | 17 |
| Max. Result (pCi/g) | 0.42 | 0.14 | 29.5 | 0.24 | 2.04 | 2.44 | 1.63 | 1.50 | 0.10 | 1.60 | 0.050 | 0.060 |
| **Avg. Result** (pCi/g) | **0.087** | **0.036** | **24.0** | **0.078** | **0.88** | **1.19** | **0.68** | **0.74** | **0.05** | **0.79** | **0.017** | **0.011** |
| σ (pCi/g) | 0.081 | 0.030 | 2.95 | 0.12 | 0.36 | 0.61 | 0.45 | 0.22 | 0.02 | 0.28 | 0.030 | 0.014 |
| Coefficient of Variance | 0.93 | 0.83 | 0.12 | 1.53 | 0.42 | 0.51 | 0.67 | 0.30 | 0.45 | 0.36 | 1.78 | 1.2 |
| **Upper Tolerance Level** (pCi/g) | **0.24** | **0.10** | **30** | **0.35** | **1.6** | **2.5** | **1.6** | **1.2** | **0.09** | **1.3** | **0.080** | **0.023** |

a) Thorium-232 (Th-232) concentrations assumed based on measured Th-228 results; reported values assumed to apply to entire thorium series.
b) Standard deviation divided by average result; a value greater than 1.0 indicates distribution is likely non-normal.
c) 95% upper confidence level with 95% coverage [average result + (standard deviation × k factor)]; k factors from Odeh, R.E. and D.B. Owen 1980. *Tables for Normal Tolerance Limits, Sampling Plans and Screening*. Marcel Dekker, Ltd., New York

Notes:
pCi/g: picoCuries per gram
σ: standard deviation

## Table 3-3
## Radionuclide Soil Human Health PRGs

| | Toxicity Values | | | | PRG | |
|---|---|---|---|---|---|---|
| | Soil Ingestion | Food Ingestion | Inhalation | External Gamma | Rural Resident | Resident |
| Isotope | (risk/pCi) | (risk/pCi) | (risk/pCi) | (risk-g/pCi-y) | (pCi/g) | (pCi/g) |
| $^{228}$Ac | 5.55E-12 | 2.89E-12 | 4.92E-11 | 4.53E-06 | 6.8E-02 | 8.5E-02 |
| $^{241}$Am | 2.17E-10 | 1.34E-10 | 2.81E-08 | 2.76E-08 | 1.9E+00 | 2.0E+00 |
| $^{133}$Ba | 1.39E-11 | 9.44E-12 | 1.16E-11 | 1.44E-06 | 1.8E-01 | 1.8E-01 |
| $^{14}$C | 2.79E-12 | 2.00E-12 | 7.07E-12 | 7.83E-12 | 4.6E-01 | 2.8E+02 |
| $^{243}$Cm | 2.05E-10 | 1.23E-10 | 2.69E-08 | 4.19E-07 | 3.5E-01 | 3.5E-01 |
| $^{60}$Co | 4.03E-11 | 2.23E-11 | 3.58E-11 | 1.24E-05 | 3.6E-02 | 3.6E-02 |
| $^{134}$Cs | 5.81E-11 | 5.14E-11 | 1.65E-11 | 7.10E-06 | 1.6E-01 | 1.6E-01 |
| $^{137}$Cs+D | 4.33E-11 | 3.74E-11 | 1.19E-11 | 2.55E-06 | 6.0E-02 | 6.0E-02 |
| $^{152}$Eu | 1.62E-11 | 8.70E-12 | 9.10E-11 | 5.30E-06 | 4.2E-02 | 4.2E-02 |
| $^{154}$Eu | 2.85E-11 | 1.49E-11 | 1.15E-10 | 5.83E-06 | 5.0E-02 | 5.0E-02 |
| $^{155}$Eu | 5.40E-12 | 2.77E-12 | 1.48E-11 | 1.24E-07 | 3.8E+00 | 3.8E+00 |
| $^{55}$Fe | 2.09E-12 | 1.16E-12 | 7.99E-13 | 0.00E+00 | 2.7E+03 | 2.9E+03 |
| $^{3}$H | 2.20E-13 | 1.44E-13 | 1.99E-13 | -- | 2.3E+00 | 2.7E+00 |
| $^{129}$I | 2.71E-10 | 3.22E-10 | 6.07E-11 | 6.10E-09 | 6.0E-01 | 2.5E+00 |
| $^{40}$K | 6.18E-11 | 3.43E-11 | 1.03E-11 | 7.97E-07 | 1.1E-01 | 1.4E-01 |
| $^{22}$Na | 1.97E-11 | 1.26E-11 | 3.89E-12 | 1.03E-05 | 8.7E-02 | 8.7E-02 |
| $^{59}$Ni | 7.33E-13 | 3.89E-13 | 4.66E-13 | 0.00E+00 | 2.1E+02 | 1.1E+03 |
| $^{63}$Ni | 1.79E-12 | 9.51E-13 | 1.64E-12 | 0.00E+00 | 9.5E+01 | 4.9E+02 |
| $^{237}$Np+D | 1.62E-10 | 9.1E-11 | 1.77E-08 | 7.97E-07 | 1.3E-01 | 1.4E-01 |
| $^{210}$Pb+D | 2.66E-09 | 3.44E-09 | 1.39E-08 | 4.21E-09 | 1.5E-01 | 4.5E-01 |
| $^{238}$Pu | 2.72E-10 | 1.69E-10 | 3.36E-08 | 7.22E-11 | 3.0E+00 | 3.3E+00 |
| $^{239}$Pu | 2.76E-10 | 1.74E-10 | 3.33E-08 | 2.00E-10 | 2.6E+00 | 2.9E+00 |
| $^{240}$Pu | 2.77E-10 | 1.74E-10 | 3.33E-08 | 6.98E-11 | 2.6E+00 | 2.9E+00 |
| $^{241}$Pu | 3.29E-12 | 2.28E-12 | 3.34E-10 | 4.11E-12 | 4.1E+02 | 4.5E+02 |
| $^{242}$Pu | 2.63E-10 | 1.65E-10 | 3.13E-08 | 6.25E-11 | 3.0E+00 | 3.0E+00 |
| $^{226}$Ra+D | 7.30E-10 | 5.15E-10 | 1.16E-08 | 8.49E-06 | 1.2E-02 | 1.3E-02 |
| $^{228}$Ra+D | 2.29E-09 | 1.43E-09 | 5.23E-09 | 4.53E-06 | 6.8E-02 | 8.5E-02 |
| $^{125}$Sb+D | 1.32E-11 | 7.21E-12 | 1.93E-11 | 1.81E-06 | 4.6E-01 | 4.6E-01 |
| $^{90}$Sr+D | 1.44E-10 | 9.53E-11 | 1.13E-10 | 1.96E-08 | 2.3E-01 | 3.9E+00 |
| $^{99}$Tc | 7.66E-12 | 4.0E-12 | 1.41E-11 | 8.14E-11 | 2.5E-01 | 9.6E+01 |
| $^{228}$Th+D | 8.09E-10 | 4.22E-10 | 1.43E-07 | 7.76E-06 | 1.5E-01 | 1.5E-01 |
| $^{230}$Th | 2.02E-10 | 1.19E-10 | 2.85E-08 | 8.19E-10 | 3.5E+00 | 3.8E+00 |
| $^{232}$Th | 2.31E-10 | 1.33E-10 | 4.33E-08 | 3.42E-10 | 3.1E+00 | 3.4E+00 |
| $^{234}$U | 1.58E-10 | 9.55E-11 | 1.14E-08 | 2.52E-10 | 4.0E+00 | 5.0E+00 |
| $^{235}$U+D | 1.63E-10 | 9.76E-11 | 1.01E-08 | 5.43E-07 | 2.0E-01 | 2.0E-01 |
| $^{238}$U+D | 2.10E-10 | 1.21E-10 | 9.35E-09 | 1.14E-07 | 7.4E-01 | 7.8E-01 |

Notes:
"--" indicates value not available.
"+D" indicates the inclusion of short-lived radioactive decay products in equilibrium with the indicated parent,
g: gram
pCi: picoCurie
PRG: preliminary remediation goal
y: year

## Table 3 - 4
## Terrestrial Ecological PRGs for Radionuclides

| Preliminary Remediation Goals - Terrestrial | | |
|---|---|---|
| **Radionuclide** | **Water (pCi/L)** | **Soil (pCi/g)** |
| Am-241 | 2.00E+05 | 4.00E+03 |
| Ba-133 | 1.20E+03 | 6.67E+02 |
| Cm-243/244 | 1.84E+05 | 4.06E+03 |
| Co-60 | 1.00E+06 | 7.00E+02 |
| Cs-134 | 3.26E+05 | 1.13E+01 |
| Cs-137 | 6.00E+05 | 2.00E+01 |
| Eu-152 | 2.55E+06 | 1.52E+03 |
| Eu-154 | 2.00E+06 | 1.00E+03 |
| Eu-155 | 3.00E+07 | 2.00E+04 |
| Fe-55 | 1.00E+05 | 5.53E+04 |
| H-3 | 2.00E+08 | 2.00E+05 |
| I-129 | 5.70E+06 | 5.67E+03 |
| K-40 | 1.93E+06 | 1.19E+02 |
| Na-22 | 2.53E+01 | 1.64E+01 |
| Ni-59 | 1.51E+05 | 2.68E+05 |
| Ni-63 | 6.25E+04 | 1.04E+05 |
| Np-237 | 6.49E+06 | 3.86E+03 |
| Pb-210 | 2.92E+05 | 1.39E+03 |
| Pu-238 | 1.89E+05 | 5.27E+03 |
| Pu-239 | 2.00E+05 | 6.00E+03 |
| Pu-240 | 5.13E+02 | 1.85E+01 |
| Pu-241 | 1.07E+07 | 1.90E+05 |
| Ra-226 | 8.00E+03 | 5.00E+01 |
| Ra-228 | 7.00E+03 | 4.00E+01 |
| Sb-125 | 6.97E+06 | 3.52E+03 |
| Sr-90 | 5.00E+04 | 2.00E+01 |
| Tc-99 | 2.00E+07 | 4.00E+03 |
| Th-228 | 6.33E+04 | 5.30E+02 |
| Th-230 | 4.52E+05 | 9.98E+03 |
| Th-232 | 5.00E+04 | 2.00E+03 |
| U-233 | 4.00E+05 | 5.00E+03 |
| U-234 | 4.00E+05 | 5.00E+03 |
| U-235 | 4.00E+05 | 3.00E+03 |
| U-238 | 4.00E+05 | 2.00E+03 |

Notes:
pCi/L: picoCuries per liter
pCi/g: picoCuries per gram
PRG: preliminary remediation goals; biological concentration guides (DOE 2002)

## Table 3 - 5
## Aquatic Ecological PRGs for Radionuclides

| Preliminary Remediation Goals - Aquatic | | |
|---|---|---|
| **Radionuclide** | **Water (pCi/L)** | **Sediment (pCi/g)** |
| Am-241 | 4.38E+02 | 7.04E+05 |
| Ba-133 | 6.76E+01 | 8.57E+04 |
| Cm-243/244 | 6.63E+01 | 4.01E+06 |
| Co-60 | 3.76E+03 | 1.49E+04 |
| Cs-134 | 5.18E+02 | 2.28E+04 |
| Cs-137 | 1.05E+03 | 4.93E+04 |
| Eu-152 | 2.55E+04 | 3.06E+04 |
| Eu-154 | 2.16E+04 | 2.59E+04 |
| Eu-155 | 2.64E+05 | 3.18E+05 |
| Fe-55 | 8.00E+02 | 6.51E+06 |
| H-3 | 4.99E+09 | 7.04E+06 |
| I-129 | 1.00E+06 | 4.93E+05 |
| K-40 | 2.90E+03 | 5.80E+04 |
| Na-22 | 3.56E+00 | 1.64E+04 |
| Ni-59 | 3.58E+04 | 5.88E+06 |
| Ni-63 | 1.47E+04 | 2.27E+06 |
| Np-237 | 6.85E+01 | 7.86E+04 |
| Pb-210 | 6.01E+02 | 9.18E+04 |
| Pu-238 | 1.76E+02 | 3.95E+06 |
| Pu-239 | 1.87E+02 | 7.04E+06 |
| Pu-240 | 1.89E-01 | 4.00E+06 |
| Pu-241 | 3.90E+03 | 7.69E+06 |
| Ra-226 | 1.02E+01 | 1.45E+04 |
| Ra-228 | 8.49E+00 | 2.90E+04 |
| Sb-125 | 3.67E+05 | 7.04E+04 |
| Sr-90 | 5.39E+04 | 3.52E+04 |
| Tc-99 | 2.47E+06 | 4.69E+05 |
| Th-228 | 3.74E+02 | 1.64E+04 |
| Th-230 | 2.57E+03 | 2.74E+06 |
| Th-232 | 3.04E+02 | 3.29E+06 |
| U-233 | 2.00E+02 | 1.06E+07 |
| U-234 | 2.02E+02 | 3.08E+06 |
| U-235 | 2.17E+02 | 1.05E+05 |
| U-238 | 2.23E+02 | 4.28E+04 |

Notes:
pCi/L: picoCuries per liter
pCi/g: picoCuries per gram
PRG: preliminary remediation goals; biological concentration guides (DOE 2002)

**Table 3-6**
**Chemicals Analyzed But Not Detected In Area IV Soil**

| CAS Number | Analyte | Number of samples |
|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 165 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 278 |
| 79-00-5 | 1,1,2-Trichloroethane | 278 |
| 563-58-6 | 1,1-Dichloropropene | 80 |
| 87-61-6 | 1,2,3-Trichlorobenzene | 80 |
| 96-18-4 | 1,2,3-Trichloropropane | 82 |
| 120-82-1 | 1,2,4-Trichlorobenzene | 213 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 165 |
| 106-93-4 | 1,2-Dibromoethane | 80 |
| 95-50-1 | 1,2-Dichlorobenzene | 325 |
| 78-87-5 | 1,2-Dichloropropane | 264 |
| 122-66-7 | * 1,2-Diphenylhydrazine | 48 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 165 |
| 541-73-1 | 1,3-Dichlorobenzene | 325 |
| 142-28-9 | 1,3-Dichloropropane | 80 |
| 542-75-6 | 1,3-Dichloropropene | 53 |
| 99-65-0 | * 1,3-Dinitrobenzene | 9 |
| 106-46-7 | 1,4-Dichlorobenzene | 325 |
| 594-20-7 | 2,2-Dichloropropane | 80 |
| 95-95-4 | 2,4,5-Trichlorophenol | 104 |
| 88-06-2 | 2,4,6-Trichlorophenol | 163 |
| 118-96-7 | 2,4,6-Trinitrotoluene | 9 |
| 120-83-2 | 2,4-Dichlorophenol | 138 |
| 105-67-9 | 2,4-Dimethylphenol | 163 |
| 51-28-5 | 2,4-Dinitrophenol | 163 |
| 121-14-2 | * 2,4-Dinitrotoluene | 158 |
| 87-65-0 | 2,6-Dichlorophenol | 25 |
| 606-20-2 | * 2,6-Dinitrotoluene | 158 |
| 75-88-7 | 2-Chloro-1,1,1-trifluoroethane | 124 |
| 110-75-8 | 2-Chloroethylvinyl ether | 191 |
| 91-58-7 | 2-Chloronaphthalene | 149 |
| 95-57-8 | 2-Chlorophenol | 163 |
| 95-49-8 | 2-Chlorotoluene | 80 |
| 88-74-4 | 2-Nitroaniline | 104 |
| 88-75-5 | 2-Nitrophenol | 163 |
| 88-72-2 | * 2-Nitrotoluene | 9 |
| 91-94-1 | * 3,3'-Dichlorobenzidine | 149 |
| 99-09-2 | 3-Nitroaniline | 104 |
| 99-08-1 | 3-Nitrotoluene | 9 |
| 72-54-8 | * 4,4'-DDD | 1 |
| 72-55-9 | * 4,4'-DDE | 1 |
| 50-29-3 | * 4,4'-DDT | 1 |
| 534-52-1 | 4,6-Dinitro-o-cresol | 163 |
| 101-55-3 | 4-Bromophenyl phenyl ether | 149 |
| 7005-72-3 | 4-Chlorophenylphenyl ether | 149 |
| 100-02-7 | 4-Nitrophenol | 163 |
| 99-99-0 | 4-Nitrotoluene | 9 |
| 309-00-2 | * Aldrin | 1 |
| 319-84-6 | * alpha-BHC | 1 |
| 62-53-3 | Aniline | 59 |
| 12674-11-2 | Aroclor 1016 | 395 |
| 11104-28-2 | Aroclor 1221 | 395 |
| 11141-16-5 | Aroclor 1232 | 395 |
| 37324-23-5 | Aroclor 1262 | 6 |
| 11100-14-4 | Aroclor 1268 | 6 |
| 103-33-3 | Azobenzene | 19 |

**Table 3-6**
**Chemicals Analyzed But Not Detected In Area IV Soil**

| CAS Number | Analyte | Number of samples |
|---|---|---|
| 92-87-5 | * Benzidine | 96 |
| 65-85-0 | Benzoic acid | 93 |
| 100-51-6 | Benzyl alcohol | 104 |
| 111-91-1 | bis(2-Chloroethoxy)methane | 149 |
| 111-44-4 | * bis(2-Chloroethyl) ether | 149 |
| 108-86-1 | Bromobenzene | 80 |
| 74-97-5 | Bromochloromethane | 80 |
| 75-27-4 | Bromodichloromethane | 278 |
| 75-25-2 | Bromoform | 278 |
| 74-83-9 | Bromomethane | 278 |
| 86-74-8 | Carbazole | 35 |
| 75-15-0 | Carbon Disulfide | 48 |
| 56-23-5 | Carbon Tetrachloride | 278 |
| 74-87-3 | Chloromethane | 278 |
| 79-38-9 | Chlorotrifluoroethylene | 135 |
| 10061-01-5 | cis-1,3-Dichloropropene | 213 |
| 57-12-5 | Cyanides | 8 |
| 124-48-1 | Dibromochloromethane | 195 |
| 74-95-3 | Dibromomethane | 80 |
| 25321-22-6 | Dichlorobenzenes | 12 |
| 75-71-8 | Dichlorodifluoromethane | 170 |
| 131-11-3 | Dimethyl phthalate | 160 |
| 122-39-4 | Diphenylamine | 25 |
| 58-89-9 | * gamma-BHC | 1 |
| 118-74-1 | * Hexachlorobenzene | 149 |
| 87-68-3 | Hexachlorobutadiene | 213 |
| 77-47-4 | Hexachlorocyclopentadiene | 149 |
| 67-72-1 | Hexachloroethane | 149 |
| 78-59-1 | Isophorone | 149 |
| 98-82-8 | Isopropylbenzene | 80 |
| UKN048 | m+p Cresol | 12 |
| 108-10-1 | Methyl isobutyl ketone (MIBK) | 105 |
| 1634-04-4 | Methyl tert-butyl ether | 31 |
| 104-51-8 | n-Butylbenzene | 80 |
| 98-95-3 | Nitrobenzene | 158 |
| 55-63-0 | Nitroglycerin | 2 |
| 62-75-9 | * n-Nitrosodimethylamine | 291 |
| 621-64-7 | * n-Nitrosodi-n-propylamine | 149 |
| 103-65-1 | n-Propylbenzene | 80 |
| 95-48-7 | o-Cresol | 104 |
| 95-47-6 | o-Xylene | 165 |
| 32774-16-6 | PCB-169 | 3 |
| 37680-65-2 | PCB-18 | 1 |
| 7012-37-5 | PCB-28 | 1 |
| 106-47-8 | p-Chloroaniline | 104 |
| 35421-08-0 | p-Chloro-m-cresol | 163 |
| 106-43-4 | p-Chlorotoluene | 80 |
| 106-44-5 | p-Cresol | 90 |
| 87-86-5 | Pentachlorophenol | 163 |
| 7601-90-3 | Perchlorate | 100 |
| 100-01-6 | p-Nitroaniline | 104 |
| 1336-36-3 | Polychlorinated biphenyls | 4 |
| 101-86-1 | Pyridine | 5 |
| 121-82-4 | * RDX | 9 |
| 135-9-88 | sec-Butylbenzene | 80 |
| 100-42-5 | Styrene | 121 |

## Table 3-6
## Chemicals Analyzed But Not Detected In Area IV Soil

| CAS Number | Analyte | Number of samples |
|---|---|---|
| 99-35-4 | sym-Trinitrobenzene | 9 |
| 994-05-8 | tert-Amyl methyl ether | 1 |
| 75-65-0 | tert-Butyl alcohol | 1 |
| 637-92-3 | tert-Butyl ethyl ether | 1 |
| 98-06-6 | tert-Butylbenzene | 80 |
| 7440-31-5 | Tin | 2 |
| 156-60-5 | trans-1,2-Dichloroethene | 258 |
| 10061-02-6 | trans-1,3-Dichloropropene | 225 |

Notes:

CAS: Chemical Abstracts Service

PCBs: polychlorinated biphenyls

SVOCs: semi-volatile organic compounds

VOCs: volatile organic compounds

*: Chemical not detected at site, but detection limit was above preliminary remediation goal

**Table 3-7**
**Chemicals Detected In Area IV Soil**

| CAS Number | Analyte | Detections in All EUs | Number of samples | Group |
|---|---|---|---|---|
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 94 | 171 | Dioxins |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 120 | 171 | Dioxins |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 63 | 171 | Dioxins |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | 70 | 171 | Dioxins |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 64 | 171 | Dioxins |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | 66 | 171 | Dioxins |
| 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 91 | 171 | Dioxins |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | 62 | 171 | Dioxins |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 85 | 171 | Dioxins |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | 52 | 171 | Dioxins |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 50 | 171 | Dioxins |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | 76 | 171 | Dioxins |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | 64 | 171 | Dioxins |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | 68 | 171 | Dioxins |
| 38998-75-3 | Heptachlorodibenzofurans | 113 | 169 | Dioxins |
| 37871-00-4 | Heptachlorodibenzo-p-dioxins | 128 | 169 | Dioxins |
| 55684-94-1 | Hexachlorodibenzofurans | 110 | 169 | Dioxins |
| 34465-46-8 | Hexachlorodibenzo-p-dioxins | 110 | 169 | Dioxins |
| 39001-02-0 | Octachlorodibenzofuran | 99 | 171 | Dioxins |
| 3268-87-9 | Octachlorodibenzo-p-dioxin | 137 | 171 | Dioxins |
| 30402-15-4 | Pentachlorodibenzofurans | 99 | 169 | Dioxins |
| 36088-22-9 | Pentachlorodibenzo-p-dioxins | 68 | 169 | Dioxins |
| 1746-01-6 | TCDD-TEQ (Total all) | 141 | 299 | Dioxins |
| 30402-14-3 | Tetrachlorodibenzofurans | 96 | 169 | Dioxins |
| 41903-57-5 | Tetrachlorodibenzo-p-dioxins | 59 | 169 | Dioxins |
| 7429-90-5 | Aluminum | 349 | 351 | Inorganic |
| 7440-36-0 | Antimony | 113 | 345 | Inorganic |
| 7440-38-2 | Arsenic | 342 | 446 | Inorganic |
| 7440-39-3 | Barium | 403 | 405 | Inorganic |
| 7440-41-7 | Beryllium | 311 | 402 | Inorganic |
| 7440-42-8 | Boron | 88 | 308 | Inorganic |
| 7440-43-9 | Cadmium | 193 | 406 | Inorganic |
| 7440-70-2 | Calcium | 92 | 93 | Inorganic |
| 7440-47-3 | Chromium | 418 | 422 | Inorganic |
| 7440-48-4 | Cobalt | 396 | 402 | Inorganic |
| 7440-50-8 | Copper | 417 | 422 | Inorganic |
| 7439-89-6 | Iron | 97 | 98 | Inorganic |
| 7439-92-1 | Lead | 421 | 444 | Inorganic |
| 7439-93-2 | Lithium | 54 | 61 | Inorganic |
| 7439-95-4 | Magnesium | 92 | 93 | Inorganic |
| 7439-96-5 | Manganese | 98 | 98 | Inorganic |
| 7487-94-7 | Mercury | 289 | 546 | Inorganic |
| 7439-98-7 | Molybdenum | 138 | 397 | Inorganic |
| 7440-02-0 | Nickel | 399 | 422 | Inorganic |
| 7440-09-7 | Potassium | 199 | 201 | Inorganic |
| 7782-49-2 | Selenium | 90 | 385 | Inorganic |
| 7440-22-4 | Silver | 142 | 426 | Inorganic |
| 7440-23-5 | Sodium | 242 | 247 | Inorganic |
| 7440-28-0 | Thallium | 147 | 398 | Inorganic |
| 7440-62-2 | Vanadium | 401 | 402 | Inorganic |
| 7440-66-6 | Zinc | 421 | 422 | Inorganic |
| 7440-67-7 | Zirconium | 54 | 74 | Inorganic |
| 53469-21-9 | Aroclor 1242 | 1 | 395 | PCBs |
| 12672-29-6 | Aroclor 1248 | 12 | 395 | PCBs |
| 11097-69-1 | Aroclor 1254 | 106 | 397 | PCBs |
| 11096-82-5 | Aroclor 1260 | 62 | 395 | PCBs |

**Table 3-7**
**Chemicals Detected In Area IV Soil**

| CAS Number | Analyte | Detections in All EUs | Number of samples | Group |
|---|---|---|---|---|
| 32598-14-4 | PCB-105 | 3 | 3 | PCBs |
| 74472-37-0 | PCB-114 | 3 | 3 | PCBs |
| 31508-00-6 | PCB-118 | 3 | 3 | PCBs |
| 65510-44-3 | PCB-123 | 3 | 3 | PCBs |
| 57465-28-8 | PCB-126 | 3 | 3 | PCBs |
| 38380-07-3 | PCB-128 | 1 | 1 | PCBs |
| 35068-28-2 | PCB-138 | 1 | 1 | PCBs |
| 35065-27-1 | PCB-153 | 1 | 1 | PCBs |
| 38380-08-4 | PCB-156 | 3 | 3 | PCBs |
| 69782-90-7 | PCB-157 | 3 | 3 | PCBs |
| 52663-72-6 | PCB-167 | 3 | 3 | PCBs |
| 35065-30-6 | PCB-170 | 3 | 3 | PCBs |
| 35065-29-3 | PCB-180 | 3 | 3 | PCBs |
| 52663-68-0 | PCB-187 | 1 | 1 | PCBs |
| 39635-31-9 | PCB-189 | 3 | 3 | PCBs |
| 52663-78-2 | PCB-195 | 1 | 1 | PCBs |
| 40186-72-9 | PCB-206 | 1 | 1 | PCBs |
| 41464-39-5 | PCB-44 | 1 | 1 | PCBs |
| 35693-99-3 | PCB-52 | 1 | 1 | PCBs |
| 32598-10-0 | PCB-66 | 1 | 1 | PCBs |
| 32598-13-3 | PCB-77 | 1 | 3 | PCBs |
| 34883-43-7 | PCB-8 | 1 | 1 | PCBs |
| 70362-50-4 | PCB-81 | 3 | 3 | PCBs |
| 83-46-5 | .beta.-Sitosterol | 1 | 1 | SVOC |
| 95-63-6 | 1,2,4-Trimethylbenzene | 1 | 165 | SVOC |
| 90-12-0 | 1-Methyl naphthalene | 4 | 103 | SVOC |
| 872-50-4 | 1-Methyl-2-Pyrrolidinone | 2 | 2 | SVOC |
| 591-78-6 | 2-Hexanone | 1 | 105 | SVOC |
| 91-57-6 | 2-Methylnaphthalene | 24 | 282 | SVOC |
| 2216-33-3 | 3-Methyloctane | 2 | 2 | SVOC |
| 83-32-9 | Acenaphthene | 12 | 388 | SVOC |
| 24887-75-0 | Androstane | 2 | 2 | SVOC |
| 120-12-7 | Anthracene | 22 | 388 | SVOC |
| 56-55-3 | Benzo(a)anthracene | 47 | 388 | SVOC |
| 50-32-8 | Benzo(a)pyrene | 49 | 387 | SVOC |
| 205-99-2 | Benzo(b)fluoranthene | 55 | 387 | SVOC |
| 192-97-2 | Benzo(e)pyrene | 1 | 1 | SVOC |
| 191-24-2 | Benzo(ghi)perylene | 44 | 389 | SVOC |
| 207-08-9 | Benzo(k)fluoranthene | 42 | 386 | SVOC |
| 117-81-7 | bis(2-Ethylhexyl) phthalate | 56 | 248 | SVOC |
| 85-68-7 | Butyl benzyl phthalate | 1 | 160 | SVOC |
| 601-53-6 | Cholestan-3-one, (5.beta.)- | 1 | 1 | SVOC |
| 218-01-9 | Chrysene | 63 | 389 | SVOC |
| 53-70-3 | Dibenzo(a,h)anthracene | 23 | 387 | SVOC |
| 84-66-2 | Diethyl phthalate | 13 | 248 | SVOC |
| 84-74-2 | Di-n-butyl phthalate | 53 | 248 | SVOC |
| 117-84-0 | Di-n-octyl phthalate | 2 | 160 | SVOC |
| 55193-56-1 | Eicosane, 10-methyl- | 1 | 1 | SVOC |
| 206-44-0 | Fluoranthene | 72 | 388 | SVOC |
| 86-73-7 | Fluorene | 10 | 388 | SVOC |
| 4860-03-1 | Hexadecane, 1-chloro- | 1 | 1 | SVOC |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 39 | 387 | SVOC |
| 91-20-3 | Naphthalene | 35 | 452 | SVOC |
| 630-02-4 | n-Octacosane | 3 | 3 | SVOC |
| 593-45-3 | Octadecane | 3 | 3 | SVOC |
| 3386-33-2 | Octadecane, 1-chloro- | 2 | 2 | SVOC |

**Table 3-7**
**Chemicals Detected In Area IV Soil**

| CAS Number | Analyte | Detections in All EUs | Number of samples | Group |
|---|---|---|---|---|
| 629-93-6 | Octadecane, 1-iodo- | 1 | 1 | SVOC |
| 57-10-3 | Palmitic acid | 1 | 1 | SVOC |
| 198-55-0 | Perylene | 1 | 1 | SVOC |
| 85-01-8 | Phenanthrene | 62 | 388 | SVOC |
| 108-95-2 | Phenol | 1 | 163 | SVOC |
| 129-00-0 | Pyrene | 79 | 389 | SVOC |
| 14167-59-0 | Tetratriacontane | 1 | 1 | SVOC |
| 80-56-8 | .alpha.-Pinene | 1 | 1 | VOC |
| 71-55-6 | 1,1,1-Trichloroethane | 5 | 280 | VOC |
| 76-13-1 | 1,1,2-Trichloro-1,2,2-trifluoroethane | 2 | 167 | VOC |
| 75-34-3 | 1,1-Dichloroethane | 3 | 278 | VOC |
| 75-35-4 | 1,1-Dichloroethene | 2 | 278 | VOC |
| 107-06-2 | 1,2-Dichloroethane | 1 | 278 | VOC |
| 540-59-0 | 1,2-Dichloroethene | 4 | 38 | VOC |
| 544-10-5 | 1-Chlorohexane | 1 | 5 | VOC |
| 208-96-8 | Acenaphthylene | 4 | 388 | VOC |
| 67-64-1 | Acetone | 42 | 222 | VOC |
| 71-43-2 | Benzene | 3 | 293 | VOC |
| 123-72-8 | Butanal | 1 | 1 | VOC |
| 79-92-5 | Camphene | 1 | 1 | VOC |
| 76-22-2 | Camphor | 1 | 1 | VOC |
| 108-90-7 | Chlorobenzene | 2 | 284 | VOC |
| 75-00-3 | Chloroethane | 1 | 278 | VOC |
| 67-66-3 | Chloroform | 1 | 278 | VOC |
| 156-59-2 | cis-1,2-Dichloroethene | 3 | 197 | VOC |
| 5989-27-5 | d-Limonene | 1 | 1 | VOC |
| 100-41-4 | Ethylbenzene | 8 | 293 | VOC |
| 111-71-7 | Heptanal | 1 | 1 | VOC |
| 66-25-1 | Hexanal | 3 | 3 | VOC |
| 67-63-0 | Isopropanol | 3 | 7 | VOC |
| 136777-61-2 | m,p-Xylenes | 1 | 165 | VOC |
| 78-93-3 | Methyl ethyl ketone | 11 | 192 | VOC |
| 75-09-2 | Methylene chloride | 32 | 280 | VOC |
| 109-66-0 | n-Pentane | 1 | 1 | VOC |
| 99-87-6 | p-Cymene | 2 | 80 | VOC |
| 110-62-3 | Pentanal | 1 | 1 | VOC |
| 127-18-4 | Tetrachloroethene | 4 | 278 | VOC |
| 108-88-3 | Toluene | 25 | 293 | VOC |
| 79-01-6 | Trichloroethene | 8 | 280 | VOC |
| 75-69-4 | Trichlorofluoromethane | 2 | 206 | VOC |
| 75-01-4 | Vinyl chloride | 2 | 278 | VOC |
| 1330-20-7 | Xylenes, Total | 20 | 114 | VOC |

Notes:
CAS: Chemical Abstracts Service
PCBs: polychlorinated biphenyls
SVOCs: semi-volatile organic compounds
TCDD: tetrachlorodibenzo-p-dioxin
TEQ: total dioxin toxic equivalence
VOCs: volatile organic compounds

**Table 3-8**
**Selection of Chemicals of Interest In Area IV Soil**

| CAS Number | Analyte | Group | Detections in All EUs | Number of Samples | Number of Samples Exceeding 0.1 x PRG | Number of Samples Exceeding Background | Is Chemical a Chemical of Interest? |
|---|---|---|---|---|---|---|---|
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Dioxins | 94 | 171 | 20 | 67 | Yes |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | Dioxins | 120 | 171 | 109 | 75 | Yes |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | Dioxins | 63 | 171 | 6 | 60 | Yes |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | Dioxins | 70 | 171 | 21 | 58 | Yes |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | Dioxins | 64 | 171 | 19 | 59 | Yes |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | Dioxins | 66 | 171 | 13 | 58 | Yes |
| 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | Dioxins | 91 | 171 | 37 | 71 | Yes |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | Dioxins | 62 | 171 | 6 | 38 | Yes |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | Dioxins | 85 | 171 | 79 | 63 | Yes |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | Dioxins | 52 | 171 | 52 | 30 | Yes |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | Dioxins | 50 | 171 | 35 | 48 | Yes |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | Dioxins | 76 | 171 | 23 | 61 | Yes |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | Dioxins | 64 | 171 | 58 | 46 | Yes |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | Dioxins | 68 | 171 | 68 | 23 | Yes |
| 38998-75-3 | Heptachlorodibenzofurans | Dioxins | 113 | 169 | NO PRG | NO BACKGROUND | No |
| 37871-00-4 | Heptachlorodibenzo-p-dioxins | Dioxins | 128 | 169 | 119 | NO BACKGROUND | Yes |
| 55684-94-1 | Hexachlorodibenzofurans | Dioxins | 110 | 169 | NO PRG | NO BACKGROUND | No |
| 34465-46-8 | Hexachlorodibenzo-p-dioxins | Dioxins | 110 | 169 | NO PRG | NO BACKGROUND | No |
| 39001-02-0 | Octachlorodibenzofuran | Dioxins | 99 | 171 | 51 | 59 | Yes |
| 3268-87-9 | Octachlorodibenzo-p-dioxin | Dioxins | 137 | 171 | 108 | 72 | Yes |
| 30402-15-4 | Pentachlorodibenzofurans | Dioxins | 99 | 169 | NO PRG | NO BACKGROUND | No |
| 36088-22-9 | Pentachlorodibenzo-p-dioxins | Dioxins | 68 | 169 | NO PRG | NO BACKGROUND | No |
| 1746-01-6 | TCDD-TEQ (Total all) | Dioxins | 141 | 299 | 125 | 88 | Yes |
| 30402-14-3 | Tetrachlorodibenzofurans | Dioxins | 96 | 169 | NO PRG | NO BACKGROUND | No |
| 41903-57-5 | Tetrachlorodibenzo-p-dioxins | Dioxins | 59 | 169 | NO PRG | NO BACKGROUND | No |
| 7429-90-5 | Aluminum | Inorganic | 349 | 351 | 346 | 36 | Yes |
| 7440-36-0 | Antimony | Inorganic | 113 | 345 | 35 | 13 | Yes |
| 7440-38-2 | Arsenic | Inorganic | 342 | 446 | 336 | 10 | Yes |
| 7440-39-3 | Barium | Inorganic | 403 | 405 | 18 | 18 | Yes |
| 7440-41-7 | Beryllium | Inorganic | 311 | 402 | 310 | 5 | Yes |
| 7440-42-8 | Boron | Inorganic | 88 | 308 | 0 | 12 | No |
| 7440-43-9 | Cadmium | Inorganic | 193 | 406 | 62 | 41 | Yes |
| 7440-70-2 | Calcium | Inorganic | 92 | 93 | NO PRG | NO BACKGROUND | No |
| 7440-47-3 | Chromium | Inorganic | 418 | 422 | 143 | 13 | Yes |
| 7440-48-4 | Cobalt | Inorganic | 396 | 402 | 2 | 1 | Yes |
| 7440-50-8 | Copper | Inorganic | 417 | 422 | 30 | 28 | Yes |
| 7439-89-6 | Iron | Inorganic | 97 | 98 | 95 | 0 | Yes |
| 7439-92-1 | Lead | Inorganic | 421 | 444 | 80 | 40 | Yes |
| 7439-93-2 | Lithium | Inorganic | 54 | 61 | 0 | 0 | No |
| 7439-95-4 | Magnesium | Inorganic | 92 | 93 | 0 | NO BACKGROUND | No |
| 7439-96-5 | Manganese | Inorganic | 98 | 98 | 93 | 3 | Yes |
| 7487-94-7 | Mercury | Inorganic | 289 | 546 | 13 | 104 | Yes |
| 7439-98-7 | Molybdenum | Inorganic | 138 | 397 | 4 | 4 | Yes |
| 7440-02-0 | Nickel | Inorganic | 399 | 422 | 118 | 12 | Yes |
| 7440-09-7 | Potassium | Inorganic | 199 | 201 | NO PRG | 5 | Yes |
| 7782-49-2 | Selenium | Inorganic | 90 | 385 | 9 | 36 | Yes |
| 7440-22-4 | Silver | Inorganic | 142 | 426 | 42 | 63 | Yes |
| 7440-23-5 | Sodium | Inorganic | 242 | 247 | NO PRG | 126 | Yes |
| 7440-28-0 | Thallium | Inorganic | 147 | 398 | 27 | 30 | Yes |
| 7440-62-2 | Vanadium | Inorganic | 401 | 402 | 399 | 6 | Yes |
| 7440-66-6 | Zinc | Inorganic | 421 | 422 | 42 | 55 | Yes |
| 7440-67-7 | Zirconium | Inorganic | 54 | 74 | 54 | 0 | Yes |
| 53469-21-9 | Aroclor 1242 | PCBs | 1 | 395 | 1 | NO BACKGROUND | Yes |
| 12672-29-6 | Aroclor 1248 | PCBs | 12 | 395 | 12 | NO BACKGROUND | Yes |
| 11097-69-1 | Aroclor 1254 | PCBs | 106 | 397 | 106 | NO BACKGROUND | Yes |
| 11096-82-5 | Aroclor 1260 | PCBs | 62 | 395 | 62 | NO BACKGROUND | Yes |
| 32598-14-4 | PCB-105 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 74472-37-0 | PCB-114 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |

**Table 3-8**
**Selection of Chemicals of Interest In Area IV Soil**

| CAS Number | Analyte | Group | Detections in All EUs | Number of Samples | Number of Samples Exceeding 0.1 x PRG | Number of Samples Exceeding Background | Is Chemical a Chemical of Interest? |
|---|---|---|---|---|---|---|---|
| 31508-00-6 | PCB-118 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 65510-44-3 | PCB-123 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 57465-28-8 | PCB-126 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 38380-07-3 | PCB-128 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 35068-28-2 | PCB-138 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 35065-27-1 | PCB-153 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 38380-08-4 | PCB-156 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 69782-90-7 | PCB-157 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 52663-72-6 | PCB-167 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 35065-30-6 | PCB-170 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 35065-29-3 | PCB-180 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 52663-68-0 | PCB-187 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 39635-31-9 | PCB-189 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 52663-78-2 | PCB-195 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 40186-72-9 | PCB-206 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 41464-39-5 | PCB-44 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 35693-99-3 | PCB-52 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 32598-10-0 | PCB-66 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 32598-13-3 | PCB-77 | PCBs | 1 | 3 | NO PRG | NO BACKGROUND | No |
| 34883-43-7 | PCB-8 | PCBs | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 70362-50-4 | PCB-81 | PCBs | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 83-46-5 | .beta.-Sitosterol | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 95-63-6 | 1,2,4-Trimethylbenzene | SVOC | 1 | 165 | 0 | NO BACKGROUND | No |
| 90-12-0 | 1-Methyl naphthalene | SVOC | 4 | 103 | NO PRG | NO BACKGROUND | No |
| 872-50-4 | 1-Methyl-2-Pyrrolidinone | SVOC | 2 | 2 | NO PRG | NO BACKGROUND | No |
| 591-78-6 | 2-Hexanone | SVOC | 1 | 105 | NO PRG | NO BACKGROUND | No |
| 91-57-6 | 2-Methylnaphthalene | SVOC | 24 | 282 | 0 | NO BACKGROUND | No |
| 2216-33-3 | 3-Methyloctane | SVOC | 2 | 2 | NO PRG | NO BACKGROUND | No |
| 83-32-9 | Acenaphthene | SVOC | 12 | 388 | 0 | NO BACKGROUND | No |
| 24887-75-0 | Androstane | SVOC | 2 | 2 | NO PRG | NO BACKGROUND | No |
| 120-12-7 | Anthracene | SVOC | 22 | 388 | 0 | NO BACKGROUND | No |
| 56-55-3 | Benzo(a)anthracene | SVOC | 47 | 388 | 43 | NO BACKGROUND | Yes |
| 50-32-8 | Benzo(a)pyrene | SVOC | 49 | 387 | 49 | NO BACKGROUND | Yes |
| 205-99-2 | Benzo(b)fluoranthene | SVOC | 55 | 387 | 49 | NO BACKGROUND | Yes |
| 192-97-2 | Benzo(e)pyrene | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 191-24-2 | Benzo(ghi)perylene | SVOC | 44 | 389 | NO PRG | NO BACKGROUND | No |
| 207-08-9 | Benzo(k)fluoranthene | SVOC | 42 | 386 | 21 | NO BACKGROUND | Yes |
| 117-81-7 | bis(2-Ethylhexyl) phthalate | SVOC | 56 | 248 | 11 | NO BACKGROUND | Yes |
| 85-68-7 | Butyl benzyl phthalate | SVOC | 1 | 160 | 0 | NO BACKGROUND | No |
| 601-53-6 | Cholestan-3-one, (5.beta.)- | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 218-01-9 | Chrysene | SVOC | 63 | 389 | 14 | NO BACKGROUND | Yes |
| 53-70-3 | Dibenzo(a,h)anthracene | SVOC | 23 | 387 | 23 | NO BACKGROUND | Yes |
| 84-66-2 | Diethyl phthalate | SVOC | 13 | 248 | 0 | NO BACKGROUND | No |
| 84-74-2 | Di-n-butyl phthalate | SVOC | 53 | 248 | 0 | NO BACKGROUND | No |
| 117-84-0 | Di-n-octyl phthalate | SVOC | 2 | 160 | 0 | NO BACKGROUND | No |
| 55193-56-1 | Eicosane, 10-methyl- | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 206-44-0 | Fluoranthene | SVOC | 72 | 388 | 1 | NO BACKGROUND | Yes |
| 86-73-7 | Fluorene | SVOC | 10 | 388 | 0 | NO BACKGROUND | No |
| 4860-03-1 | Hexadecane, 1-chloro- | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | SVOC | 39 | 387 | 39 | NO BACKGROUND | Yes |
| 91-20-3 | Naphthalene | SVOC | 35 | 452 | 2 | NO BACKGROUND | Yes |
| 630-02-4 | n-Octacosane | SVOC | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 593-45-3 | Octadecane | SVOC | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 3386-33-2 | Octadecane, 1-chloro- | SVOC | 2 | 2 | NO PRG | NO BACKGROUND | No |
| 629-93-6 | Octadecane, 1-iodo- | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 57-10-3 | Palmitic acid | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 198-55-0 | Perylene | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |

**Table 3-8**
**Selection of Chemicals of Interest In Area IV Soil**

| CAS Number | Analyte | Group | Detections in All EUs | Number of Samples | Number of Samples Exceeding 0.1 x PRG | Number of Samples Exceeding Background | Is Chemical a Chemical of Interest? |
|---|---|---|---|---|---|---|---|
| 85-01-8 | Phenanthrene | SVOC | 62 | 388 | NO PRG | NO BACKGROUND | No |
| 108-95-2 | Phenol | SVOC | 1 | 163 | 0 | NO BACKGROUND | No |
| 129-00-0 | Pyrene | SVOC | 79 | 389 | 2 | NO BACKGROUND | Yes |
| 14167-59-0 | Tetratriacontane | SVOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 80-56-8 | .alpha.-Pinene | VOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 71-55-6 | 1,1,1-Trichloroethane | VOC | 5 | 280 | 0 | NO BACKGROUND | No |
| 76-13-1 | 1,1,2-Trichloro-1,2,2-trifluoroethane | VOC | 2 | 167 | 0 | NO BACKGROUND | No |
| 75-34-3 | 1,1-Dichloroethane | VOC | 3 | 278 | 1 | NO BACKGROUND | Yes |
| 75-35-4 | 1,1-Dichloroethene | VOC | 2 | 278 | 2 | NO BACKGROUND | Yes |
| 107-06-2 | 1,2-Dichloroethane | VOC | 1 | 278 | 0 | NO BACKGROUND | No |
| 540-59-0 | 1,2-Dichloroethene | VOC | 4 | 38 | NO PRG | NO BACKGROUND | No |
| 544-10-5 | 1-Chlorohexane | VOC | 1 | 5 | NO PRG | NO BACKGROUND | No |
| 208-96-8 | Acenaphthylene | VOC | 4 | 388 | NO PRG | NO BACKGROUND | No |
| 67-64-1 | Acetone | VOC | 42 | 222 | 1 | NO BACKGROUND | Yes |
| 71-43-2 | Benzene | VOC | 3 | 293 | 1 | NO BACKGROUND | Yes |
| 123-72-8 | Butanal | VOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 79-92-5 | Camphene | VOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 76-22-2 | Camphor | VOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 108-90-7 | Chlorobenzene | VOC | 2 | 284 | 0 | NO BACKGROUND | No |
| 75-00-3 | Chloroethane | VOC | 1 | 278 | 0 | NO BACKGROUND | No |
| 67-66-3 | Chloroform | VOC | 1 | 278 | 0 | NO BACKGROUND | No |
| 156-59-2 | cis-1,2-Dichloroethene | VOC | 3 | 197 | 0 | NO BACKGROUND | No |
| 5989-27-5 | d-Limonene | VOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 100-41-4 | Ethylbenzene | VOC | 8 | 293 | 3 | NO BACKGROUND | Yes |
| 111-71-7 | Heptanal | VOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 66-25-1 | Hexanal | VOC | 3 | 3 | NO PRG | NO BACKGROUND | No |
| 67-63-0 | Isopropanol | VOC | 3 | 7 | NO PRG | NO BACKGROUND | No |
| 136777-61-2 | m,p-Xylenes | VOC | 1 | 165 | 0 | NO BACKGROUND | No |
| 78-93-3 | Methyl ethyl ketone | VOC | 11 | 192 | 0 | NO BACKGROUND | No |
| 75-09-2 | Methylene chloride | VOC | 32 | 280 | 7 | NO BACKGROUND | Yes |
| 109-66-0 | n-Pentane | VOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 99-87-6 | p-Cymene | VOC | 2 | 80 | NO PRG | NO BACKGROUND | No |
| 110-62-3 | Pentanal | VOC | 1 | 1 | NO PRG | NO BACKGROUND | No |
| 127-18-4 | Tetrachloroethene | VOC | 4 | 278 | 4 | NO BACKGROUND | Yes |
| 108-88-3 | Toluene | VOC | 25 | 293 | 0 | NO BACKGROUND | No |
| 79-01-6 | Trichloroethene | VOC | 8 | 280 | 6 | NO BACKGROUND | Yes |
| 75-69-4 | Trichlorofluoromethane | VOC | 2 | 206 | 0 | NO BACKGROUND | No |
| 75-01-4 | Vinyl chloride | VOC | 2 | 278 | 2 | NO BACKGROUND | Yes |
| 1330-20-7 | Xylenes, Total | VOC | 20 | 114 | 0 | NO BACKGROUND | No |

Notes:
CAS: Chemical Abstracts Service
PAH: polyaromatic hydrocarbon
PCBs: polychlorinated biphenyls
SVOCs: semi-volatile organic compounds
TCDD: tetrachlorodibenzo-p-dioxin
TEQ: total dioxin toxic equivalence
VOCs: volatile organic compounds

NO PRG: Chemical does not have PRG
NO BACKGROUND: Chemical does not have background value

**Table 3-9**
**Chemicals of Interest In Area IV Soil**

| CAS Number | Analyte | Group |
|---|---|---|
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Dioxins |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | Dioxins |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | Dioxins |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | Dioxins |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | Dioxins |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | Dioxins |
| 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | Dioxins |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | Dioxins |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | Dioxins |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | Dioxins |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | Dioxins |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | Dioxins |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | Dioxins |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | Dioxins |
| 37871-00-4 | Heptachlorodibenzo-p-dioxins | Dioxins |
| 39001-02-0 | Octachlorodibenzofuran | Dioxins |
| 3268-87-9 | Octachlorodibenzo-p-dioxin | Dioxins |
| 1746-01-6 | TCDD-TEQ (Total all) | Dioxins |
| 7429-90-5 | Aluminum | Inorganic |
| 7440-36-0 | Antimony | Inorganic |
| 7440-38-2 | Arsenic | Inorganic |
| 7440-39-3 | Barium | Inorganic |
| 7440-41-7 | Beryllium | Inorganic |
| 7440-43-9 | Cadmium | Inorganic |
| 7440-47-3 | Chromium | Inorganic |
| 7440-48-4 | Cobalt | Inorganic |
| 7440-50-8 | Copper | Inorganic |
| 7439-89-6 | Iron | Inorganic |
| 7439-92-1 | Lead | Inorganic |
| 7439-96-5 | Manganese | Inorganic |
| 7487-94-7 | Mercury | Inorganic |
| 7439-98-7 | Molybdenum | Inorganic |
| 7440-02-0 | Nickel | Inorganic |
| 7440-09-7 | Potassium | Inorganic |
| 7782-49-2 | Selenium | Inorganic |
| 7440-22-4 | Silver | Inorganic |
| 7440-23-5 | Sodium | Inorganic |
| 7440-28-0 | Thallium | Inorganic |
| 7440-62-2 | Vanadium | Inorganic |
| 7440-66-6 | Zinc | Inorganic |
| 7440-67-7 | Zirconium | Inorganic |
| 53469-21-9 | Aroclor 1242 | PCBs |
| 12672-29-6 | Aroclor 1248 | PCBs |
| 11097-69-1 | Aroclor 1254 | PCBs |
| 11096-82-5 | Aroclor 1260 | PCBs |
| 56-55-3 | Benzo(a)anthracene | SVOC |
| 50-32-8 | Benzo(a)pyrene | SVOC |
| 205-99-2 | Benzo(b)fluoranthene | SVOC |
| 207-08-9 | Benzo(k)fluoranthene | SVOC |
| 117-81-7 | bis(2-Ethylhexyl) phthalate | SVOC |
| 218-01-9 | Chrysene | SVOC |
| 53-70-3 | Dibenzo(a,h)anthracene | SVOC |
| 206-44-0 | Fluoranthene | SVOC |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | SVOC |
| 91-20-3 | Naphthalene | SVOC |
| 129-00-0 | Pyrene | SVOC |
| 75-34-3 | 1,1-Dichloroethane | VOC |

**Table 3-9**
**Chemicals of Interest In Area IV Soil**

| CAS Number | Analyte | Group |
|---|---|---|
| 75-35-4 | 1,1-Dichloroethene | VOC |
| 67-64-1 | Acetone | VOC |
| 71-43-2 | Benzene | VOC |
| 100-41-4 | Ethylbenzene | VOC |
| 75-09-2 | Methylene chloride | VOC |
| 127-18-4 | Tetrachloroethene | VOC |
| 79-01-6 | Trichloroethene | VOC |
| 75-01-4 | Vinyl chloride | VOC |
| 208-96-8 | Acenaphthylene | SVOC |

Notes:
CAS: Chemical Abstracts Service
PCBs: polychlorinated biphenyls
SVOCs: semi-volatile organic compounds
TCDD: tetrachlorodibenzo-p-dioxin
TEQ: total dioxin toxic equivalence
VOCs: volatile organic compounds

## Table 3-10
## Previous Assessment Potential Radionuclides of Concern

| Radionuclide | HSA Identified | EA Identified | Source | Half Life (years) |
|---|---|---|---|---|
| $^{241}Am$ | X | X | Neutron Capture | 458 |
| $^{60}Co$ | X | X | Activation Product | 5.3 |
| $^{134}Cs$ | X | | Fission Product | 2.1 |
| $^{137}Cs$ | X | X | Fission Product | 30 |
| $^{152}Eu$ | X | X | Activation Product | 12.7 |
| $^{154}Eu$ | X | X | Activation Product | 16 |
| $^{55}Fe$ | X | X | Activation Product | 2.6 |
| $^{3}H$ | X | X | Activation Product | 12.3 |
| $^{129}I$ | | X | Fission Product | 1.70E+07 |
| $^{40}K$ | X | X | Natural | 1.30E+09 |
| $^{54}Mn$ | X | | Activation Product | 0.85 |
| $^{22}Na$ | X | | Activation Product | 2.6 |
| $^{59}Ni$ | X | X | Activation Product | 8.00E+04 |
| $^{63}Ni$ | X | X | Activation Product | 92 |
| $^{210}Pb$ | | X | Natural | 21 |
| $^{238}Pu$ | X | X | Neutron Capture | 86.4 |
| $^{239}Pu$ | X | X | Fuel material | 2.40E+04 |
| $^{240}Pu$ | X | X | Neutron Capture | 6.60E+03 |
| $^{241}Pu$ | X | X | Neutron Capture | 13.2 |
| $^{242}Pu$ | X | X | Neutron Capture | 3.80E+05 |
| $^{226}Ra$ | X | X | Natural | 1.60E+03 |
| $^{228}Ra$ | | X | Natural | 5.8 |
| $^{90}Sr$ | X | X | Fission Product | 27.7 |
| $^{228}Th$ | X | X | Natural | 1.9 |
| $^{230}Th$ | | X | Natural | 8.00E+04 |
| $^{232}Th$ | X | X | Fuel material | 1.40E+10 |
| $^{234}U$ | X | X | Fuel material | 2.30E+05 |
| $^{235}U$ | X | X | Fuel material | 7.10E+08 |
| $^{238}U$ | X | X | Fuel material | 4.50E+09 |

Notes: HSA = Historical Site Assessment. EA = Environmental Assessment.

## Table 3-11
## Radiological Contaminants of Interest

| Radionuclide | Source | Half Life (years) |
|---|---|---|
| $^{241}Am$ | Neutron Capture in Fuel | 458 |
| $^{133}Ba$ | Activation Product Detected Onsite | 10.5 |
| $^{14}C$ | Neutron Capture in Graphite and Soil | 5.73E+03 |
| $^{243}Cm$ | Neutron Capture in Fuel | 29.1 |
| $^{60}Co$ | Activation Product in Reactors | 5.3 |
| $^{134}Cs$ | Fission Product | 2.1 |
| $^{137}Cs$ +D | Fission Product | 30 |
| $^{152}Eu$ | Activation Product in Reactors | 12.7 |
| $^{154}Eu$ | Activation Product in Reactors | 16 |
| $^{155}Eu$ | Activation Product Detected Onsite | 4.7 |
| $^{55}Fe$ | Activation Product in Reactors | 2.6 |
| $^{3}H$ | Activation Product in Reactors | 12.3 |
| $^{129}I$ | Fission Product | 1.70E+07 |
| $^{40}K$ | Natural and Activation Product | 1.30E+09 |
| $^{22}Na$ | Activation Product in Coolant | 2.6 |
| $^{59}Ni$ | Activation Product in Reactors | 8.00E+04 |
| $^{63}Ni$ | Activation Product in Reactors | 92 |
| $^{237}Np$ +D | Neutron Capture in Fuel | 2.14E+06 |
| $^{210}Pb$ +D | Natural Only | 21 |
| $^{238}Pu$ | Neutron Capture in Fuel | 86.4 |
| $^{239}Pu$ | Fuel material | 2.40E+04 |
| $^{240}Pu$ | Neutron Capture in Fuel | 6.60E+03 |
| $^{241}Pu$ | Neutron Capture in Fuel | 13.2 |
| $^{242}Pu$ +D | Neutron Capture in Fuel | 3.80E+05 |
| $^{226}Ra$ +D | Natural Only | 1.60E+03 |
| $^{228}Ra$ +D | Natural Only | 5.8 |
| $^{125}Sb$ +D | Fission Product Detected Onsite | 2.758 |
| $^{90}Sr$ | Fission Product | 27.7 |
| $^{99}Tc$ | Fission Product | 2.13E+05 |
| $^{228}Th$ +D | Natural and Fuel Material | 1.9 |
| $^{230}Th$ | Natural and Fuel Material | 8.00E+04 |
| $^{232}Th$ | Natural and Fuel Material | 1.40E+10 |
| $^{234}U$ | Natural and Fuel Material | 2.30E+05 |
| $^{235}U$ +D | Natural and Fuel Material | 7.10E+08 |
| $^{238}U$ +D | Natural and Fuel Material | 4.50E+09 |

## Table 3-12
## Groundwater Chemicals of Interest

| Analyte | Analyte Group | Units | Maximum Concentration Detected | MCL (1/10 value) | PRG (1/10 value) |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | VOC | ug/L | 15000 | 20 | 173.220339 |
| 1,1,2,2-Tetrachloroethane | VOC | ug/L | 1.5 | | 0.005239864 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | VOC | ug/L | 12000 | 120 | 5917.985748 |
| 1,1,2-Trichloroethane | VOC | ug/L | 4.5 | 0.5 | 0.018637778 |
| 1,1-Dichloroethane | VOC | ug/L | 2800 | 0.05 | 0.194464113 |
| 1,1-Dichloroethene | VOC | ug/L | 4600 | 0.6 | 13.51851852 |
| 1,2,3-Trichloropropane | VOC | ug/L | 0.04 | | 0.000554223 |
| 1,2,3-Trichloropropene | VOC | ug/L | 80 | | 0.217693837 |
| 1,2-Dibromo-3-chloropropane | VOC | ug/L | 0.0032 | 0.02 | 0.000158349 |
| 1,2-Dichloroethane | VOC | ug/L | 250000 | | 0.016329905 |
| 1,2-Dichloropropane | VOC | ug/L | 2.3 | 0.5 | 0.030790151 |
| 1,4-Dichlorobenzene | VOC | ug/L | 2 | 0.5 | 0.032320432 |
| Acetone | VOC | ug/L | 36000 | | 547.5 |
| Acrylonitrile | VOC | ug/L | 42 | | 0.001108445 |
| Benzene | VOC | ug/L | 15 | 0.1 | 0.011084454 |
| Bromodichloromethane | VOC | ug/L | 170 | | 0.008526503 |
| Bromoform | VOC | ug/L | 41 | | 0.85103208 |
| Bromomethane | VOC | ug/L | 4 | | 0.866101695 |
| Carbon Tetrachloride | VOC | ug/L | 29000 | 0.05 | 0.007389636 |
| Chloroethane | VOC | ug/L | 6 | | 0.382222567 |
| Chloroform | VOC | ug/L | 71000 | | 0.052837367 |
| cis-1,2-Dichloroethene | VOC | ug/L | 810 | 0.6 | 6.083333333 |
| Dibromochloromethane | VOC | ug/L | 190 | | 0.011791973 |
| Ethylbenzene | VOC | ug/L | 43 | 30 | 0.122086236 |
| Methyl ethyl ketone | VOC | ug/L | 1300 | | 696.8181818 |
| Methylene chloride | VOC | ug/L | 440000 | 0.5 | 0.211893925 |
| m-Xylene | VOC | ug/L | 60 | | 20.57337221 |
| o-Xylene | VOC | ug/L | 110 | | 20.57337221 |
| Tetrachloroethene | VOC | ug/L | 2100 | 0.5 | 0.01040135 |
| Tetrahydrofuran | VOC | ug/L | 10 | | 0.159905091 |
| Toluene | VOC | ug/L | 1900 | 15 | 57.63157895 |
| trans-1,2-Dichloroethene | VOC | ug/L | 410 | 1 | 12.16666667 |
| Trichloroethene | VOC | ug/L | 5000 | 0.5 | 0.138742649 |
| Trichlorofluoromethane | VOC | ug/L | 560 | 15 | 128.8235294 |

**Table 3-12**
**Groundwater Chemicals of Interest**

| Analyte | Analyte Group | Units | Maximum Concentration Detected | MCL (1/10 value) | PRG (1/10 value) |
|---|---|---|---|---|---|
| Vinyl chloride | VOC | ug/L | 3900 | 0.05 | 0.004105353 |
| Xylenes, Total | VOC | ug/L | 3900 | 175 | 121.6666667 |
| 1,2,4-Trichlorobenzene | SVOC | ug/L | 1.2 | 0.5 | 0.715686275 |
| 1,3,5-Trimethylbenzene | SVOC | ug/L | 2 | | 1.232618196 |
| 1,4-Dioxane | SVOC | ug/L | 600 | | 0.249005683 |
| 2,4,6-Trichlorophenol | SVOC | ug/L | 1.7 | | 0.096045049 |
| 2-Chlorophenol | SVOC | ug/L | 10 | | 3.041666667 |
| 4,6-Dinitro-o-cresol | SVOC | ug/L | 5 | | 0.365 |
| Benzo(k)fluoranthene | SVOC | ug/L | 0.07 | | 0.005602628 |
| bis(2-Chloroethyl) ether | SVOC | ug/L | 540 | | 0.000443378 |
| bis(2-Ethylhexyl) phthalate | SVOC | ug/L | 390 | 0.4 | 2.241051145 |
| Kepone | SVOC | ug/L | 0.11 | | 0.000420197 |
| Naphthalene | SVOC | ug/L | 16 | | 0.009237045 |
| Nitrobenzene | SVOC | ug/L | 380 | | 0.339534884 |
| Pentachlorophenol | SVOC | ug/L | 3 | 0.1 | 0.083001894 |
| Aldrin | Pesticides | ug/L | 0.37 | | 0.00039548 |
| Aluminum | Inorganic | ug/L | 4400 | 100 | 3650 |
| Antimony | Inorganic | ug/L | 16 | 0.6 | 1.46 |
| Arsenic | Inorganic | ug/L | 19 | 1 | 0.000711445 |
| Barium | Inorganic | ug/L | 340 | 100 | 255.5 |
| Beryllium | Inorganic | ug/L | 1.8 | 0.4 | 7.3 |
| Boron | Inorganic | ug/L | 1840 | | 730 |
| Cadmium | Inorganic | ug/L | 6.1 | 0.5 | 1.825 |
| Chromium | Inorganic | ug/L | 88 | 5 | |
| Cobalt | Inorganic | ug/L | 230 | | 73 |
| Copper | Inorganic | ug/L | 250 | 130 | 146 |
| Cyanides | Inorganic | ug/L | 360 | 15 | 73 |
| Iron | Inorganic | ug/L | 27000 | | 1095 |
| Lead | Inorganic | ug/L | 120 | 1.5 | |
| Manganese | Inorganic | ug/L | 18400 | | 87.6 |
| Mercury | Inorganic | ug/L | 0.8 | 0.2 | 1.095 |
| Molybdenum | Inorganic | ug/L | 88 | | 18.25 |
| Nickel | Inorganic | ug/L | 990 | 10 | 73 |
| Perchlorate | Inorganic | ug/L | 56 | | 0.365 |

## Table 3-12
## Groundwater Chemicals of Interest

| Analyte | Analyte Group | Units | Maximum Concentration Detected | MCL (1/10 value) | PRG (1/10 value) |
|---|---|---|---|---|---|
| Selenium | Inorganic | ug/L | 80 | 5 | 18.25 |
| Silver | Inorganic | ug/L | 23 | | 18.25 |
| Strontium | Inorganic | ug/L | 2200 | | 2190 |
| Thallium | Inorganic | ug/L | 3.7 | 0.2 | 0.2409 |
| Vanadium | Inorganic | ug/L | 37 | 2 | 3.65 |
| Zinc | Inorganic | ug/L | 9800 | | 1095 |
| 1,3-Dinitrobenzene | Explosive | ug/L | 43 | | 0.365 |
| n-Nitrosodimethylamine | Explosive | ug/L | 1300 | | 0.000420197 |
| n-Nitrosodi-n-propylamine | Explosive | ug/L | 34 | | 0.00096045 |
| n-Nitrosodiphenylamine | Explosive | ug/L | 70 | | 0.747017048 |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Dioxins | ug/L | 0.0046 | | 5.17166E-06 |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | Dioxins | ug/L | 0.0051 | | 5.17166E-06 |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | Dioxins | ug/L | 0.006 | | 5.17166E-07 |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | Dioxins | ug/L | 0.0056 | | 5.17166E-07 |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | Dioxins | ug/L | 0.0049 | | 5.17166E-07 |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | Dioxins | ug/L | 0.0059 | | 5.17166E-07 |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | Dioxins | ug/L | 0.0053 | | 5.17166E-07 |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | Dioxins | ug/L | 0.0064 | | 5.17166E-07 |
| 1,2,3,7,8-Pentachlorodibenzofuran | Dioxins | ug/L | 0.0068 | | 1.03433E-06 |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | Dioxins | ug/L | 0.005 | | 5.17166E-08 |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | Dioxins | ug/L | 0.0048 | | 5.17166E-07 |
| 2,3,4,7,8-Pentachlorodibenzofuran | Dioxins | ug/L | 0.0058 | | 1.03433E-07 |
| 2,3,7,8-TCDD | Dioxins | ug/L | 0.0045 | 0.000003 | 5.17166E-08 |
| 2,3,7,8-TCDD TEQ | Dioxins | ug/L | 0.00055 | 0.000003 | 5.17166E-08 |
| 2,3,7,8-Tetrachlorodibenzofuran | Dioxins | ug/L | 0.0024 | | 5.17166E-07 |
| Heptachlorodibenzo-p-dioxins | Dioxins | ug/L | 0.0204 | | 5.17166E-06 |
| Hexachlorodibenzo-p-dioxins | Dioxins | ug/L | 0.00136 | | 5.17166E-07 |
| Octachlorodibenzofuran | Dioxins | ug/L | 0.0114 | | 0.000517166 |
| Octachlorodibenzo-p-dioxin | Dioxins | ug/L | 0.55 | | 0.000517166 |
| Actinium-228 | Radionuclide | pCi/L | 354 | 0.5 | 2.39 |
| Americium-241 | Radionuclide | pCi/L | 16.4 | 1.5 | 0.0458 |
| Antimony-125 | Radionuclide | pCi/L | 6.28 | 30 | 0.928 |
| Cesium-134 | Radionuclide | pCi/L | 109 | 8 | 0.113 |
| Cesium-137 | Radionuclide | pCi/L | 4.7 | 20 | 0.157 |

**Table 3-12**
**Groundwater Chemicals of Interest**

| Analyte | Analyte Group | Units | Maximum Concentration Detected | MCL (1/10 value) | PRG (1/10 value) |
|---|---|---|---|---|---|
| Cobalt-60 | Radionuclide | pCi/L | 5.9 | 10 | 0.303 |
| Europium-152 | Radionuclide | pCi/L | 7.52 | 6 | 0.784 |
| Europium-154 | Radionuclide | pCi/L | 7.48 | 20 | 0.462 |
| Europium-155 | Radionuclide | pCi/L | 7.68 | 60 | 2.51 |
| Gross alpha | Radionuclide | pCi/L | 100 | 1.5 | |
| Gross beta | Radionuclide | pCi/L | 6.7 | 1.5 | |
| Lead-210 | Radionuclide | pCi/L | 3850 | | 0.00375 |
| Manganese-54 | Radionuclide | pCi/L | 2.48 | 30 | 2.09 |
| Potassium-40 | Radionuclide | pCi/L | 1430 | 29.6 | 0.193 |
| Radium-226 | Radionuclide | pCi/L | 1340 | 0.5 | 0.0000816 |
| Radium-228 | Radionuclide | pCi/L | 4.01 | 0.5 | 0.00458 |
| Ruthenium-106 | Radionuclide | pCi/L | 34 | 3 | |
| Sodium-22 | Radionuclide | pCi/L | 2.54 | 40 | 0.495 |
| Thorium-228 | Radionuclide | pCi/L | 0.6 | 1.5 | 0.0159 |
| Thorium-230 | Radionuclide | pCi/L | 1.28 | 1.5 | 0.0523 |
| Thorium-232 | Radionuclide | pCi/L | 0.662 | 1.5 | 0.0471 |
| Total uranium | Radionuclide | pCi/L | 41.9 | | 0.73 |
| Tritium | Radionuclide | pCi/L | 117000 | 2000 | 14.4 |
| Uranium-234 | Radionuclide | pCi/L | 12.7 | | 0.0674 |
| Uranium-235 | Radionuclide | pCi/L | 498 | | 0.0663 |
| Uranium-238 | Radionuclide | pCi/L | 41.9 | | 0.73 |
| Fluoride | General | ug/L | 3700 | 200 | 219 |
| Nitrate-N | General | ug/L | 5000 | 0.001 | 1000 |

## Table 3-13
## Number of Existing Soil Vapor Samples by Depth

| Exposure Units | Number of Samples 0-5 feet bgs | Number of Samples >5-10 feet bgs | Number of Samples >10-27 feet bgs | Number of Samples |
|---|---|---|---|---|
| EU-01 | 20 | 9 | 1 | 30 |
| EU-02 | 0 | 0 | 0 | 0 |
| EU-03 | 9 | 3 | 6 | 18 |
| EU-04 | 2 | 1 | 0 | 3 |
| EU-05 | 2 | 0 | 0 | 2 |
| EU-06 | 11 | 1 | 0 | 12 |
| EU-07 | 28 | 6 | 0 | 34 |
| EU-08 | 9 | 4 | 1 | 14 |
| EU-09 | 4 | 2 | 0 | 6 |
| EU-10 | 42 | 44 | 20 | 106 |
| EU-11 | 7 | 5 | 1 | 13 |
| EU-12 | 2 | 1 | 0 | 3 |
| EU-13 | 11 | 7 | 0 | 18 |
| EU-14 | 0 | 0 | 0 | 0 |
| EU-15 | 0 | 0 | 0 | 0 |
| EU-16 | 0 | 0 | 0 | 0 |
| **TOTALS** | **147** | **83** | **29** | **259** |
| Percentage | 57% | 32% | 11% | |

**Notes:**

bgs = below ground surface

## Table 3-14
## Summary Statistics of Chemicals Detected in Soil Vapor in Area IV

| Chemical | Number of Detections | Number of Samples | Detection Frequency | Minimum Detected (ug/m3) | Maximum Detected (ug/m3) | Residential CHHSL (ug/m3) | Exceeds CHHSL? |
|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 3 | 185 | 2% | 2,000 | 15,000 | 991,000 | No |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 4 | 185 | 2% | 1,400 | 3,500 | — | No |
| 1,1-Dichloroethene | 6 | 188 | 3% | 9.72 | 10,000 | — | No |
| 1,2-Dichloroethane | 1 | 185 | 1% | 1,500 | 1,500 | 50 | Yes |
| cis-1,2-Dichloroethene | 3 | 188 | 2% | 681.34 | 15,000 | 15,900 | No |
| Dichlorodifluoromethane | 1 | 184 | 1% | 1,100 | 1,100 | — | No |
| Isopropanol | 1 | 3 | 33% | 427.5 | 427.50 | — | No |
| Methane | 12 | 44 | 27% | 9,900 | 27,000 | — | No |
| Tetrachloroethene | 6 | 188 | 3% | 26.28 | 3,400 | 180 | Yes |
| trans-1,2-Dichloroethene | 2 | 188 | 1% | 109.26 | 157.55 | 31,900 | No |
| Trichloroethene | 9 | 188 | 5% | 210.97 | 66,000 | 528 | Yes |
| Trichlorofluoromethane | 1 | 185 | 1% | 4,500 | 4,500 | — | No |
| Vinyl chloride | 1 | 188 | 1% | 26.47 | 26.47 | 13 | Yes |

Notes:
CHHSL: California Human Health Screening Level (EPA 2005)
$ug/m^3$: micrograms per cubic meter.

# Section 4
# Data Gap Analysis Results

The data gap analysis, performed according to the methodologies described in Section 3, has resulted in the identification of specific data requirements for completion of the EIS. The information and data needs for each potentially impacted media identified in the human health and ecological risk assessment conceptual site models (Figures 3-1 and 3-2) are discussed below. These media include soil, groundwater, surface water, sediment, air, buildings and bedrock. The data requirements identified through this analysis will be addressed with a flexible field sampling program designed to fill these gaps.

## 4.1 Soil

The chemical and radiological Data Gaps identified for the soil media are described below.

## 4.1.1 Chemical Data Gaps

As described in Section 3.6, chemical analytical data gaps were identified using: 1) a statistical approach to determine the number of samples needed to perform a human health risk assessment consistent with CERCLA; and 2) standard practice and experience to determine the number of samples needed to characterize areas that have not been previously sampled and the nature and extent of chemicals that have already been identified in soils at concentrations greater than DCGLs. The results reflecting the number of required additional sample analyses, as determined through both approaches, are summarized in **Table 4-1**. Details of the analysis are presented in the Tables in **Appendix I**.

### 4.1.1.1 Statistical Approach

As discussed in Section 3.6.6, a statistical approach was used to determine the minimum number of samples required for chemical analyses for a risk assessment consistent with CERCLA. The analysis was performed on an individual constituent basis because not every previously collected sample was analyzed for the same suite of analytes. Therefore, the data gap (the number of additional required samples) is driven by the largest number of additional samples needed for any constituent within a specific chemical group (e.g., VOCs). Similarly, the overall data gap for a particular EU is the largest data gap between the chemical groups for that unit. To determine the total data gap for Area IV, the data gaps for each EU were added together to establish the number of additional samples that need to be collected for a given risk assessment scenario. This analysis was performed for two soil depth intervals (0 to 2 feet and 2 to 10 feet) and two exposure use scenarios (residential and rural residential) on an EU-specific basis to calculate the minimum number of additional samples needed (i.e., data gap) to meet the requisites to conduct a risk assessment consistent with CERCLA.

The details shown in the Appendix I tables also indicate if each EU is currently considered "impacted" by at least one COI in the chemical group. A unit is considered to be impacted if the average concentration of at least one COI in that chemical group is greater than the DCGL (provided the number of existing sample results is equal to or greater than eight). If the EU is not considered impacted, then the impact status of the unit is considered "indeterminate" because the unit either may not have been impacted or there may have been an insufficient number of samples to perform the statistical analysis. If an EU was determined to be impacted, then the number of additional samples required for each chemical group was adjusted ("Adjusted No. of Samples" column) according to the following rules:

1. If the relative shift for an analyte was less than 1.0, then the relative shift for that analyte was set to 1.0 and the data gap (required number of samples) was calculated. If the relative shift was greater than or equal to 1.0, then no adjustment to the relative shift was made. The number of existing valid analyses was subtracted from the number of required samples, to calculate the data gap. The largest data gap for any analyte after this adjustment was reported for the chemical group.

2. The largest (maximum) data gap of the five chemical groups is considered the overall data gap for that EU.

The minimum number of additional samples required to adequately perform a human health risk assessment under a residential use scenario is 459 (i.e., 223 samples from the 0 to 2 feet soil interval and 236 samples from the 2 to 10 feet soil interval). For the rural residential use scenario, 479 additional samples are required (i.e., 237 samples from the 0 to 2 feet soil interval and 242 samples from the 2 to 10 feet soil interval).

#### 4.1.1.2 Characterization and Extent of Contamination Approach

A separate evaluation based on standard practice and experience in characterizing and determining the nature and extent of contamination at CERCLA sites was conducted to identify additional data requirements for conducting the EIS evaluation of alternatives. In determining the data gaps, maps indicating soil contamination distribution (from existing data) at each RFI Chemical Use Area were examined. These maps also showed the location of the RFI Chemical Use Areas as provide by various RFI reports and planning documents (MWH 2006, MWH 2007, MWH 2008, CH2M HILL 2008, Boeing 2008).

The evaluation identified three types of data requirements:

- data required to adequately characterize areas where some chemical use is indicated but where insufficient sampling has been conducted to determine if a release has occurred;

- data required in areas where chemicals are present at concentrations above DCGLs but the lateral and/or vertical extent has not been sufficiently determined for the purposes of evaluating alternatives in the EIS; and

- data in areas of the EU where there are no Chemical Use Areas, but data are required to fully characterize the entire EU.

The identified data gaps in each EU are summarized below:

- EU1 – Data gaps at RFI Sites within this EU include:

  - At the Old Conservation Yard RFI Site additional characterization sampling is required at the Former Rocketdyne Conservation Yard, Former AST 4731 Earthen Berm, North Slope Debris Area B, Container Storage Area, Transformer Area 737, the Southwest Transformer Area, and the Transformer Area South of the Old Conservation Yard. Further delineation of identified contamination at the Old Conservation Yard is required at the Former AI Conservation Yard, Former Fueling Area at Building 320, Former North Slope Storage Area, Former AST 4732 Earthen Berm, Former Telephone Pole Storage Area, Southern Debris Area, Former SRE Discharge Line, Northern Debris Area (including vertical delineation), North Slope Debris Area A, Southeast Transformer Area, and the Topographic Low Spot (including vertical delineation).

  - At the Building B204 Waste Oil Tank RFI Site, further lateral and vertical delineation of known contamination is needed.

  - Additional samples are also required to fully characterize undeveloped areas within EU1.

- EU2 – The only RFI Site within this EU is the New Conservation Yard. Further lateral delineation of known contamination is required at the two Chemical Use Areas, the New Conservation Yard and the Ash Pile. Vertical delineation of the Ash Pile is also required. There is a significant amount of undeveloped land within EU 2 and additional samples are required to fully characterize these areas.

- EU3 – The only RFI Site within EU3 is the Sodium Reactor Experiment (SRE) Complex Area. Further characterization is required at UST-71, UST-27, SRE Pond Influent Channels, Sodium Compound Cleaning Area, Building 4133 Debris Area, SCE Steam Power Plant, and the AS Storage Area. Characterization of soil is also needed in at Buildings 4153, 4184, 4505, and 4695. Further lateral delineation of existing contamination is required at the Oil Stain at Building 4003, and both lateral and vertical delineation of contamination at the SRE Pond, Transformer Area 4693, and the Transformer Area South of Building 4003. Downstream extent needs to be delineated in the SRE Pond Discharge Pipeline, and Downslope drainage and Pond Areas. Confirmation and lateral and vertical delineation samples are required in the Building 4003 Leach Field. Deeper (greater than 10 feet) samples may be required

in the area of the three underground storage tanks to confirm that the areas are clean. Vertical delineation is also required at the Toluene Process Unit, the Former Industrial Dry Well, and the SCE Cooling Tower at the Steam Power Plant. Additional samples are also required to characterize undeveloped areas within EU3.

- EU4 – Characterization sampling for chemicals is required at all 15 Chemical Use Areas within the DOE Leach Fields located in this EU except the USTs which were used for radiological processes only. Characterization of the 2 to 10 feet interval is required at the Building 4064 Leach Field RFI Site as well as the four Chemical Use Areas at the Hazardous Waste Material Facility (HWMF) RFI Site. Deeper samples should also be collected from the Building 4064 Leach Field and the Building 4133 at the HWMF. One Chemical Use Area from the RCRA Program "Unaffiliated Areas", Building 4037, is located in this EU and also requires further Characterization. Additional samples are also required to characterize undeveloped areas within EU4.

- EU5 – Characterization sampling is required at Building 4029 (Reactive Metal Storage Yard), the Southeast Drum Storage Yard and the Building 4005 Coal Gasification Process Development Unit (PDU) and Leach Field RFI Sites. Additional samples are also required to characterize undeveloped areas within EU5.

- EU6 – Characterization sampling is required at all 23 Radioactive Material Handling Facility Chemical Use Areas, 2 DOE Leach Fields 3 Unaffiliated Areas, 8 PDU Site Chemical Use Areas, and 1 Hazardous Material Storage Area Chemical Use Area. Additional samples are also required to characterize undeveloped areas within EU6.

- EU7 – Characterization samples are required from the 17th Street Drainage Area (PDU Site), 9 of the 10 Boeing Leach Fields Chemical Use Areas, and the ASTs, Cryo Lab and Test Cells, and Hazardous Material Storage Pad of the Environmental Effects Laboratory (EEL) RFI Site. Lateral delieation of contamination is also needed at the 17th Street Drainage Area, and Lateral and vertical delineation of identified contamination is required at and Building 4011 Leach Field Compound A, as well as the Transformers at the EEL RFI Site. Deeper sampling at the Boeing Leach Fields UST is required for characterization. Additional samples are also required to characterize undeveloped areas within EU7.

- EU 8 – Several RFI Sites are located within EU8:

    - All 10 PDU RFI Site Chemical Use Areas located within EU 8 require characterization sampling. Deeper samples for characterization should also be collected in the area of the Building 4006 Tanks. Some delineation sampling is

required at the Substations, and deeper delineation samples need to be collected at the Building 4005 and 4006 Leach Field.

- Characterization sampling is required at 8 Building 4059 Former SNAP Reactor Facility Chemical Use Areas.
- Characterization sampling is required at all 17 DOE Leach Fields 2 RFI Site Chemical Use Areas.
- Characterization sampling is required at the 9 Building 4457 HMSA RFI Site Chemical Use Areas. Vertical delineation sampling is also required in the area of the Building 4457 and Sumps area.
- Two Unaffiliated Area Chemical Use Areas require characterization sampling.
- Two Boeing Leach Fields Chemical Use Areas are located in EU8. Characterization sampling is required at the Sodium Component Test Installation and the Building 4502 Parking Lot. Delineation of identified contamination is required at the Building 4735 AST.
- Additional samples are also required to characterize undeveloped areas within EU8.

- EU9 – Characterization sampling is required at 5 of the 6 Building 4065 Metals Laboratory Clarifier Chemical Use Areas, 3 of the 4 Building 4020 Rockwell International Hot Laboratory and Leach Field Chemical Use Areas, all 7 DOE Leach Fields Chemical Use Areas, and all 9 Chemical Use Areas included in the Unaffiliated Areas RFI Site. Delineation of known contamination is required at the Building 4065 Metals Clarifier and Transformer 4762, the Metals contamination at the Northeast Corner of the Metals Clarifier, and deeper samples should be collected for characterization and delineation at the Unaffiliated Areas USTs. Additional samples are also required to characterize undeveloped areas within EU9.

- EU 10 – the Building 4100 trench and Building 4056 Landfill RFI Sites are located within this EU.
  - Characterization samples are required at the Building 4100 and Building 4100 Leach Field Transformer 4709, and at the Hummocky Terrain. The vertical extent of contamination in the trenches should be delineated, but this may be able to be accomplished visually.
  - Confirmation samples to confirm that the extent of contamination has been defined should be collected at the B056 Land Fill and the Southern Debris Area. Delineation samples are required in the Building 056 Excavation Debris Area and the Building 100 Discharge Area. The vertical extent of contamination should be delineated in the Building 4056 Landfill.

- Additional samples are also required to characterize undeveloped areas within EU10.

- EU11 – The Former Sodium Disposal Facility (FSDF) and the Building 4009 Leach Field are located within this EU.

  - At the Building 4886 (FSDF) samples are required to delineate the extent of contamination at the South of Former Disposal Facility, Ponds, and Building 4886, the Southern Investigation Area, the Former Drum Debris Area, and the FSDF Pistol Range. Vertical delineation of contamination is required at the Steam Lance, Solar Concentrator, and Southern Investigation Area. Bedrock samples to confirm removal of contamination in the Pond areas may be required.

  - At the Building 4009 Leach field characterization samples are required at Building 4009, and the Transformer Pole. Confirmation samples beneath the former Leach Field and Septic Tank should be collected. Delineation samples are required at the Solar Concentrator Facility. Deep samples may also required at the SGR Liquid Waste Hold-up Tank Area.

  - Additional samples are also required to characterize undeveloped areas within EU11.

- EU12 – Samples are required for delineation of contamination and further characterization in the Area IV Pond Dredge Area. Characterization samples are required at 9 DOE Leach Fields Chemical Use Areas. Vertical delineation is also required at the Building 4353 and Leach Field Chemical Use Area. Additional samples are also required to characterize undeveloped areas within EU12.

- EU13 – The Empire State Atomic Development Authority (ESADA) is the only RFI Site located in this area. Characterization samples are needed at the Transformer Pole X35. Samples are required for delineation of contamination at the Former ESADA Storage Yard, the PDU AST Area, and the ESADA Pistol Range. Deeper samples may also be required for delineation of the Former ESADA Storage Yard, Pistol Range and PDU AST Tank Area, although sampling at depth may require bedrock samples. Deeper characterization samples from the Former ESADA Storage Yard are also required. Additional samples are also required to characterize undeveloped areas within EU13.

- EU14 – No RFI Sites are located in this area. Samples will be required for the human heath risk assessment of this area.

- EU-15 - No RFI Sites are located in this area. Samples will be required for the human heath risk assessment of this area.

- EU-16 - No RFI Sites are located in this area. Samples will be required for the human heath risk assessment of this area.

Estimated numbers of samples as well as the analyses necessary to fill these data gaps are shown in **Tables I-7 and I-8**. The process histories were reviewed to determine which common chemical groups (VOCs, SVOCs, pesticides/PCBs, metals and dioxins/furans) used in the areas. In some cases less common chemical groups were also considered (e.g., cyanide, energetics, and propellants). Petroleum hydrocarbons (TPH) were not considered a separate chemical group as the constituent hydrocarbons used in the human health risk assessment will be address through the analysis for VOCs and SVOCs.

In determining the analyses required to be performed, samples from areas where characterization is the primary need are generally considered for analysis of the full suite of common chemical constituents. In some areas, the chemicals associated with the use are limited (e.g., PCB and oils are associated with transformers). If use of some of the less common constituents is indicated in the process history, those analyses are also identified as a data gap. Samples from areas requiring delineation are generally considered for analysis of the particular COI chemical group(s) present in that area. Where VOC data are needed to fill a data gap, the gap could potentially be filled with either soil vapor data or soil data, and the specific sampling requirements will be documented in the sampling plan.

The estimated number of additional required samples, and the chemical analyses required for each of the approximately 250 Chemical Use Areas are shown in Tables I-7 and I-8. The number of locations at each Chemical Use Area is shown on Table I-7, however two samples (i.e., one from the 0 to 2 feet soil interval and one from the 2 to 10 feet soil interval) are generally assumed to be required from each sample location identified in the table. In addition, it is assumed that one additional sample will be needed from locations identified in appendix Table I-8 at a depth below 10 feet to determine the vertical extent of contaminated soil.

Some EUs have no identified Chemical Use Areas (EUs 14, 15, and 16). The number of samples required to be collected from these EUs is the number required to perform a risk assessment consistent with CERCLA. As calculated in the risk assessment statistical method, 15 samples from each depth interval is required from each of these EUs. In these areas, sampling can be conducted randomly, on a grid (approximately 1 acre areas), or biased toward any features identified as potential source areas prior to sampling.

The total number of samples estimated to be required to characterize and delineate areas of known or suspected contamination is approximately 2180. However, a number of site-specific factors may increase or decrease the number of actual samples required. Such factors include:

- Shallow bedrock that precludes the need and ability to collect deeper samples (note that some bedrock samples may be collected from the soil/bedrock interface for analysis)

- Identification of contamination in areas not previously characterized that then requires lateral and vertical delineation
- The presence of natural (topographic and bedrock) features that aid in the delineation of soil contamination.
- Newly-identified facility-specific conditions such as new process information, samples being collected under the active RFI program or removal actions under other programs.

Some of these factors will be identified and the actual numbers and locations of samples adjusted during the preparation of the Field Sampling Plan. Other factors may be addressed through application of the TRIAD approach during implementation of the sampling program.

As mentioned in previous sections, numerous samples are being collected under the current RFI program. A preliminary review of the sampling program indicates that, potentially, many of the identified data gaps could be filled with data collected during the RFI. However, they remain data gaps until the analytical data have been reviewed, and use of the data for purposes of risk assessment, characterization and delineation can be verified.

The RFI program is not collecting samples in areas where no chemical uses are indicated such as in EUs 14, 15, and 16, and in the undeveloped areas of other EUs. The number of samples required to fully characterize undeveloped areas and to provide data for the human health risk assessment in EUs where no chemical use has been documented, is 296.

## 4.1.2 Radionuclide Analysis Data Gap

### 4.1.2.1 Surface Soils

The results of the calculation of the required number of surface samples for radionuclide analysis for each SU, determined according to MARSSIM guidelines, and the sample size determined for a CERCLA risk assessment are shown on **Table 4-2** for the residential and rural residential exposure scenarios. The analysis was performed on an individual radionuclide basis for each SU, not every previously-collected sample was analyzed for the same suite of analytes. Therefore the data gap is driven by the largest number for any constituent in the SU. However, radionuclides that are being investigated as COIs but have never been detected above background levels in Area IV were not used to drive the data gap since it is uncertain if they will become COCs until further sampling and analysis is performed. Details of the calculation of the data gap for surface soils are shown for each radiological COI and each SU in the tables in **Appendix G**.

Under both the residential and rural residential scenario, 17 Class 1 SUs had average results for at least one constituent (with at least eight valid sample results) that was over the DCGL or had a standard deviation greater than one-half the DCGL. For these areas, collection of the statistical number of samples required to have confidence that the area does not exceed the DCGL will not be required. These SUs are denoted

with a 1 in the remediation test column of the tables in Appendix G in the row for the analyte that exceeds a DCGL. The numbers of samples required for these areas to further define the extent and nature of contamination was calculated assuming a relative shift of 1.5 and the SU size.

The total number of samples required to adequately characterize and delineate radiological contamination in Area IV surface soil for both the residential and rural residential land use exposure scenarios, as determined by the CERCLA risk assessment area size limit, is 616. This is the data gap for radiological surface soils.

### 4.1.2.2 Near Surface and Subsurface Soils

The gap analysis identified an insufficient number of existing sample results for near surface and subsurface samples in Area IV on which to base future sampling decisions. There are only 12 samples for near surface and 40 samples for subsurface across all of Area IV. Of these, there is only a limited list of analytes and most of them had a "method detection uncertain" status. Because of the lack of data, the statistical calculation of the data gap was based on assumptions. Since the required detection limits will be set lower than the DCGL for future sampling and since contamination of the near surface soils is considered unlikely and even less likely for subsurface soils, the number of near surface samples was calculated assuming a relative shift of 3.0 and applied using the same area size limits for risk assessment as for surface soils. Subsurface soils will be collected at all near surface soil locations. However, analyses will only be performed for 25 percent of the subsurface surface soil locations with a minimum of one sample per SU unless concentrations above the background screening value are detected in near surface soils. The data gap is shown in Table 4-2 for both near surface and subsurface soils. The required number of near surface samples is 491 and of subsurface soil samples is 151, although a total of 491 samples should be collected to allow further analysis based on near surface results. The data gap is shown for each SU in **Table 4-3**.

### 4.1.2.3 Gamma Walkover Survey Data Gap

A large number of radiological surveys have been performed within SSFL to document achievement of remedial goals in various portions of the site. Independent third parties such as the staffs of California regulatory agencies and of the Oak Ridge Institute for Science and Education have performed independent verification surveys to reconfirm results for many of the original surveys. Documentation of gamma walkover surveys has been reviewed as an integral part of this data gap analysis to assure that survey information is comprehensive and fully defensible. Results of this review are addressed within this section. **Table 4-4** presents SU classification, acreage, the planned GWS coverage and the coverage already completed, based on the analysis below.

Surveys implemented prior to the development of MARSSIM were individually assessed to evaluate their acceptability for use. A summary of GWS data collected for SSFL Area IV is presented below. Results are designated as being either compliant or non-compliant for use in final verification decision-making, where non-compliant

data may represent a data gap. Rationale for designating data as compliant or non-compliant is provided in the discussion, below.

It is assumed that no additional GWS data are required for those areas where the historical GWS data are considered compliant thus reducing future coverage requirements as presented in **Table 4-4**. Areas with compliant GWS coverage are illustrated in **Figure 4-1.**

MARSSIM-non-compliant walkover surveys have been performed on greater than 80 percent of Area IV and were originally used to direct sampling activities. These data can assist in MARSSIM classification decisions. However, future verification decisions will be supported only by GWS deemed compliant with MARSSIM guidance or collected as part of this data gap sampling program.

To date, MARSSIM-compliant walkover surveys have been completed for a total of about 9 acres. Although GWSs of the appropriate quality have been performed for about 23 percent of EUs -01 and -06, and 40% of NA-03 (an area within the Undeveloped Area), GWSs performed to date include less than 7 percent of other EUs. MARSSIM guidance requires less than 100% coverage of Class 2 and Class 3 SUs for final status surveys. However, 100% coverage will be performed for the characterization surveys performed for the Area IV EIS in order to provide full characterization of the site and to verify the process knowledge.

***Compliant Gamma Walkover Data/Areas***
The following presents supporting information for GWS data deemed MARSSIM compliant for use in final verification decision making. The reference documents for these GWS data include:

1. Final Status Survey Report: Characterization and Final Status Survey Radioactive Materials Handling Facility Perimeter, Cabrera Services, March 2006 (8 survey units located north and west of the Radioactive Materials Handling Facility);
2. Final Status Survey Report: Final Status Survey Post Historical Site Assessment Sites, Block 1, Cabrera Services, March, 2007 (Sites 4023, 4028, 4030, 4363 and 4583 as noted in the report);
3. Characterization and Final Status Survey Report: Radioactive Materials Handling Facility Holdup Pond (Site 4614);
4. Building 4059 Final Status Survey Report (Phase A and Phase B), July 2005 with Revision February 2008 and associated Building 4059 Final Status Survey Procedure Procedure, September 2004;
5. 17th Street Drainage Final Status Survey Report, March 2000; and
6. Verification Survey for the Land Area Formerly Supporting the Hot Laboratory (4020), December 2000 , in conjunction with Area 4020 MARSSIM Final Status Survey Report (includes Building 4468) (August 2000) and the Area 4020, Final Status Survey Procedure (August 1999)

Walkover surveys cited in 1,2,and 3 above were "designed in accordance with MARSSIM guidance such that collected survey data can be used to demonstrate compliance with the release criteria for unrestricted use." Each of these surveys incorporate the data quality assessment process and associated QA/QC. The following excerpt from survey report 1 above reflects the approach and equipment used in each of the three above gamma walkover efforts:

> *Gross gamma walkover survey data were collected using a Ludlum Model 2221 scaler/rate meter with a Ludlum Model 44-20 3" x 3" sodium iodide (NaI) gamma scintillation detector. The detector was suspended at a height of approximately 10 centimeters above the ground and moved in parallel lines about 0.5 meters apart at a speed of roughly 0.5 meters per second. The measurements were position correlated using the GPS. Data were automatically logged with the measurement coordinates using a Trimble TDC1 GPS. The GPS link tied survey data to spatial locations using state plane coordinates for California, Zone 5, North American Datum (NAD) 1983. The GPS was checked daily to ensure accuracy and repeatability.*

The survey contractor calculated a scan minimum detectable concentration of 3.7 pCi/g for $^{137}$Cs thus these walkover surveys were able to detect the modified $^{137}$Cs derived concentration guideline level of 4.7 pCi/g. Gross gamma walkover data, organized by survey unit and presented in Microsoft® Excel data files, is reportedly available for this walkover effort with data files containing location and recorded count rate information along with background population records.

Walkover surveys cited in 4, above, was developed to "follow the protocols of the Multi-Agency Radiation Survey and Site Investigation Manual" and were performed using Ludlum Model 44-2 detectors which incorporate 1" x 1" NaI scintillation crystals. The survey also utilized a TSA Systems Model GPRS-104 Radiation Scanning System that incorporates a 3" wide x 3" long x 1.5" thick plastic scintillation detector interconnected with a global positioning system receiver for location and data logging. The report incorporates the data quality objectives (DQO) process and derives a site specific scan MDC for Eu-152 of 3.1 pCi/g which would be somewhat lower than the stated required MDC (4.0 pCi/g). Although an overview of "Environmental Calibration Site" is contained within paragraph 3.5.2 of the survey report, comprehensive instrument quality assurance/quality control protocols have not been reviewed. Some such procedures may be incorporated in RS-00012, "Methods and Procedures for Radiological Monitoring" Rev A, January 2, 2002" which is incorporated by reference. Verification Surveys were also performed on 50 to 100% of this footprint by ORISE following MARSSIM guidance in 2005.

The walkover survey report cited in 5 above notes that "On June 1, 1999, a MARSSIM final status survey was completed at the 17$^{th}$ Street Drainage Area confirming that the area meets release limits approved by the Department of Energy, and the Department of Health Services." It also notes that "The MARSSIM final status survey for the 17$^{th}$ Street Area followed the guidelines of the Rocketdyne Procedure R21-RF-RS00005"

and calculates required and scan MDCs of 12.9 and 10.3 pCi/g, respectively. Paragraph 4.1.1, Surface Exposure Rate, provides a overview of gamma count rates and exposure levels. The report incorporated "17th Street Drainage Area – Radiation Characterization Surveys and Excavation" dated December, 1998. This enclosure notes that "66 hotspot locations were found during the walkabout survey" and that "a total of 13 representative surface walkabout hotspot locations were sampled and analyzed" with results reflecting a maximum of 2.11 pCi/g or about 22% of the release limit. Brief procedures applicable to "Instrument Performance Check" are contained in paragraph 3.9.3 which requires "periodic checks of the instrument's response to normal background and to a Field Check Source". In addition, paragraph 3.9.4 addresses "Environmental Calibration Site" as the "daily source check area". Although additional quality assurance/quality control provisions may be incorporated into the aforementioned Rocketdyne procedure, comprehensive instrument quality assurance/quality control action levels for performance tests protocols were not located within the survey reports. Verification Surveys were also performed on 100% of this footprint by ORISE following MARSSIM guidance in 2000.

Although limited walkover information is provided in the Area 4020 Final Status Survey Report cited in 6, the ORISE verification survey report augments the report and provides additional detail. The ORISE report notes that "For the Phase III 1999 survey, Rocketdyne had adapted the final status survey methodologies contained in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NRC 1997)." Phase I and II ESSAP surveys in 1997 and 1998 were performed using other protocols and a 10 m X 10 m grid to facilitate backfill prior to the rainy season. The ORISE verification report also notes that "Surface scans for gamma activity were performed over 100 percent of the RIHL using NaI scintillation detectors coupled to ratemeters with audible indicators"; that "Surface scans for gamma activity did not identify any locations of direct radiation in excess of ambient background levels" and that confirmatory "soils samples were collected from 42 locations within the RIHL areas". The highest $^{137}Cs$ concentration measured in confirmation survey soil samples was 0.4 pCi/g. An overview of ORISE "Survey and Analytical Procedures" is contained within Appendix B with more detailed "Calibration and Quality Assurance" procedures being contained within their Survey Procedures Manual (October 1997) and Quality Assurance Manual (September 1996). The Boeing "Walk-About Survey" and "Walk-About Hot Spot Survey" are addressed in Section 5.5 and 5.6 of the final status survey report, respectively. Paragraph 5.5.6 requires that the surveyor "Note the approximate maximum and minimum count rate observed during the walk across the survey transit line and approximate average count rate value for the entire pass". In addition, although 5.5.7 notes that "If a gamma count rate exceeds 4300 cpm, the surveyor will mark the potential spot" the rationale for this action level is not specified. Verification Surveys were also performed on 50 to 100% of this footprint by ORISE following MARSSIM guidance in 2005. Verification Surveys were also performed on 100% of this footprint by ORISE following MARSSIM guidance in 2000.

***Non-compliant Gamma Walkover Data/Areas***
The reference documents containing non-compliant GWS data are discussed below.

Area IV Radiological Characterization Survey, Final Report, Volume I, Santa Susana Field Laboratory, August 15, 1996. A "walk-about survey" of most portions of the Santa Susana Field Laboratory Area IV was performed between March 1994 and September 1995. This survey utilized Ludlum Model 44-2 NaI detectors coupled with Ludlum Model 2221 or Model 2220-ESG scaler/ratemeters and used a Reuter-Stokes Pressurized Ion Chamber for standardization. The Ludlum Model 44-2 uses a 1-inch-by-1-inch (1×1) NaI detector. "The maximum, average, and minimum counting rates observed on the meter during each traverse across the survey block". "A counting rate of 4000 cpm, equivalent to 4-5 μR/hr above the estimated background, was used as the threshold for further review." "When these measurements exceeded estimated background by more than 5 μR/hr, a soil sample was collected."

The rationale for Non-compliant Designation includes: 1) Data limited to the maximum, average and minimum counting rates observed for each traverse across the survey block rather than for the count rate and GPS location to be recorded each second (or two) during the survey; 2) The collection of soil samples was limited to areas that exceeded background by more than 5 μR/hr rather than investigating any anomalies that are detected (i.e., 4200 cpm used to designate a "hot spot" could also result in significant potentially elevated areas being overlooked.) Rationale for selection of this action level was not located in the report; 3) Scan MDC for detection for the Ludlum Model 44-2 relative to the site soil DCGL of 9.2 pCi/g above background. NUREG-1507 indicates that the scan MDC for 137Cs is about 6.4 and 10.4 for 2×2 and 1.25×1.5 NaI detectors, respectively. Assuming a linear relationship with the volume of the detector and holding other factors as constant, the 1" × 1" detectors used for the survey would be expected to exhibit a scan MDC of about 20 pCi/g. (Information relative to the required and actual scan MDCs for the 1" x 1" detector were not located within the document, though it is noted that longer residence times and other factors can reduce the 137Cs MDC to the about 10 pCi/g.)

Area 4064, Final Status Survey Report, Release Date April 13, 1999. "In September, 1998, the Final Status Survey was conducted in the entire 2 acres of area 4064, including drainage pathways, former parking lot areas, surrounding areas, and the side yard area." "The entire 2-acre lot was surveyed and sampled including a direct qualitative surface gamma scan (100%) for contamination". "Gamma peaks greater than 4100 cpm, measured at the surface" "were considered radiological suspect locations that required soil sampling and analysis." Surveys were performed with a Ludlum Model 44-2 (1×1 NaI detector).

The rationale for Non-compliant Designation includes: 1) although MARSSIM was published in December, 1997, available information suggests that this survey was performed using radiological survey procedures utilized by DOE prior to publication of MARSSIM; 2) Scan MDC for detection for the Ludlum Model 44-2 relative to the site soil DCGL of 9.2 pCi/g above background. NUREG-1507 indicates that the scan

MDC for $^{137}Cs$ is about 6.4 and 10.4 for 2×2 and 1.25×1.5 NaI detectors, respectively. Assuming a linear relationship with the volume of the detector and holding other factors as constant, the 1×1 detectors used for the survey would be expected to exhibit a scan MDC of about 20 pCi/g for $^{137}Cs$. (Information relative to the required and actual scan MDCs for the 1" x 1" detector were not located within the document, though it is noted that longer residence times and other factors can reduce the $^{137}Cs$ MDC to the about 10 pCi/g.); 3) The collection of soil samples was limited to areas that exceeded background by more than 4100 cpm, measured at the surface. The rationale supporting this value/approach (or to enable a count rate to soil concentration ratio to be established) was not located in the document. This approach together with the scan MDC could have resulted in an inability to locate elevated areas that would be located using MARSSIM-compliant approaches.

Historical Site Assessment of Area IV, Santa Susana Field Laboratory, Ventura County, California, Sapere Consulting, Inc., and the Boeing Company, May 2005. A walkover survey was performed in September of 1979 of the Building 4010 area by the Formerly Utilized Sites Remedial Action Program (FUSRAP) Survey Group from Argonne National Laboratory. "At the time of the survey, the building had already been demolished and the asphalt parking lot area was already in place."

The rationale for Incomplete Designation includes: The required detection sensitivity would not have been achieved given the existence of cover materials. Further, details with respect to survey protocols and the precise area surveyed were not located.

Confirmatory Radiological Survey of the L-85 Reactor Facility, Final Report, Oak Ridge Associated Universities Radiological Site Assessment Program, December, 1986. This report notes that "ORAU personnel performed walkover surface scans, using gamma scintillation detectors, to a distance of 10 meters from the building (Building T-093) in all directions. Scans were extended to cover the access roads and parking lots to a distance of 80 meters from the building." These surveys were performed with 1.25× 1.5 NaI gamma detectors coupled with PR M-6 rate meters.

The rationale for Incomplete Designation includes: Details with respect to survey protocols were not located for walkover surveys. In addition, given that over 20 years has elapsed, it is not clear that the survey is representative of current conditions.

Radiological Survey of Building T005, February 1988; Radiological Survey of the Sodium Disposal Facility, Building T886, June 1988; et al. A number of survey reports dating prior to 1996 include exposure assessments based on one-minute counts using Ludlum Model 44-2 scintillation detectors at one meter above the ground surface. Such surveys can include hundreds of radiological measurements and thus provide valuable information relative to radiological characteristics and permit establishment of an upper bound on soil concentrations present. They do not, however, provide a basis for determination as to whether areas of activity exceeding remediation criteria may exist. As such, the associated areas are retained for resurvey as part of this data gap assessment.

## 4.2 Groundwater

Based on a review of the site conceptual model coupled with an evaluation of analytical results and sampling locations, several data gaps were identified for groundwater characterization. This includes data necessary to define nature and extent of contamination and for assessment of groundwater cleanup remedies in the EIS.

The groundwater site conceptual model is illustrated in **Figure 4-2**. As shown in the figure, groundwater occurs in the overburden and bedrock, and downward vertical gradients prevail. Near the center of Area IV a groundwater divide occurs; starting at the divide, the gradient is to the northwest and to the southeast. Low bulk hydraulic conductivities of the rock units provide a resistive pathway for the movement of groundwater. However, where fractures, which appear to be limited, are open and interconnected, groundwater travels more readily. Discharge points are located in the valleys as indicated by the upward vertical gradient beneath the tributary to the northwest. Where open pathways (e.g., fractures) reach to the surface, groundwater is revealed as seeps and springs. Contaminant travel paths will tend to follow the movement of groundwater, but also be controlled by other fate and transport properties of the aquifer and the contaminant. Therefore, typically, the contaminant distribution follows the prevailing hydraulic gradient, but deviates in response to aquifer conditions and chemical properties.

### 4.2.1 Groundwater COI Statistics

**Table 4-5** presents the statistics that were prepared for the groundwater COIs. The groundwater data presented are for the most recent five-year period (2003 to 2007) available in the database provided by Boeing. This period was chosen so that an accurate representation of current conditions could be evaluated. An evaluation of the statistics is beneficial in identifying prevalent constituents that can be used to assess data gaps. Also, some of the information in the Table 4-3 is used to directly identify data gaps.

As shown in the Table 4-5, the most frequently detected radionuclide is tritium. Tritium was detected 656 times out of 678 samples. The maximum concentration of 117,000 pCi/L (MCL is 20,000pCi/L) was detected at RD-95, which is located in the northwest part of Area IV.

TCE, cis-1,2-DCE and 1,1-DCE are three VOCs that may be of the next most concern as groundwater contaminants. Each of these compounds was detected at a high frequency (1,593 out of 1,594, 450 out of 901, and 279 out of 642 samples, respectively). Their maximum concentrations were at least two orders of magnitude higher than their respective MCLs.

As shows in the Table 4-5, VOCs are the group that was most often analyzed. Most VOCs are listed as being analyzed almost 3,000 times. Tritium and gross alpha under the radiological group are second regarding the number of times a constituent has

been analyzed. These two radiological constituents were analyzed 678 and 732 times, respectively. Many metals were analyzed several hundred times also. Although several constituents have been analyzed several hundred times or more, some constituents have not been analyzed for as often. Some metals, dioxins, and many radionuclides have been analyzed a limited number of times (less than 35 times) during the last five years.

### 4.2.2 Distribution of Prevalent Groundwater COIs

**Figures 4-3 and 4-4** illustrate the distribution of tritium in shallow groundwater and Chatsworth Formation groundwater, respectively. As illustrated in Figure 4-3, no exceedances above the MCL have been recorded in the shallow groundwater. However, in the bedrock (Figure 4-4), tritium has been detected above the MCL in five wells. The wells are located in EU-08; two of the wells, RD-88 and 90, are located within approximately 50 and 150 feet, respectively, of the property boundary. A well is not located directly downgradient (following flowpaths that are perpendicular to the mapped potentiometric contours) of RD-88 and 90, which have reported tritium concentrations above the MCL. Two wells (RD-87 and 94) are located downgradient of the elevated tritium wells, but are offset to the east and west, respectively. Beyond these wells, the next nearest wells that may be considered downgradient of the area are approximately 1,500 feet to the west.

**Figures 4-5 and 4-6** summarizes the distribution of TCE in the shallow groundwater and Chatsworth Formation, respectively. TCE has been detected above its MCL (5 ug/L) in several locations in Area IV. The highest TCE concentrations are reported in the southwest portion of Area IV. Elevated TCE concentrations are also reported in shallow groundwater in the central and west-central portions. Elevated TCE concentrations in the bedrock are also identified in the southwest area where the groundwater gradient is to the west. However, the distribution of bedrock wells in the central and east-central portions is limited and TCE occurrence can not be verified. For example, elevated TCE concentrations are detected at PZ-104 in the shallow zone; however, the nearest rock well is RD-20 which is considered an upgradient location. No Area IV bedrock wells are next to or downgradient of PZ-104. A similar limitation is observed at PZ-051 and -052. Lastly, the elevated TCE concentrations in rock near west-central Area IV (e.g., RD-30) are not well defined. No wells are located northwest from this location, which is dowgradient of the area. The well cluster RD-34 B/C is located at the west end of the well group.

Perhaps the most significant observation of the distribution of cis-1,2-DCE, which is shown in **Figures 4-7 and 4-8**, is that elevated concentrations are located downgradient of the southeast end of Area IV, but outside of Area IV. Approximately 300 feet east of Area IV, elevated cis-1,2-DCE concentrations are recorded at RD-55 and -58, but no bedrock wells are located upgradient in Area IV. Also, the available limited shallow groundwater data suggest no shallow source at these rock locations (RD-55 and -58). Therefore, the data suggest that a source may be upgradient in the southeast portion of Area IV where no wells are located.

The distribution of elevated concentrations of 1,1-DCE is similar to TCE and is shown in **Figures 4-9 and 4-10.** The highest concentrations are found in the shallow aquifer in the southwest portion of the area. Elevated concentrations are also detected in bedrock in the southwest and west-central portions of the area.

### 4.2.3 Soil and Soil Vapor Concentrations

**Figures 4-11 and 4-12** illustrate soil DCGLs exceedance locations in relation to groundwater sampling locations, for the 0 to 2 feet bgs and 2 to 10 feet bgs intervals, respectively. As demonstrated in these figures, in some areas where DCGLs are exceeded, groundwater sampling points are absent or minimal. Groundwater sampling points should be available to evaluate whether the constituents have impacted the groundwater. The following locations are where soil exceedances are recorded, but no (or minimal) groundwater sampling points are available.

- Large Class 1 SU in EU-10
- Class 1 SU in EU-03
- Large Class 1 SU in EU-01
- Class 1 SU in EU-02
- Class 1 SU in EU-06
- Class 1 SU in EU-12
- Class 2 SU locations in EU-16
- Class 1 SU in EU-13

In addition to comparing soil criteria exceedances to groundwater sampling locations, soil vapor concentrations were also compared to the sampling locations. **Figures 4-13 and 4-14** present a comparison of TCE in soil vapor and groundwater sampling locations (with detections of TCE). As shown in the figures, no elevated soil vapor samples were detected in areas where elevated concentrations of TCE were detected in groundwater. This observation may be due to a limited number of soil vapor samples being collected. Moreover, where an elevated TCE concentration was detected in groundwater (RS/RD-54), an elevated TCE concentration was detected in soil vapor. However, at some locations, an elevated TCE concentration was detected in the groundwater (e.g., RS-18 in Figure 4-5), but no TCE soil vapor sample was collected. In areas where elevated TCE groundwater concentrations were detected, soil vapor samples should be collected and analyzed.

### 4.2.4 Data Gaps in Groundwater Monitoring Network

Based on the review of the Area IV hydrogeologic information and the analytical database, the following data gaps have been identified. A recommendation is

provided for filling in each data gap. The data gaps are grouped as installing and testing new wells, collecting groundwater attenuation parameters, and conducting a background study.

***Installing and Testing New Wells***

Data suggest that contamination may occur in, or may be migrating to, areas that are not monitored by wells. Wells need to be installed and groundwater samples need to be collected in these areas so that the nature and extent of contamination can be delineated. Geophysical logs shall be run at each of the boreholes to receive multichannel wells and discrete zone tests (i.e., packer tests) shall be performed to assist in identifying zones to be monitored. The discrete zone tests shall consist of collecting samples to be analyzed for COIs and conducting hydraulic tests (which may be limited to zones producing moderate amounts of water) to characterize the interconnectedness of the water-bearing fractures between the tested well and neighboring wells. The proposed well locations (identified with the prefix DOE) are shown in **Figure 4-15.**

- A well is not located directly downgradient (following flowpaths that are perpendicular to the mapped potentiometric contours) of RD-88 and 90, which have reported tritium concentrations above the MCL. Two wells (RD-87 and 94) are located downgradient of the elevated tritium wells, but are offset to the east and west, respectively.
    - Install one multichannel bedrock well (DOE1) northwest of RD- 88 and RD-90.
- Elevated TCE concentrations are detected at PZ-104 in the shallow zone; however, the nearest rock well is RD-20 which is considered an upgradient location. No Area IV bedrock wells are next to or downgradient of PZ-104.
    - Install one multichannel bedrock well (DOE2) immediately east of PZ104.
- Elevated TCE concentrations are detected at PZ-051 and PZ-052, but no bedrock wells are located nearby.
    - Install one multichannel bedrock well (DOE3) immediately east of PZ051.
- The elevated TCE concentrations in rock near west central Area IV (e.g., RD-30) are not well defined. No wells are located northwest from this location, which is downgradient of the area. The well cluster RD-34 B/C is located at the west end of the well group.
    - Install one multichannel bedrock well (DOE4) northwest of RD-63.
- Data suggest that a contaminant source may be located in the southeast part of Area IV (upgradient of wells RD-55 and 58) where no wells are located.

- Install one multichannel bedrock well (DOE5) in Areas IV west of RD-55 and one multichannel well (DOE6) in Area IV west of RD-58.

- Soil contamination suggests a possible source exists where wells do not monitor groundwater west and northwest of the large Class 1 SU in EU10.
  - Well PZ-124 is near this proposed well location; this shallow well can be used as a sampling point for shallow water. If contamination at concentrations significantly above an MCL is detected, then the multi-channel well (DOE7) in rock shall be installed.

- Soil contamination suggests a possible source exists where wells do not monitor groundwater north of the Class 1 SU in E-U3.
  - Collect a shallow groundwater sample (via a new monitoring well or temporary point); if elevated constituents are detected, install a deeper monitoring well (DOE8).

- Soil contamination suggests a possible source exists where wells do not monitor groundwater north of the large Class 1 SU in EU-01.
  - Collect a shallow groundwater sample (via a new monitoring well or temporary point); if elevated constituents are detected, install a deeper monitoring well (DOE9).

- Soil contamination suggests a possible source exists where wells do not monitor groundwater south of the east end of the Class 1 SU in EU-02.
  - Collect a shallow groundwater sample (via a new monitoring well or temporary point); if elevated constituents are detected, install a deeper monitoring well (DOE10).

- Soil contamination suggests a possible source exists where wells do not monitor groundwater at the east edge of the Class 1 SU in EU-06.
  - Collect a shallow groundwater sample (via a new monitoring well or temporary point); if elevated constituents are detected, install a deeper monitoring well (DOE11).

- Soil contamination suggests a possible source exists where wells do not monitor groundwater south and west of the Class 1 SU in EU-12.
  - Collect a shallow groundwater sample (via a new monitoring well or temporary point); if elevated constituents are detected, install a deeper monitoring well (DOE12).

- Soil contamination suggests a possible source exists where wells do not monitor groundwater in the large Class 3 SU location in EU-16.
    - Collect a shallow groundwater sample (via a new monitoring well or temporary point) at the proposed location; if elevated constituents are detected, install a deeper monitoring well (DOE13).
- Soil contamination suggests a possible source exists where wells do not monitor groundwater west-southwest of the Class 1 SU in EU13.
    - Collect a shallow groundwater sample (via a new monitoring well or temporary point); if elevated constituents are detected, install a deeper monitoring well (DOE14).

***Collecting Natural Attenuation Parameter Data***
Natural attenuation may have some control in organic compound concentrations in groundwater. However, data on monitored natural attenuation (MNA) parameters are limited in Area IV. Activities for MNA studies are currently proposed by Boeing at some locations at SSFL; one location is in Area IV, and it is a contingent location (MWH 2007). Therefore, there is a need to collect groundwater samples and have them analyzed for MNA parameters to evaluate if the saturated zone chemistry is favorable to natural attenuation.

***Conducting a Background Study***
A groundwater divide, in general, bisects Area IV. Therefore, no wells are upgradient of Area IV and no traditional upgradient background wells can be selected. A set of groundwater comparison concentrations was developed for metals from reported concentrations at wells located throughout the SSFL (MWH 2005). The concentrations are not specific to Area IV; the concentrations may be used as one set of comparative concentrations, but should not be specifically considered background concentrations for Area IV. Therefore, a study should be performed using available data (i.e., the study is not expected to involve the installation of additional wells for the sole purpose of collecting upgradient/background samples) to identify the background concentrations of the naturally occurring groundwater constituents. This study will need to include wells installed in the both the Chatsworth and Santa Susana Formations since both underlie parts of Area IV.

## 4.3 Groundwater Seeps

Data for groundwater seeps can aid in the understanding of the fate and transport of contaminants in groundwater and to assess the potential human health and ecological exposure pathways for the respective risk assessments. However, most seeps only exhibit water during and immediately following the rainy season. The requirement to sample seeps will be incorporated into the field sampling investigation designed to address the overall data gaps presented in this report. Therefore, all identified seep locations will be visited during the field program and will be sampled for

radionuclide and chemical COIs should sufficient water be present. A GWS will be performed at all seeps.

## 4.4 Soil Vapor

Collection of additional soil vapor data will be a consideration for the field sampling investigation, particularly for the potential placement of monitoring wells. It is recognized that under the RFI program, collection of additional soil gas samples is proposed. These data, coupled with the overall needs of the data gap analysis as refined during the development of the FSAP, will be used to determine specific needs for additional soil gas.

## 4.5 Surface Water

Surface water sampling for most site drainages is being conducted under the NPDES permit program. Data collected under the NPDES program are deemed sufficient for site characterization for some areas of Area IV. As noted under Section 4.7 – "Ecological Receptors", there are internal Area IV drainages leading to ponds in other SFFL areas with limited or no data. If present during the field sampling program, surface water samples will be collected and analyzed for radionuclide and chemical COIs. Any pond or body of water receiving runoff from Area IV will also be proposed for sampling under the field sampling investigation. Also, to produce confirmatory data to the NPDES results, NPDES monitoring points will also be sampled should sufficient rainfall occur during the field sampling investigation.

## 4.6 Sediment

Contamination extent associated with NPDES monitored drainages appears to be bounded by existing sample results. However, as discussed in Section 4.7, there are internal drainages to Area IV that lack sediment data. These drainages become a data gap and will require sampling for radionuclide and chemical COIs.

## 4.7 Ecological Receptors

### 4.7.1 Data Gap Results for Ecological Risk Assessment - Chemicals

The historical chemical data collected from soil (0 to 2 feet, 2 to 4 feet, 4 to 6 feet), sediment, surface water, groundwater seep, sump soil, sump water, and soil gas were reviewed to determine if they were acceptable for use in the ERA. As stated above, if the laboratory detection limit for a chemical in a given medium was higher than the lowest ESL for that chemical in that medium, then the results for that chemical in that medium were not deemed usable for purposes of assessing risk to ecological receptors.

Following an evaluation of the entire data set for usability, the data for soil were subsequently reviewed in an effort to evaluate whether the soil chemical ESLs were as low as or lower than the soil human health PRGs. A significant number of soil samples are proposed to be collected and analyzed for use in the human health risk

assessment. In order to make sure that the same soil chemical results can also be used in the ERA, a comparison of chemical ESLs to the human health PRGs was completed. If an ESL for a particular chemical (or CPEC) was lower than the human health PRG, it was noted. The method of analysis for any chemical found where the ESL is lower than the human health PRG will be evaluated to ensure that the laboratory analytical detection limits used for soil samples collected in the upcoming field event will be lower than the ESL. The data gaps associated with the chemical data are further discussed as part of the screening for preliminary CPECs in Section 4.7.3. Similarly, the MDLs for radionuclides were compared to the ecological PRGs for radionuclides to ensure that the laboratory analytical detection limits used for samples collected in the upcoming field event will be adequate. The data gaps associated with radionuclides are further described below in Section 4.7.2

## 4.7.2 Data Gaps Results for Ecological Risk Assessment - Radionuclides

### 4.7.2.1 Soil in Area IV

Analytical data for radionuclides exist for surface soil (0 to 2 feet) from over 14,000 samples collected from Area IV EUs (**Figure 4-16**). However, less than 10 samples have been collected from four EUs (EU-13 through EU-16). More than 10 soil samples with radionuclide data were collected from EU-01 through EU-12. However, only EU-04, -06 and -08 have data from more than 10 samples for most if not all of the radionuclides in the database (**Appendix E Tables E-4, E-5, and E-6**). All other EUs have zero samples for one or more radionuclides potentially related to Area IV operations. Therefore, 10 additional surface soil samples from all EUs, except EU-04, -06 and -08, will be required for the ERA. It is expected that at least this number of additional samples will be required for the human health risk assessment (see Section 4.1) and will be collected as part of the overall soil characterization efforts.

Not all radionuclides detected in surface soil are necessarily related to operations in Area IV. There are sufficient acceptable data for K-40 in surface soil at EU-01 through EU-12 to indicate that concentrations do not exceed the derived background concentration (**Appendix E Table E-4**). Additional samples to be collected in all Area IV EUs can be used to confirm this projection.

There are data for four radionuclides (Cs-137, K-40, Ra-226, and U-235) in six samples from the 2 to 4 feet soil interval collected from two EUs in Area IV; three each at EU-04 and one in EU-07 (**Appendix E Table E-5**). This is an insufficient number of data points for this medium to support the ERA. Additional 2 to 4 feet soil samples are needed for the ERA in all EUs and the adjacent offsite area.

There are data for four radionuclides (Cs-137, K-40, Ra-226, and U-235) in eight samples from the 4 to 6 feet soil interval collected from two EUs in Area IV; three at EU-04 and five at EU-07 (**Appendix E Table E-6**). This is an insufficient number of data points for this medium to support the ERA. Additional 4 to 6 feet soil samples are needed for the ERA in all EUs and the adjacent offsite area.

The MDLs for the soil data in all but two samples are adequate for the ERA. Soil MDLs do not exceed the ecological PRGs for radionuclides. New samples collected for the Area IV ERA will need to have MDLs lower than the ecological PRGs.

#### 4.7.2.2 Surface Water and Sediment in Area IV

During the field visit conducted in April 2008, no bodies of water that support viable aquatic life were found in Area IV. Therefore, no sampling is recommended.

#### 4.7.2.3 Seep Water/Shallow Groundwater

There are approximately 320 shallow groundwater samples from Area IV with radionuclide data (**Appendix E Table E-7**). Shallow groundwater samples are available from EUs -04, -08, -10, and 011, which are adjacent to the Area IV boundary where shallow groundwater potentially daylights at seeps along the west and northwest escarpment (see Figure 4-15). Shallow groundwater also potentially daylights at seeps along the east and southeast escarpment. With the exception of EU-07 and -11, which have more than 10 samples for most analytes, there are no or little data for radionuclides in shallow groundwater at other Area IV EUs, including EUs -02, -05, -09, -012 and -015, which are adjacent to the east and southeast boundary of Area IV. The shallow groundwater data for these EUs are deemed insufficient to evaluate the potential risk for terrestrial animals exposed by drinking seep water and for aquatic biota in downgradient surface water bodies that contain water for sufficient duration to support aquatic life.

The MDLs for the shallow groundwater data are adequate for the ERA. Groundwater MDLs do not exceed the ecological PRGs for radionuclides. Any new groundwater samples collected for the Area IV ERA will need to have MDLs less than the lower of the ecological terrestrial and aquatic PRGs for water.

#### 4.7.2.4 Offsite Surface Water and Sediment

As the site is defined as Area IV, any sampling locations not present within Area IV are defined as "offsite." Data for offsite surface water and sediment have been collected under the NPDES stormwater program. These data and additional data proposed under the human health risk assessment will be used to support the ERA. There is a potential data gap for the ERA for bodies of water located outside the boundaries of Area IV that both contain water for sufficient duration to support aquatic life and are potentially impacted by migration of contaminants from Area IV. Pond R2 in Area II and Silvernale Pond in Area III are potential offsite locations that will require samples to be analyzed for radionuclides.

#### 4.7.2.5 Offsite Soil

There are five surface soil samples with radiological data from locations outside the boundaries of Area IV. These samples are associated with ravines to the west and northwest, which drain surface runoff and groundwater potentially discharging from Area IV (see Figure 2-1**)**. The number of soil samples is insufficient for the ERA, but

they can be combined with surface soil samples to be collected from the buffer areas adjacent to Area IV.

The MDLs for the soil data in all but two samples are adequate for the ERA. Soil MDLs do not exceed the ecological PRGs for radionuclides. New samples collected for the Area IV ERA will need to have MDLs lower than the ecological PRGs.

### 4.7.3 Results of the Screen for Radionuclides and Chemicals of Potential Ecological Concern

The results of the screens for RPECs and CPECs are summarized below.

*Radiological*
The results of the RPEC screens are summarized by each analyte and medium for which there are sufficient data to conclude that the radionuclide is present at a concentration that exceeds the PRG. Radionuclides without PRGs are daughter products of longer-lived radionuclides and will be considered RPECs if their parent radionuclides are RPECs. There are insufficient data to conduct a RPEC screen for surface water, sediment, seep water, and offsite soil.

**Soil (0 to 2 feet)** – In EU-04, -06 and -08, only two radionuclides were detected at a concentration exceeding the ecological PRGs. Strontium-90 exceeded the soil PRG in surface soil at EU-06. Cesium-137 exceeded the PRG in surface soil from all three EUs. Cesium-137 was also detected above the soil PRG in -03, -07, -09 and -11. These two radionuclides, Cs-137 and Sr-90, are Area IV RPECs. Until sufficient data are collected from Area IV EUs and the offsite area for other radionuclides, it is premature to identify a final set of RPECs.

**Shallow Groundwater** – In EU-04, -06, -07 and -11, only two radionuclides were detected at a concentration exceeding the ecological PRGs for aquatic biota. Lead-210 exceeded the water PRG for aquatic biota in groundwater at EU-06, -07, and -11. Radium-226 exceeded the PRG in shallow groundwater from all four of these EUs. These two radionuclides, Ra-226 and Pb-210, are Area IV RPECs. Until sufficient data are collected from Area IV EUs and the offsite area for other radionuclides, it is premature to identify a final set of RPECs.

*Chemical*
The results of the CPEC screens, described above in Section 4.7.1, are summarized below by each media type. In all cases, these results only show those chemicals for which ESLs were not available and those for which maximum detected concentrations exceeded available ESLs.

**Surface Water** – Following the screens described above, surface water data are limited to one sample (**Table 4-6**). Within this sample, the maximum detected concentrations of 15 inorganics and four VOCs exceeded available ESLs. In addition, three TPHs are retained as initial CPECs because ESLs are unavailable. In summary, the review and evaluation of available surface water data indicates that (1) detection limits were too

high in some cases, (2) chemical ESLs were not available in other cases, and (3) additional sampling is required to better define the nature and extent of contaminants in surface water.

**Seep Water** – The results of the review of available seep water data following the aforementioned screens indicate that 24 chemicals were detected (**Table 4-7**). Many of these are essential nutrients, electrolytes, nontoxic chemicals, or conventional water quality parameters, such as total dissolved solids. For some of these detected chemicals, adverse effects can be observed in certain types of aquatic biota (e.g., daphnids), but only at extraordinarily high concentrations. Because detection limits were sufficiently low in most cases, and because a large number of samples (almost 60) were retained as "acceptable," the results of the seep water screening suggest that seeps pose little significant threat to ecological receptors. Of potential concern is the finding that the maximum concentrations of toluene and chlorobenzene exceed ESLs.

**Sediment** – Not counting one unidentified SVOC, from 6 to over 60 samples (depending on the individual chemicals detected) are associated with maximum detected concentrations in excess of ESLs or chemicals without ESLs (**Table 4-8**). These individual chemicals include dioxins, inorganics, PCB congeners, SVOCs (mostly PAHs), VOCs, and one pesticide (4,4'-DDD). Because the number of samples in most cases is so limited for important analytes such as dioxins and PCBs, available sediment data are of limited use for describing the nature and extent of contamination across the site. Additional sediment sampling and analyses are recommended to allow for more complete descriptions of the location and magnitude of important contaminants in sediment.

**Soil (all depth horizons)** – The review of soil chemical data for all three depth horizons (**Tables 4-9, 4-10, and 4-11**) reveals that many chemicals from multiple chemical classes (e.g., dioxins, PCBs, SVOCs, PAHs, metals, and VOCs) were detected in soil, often at concentrations exceeding the lowest ESLs. While most of these data appear usable for ERA purposes, it is recommended that soil samples be collected in association with the collection of terrestrial biota (e.g., plants, invertebrates, small mammals) to confirm the current nature and extent of contaminants in soil and to address data gaps in particular EUs. These recommended soil samples should be analyzed for the full suite of potentially hazardous chemicals, including dioxins, PCBs, pesticides, SVOCs (including PAHs), VOCs, and metals.

*Sump Soil*

A total of three sump soil samples were evaluated and deemed usable for chemical data (**Table 4-12**) following the completion of the screen described above. Based on the limited number of samples, it appears that sump soil contains several inorganic and organic (primarily VOCs, with some SVOCs and TPHs) chemicals at concentrations exceeding ESLs. The limited number of samples suggests that additional sump soil sampling may be warranted, but this decision will be considered following site surveys to determine the locations and habitats associated with the sump soils.

***Sump Water***
From 2 to over 50 sump water samples (depending on chemicals detected) remained following the screens described above (**Table 4-13**). These samples contained a large number of chemicals (1 to nearly 30) for which maximum detected concentrations exceeded ESLs or for which no ESLs were available. As with sump soils, decisions regarding the need to sample sump water or decisions on the approach used to evaluate sump water exposures will be based on site surveys and ecological habitat suitability.

***Soil Gas***
Following the screens described previously, nearly 190 soil gas samples were associated with either maximum chemical concentrations exceeding ESLs or chemicals for which ESLs were unavailable (**Table 4-14**). In nearly all cases, however, only a small fraction (<5 percent) of individual chemicals were detected in soil gas samples. The single exception to this finding was methane, where 12 of 44 samples were associated with detections. No ESL was available for methane in soil gas, so the impact of these results will be determined following further evaluation of the data.

## 4.7.4 Comparison of Ecological and Human Health Radiological PRGs

The radiological PRGs for the ERA for soil and water for both terrestrial receptors exposed by drinking (water, terrestrial) and aquatic receptors exposed by multiple pathways (water, aquatic) are large compared with radiological PRGs for human health risk assessment (**Table 4-15**). Except for the water (aquatic biota risk) PRGs for Pu-240 and Na-22, all ecological risk PRGs for soil and water are larger than the corresponding human health PRGs. The ecological PRGs for Pu-240 and Na-22 are less than two times smaller than the human health PRGs.

## 4.7.5 Data Gaps Related to Biological Tissues

The database currently contains a limited number (generally 1 to 4 per sample type and location) of biota tissue samples that were used in the development of BAFs and chemical ESLs, as discussed previously. What is known about these biota data is that the data are relatively old (collected in 2000) and were not collected from Area IV. Also known is that many of these samples were composed of composite samples of different taxa and were used in the SRAM to help develop ESLs and BAFs (MHW 2005). It is possible that some of these biota samples were collected from areas influenced by contamination from Area IV. After specific information is obtained that can relate the specific type of data with the location of the sample, it may be determined that some of these samples are from locations influenced by Area IV. A site visit by members of the ERA team will help determine what tissue sample locations may have been influenced by Area IV. If this is the case, these data may be included for consideration in the ERA.

### 4.7.5.1 Ecological Survey Data

The addendum to the Biological Conditions Report (BCR) (MWH and AMEC 2005) was prepared for the SSFL in April 2000, and revised in June 2003 and in March 2005, based on additional information gathered since the original biological surveys were completed for the original report (Ogden 1998). The original scope of work only included focused surveys on specific RCRA RFI sites and vegetation mapping for the remainder of the SSFL. The addendum added information regarding Federally listed endangered species and sensitive plant and wildlife species possibly present at the SSFL. Observation points have been mapped based on the surveys summarized in the BCR. These ecological survey points have been mapped and are depicted on **Figure 4-17** (plant and wildlife observations) and **Figure 4-18** (bird observations). The ecological survey information from the BCR will be used in the ERA as appropriate.

## 4.7.6 Identified Ecological Risk Data Gaps

Data gaps have been identified with regard to biota tissue samples with a full range of analytical results for radiological and chemical constituents. These data gaps are associated with biota tissue samples from Area IV as well as co-located media samples for the full range of radiological and chemical constituents. The specifics and details of the data proposed to be collected for use in the ERA are discussed below and in **Table 4-16.**

### 4.7.6.1 Proposed Abiotic and Biological Sampling for Ecological Risk Assessment

Sampling of abiotic media (i.e., surface water, sediment, soil, and soil gas) and biological tissues (i.e., selected aquatic and terrestrial plants and animals) is proposed to fill identified gaps in data to be used to assess risks to ecological receptors. This sampling effort is described below. Some modification to the proposed sampling described below is anticipated based on a more complete review of existing stormwater data.

#### *4.7.6.1.1 Purpose of Sampling*

The proposed sampling program is intended to address several unique requirements of the ERA. These include the following:

1. Chemical concentrations in abiotic media

2. Chemical concentrations in biota [to assess risks to selected receptors based on body burdens and body burden toxicity reference values (TRVs)]

3. Concentrations of bioaccumulative chemicals in biota (to be used in food web modeling)

4. Concentrations of radionuclides in abiotic media and in biota (to assess risks to ecological receptors from exposure to radionuclides)

5. Concentrations of chemicals in soil gas (to assess inhalation exposures to burrowing mammals)

#### *4.7.6.1.2 Exposure Areas and Related Assumptions*

The proposed sampling effort presented in **Table 4-16** is based on designations of unique EUs and on several important assumptions. The exposure areas defined for sampling purposes are in turn based on certain assumptions that will require confirmation via field surveys. However, based on current understanding, the exposure areas of concern are shown in Figure 3-4 and include the following:

- EUs -01 through -016
  - expected to be primarily terrestrial EUs, but may include seeps or stormwater
  - each EU is assumed to be sufficiently large and unique to warrant independent sampling
- Area in EU -03 supporting aquatic plants [cattail (*Typha* sp.)]
- Undeveloped area south of SRE
- Undeveloped area north of SRE
- Arroyo Simi Area I
  - assumed to drain EUs -06, -08, -10, and -11
- Arroyo Simi Area II
  - assumed to drain EUs -01 and -02
- R-2 Pond in Area II
- Silvernale Pond in Area III
- Background area for terrestrial receptors
- Background area for aquatic receptors

Proposed locations for aquatic samples are assumed to contain standing water for sufficient duration to support aquatic life (including intermittent or ephemeral waters used by aquatic or semi-aquatic biota). Also, sampling for specific types of biota assumes those biota are present (and in sufficient numbers to allow adequate sampling). Finally, samples from the two buffer areas are expected to be terrestrial samples unless seeps or stormwater are retained within these areas. If that is found to be the case, then aquatic sampling may be included for these locations (depending in part on persistence of aquatic environments).

#### *4.7.6.1.3 Numbers and Types of Samples*

Preliminary recommendations for number of samples to be collected within each exposure area or EU (up to 10 samples per sample type) are based on the fact that none of the historical biotic tissue data are useful for assessing current risks to ecological receptors using Area IV.

The types of samples proposed to be collected are discussed by media type below. For biota samples, COIs include all radionuclides and bioaccumulative inorganic and organic chemicals. For abiota media, COIs include all radionuclides and the full suite of organic and inorganic chemicals. The details of the sample collection process and

related health and safety protocol for the samples recommended below will be described in the FSAP.

**Surface Soil** – Surface soil samples will be collected from each of the three soil depth horizons (0 to 2, 2 to 4, and 4 to 6 feet bgs). Therefore, three samples will be collected from each soil sampling location (or "hole"). Up to 10 locations will sampled per EU. Each sample (one from each depth horizon) will be analyzed for both radionuclide and chemical COIs.

**Soil Gas** – Soil gas samples will be collected as described for surface soil samples, except that radionuclide analysis is not required.

**Sediment** – Sediment samples will be collected from the surface sediments (0 to 6 inches) and analyzed for radionuclide and chemical COIs, and total organic carbon (TOC).

**Surface Water** – Surface water samples will be collected and analyzed for conventional parameters (e.g., temperature, dissolved oxygen, pH), radionuclide and chemical COIs, and hardness. Both total recoverable and dissolved metals analyses are proposed. Where surface water is deep (e.g., >4 feet), samples will be depth-integrated (i.e., samples will be composites of surface, mid-depth, and near bottom of water column).

**Seep Water** – The risk to ecological receptors exposed to CPECs and RPECs in water discharging at seeps will be evaluated. Data representative or potentially representative of the water discharging at seep locations include: existing seep data, existing groundwater data, and potential future samples collected from these media. Therefore, an evaluation of seep water quality will likely include one or more of the abovementioned data sets. Thus, water samples from seeps, if present at the time of sampling, are planned to be collected and analyzed for radionuclide and chemical COIs. Additional groundwater data is also planned for collection. New data collection will be dependent, at least in part, on the usefulness of previously collected samples. Both total recoverable and dissolved metals analyses would be proposed for samples collected from seep locations.

**Soil Invertebrates** – Soil invertebrate samples will be composites of all taxa observed in the upper soil horizon (e.g., 0 to 2 feet), with no depuration of earthworms (the likely major component of these samples). Taxa constituting the composite samples will be identified and an approximate percentage of the total sample will be recorded (e.g., 80 percent earthworms, 20 percent grasshoppers). Samples will be analyzed for radionuclides and chemical COIs.

**Small Mammals** – Small mammal samples will be collected via Sherman live traps baited with peanut butter and will include all small mammalian taxa collected. Composite samples will be used where sample volume requires more than one individual. Otherwise, each sample will comprise a single individual.

**Western Fence Lizards** – Western fence lizards will be collected by hand or by noosing. Composite samples will be used where sample volume requires more than one individual. Otherwise, each sample will comprise a single individual.

**Terrestrial Plants** – Two types of terrestrial plant samples are proposed for each sampling location. The first type consists of seeds, flowers, and fruits. These will be composited to meet sample volume requirements. The second sample type will comprise leaves and stems, and these will be composited into individual samples. In both cases, the dominant types of plants will be identified and assigned to the sample (e.g., 75 percent grass seed heads, 25 percent miscellaneous flowers from particular plant type). Only above-ground, unwashed samples will be included (no roots, no rinsing of samples). Samples will be analyzed for radionuclides and chemical COI.

**Aquatic Plants** – Aquatic plant samples will consist of sufficient volume of a single taxon where possible. The plant taxon constituting the sample will be identified. Samples will be analyzed for radionuclide and chemical COIs.

**Aquatic Invertebrates** – Aquatic invertebrate samples will be composites of all taxa collected using 500 micrometer D-frame kick nets. Taxa constituting the composite samples will be identified and an approximate percentage of total sample will be recorded (e.g., 80 percent caddisflies, 20 percent oligochaetes). Composite samples will be analyzed for radionuclide and chemical COIs.

**Fish** – Fish samples will be limited to small fish (approximately 6 inches long), and will be comprise individual whole fish if sample volume requirements can be met. Composites of the same taxon will be used, if necessary, to meet sample volume requirements. In all cases, fish will be identified to species level. Fish will be collected using electroshocking methods and analyzed for radionuclide and chemical COIs, as well as lipid content. Two permanent surface water bodies will be sampled and they are described in Section 4.7.6.1.2 and in Table 4-16.

**Background** – For all media types and biota types, both an aquatic and terrestrial background location will used for the collection of media and biota tissue samples. The location of these areas will be identified in the FSAP.

## 4.8 Air

Radiological air data were reviewed from annual Site Environmental Reports from 1991 to 2006; predecessor environmental surveys and environmental monitoring reports from 1955 to 1990; and NESHAP reports for DOE operations in SSFL Area IV from 1991 to 2006. These data are comprised of both effluent air data reflecting the emissions to the environment from a given facility and ambient air sampling information from monitoring stations established in designated locations. These data are reviewed below.

### 4.8.1 Effluent Air Monitoring

"Atmospherically discharged effluent released to unrestricted areas" was initially monitored beginning approximately 1972 for the stacks at the "Radioactive Materials Disposal Facility", "Engineering Test Building (Main Stack)" and "Engineering Test Building (Hot Cell)." Concentrations were "in all cases less than 10 percent of the average concentrations observed in environmental air throughout the area of the site". (It is notable that reports from as early as 1973 stated that "The level of radioactivity contained in all gaseous effluents is reduced to the lowest practicable by releasing the effluents through certified HEPA filters. These effluents are sampled for particulate radioactive materials by means of continuous stack exhaust samplers. In addition, stack monitors are provided at Building 020, 022 and 055 which provide automatic alarm capability in the event of the release of gaseous activity from Building 020 or 022 or particulate activity from Building 055. The HEPA filters used for filtering gaseous effluents are 99.95 percent efficient for particles of 0.3 micron diameter." Average effluent concentrations released to unrestricted areas as stated in the 1973 *Environmental and Radioactive Effluent Monitoring Annual Report* were reported for the Buildings 003, 020 (Hot Lab), 022 (RMDF) and 055 to range from less than $2.9\times10^{-16}$ to less than $2.1\times10^{-15}$ and less than $2.6\times10^{-15}$ to $1.1\times10^{-14}$ µCi/mL for alpha and beta, respectively. Maximum concentrations were listed as $9.4\times10^{-14}$ and $1.4\times10^{-13}$ µCi/mL for alpha and beta, respectively. Building 021 was subsequently included in building emission reports at approximately the same time and was listed jointly with Buildings 022. Building 055 was dropped from the report in 1987 thus the 1988 report includes only Buildings 020 (Hot Lab) and 021-022 (RMDF).

Beginning in 1988, environmental reports incorporated gross alpha and gross beta activity information with isotopic composition of the radioactivity deposited on the filters, composited for the year. Isotopic analytes included $^{7}$Be, $^{40}$K, $^{60}$Co, $^{90}$Sr-Y, $^{137}$Cs, $^{210}$Po, $^{234}$U, $^{235}$U, $^{238}$U, $^{238}$Pu, and $^{239/240}$Pu. Reported results included air concentration, release per year, applicable lower limits of detection (LLDs) and percentages of the maximum permissible concentrations (MPCs). In 1989 results included average concentrations for each radionuclide. In addition, beginning in 1989, $^{241}$Am was included in the list of analytes (excluding 1993 and 1994). Beginning in 1992, Th-228, $^{230}$Th and $^{232}$Th were subsequently added as analytes and $^{241}$Pu was included beginning in approximately 1995. Average concentrations ranged from $8.3 \times 10^{-19}$ to $1.0 \times 10^{-14}$ µCi/mL for the Hot Lab with the highest concentrations being reported for naturally-occurring $^{7}$Be, $^{40}$K, and $^{210}$Po. Isotopic results were commonly reported as several orders of magnitude lower than the stated MPCs. Similar results were reported for the RMDF except that $^{7}$Be, $^{238}$Pu, and $^{241}$Am were reported as "0". In the 1990 report, the "specific facilities are identified as RMDF, T059 and RIHL" with activity detected above LLDs at the RMDF including 57, 38, 5.0, and 0.29 pCi for $^{60}$Co, $^{137}$Cs, $^{210}$Po, and $^{229/240}$Pu, respectively. Concentrations at the Hot Lab which exceeded LLDs consisted of 280, 7.2, 60 and 55 pCi for $^{40}$K, $^{90}$Sr, $^{137}$Cs, and $^{210}$Po-210, respectively. The concentration of $^{40}$K, a naturally occurring constituent, is elevated relative to commonly encountered concentrations and continued to be detected at relatively high levels in subsequent years with concentrations in 1991 of 56 to 140 pCi.

The concentrations of naturally occurring $^{210}Po$ and $^{7}Be$ were in the naturally occurring background range. These radionuclides are not process related.

In 1994 effluent emissions continued to be monitored for the RMDF, Hot Lab and Building T059 with Building 4059 being omitted from the environmental reports beginning in 1995. Emissions from the RMDF and Hot Lab continued to be reported in the 1996 and 1997 reports prior to its removal with the RMDF and T024 being included in reports from 1998 report. Effluents to unrestricted areas continued to be reported within the same range as ambient air concentrations. In 1999 emissions were assessed for the RMHF and T024. Emissions monitoring was then limited to the RMHF for the period 2000 to 2006.

## 4.8.2 Ambient Air Data

Historical ambient air monitoring data are available for the SSFL from June, 1957, to the present. This data originally consisted of "Long Lived Air Activity at Santa Susana" in 1957, the basis of which is not known, and "Ambient Air Radioactivity Data" which derived average beta concentrations from 1957 to present and average alpha concentrations from 1971 to present. (Prior to 1971, ambient air alpha radioactivity values were included in the beta values and not reported separately.) From 1957 to 1963, air sampling consisted of an average of 200 samples per year with reported concentrations averaging from $4.4\times10^{-13}$ to $5.6\times10^{-12}$ µCi/mL. From 1965 to 1985 an average of about 2,300 samples were collected and analyzed per year with the reported concentrations averaging from $2.2\times10^{-14}$ to $4.1\times10^{-13}$ and $1.0\times10^{-15}$ to $8.6\times10^{-15}$ µCi/mL for beta and alpha, respectively, over those time periods.

Air monitoring stations were established at specific locations within SSFL Area IV. These locations varied to some extent over the years of operation within Area IV, both in terms of the number of monitoring stations and their respective locations.

In the mid-1970s SSFL air monitoring stations were located at Buildings 009, 011, 012, 040, 074, 143 and 363 with the stations at Building 012 and 040 being relocated to Rocketdyne Buildings 600 and 207, respectively, in August, 1977. Two additional stations were located on the roofs of Atomics International Headquarters Buildings 001 and 004. These samplers operated continuously on 24-hour cycles with filter media being "automatically changed daily at the end of the sampling period". The reported average ambient air concentrations for the SSFL were less than $6.6 \pm 7.7\times10^{-15}$ and $1.7 \pm 0.2\times10^{-13}$ µCi/mL for alpha and beta, respectively (95 percent confidence level) with maximum daily concentrations of $3.9\times10^{-14}$ and $3.0\times10^{-12}$ µCi/mL for alpha and beta, respectively. These results were noted as being "due primarily to the dominance of naturally occurring radionuclides in the environment and longer-lived fission product radioactivity from fallout" (Atomics International Environmental Monitoring and Facility Effluent Annual Report, 1977, Rockwell International).

In the early 1980s sampling station locations at the SSFL included the roofs of Buildings 001 and 004 and areas adjacent to Buildings 074, 143 and 363 with samples operating on a 24-hour sampling cycle and filters being automatically changed daily

at the end of each sampling period. The samples were subsequently counted for alpha and beta radiation following a minimum 120-hour decay period. The air data were mathematically smoothed by a program that calculated a moving weekly average of daily data for the year. Weekly averages were on the order of $6\times10^{-16}$ to $3\times10^{-15}$ and $1.5\times10^{-14}$ to $3\times10^{-14}$ µCi/mL, for alpha and beta, respectively, with reported minimum detection levels of $6.4 \pm 3.8\times10^{-15}$ and $1.3 \pm 0.6\times10^{-14}$ µCi/mL for alpha and beta, respectively.

Beginning about 1988, as with the effluent air monitoring filters, filters from each ambient air sampling location were aggregated for the entire year and analyzed such that gamma emitting radionuclides were measured by high-resolution gamma spectrometers and all others were "measured by chemical separations followed by alpha or beta counting". Specific analytes are as listed above for effluent air monitoring. Results exceeding detection limits were reported in environmental reports in terms of "activity detected", "annual release", "average exhaust concentration" and "DCG" (derived concentration guides from DOE Order 5400.5). Reported concentrations of radionuclides were commonly two or more orders of magnitude lower than the applicable DCGs.

By 1990 the monitoring locations included stations adjacent to the RMHF, RMHF Pond, former RI Hot Laboratory (RIHL) and Buildings 4100 and 4886. Four of the five samplers operated for a period of 24-hours while the fifth sampler operated on a 7-day cycle. Gross alpha and beta radiation were measured with a thin-window gas-flow proportional counter after a delay of at least 120 hours to allow decay of the short-lived naturally-occurring radon daughters. Alpha results were compared to a DCG value of $6\times10^{-14}$ µCi/mL as work involved unencapsulated plutonium. For beta they were compared to $3\times10^{-11}$ µCi/mL based on the presence of $^{90}Sr$ in fission product contamination from previous work with irradiated nuclear fuel. In 1991 locations were reduced to include the RMHF, RMHF Pond, RIHL and Building 4886 with gross radioactivity results reflecting annual averages of $2.2 \pm 3.2\times10^{-15}$ to $2.6 \pm 10^{-15}$ and $4.6 \pm 2.9\times10^{-14}$ to $4.9 \pm 3.0\times10^{-14}$ µCi/mL for alpha and beta, respectively.

Ambient monitoring locations listed for the period from 1992 to 1996 consisted of Buildings 4020 (Hot Lab), 4034 (RMDF), 4886 (Former Sodium Disposal Facility), 4100 and the RMDF Pond with the Building 4100 sampler being on a 7-day cycle and the other samplers being on a daily cycle. In 1997 all monitoring was converted to a weekly cycle with a total of nine monitoring stations being utilized within the SSFL Site during 1997 and 1998. Specific monitoring locations included Buildings 4020 (southwest side), 4034 (RMDF main gate), 4886 (Former Sodium Disposal Facility), RMHF Pond (north side), 4100, and 4020 (each of the four sides of the building). In 1997 gross alpha and beta radioactivity ranged from 5.2 percent to 39 percent and 0.04 percent to 0.62 percent, respectively, of the exposure guides established in DOE Order 5400.5. In addition, the report notes that "On four occasions the north and west Hot Lab samples exceeded the alpha DCG limits" based on the conservative use of the Pu-239 concentration guide. The report concludes that "The activity detected in ambient air is attributed to naturally occurring radioactive materials."

Five monitoring stations (RMHF, RMHF Pond, former RI Hot Laboratory (RIHL) and Buildings 4100 and 4886) were utilized from 1999 to 2006. The RHMF Pond monitoring station was discontinued in 2006, resulting in a total of four stations for 2007. Results were compared to "Derived Concentration Guides for Air and Water" which are contained within Chapter III, DOE Order 5400.5.

Similar to results from 1997 as indicated above, Table 5-5 of the *Site Environment Report for Calendar Year 2006* reflects gross alpha radioactivity concentrations of 13, 26, 9.7, and 44 percent of the guideline value from DOE Order 5400.5 for Building 4100, 4010, RMHF, and 4886, respectively. The supporting text notes that "The naturally occurring radionuclides, Po-210, Ra-226, Ra-228, are the sources of the gross alpha and gross beta activities detected on air samples. During year 2006, the average gross alpha activities on the environmental air samples are less than that on the background sample."

## 4.8.3 NESHAPs

The EPA regulates airborne releases of radioactivity from DOE facilities under 40 *Code of Federal Regulations* (CFR) 61, Subpart H and from NRC licensed facilities under 40 CFR 61, Subpart I. The DOE site limit is 10 millirem (mrem) per year. To demonstrate compliance with this requirement, dose calculations are performed to assess the effective dose equivalent to the maximally exposed individual. Review of NESHAPs reports reflects that exposures have generally been estimated to be several orders of magnitude or more lower than the NESHAPs dose standard. As an example, Table 5-2 of the *Site Environment Report for Calendar Year 2006* reflects downwind exposure doses of $9.1\times10^{-8}$ and $6.0\times10^{-8}$ mrem per year for individuals present at the site boundary and for the nearest residence.

## 4.8.4 Conclusions

Large amounts of data on airborne concentrations of radionuclides have been obtained for the SSFL. Available information indicates that high-efficiency particulate air filters were used to control the emissions of radionuclides from facilities with a significant potential for airborne releases to the environment and that the releases to the environment were subject to constant monitoring to assure compliance with applicable standards. Review of available information to include both ambient air and effluent air data suggests that airborne emissions to the environment were not likely a major contributor to onsite contamination dispersed within SSFL Area IV. Further, review of NESHAPs data suggests that exposure to airborne emissions from SSFL Area IV has not been a major contributor to doses to offsite receptors.

The list of analytes for radiological air data in the final list of COIs for which there is no existing air data includes $^{14}C$, $^{134}Cs$, $^{125}Sb$, $^{152}Eu$, $^{154}Eu$, $^{55}Fe$, $^{54}Mn$, $^{22}Na$, $^{59}Ni$, $^{63}Ni$, $^{237}Np$, $^{226}Ra$, $^{228}Ra$, and $^{99}Tc$.

The review of air monitoring data indicates that sufficient operational and existing conditions data exist for Area IV. To assess risks for the EIS relative to decommissioning and demolishing of buildings and removal of soil, building data

and soil data collected during the field sampling investigation will be used. Therefore collection of additional air sampling data is not proposed. This finding does not include the possible need to sample air in the breathing zone of site workers involved in the field sampling investigation.

## 4.9 Buildings

A gap analysis was performed to assess the adequacy of radiological contamination information for existing structures (i.e., those that have not been demolished) for the risk assessment and off-site release estimates for the EIS, evaluation of transportation impacts, and final disposition of wastes. **Table 4-17** presents the results of this analysis including the referenced site name, the remaining surveys to be performed based on the 2005 *Historical Site Assessment* (and actions taken since that time), the projected MARSSIM classification, a summary of historical data and the specific data gap to be addressed. This comparison indicates that limited data gaps exist. The existing data gaps consist of the lack of building surface contamination data (i.e., fixed point measurements, radiological scan surveys, and removable contamination data) for about 17 structures, or limited portions thereof. In addition, isotopic ratios to be applied to contaminant levels as an integral part of the preparation of human health risk assessments are not generally available for remaining buildings. Unless these data gaps are addressed by interim site radiological survey efforts, they will be addressed during field investigation efforts in which case, additional detail will be incorporated into the sampling and analysis plan for the field effort.

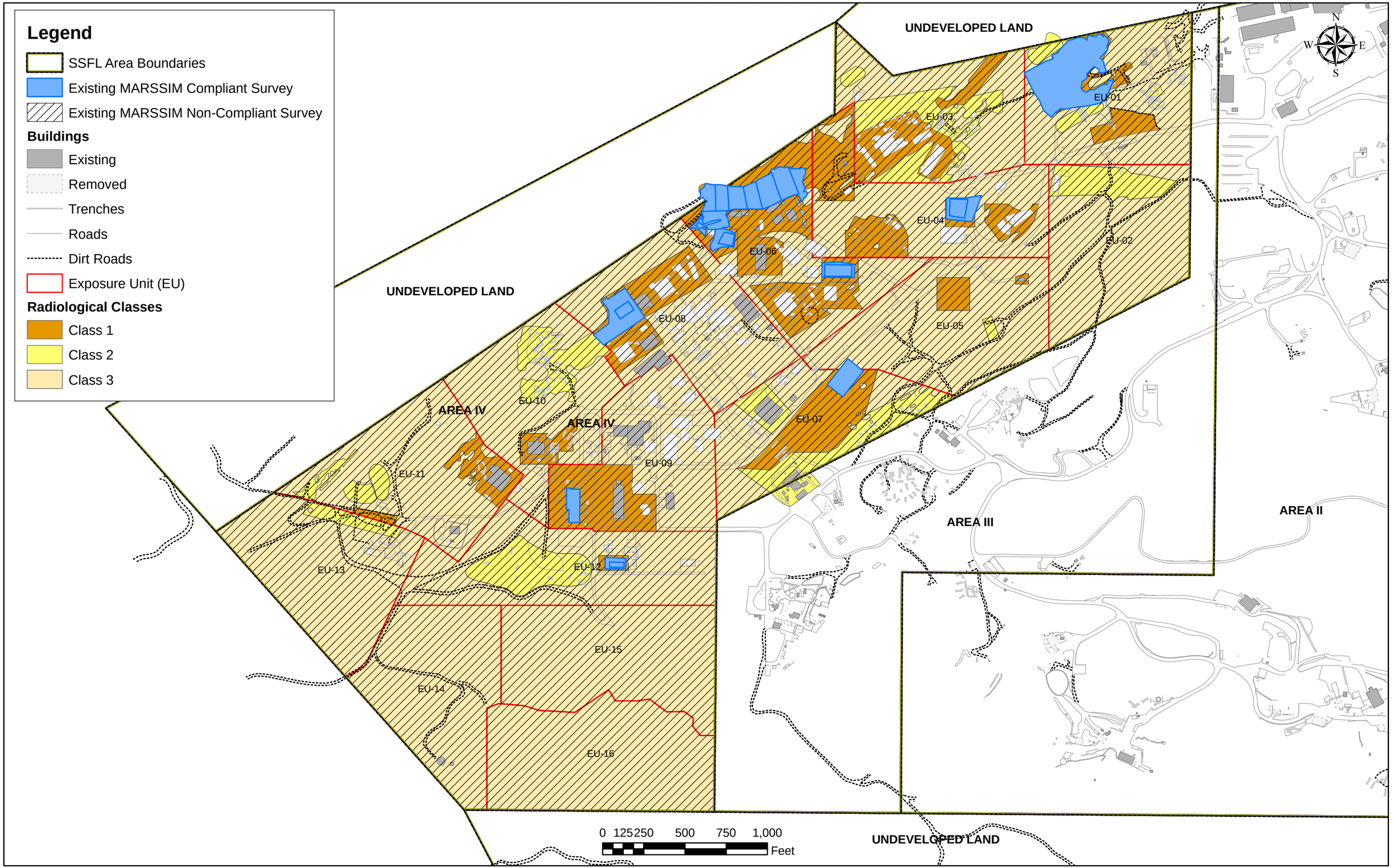
## 4.10 Surface Soil, Subsurface Soil, and Bedrock Background

Background values for metals and dioxin have been agreed upon by regulatory agencies for SSFL. The radionuclide background used for this data gap report was based on existing offsite surface soil data. These data may be useful for establishment of agreed upon future radionuclide background values. However, establishment of separate background values for each of the two geological formations is desirable and additional surface soil data may be useful for that purpose. Also, there currently is no background data for radionuclides at depth for near surface and subsurface soils, sediment, rocks, surface water, and groundwater. Therefore, the data gap includes additional background sample analysis for radionuclides for these matrices. MARSSIM statistical tests require the same number of background samples as areas samples for comparison. This number can be approximated by calculation of the number of samples necessary for the Wilcoxon Rank Sum Test using the decision rule DQOs established in Section 3.2 and assuming a relative shift of 1.5. The resulting minimum number of background samples necessary for each media type and each geological formation is 14.

## 4.11 Bedrock

The data gap analysis of bedrock samples determined that very little bedrock data has been collected to date for chemical and radionuclide COI characterization. In

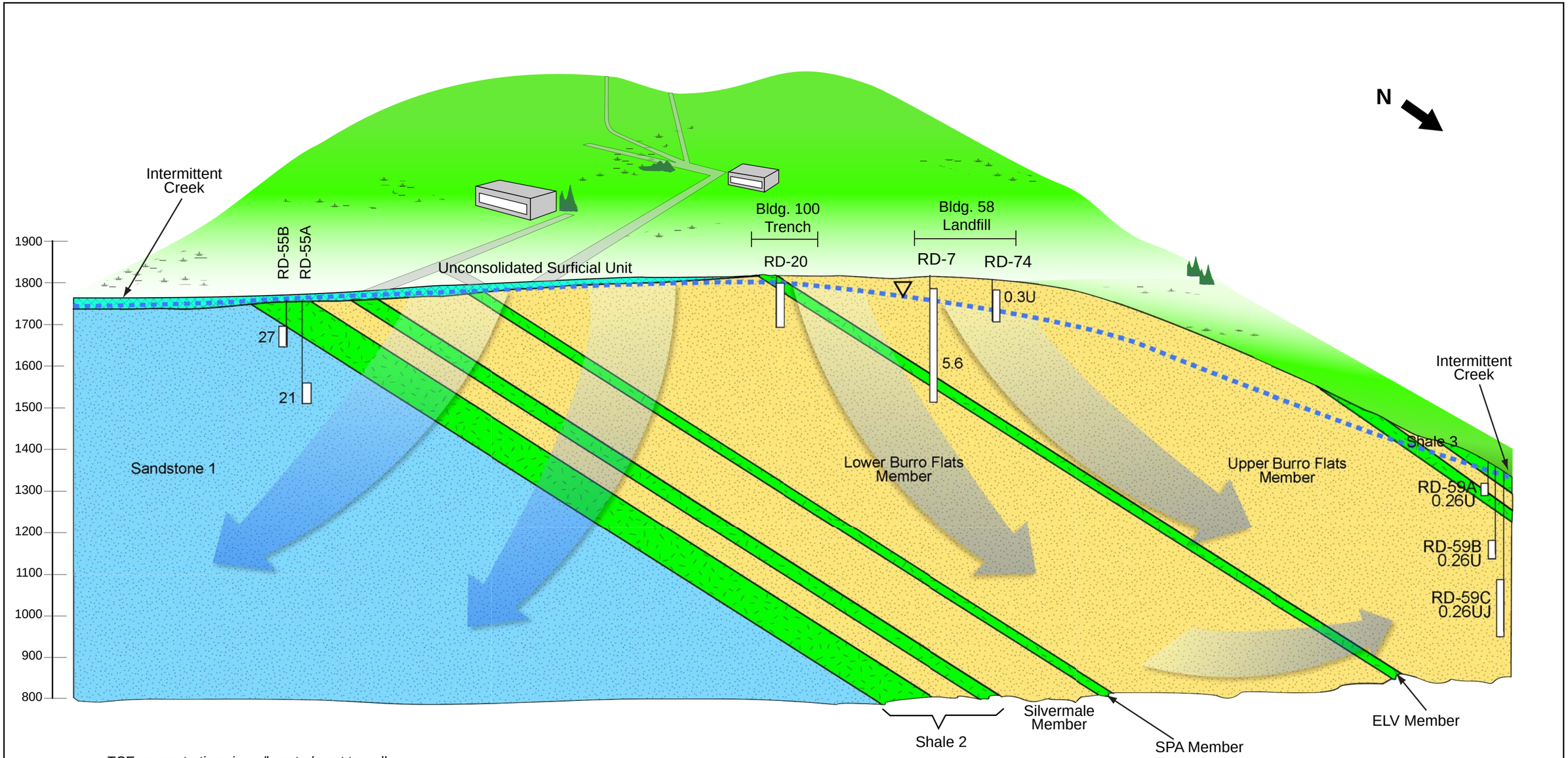
addition, bedrock aquifer properties are needed for groundwater cleanup remedy evaluations. Therefore bedrock data are a data gap for completing Area IV site characterization. Bedrock samples will be required at locations where chemical and radionuclide vertical extent of contamination is needed and from borings for wells drilled into bedrock. The locations and purposes of bedrock samples will be described in the FSAP.




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-1
Locations of Existing Gamma Walkover Surveys




- TCE concentrations in ug/l posted next to well.
- TCE concentrations at RD-59 from Annual Groundwater Monitoring Report 2006 (H&A 2007)

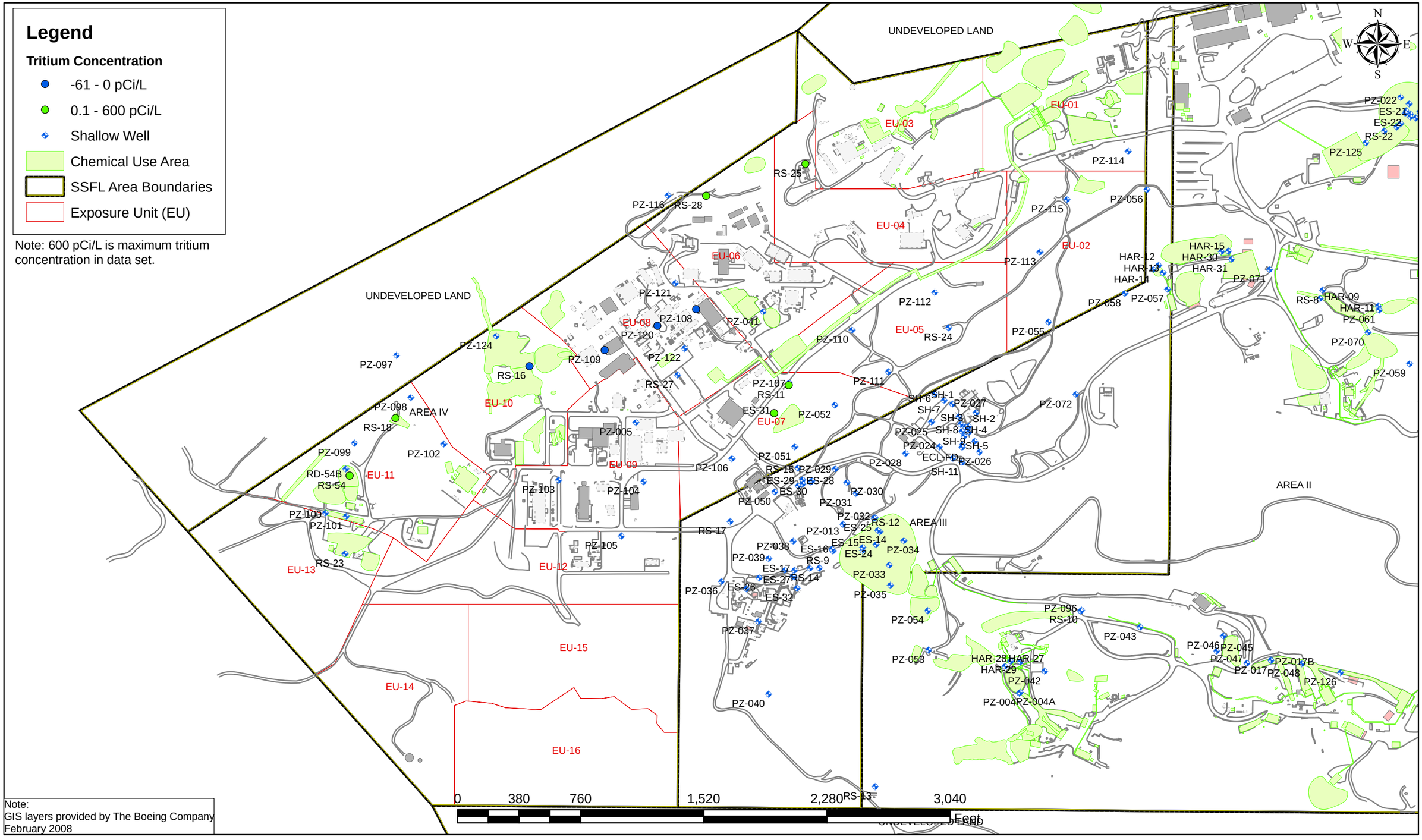
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0 100 200 300 400 500
scale

Modified from Section H-H' of MWH-Work Plan Sitewide Groundwater Characterization 2008

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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-2
Groundwater Conceptual Site Model

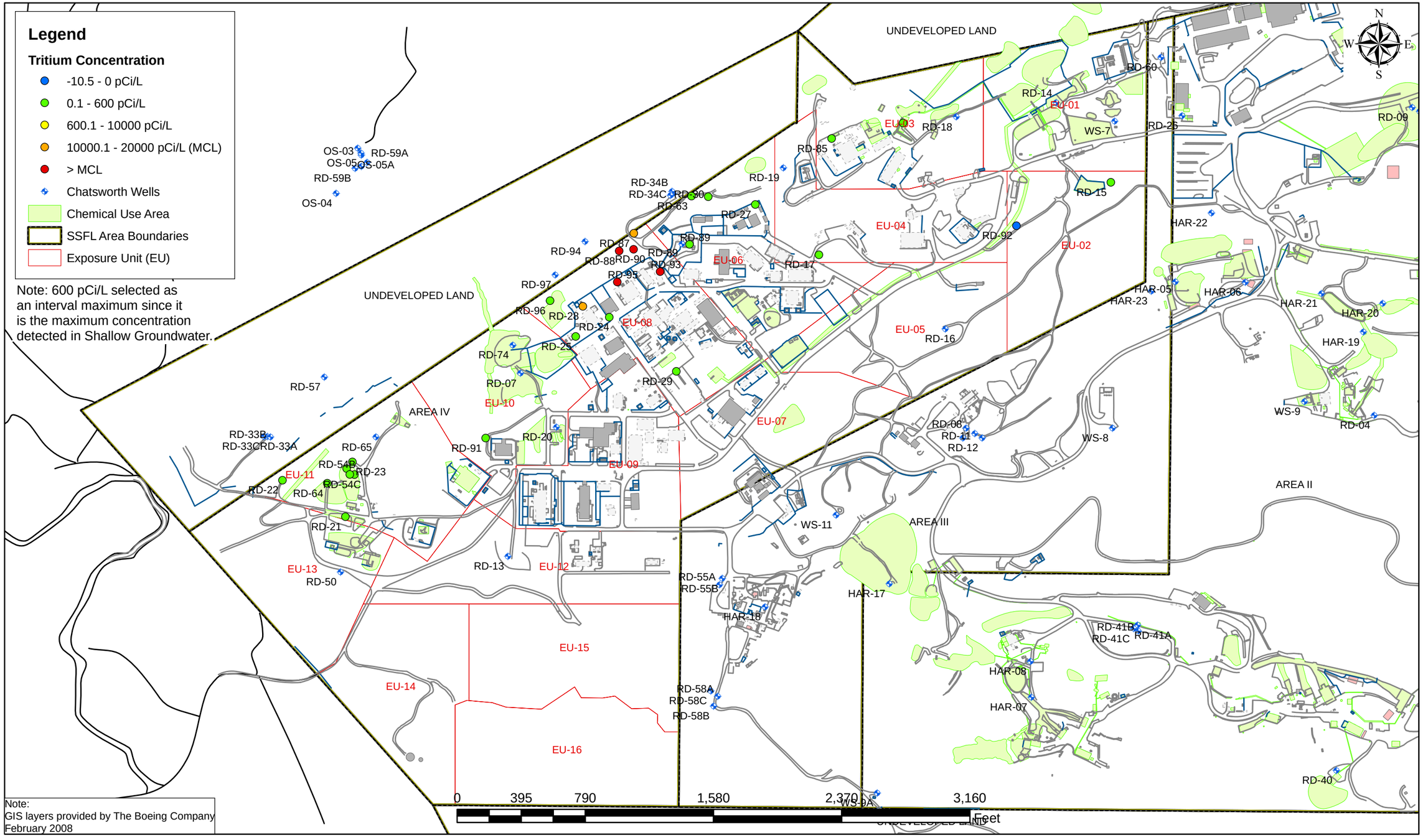



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Santa Susana Field Laboratory Area IV
Ventura County, California

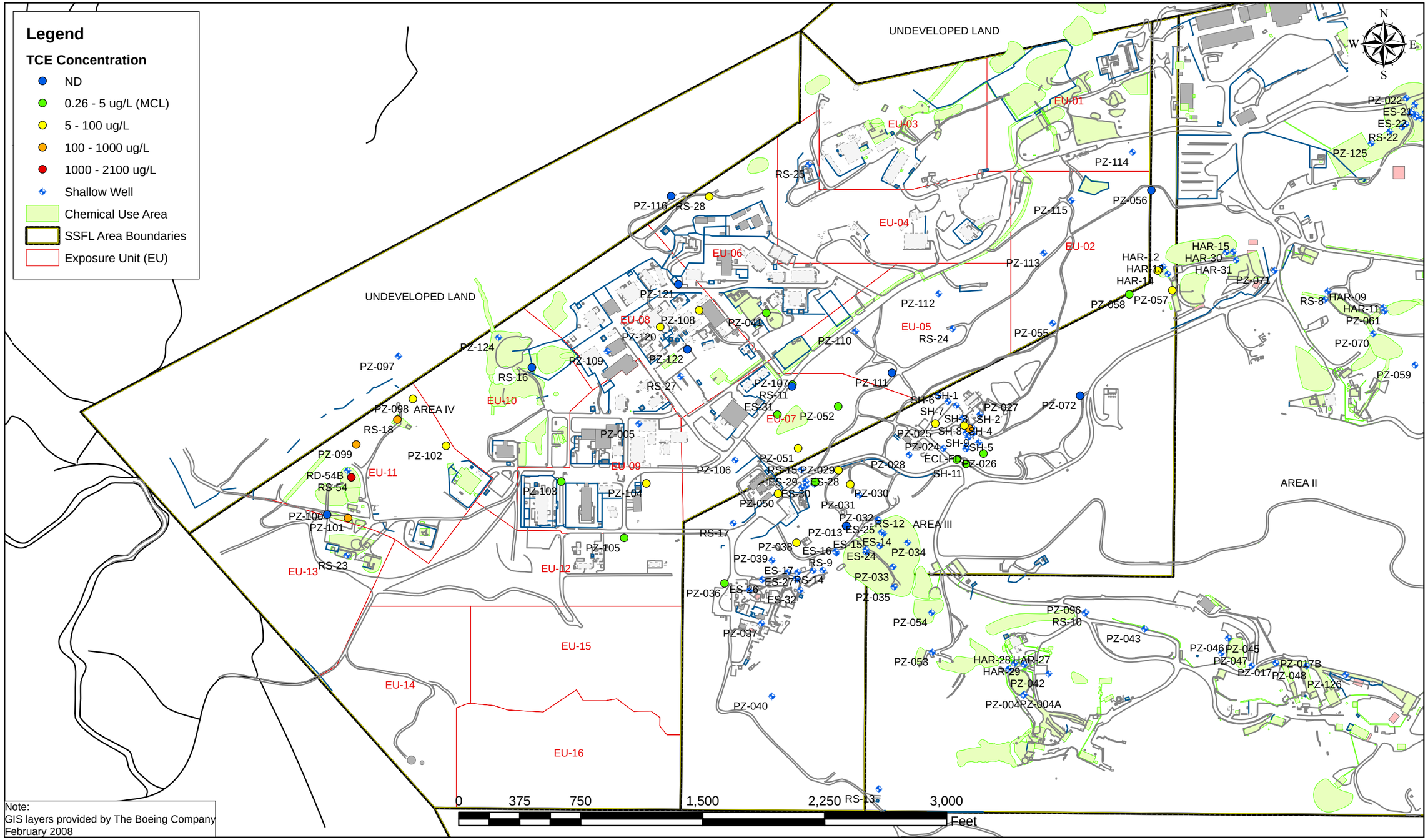
Figure 4-3
Maximum Tritium Concentrations
in Shallow Groundwater
2003-2007




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Santa Susana Field Laboratory Area IV
Ventura County, California

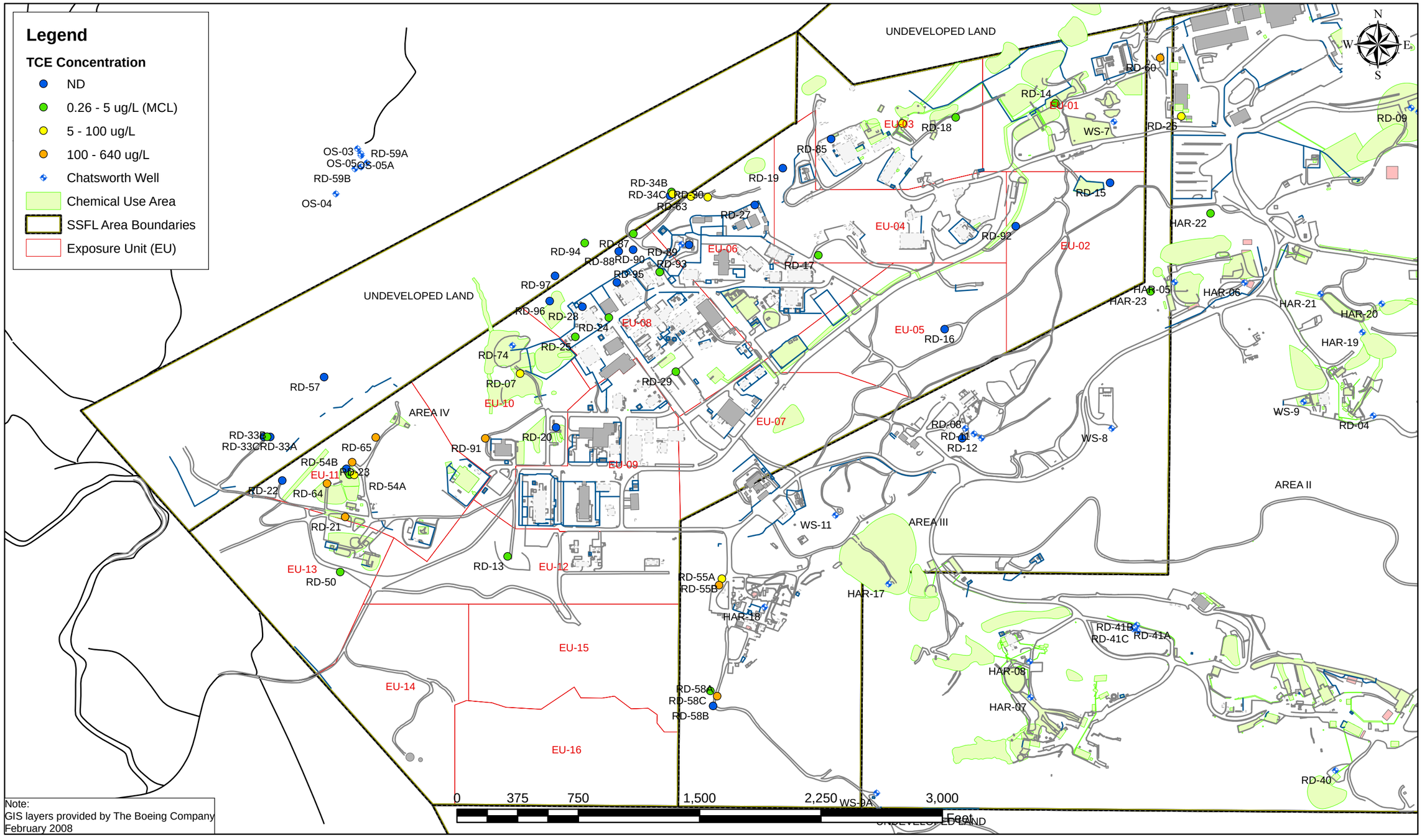
Figure 4-4
Maximum Tritium Concentrations
in Chatsworth Formation
2003-2007




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-5
Maximum TCE Concentrations
in Shallow Groundwater
2003-2007

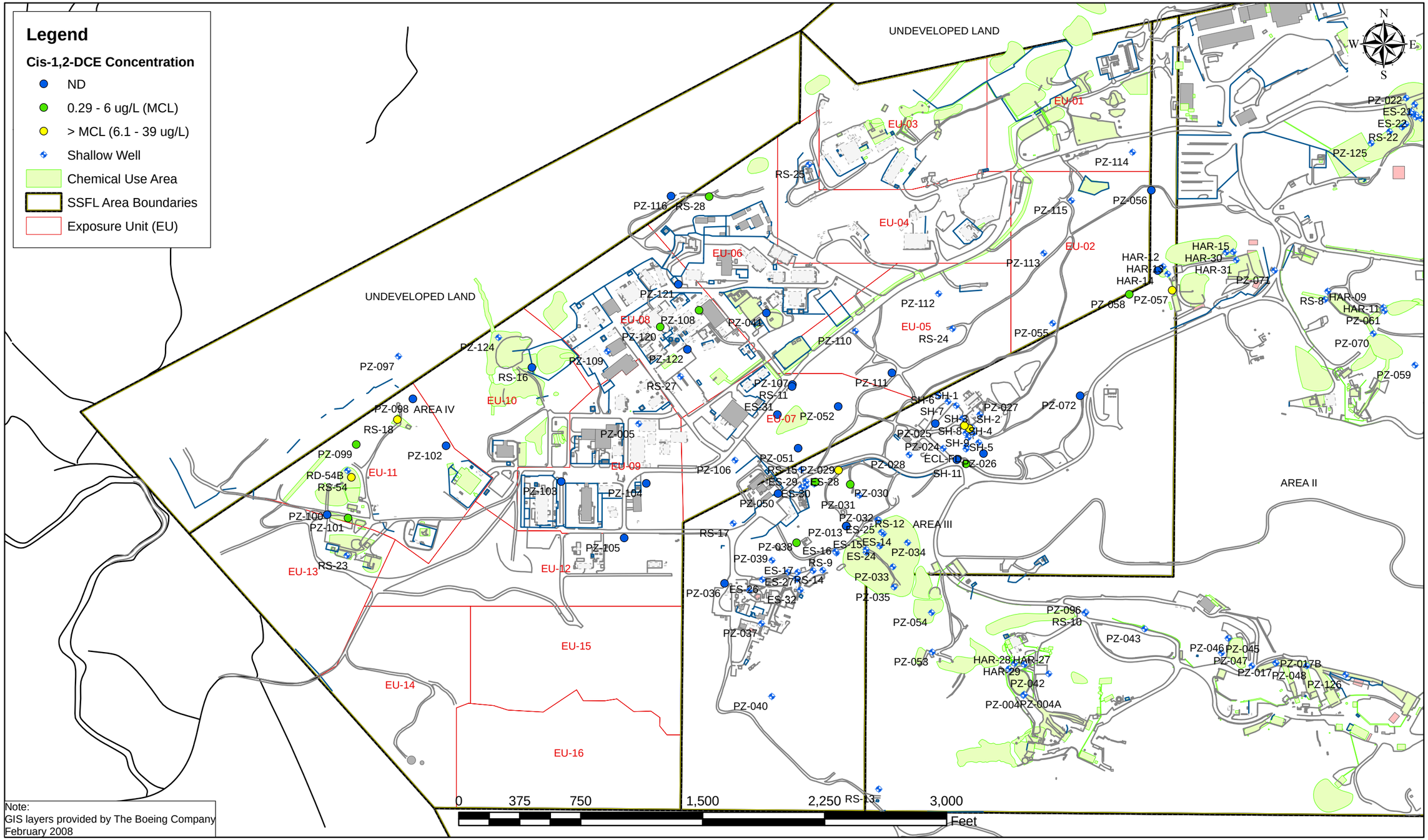



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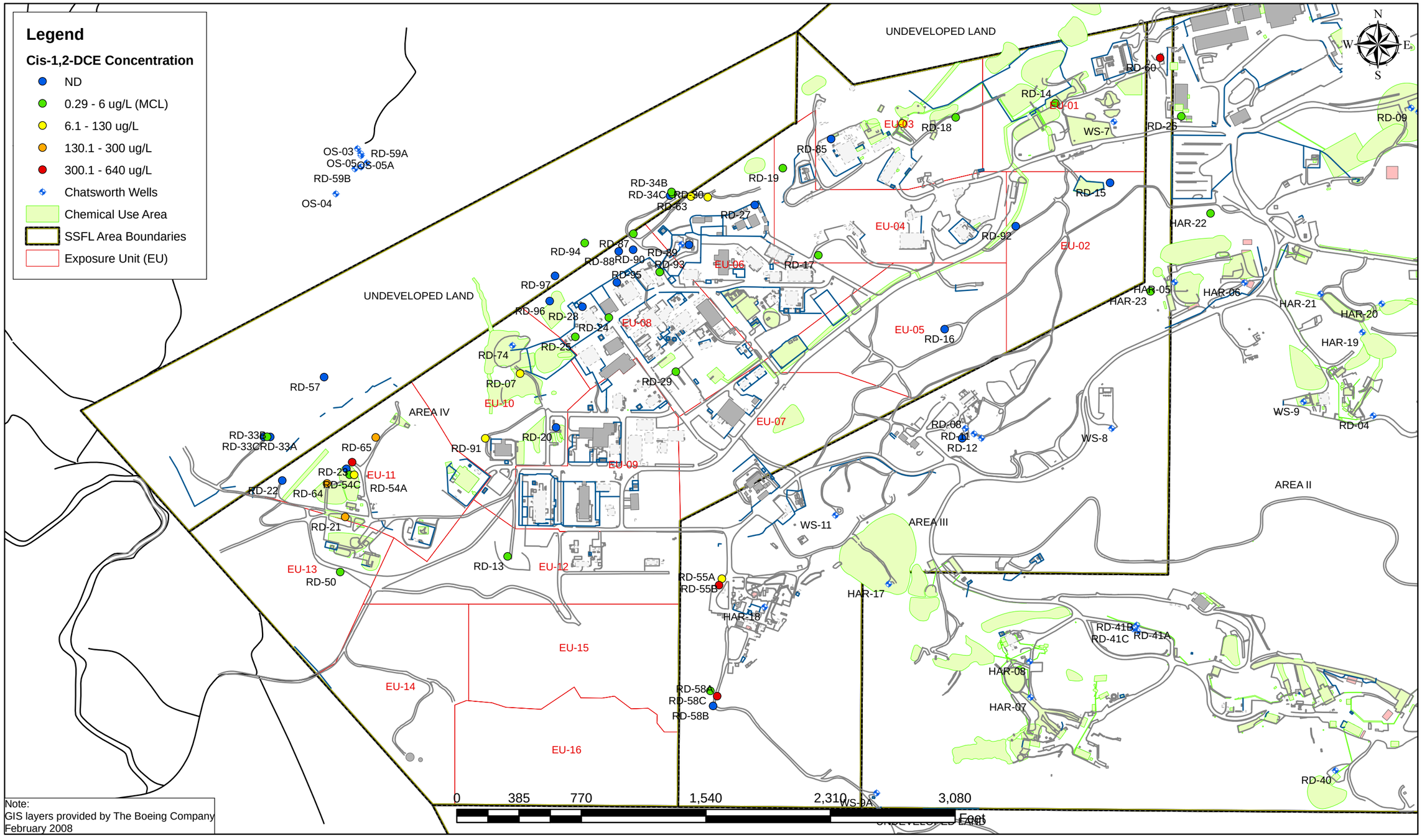
Figure 4-6
Maximum TCE Concentrations
in Chatsworth Formation
2003-2007




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-7
Maximum Cis-1,2-DCE Concentrations
in Shallow Groundwater
2003-2007

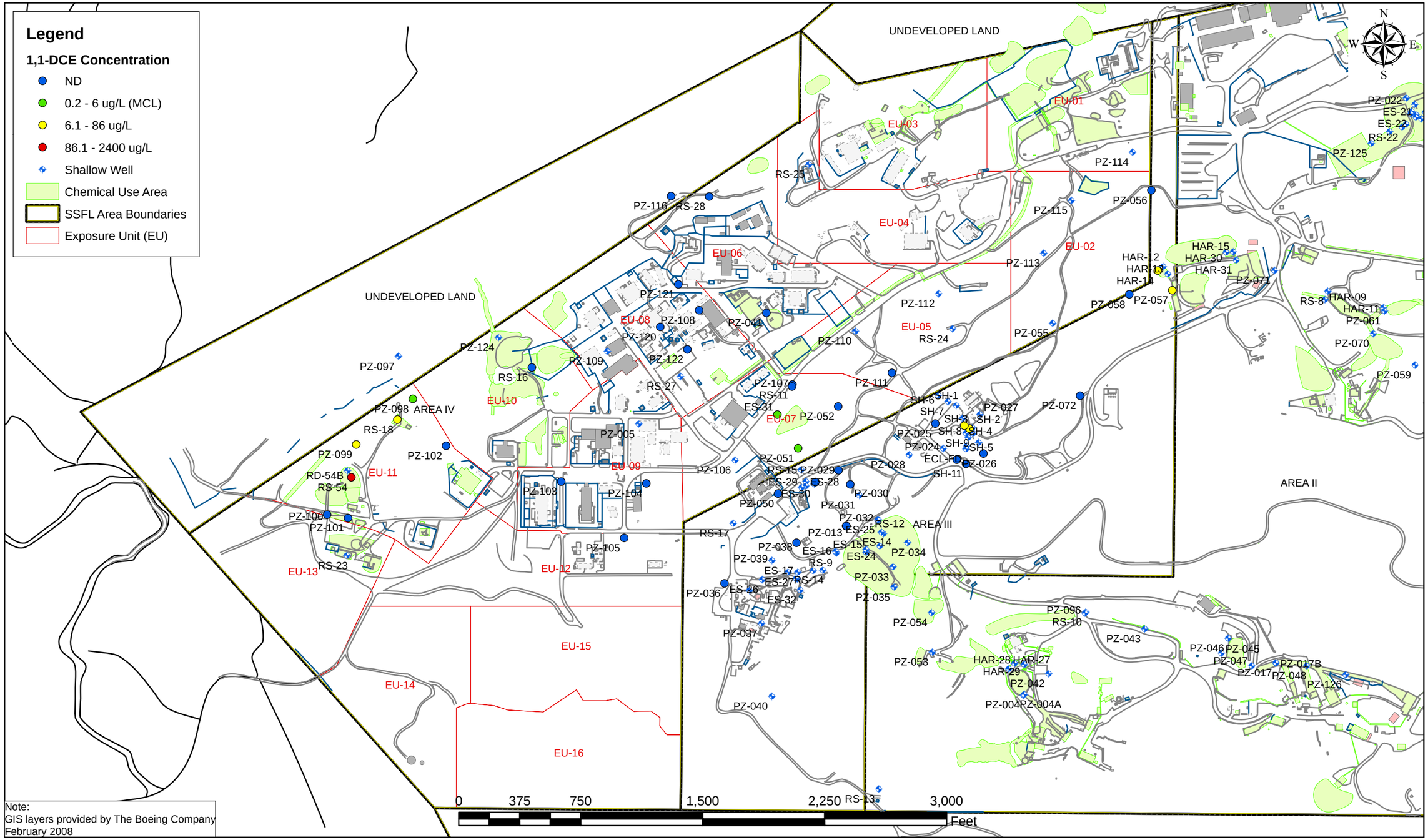



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Ventura County, California

Figure 4-8
Maximum Cis-1,2-DCE Concentrations
in Chatsworth Formation
2003-2007

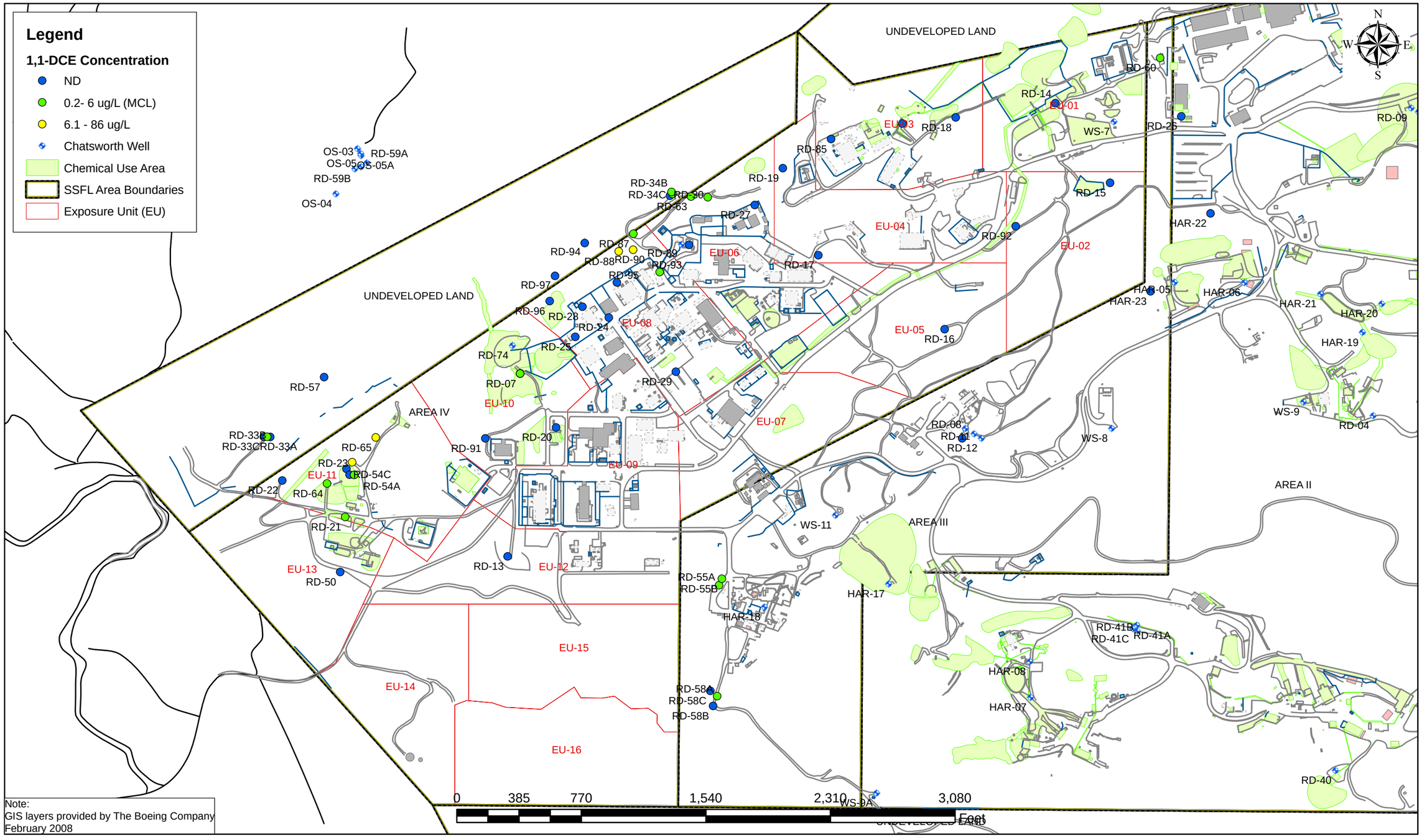



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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-9
Maximum 1,1-DCE Concentrations
in Shallow Groundwater
2003-2007




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-10
Maximum 1,1-DCE Concentrations
in Chatsworth Formation
2003-2007

**Legend**

- Result > DCGL
- Result < DCGL or ND
- Trenches
- Dirt Roads
- Roads
- Exposure Unit (EU)
- SSFL Area Boundaries

**Buildings**

- Existing
- Removed

Notes:
DCGL = Derived Concentration Guideline Level
ND = Not Detected
COI = Contaminant of Interest

UNDEVELOPED LAND
EU-01
EU-03
EU-04
EU-02
EU-06
EU-08
EU-05
EU-10
EU-07
EU-09
EU-11
AREA IV
AREA III
AREA II
EU-13
EU-12
EU-15
EU-14
EU-16
UNDEVELOPED LAND

N W E S

0 250 500 1,000 1,500 2,000 Feet

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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure 4-11**
**Non-Radiological COIs Exceeding DCGL in Soils (0-2 ft bgs)**

**Legend**

- Result > DCGL
- Result < DCGL or ND
- Trenches
- Dirt Roads
- Roads
- Exposure Unit (EU)
- SSFL Area Boundaries

**Buildings**

- Existing
- Removed

Notes:
DCGL = Derived Concentration Guideline Level
ND = Not Detected
COI = Contaminant of Interest

UNDEVELOPED LAND
UNDEVELOPED LAND
AREA IV
AREA III
AREA II
UNDEVELOPED LAND
EU-01
EU-02
EU-03
EU-04
EU-05
EU-06
EU-07
EU-08
EU-09
EU-10
EU-11
EU-12
EU-13
EU-14
EU-15
EU-16

N
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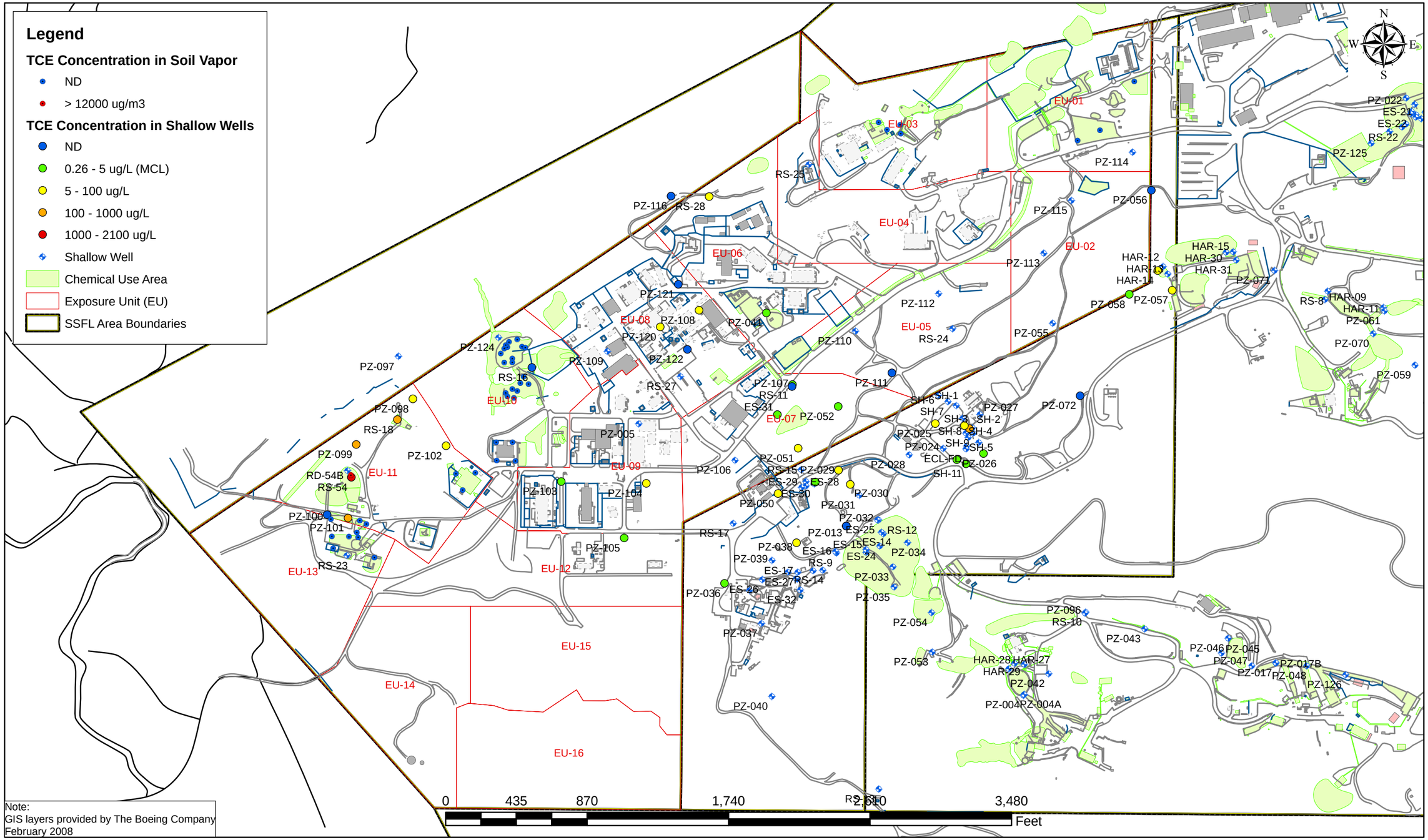
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Ventura County, California

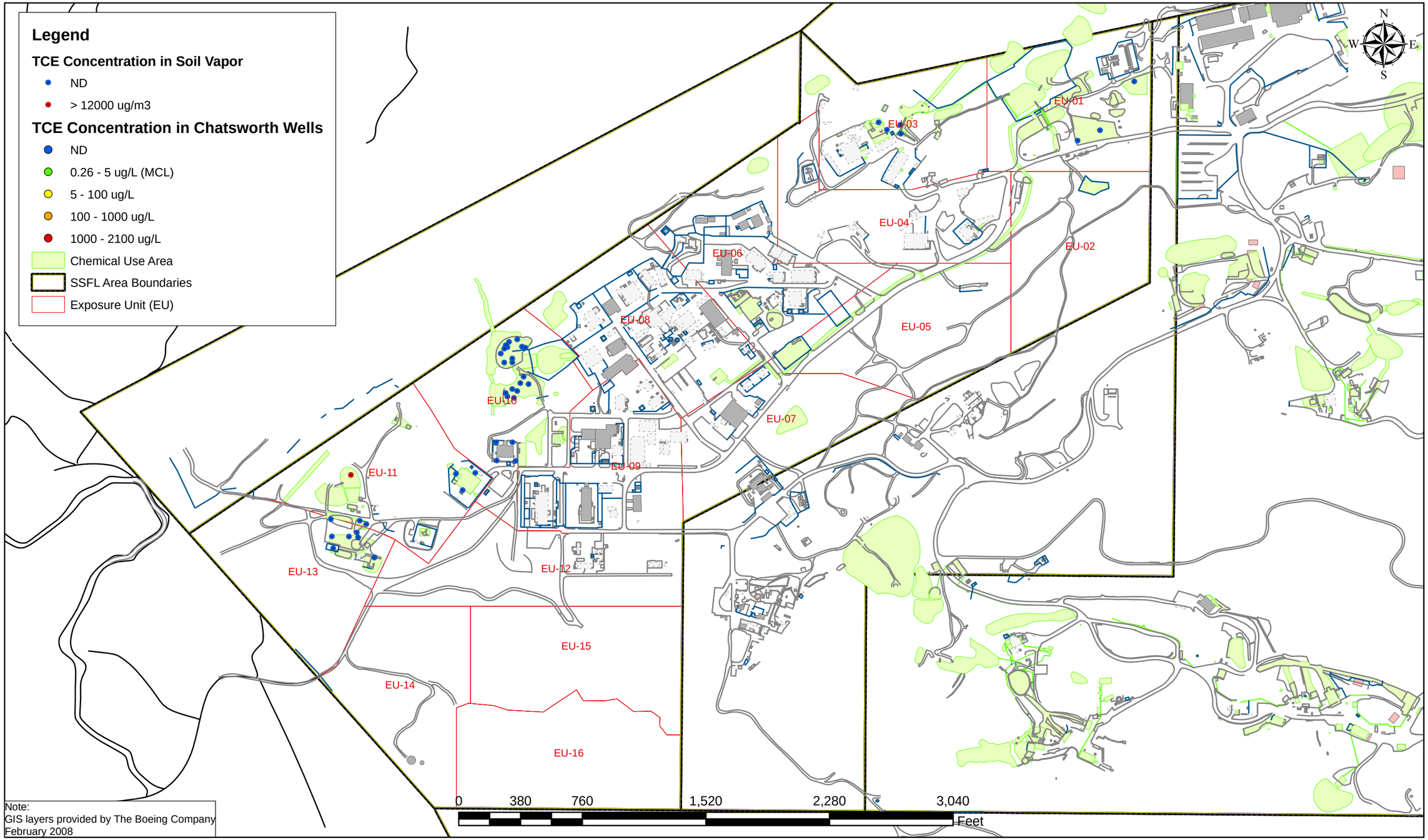
**Figure 4-12**
**Non-Radiological COIs Exceeding DCGL in Soils (2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-13
Maximum TCE Concentrations
in Soil Vapor and Shallow Groundwater
2003-2007




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-14
Maximum TCE Concentrations
in Soil Vapor and Chatsworth Formation Wells
2003-2007

DRAFT - FOR PUBLIC REVIEW AND COMMENT

## Legend

- Proposed Multi-Channel Bedrock Well
- Proposed Shallow Well (First Water Encountered Whether In Unconsolidated Unit Or Rock) With Possible Deep Multi-Channel Bedrock Well
- Existing Shallow Groundwater Well
- Existing Chatsworth Formation Well
- SSFL Area Boundaries

UNDEVELOPED LAND

AREA IV

AREA III

AREA II

DOE1 DOE2 DOE3 DOE4 DOE5 DOE6 DOE7 DOE8 DOE9 DOE10 DOE11 DOE12 DOE13 DOE14

N W E S

0 250 500 Feet

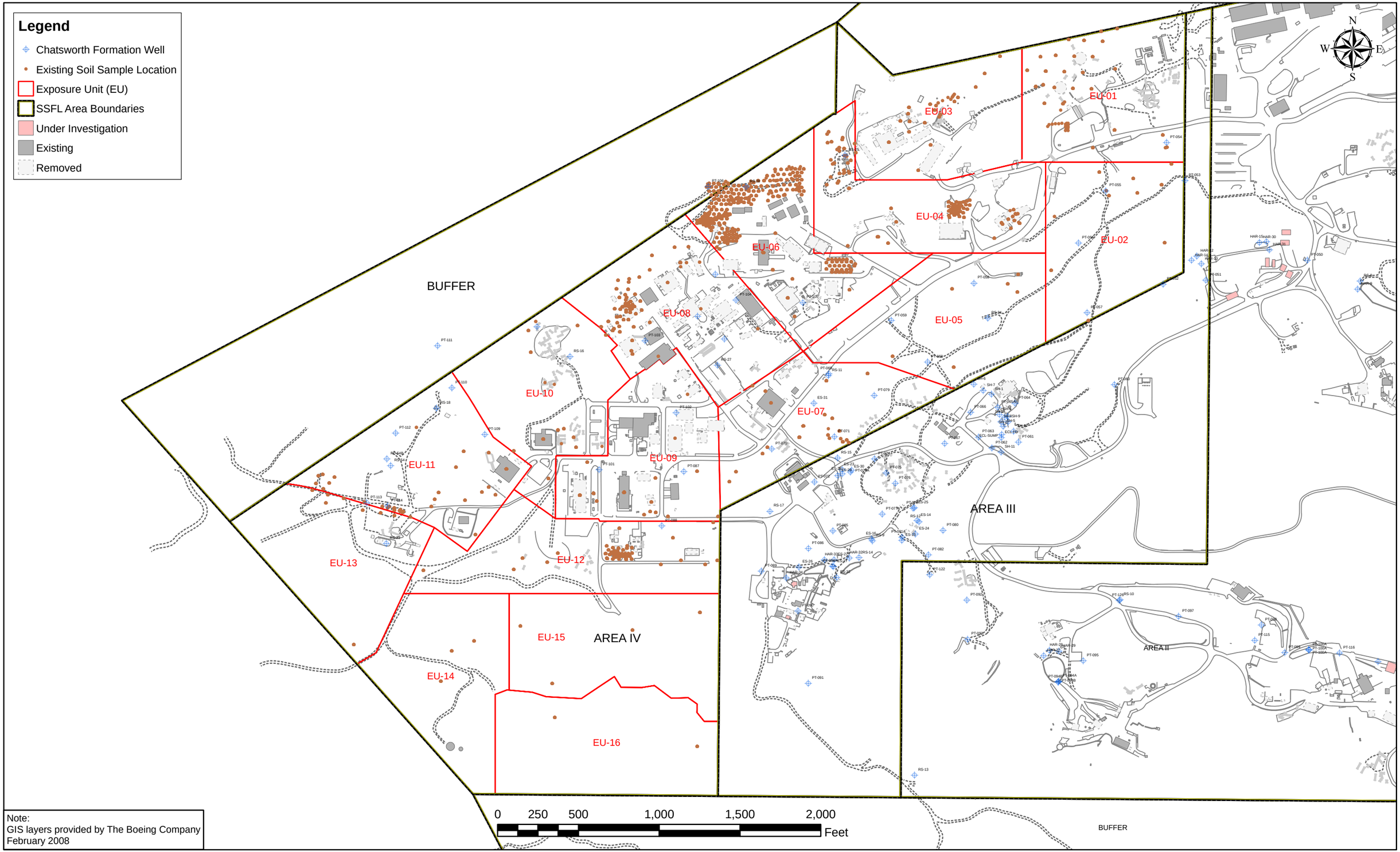
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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure 4-15**
**Proposed Monitoring Well Locations**

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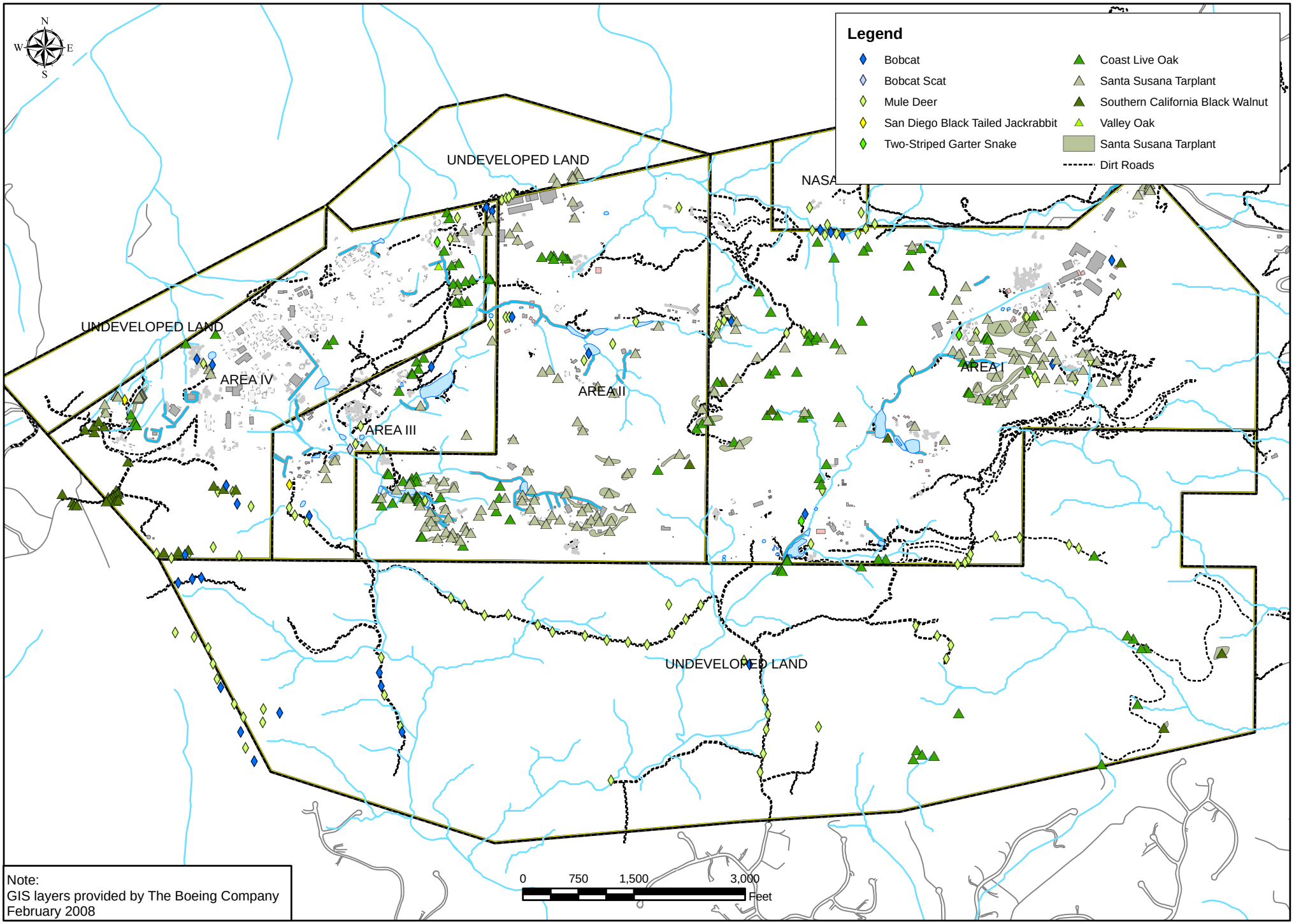



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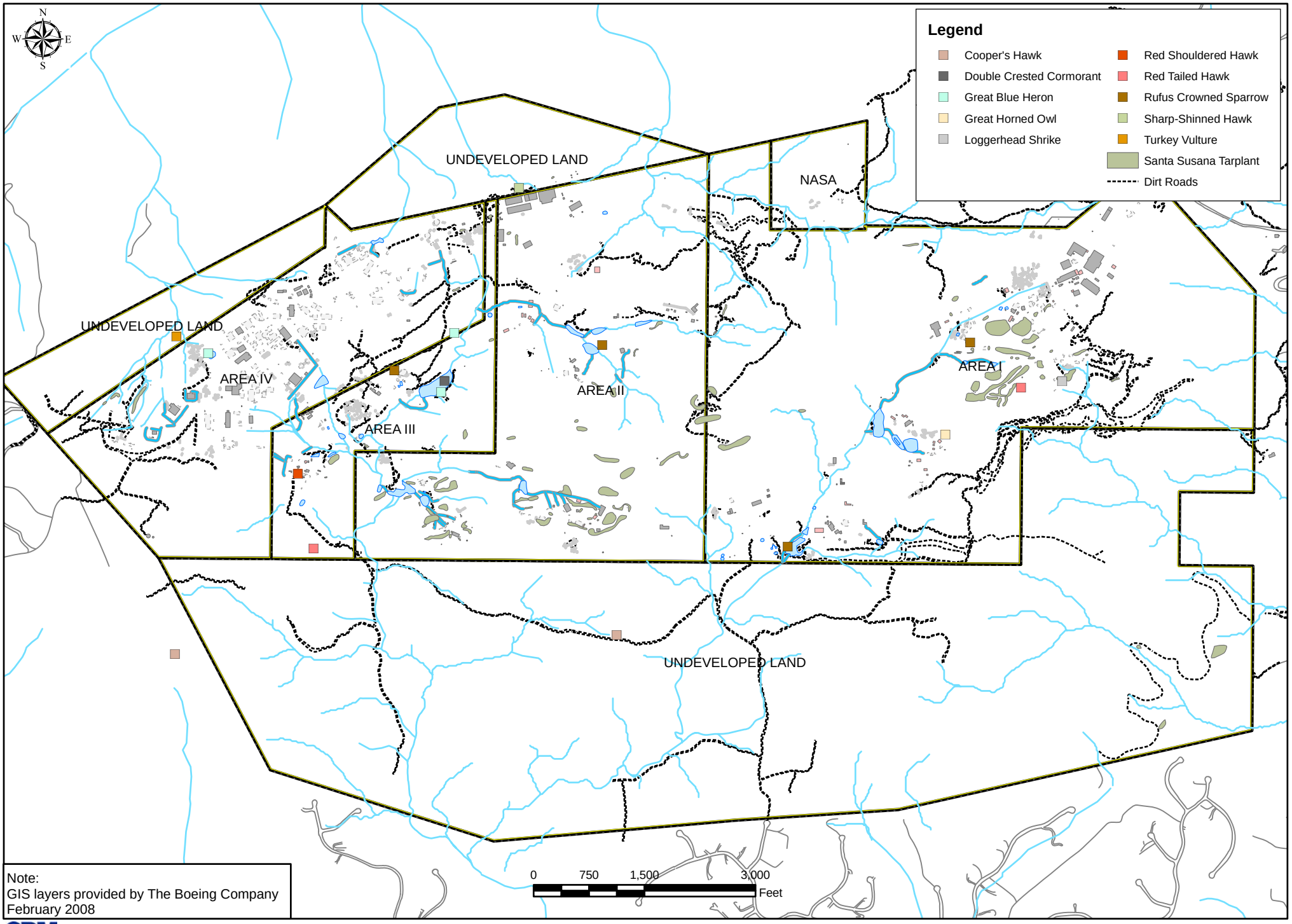
**Figure 4-16**
**Location of Existing Radiological Samples**




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Santa Susana Field Laboratory Area IV
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Figure 4-17
Plant and Ground Animal Observations




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Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 4-18
Avian Observations

**Table 4-1**
**Summary of Chemical Data Gaps for Soil Media**

| Methodology or Approach | Additional Number of Samples Required by Exposure Scenario | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Residential Use | | | | Rural Residential | | | |
| | Surface Soil (0-2 ft.) | Subsurface Soil (2-10 ft.) | Deep Soil (>10 ft.) | Total Number of Samples | Surface Soil (0-2 ft.) | Subsurface Soil (2-10 ft.) | Deep Soil (>10 ft.) | Total Number of Samples |
| **Risk-based** | 223 | 236 | 0 | 459 | 237 | 242 | 0 | 479 |
| **EIS Nature and Extent** | 1,060 | 1,060 | 61 | 2,181 | 1,060 | 1,060 | 61 | 2,181 |

NOTE: Each sample may not be required to be analyzed for each chemical/analyte group.

## Table 4-2
## Radiological Soil Data Gap Summary

| Exposure Scenario | Radiological Sample Requirements as Determined by MARSSIM | Radiological Samples Required for CERCLA Risk Assessment |
|---|---|---|
| Surface | 1981 | 658 |
| Near Surface (0.5 to 2 ft) | 491 | 491 |
| Subsurface (2 to 10 ft) | 151 | 151 |

**Table 4-3**
**Radionuclide Soil Data Gap Summary By Survey Unit**

| EU | SU | SU Acreage | SU Class | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|
| EU-01 | IVEU01RC101 | 3.39 | 1 | 26 |
| EU-01 | IVEU01RC102 | 1.14 | 1 | 9 |
| EU-01 | IVEU01RC201 | 0.53 | 2 | 1 |
| EU-01 | IVEU01RC202 | 0.37 | 2 | 1 |
| EU-01 | IVEU01RC203 | 0.08 | 2 | 1 |
| EU-01 | IVEU01RC204 | 0.17 | 2 | 1 |
| EU-01 | IVEU01RC301 | 13.13 | 3 | 12 |
| EU-02 | IVEU02RC201 | 2.68 | 2 | 5 |
| EU-02 | IVEU02RC301 | 14.96 | 3 | 14 |
| EU-03 | IVEU03RC101 | 3.76 | 1 | 27 |
| EU-03 | IVEU03RC102 | 0.83 | 1 | 7 |
| EU-03 | IVEU03RC201 | 4.48 | 2 | 7 |
| EU-03 | IVEU03RC202 | 0.26 | 2 | 1 |
| EU-03 | IVEU03RC301 | 8.80 | 3 | 8 |
| EU-04 | IVEU04RC101 | 2.53 | 1 | 19 |
| EU-04 | IVEU04RC102 | 0.64 | 1 | 5 |
| EU-04 | IVEU04RC103 | 1.15 | 1 | 9 |
| EU-04 | IVEU04RC104 | 1.98 | 1 | 15 |
| EU-04 | IVEU04RC301 | 11.97 | 3 | 11 |
| EU-05 | IVEU05RC101 | 0.10 | 1 | 1 |
| EU-05 | IVEU05RC102 | 0.92 | 1 | 7 |
| EU-05 | IVEU05RC201 | 0.20 | 2 | 1 |
| EU-05 | IVEU05RC301 | 17.66 | 3 | 16 |
| EU-06 | IVEU06RC101 | 4.99 | 1 | 38 |
| EU-06 | IVEU06RC102 | 3.00 | 1 | 23 |
| EU-06 | IVEU06RC103 | 3.46 | 1 | 26 |
| EU-06 | IVEU06RC104 | 0.77 | 1 | 6 |
| EU-06 | IVEU06RC301 | 5.86 | 3 | 6 |
| EU-07 | IVEU07RC101 | 4.77 | 1 | 36 |
| EU-07 | IVEU07RC201 | 1.24 | 2 | 2 |
| EU-07 | IVEU07RC202 | 3.66 | 2 | 6 |
| EU-07 | IVEU07RC301 | 6.45 | 3 | 6 |
| EU-08 | IVEU08RC101 | 2.54 | 1 | 20 |
| EU-08 | IVEU08RC102 | 1.44 | 1 | 11 |
| EU-08 | IVEU08RC103 | 1.23 | 1 | 10 |
| EU-08 | IVEU08RC301 | 14.64 | 3 | 13 |
| EU-09 | IVEU09RC101 | 5.36 | 1 | 41 |
| EU-09 | IVEU09RC301 | 11.82 | 3 | 11 |
| EU-10 | IVEU10RC101 | 1.30 | 1 | 10 |
| EU-10 | IVEU10RC201 | 3.20 | 2 | 5 |
| EU-10 | IVEU10RC301 | 12.89 | 3 | 12 |
| EU-11 | IVEU11RC101 | 1.97 | 1 | 15 |
| EU-11 | IVEU11RC102 | 0.30 | 1 | 3 |
| EU-11 | IVEU11RC201 | 0.46 | 2 | 1 |
| EU-11 | IVEU11RC202 | 0.51 | 2 | 1 |
| EU-11 | IVEU11RC203 | 0.45 | 2 | 1 |
| EU-11 | IVEU11RC301 | 14.05 | 3 | 13 |
| EU-12 | IVEU12RC101 | 0.38 | 1 | 3 |
| EU-12 | IVEU12RC201 | 3.64 | 2 | 6 |
| EU-12 | IVEU12RC301 | 15.29 | 3 | 14 |

## Table 4-3
## Radionuclide Soil Data Gap Summary By Survey Unit

| EU | SU | SU Acreage | SU Class | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|
| EU-13 | IVEU13RC201 | 1.09 | 2 | 2 |
| EU-13 | IVEU13RC301 | 16.03 | 3 | 15 |
| EU-14 | IVEU14RC301 | 17.08 | 3 | 16 |
| EU-15 | IVEU15RC301 | 18.68 | 3 | 17 |
| EU-16 | IVEU16RC301 | 19.65 | 3 | 18 |
| NA-01 | NEBNA01RC201 | 0.10 | 2 | 1 |
| NA-02 | IIINA02RC201 | 0.68 | 2 | 2 |
| WBNA-01 | WBNA01RC101 | 0.21 | 1 | 2 |

Notes: EU = exposure unit. SU = survey unit.

## Table 4-4
## Gamma Walkover Survey Coverage Summary

| | | | GWS Acreage | | | | |
|---|---|---|---|---|---|---|---|
| EU Name | Unit Designator | Class | Total | % | Planned | Complete | Remaining to Survey |
| EU-01 | EU-01 Rad Class 1-01 | 1 | 3.39 | 100% | 3.39 | 2.84 | 0.55 |
| | EU-01 Rad Class 1-02 | 1 | 1.14 | 100% | 1.14 | 0 | 1.14 |
| | EU-01 Rad Class 2-01 | 2 | 0.53 | 100% | 0.53 | 0.05 | 0.48 |
| | EU-01 Rad Class 2-02 | 2 | 0.37 | 100% | 0.37 | 0 | 0.37 |
| | EU-01 Rad Class 2-03 | 2 | 0.08 | 100% | 0.08 | 0 | 0.08 |
| | EU-01 Rad Class 2-04 | 2 | 0.17 | 100% | 0.17 | 0 | 0.17 |
| | EU-01 Rad Class 3-01 | 3 | 13.13 | 100% | 13.13 | 0.58 | 12.55 |
| | Totals | | 18.82 | 100% | 18.82 | 3.47 | 15.34 |
| EU-02 | EU-02 Rad Class 2-01 | 2 | 2.68 | 100% | 2.68 | 0 | 2.68 |
| | EU-02 Rad Class 3-01 | 3 | 14.96 | 100% | 14.96 | 0 | 14.96 |
| | Totals | | 17.64 | 100% | 17.64 | 0 | 17.64 |
| EU-03 | EU-03 Rad Class 1-01 | 1 | 3.76 | 100% | 3.76 | 0 | 3.76 |
| | EU-03 Rad Class 1-02 | 1 | 0.83 | 100% | 0.83 | 0 | 0.83 |
| | EU-03 Rad Class 2-01 | 2 | 4.48 | 100% | 4.48 | 0 | 4.48 |
| | EU-03 Rad Class 2-02 | 2 | 0.26 | 100% | 0.26 | 0 | 0.26 |
| | EU-03 Rad Class 3-01 | 3 | 8.80 | 100% | 8.80 | 0 | 8.80 |
| | Totals | | 18.12 | 100% | 18.12 | 0.00 | 18.12 |
| EU-04 | EU-04 Rad Class 1-01 | 1 | 2.53 | 100% | 2.53 | 0 | 2.53 |
| | EU-04 Rad Class 1-02 | 1 | 0.64 | 100% | 0.64 | 0.45 | 0.19 |
| | EU-04 Rad Class 1-03 | 1 | 1.15 | 100% | 1.15 | 0 | 1.15 |
| | EU-04 Rad Class 1-04 | 1 | 1.98 | 100% | 1.98 | 0 | 1.98 |
| | EU-04 Rad Class 3-01 | 3 | 11.97 | 100% | 11.97 | 0.14 | 11.83 |
| | Totals | | 18.26 | 100% | 18.26 | 0.59 | 17.67 |
| EU-05 | EU-05 Rad Class 1-01 | 1 | 0.10 | 100% | 0.10 | 0 | 0.10 |
| | EU-05 Rad Class 1-02 | 1 | 0.92 | 100% | 0.92 | 0 | 0.92 |
| | EU-05 Rad Class 2-01 | 2 | 0.20 | 100% | 0.20 | 0 | 0.20 |
| | EU-05 Rad Class 3-01 | 3 | 17.66 | 100% | 17.66 | 0.10 | 17.56 |
| | Totals | | 18.87 | 100% | 18.87 | 0.10 | 18.77 |
| EU-06 | EU-06 Rad Class 1-01 | 1 | 4.99 | 100% | 4.99 | 3.01 | 1.98 |
| | EU-06 Rad Class 1-02 | 1 | 3.00 | 100% | 3.00 | 0 | 3.00 |
| | EU-06 Rad Class 1-03 | 1 | 3.46 | 100% | 3.46 | 0.001 | 3.46 |
| | EU-06 Rad Class 1-04 | 1 | 0.77 | 100% | 0.77 | 0.40 | 0.37 |
| | EU-06 Rad Class 3-01 | 3 | 5.86 | 100% | 5.86 | 0.021 | 5.84 |
| | Totals | | 18.08 | 100% | 18.08 | 3.43 | 14.65 |
| EU-07 | EU-07 Rad Class 1-01 | 1 | 4.77 | 100% | 4.77 | 0.45 | 4.31 |
| | EU-07 Rad Class 2-01 | 2 | 1.24 | 100% | 1.24 | 0 | 1.24 |
| | EU-07 Rad Class 2-02 | 2 | 3.66 | 100% | 3.66 | 0 | 3.66 |
| | EU-07 Rad Class 3-01 | 3 | 6.45 | 100% | 6.45 | 0 | 6.45 |
| | Totals | | 16.12 | 100% | 16.12 | 0.45 | 15.67 |

## Table 4-4
## Gamma Walkover Survey Coverage Summary

| | | | GWS Acreage | | | | |
|---|---|---|---|---|---|---|---|
| EU Name | Unit Designator | Class | Total | % | Planned | Complete | Remaining to Survey |
| EU-08 | EU-08 Rad Class 1-01 | 1 | 2.54 | 100% | 2.54 | 0.005 | 2.53 |
| | EU-08 Rad Class 1-02 | 1 | 1.44 | 100% | 1.44 | 1.12 | 0.32 |
| | EU-08 Rad Class 1-03 | 1 | 1.23 | 100% | 1.23 | 0 | 1.23 |
| | EU-08 Rad Class 3-01 | 3 | 14.64 | 100% | 14.64 | 0 | 14.64 |
| | Totals | | 19.85 | 100% | 19.85 | 1.13 | 18.72 |
| EU-09 | EU-09 Rad Class 1-01 | 1 | 5.36 | 100% | 5.36 | 0.35 | 5.01 |
| | EU-09 Rad Class 3-01 | 3 | 11.82 | 100% | 11.82 | 0 | 11.82 |
| | Totals | | 17.18 | 100% | 17.18 | 0.35 | 16.83 |
| EU-10 | EU-10 Rad Class 1-01 | 1 | 1.30 | 100% | 1.30 | 0 | 1.30 |
| | EU-10 Rad Class 2-01 | 2 | 3.20 | 100% | 3.20 | 0.015 | 3.19 |
| | EU-10 Rad Class 3-01 | 3 | 12.89 | 100% | 12.89 | 0 | 12.89 |
| | Totals | | 17.39 | 100% | 17.39 | 0.015 | 17.38 |
| EU-11 | EU-11 Rad Class 1-01 | 1 | 1.97 | 100% | 1.97 | 0 | 1.97 |
| | EU-11 Rad Class 1-02 | 1 | 0.30 | 100% | 0.30 | 0 | 0.30 |
| | EU-11 Rad Class 2-01 | 2 | 0.46 | 100% | 0.46 | 0 | 0.46 |
| | EU-11 Rad Class 2-02 | 2 | 0.51 | 100% | 0.51 | 0 | 0.51 |
| | EU-11 Rad Class 2-03 | 2 | 0.45 | 100% | 0.45 | 0 | 0.45 |
| | EU-11 Rad Class 3-01 | 3 | 14.05 | 100% | 14.05 | 0 | 14.05 |
| | Totals | | 17.73 | 100% | 17.73 | 0 | 17.73 |
| EU-12 | EU-12 Rad Class 1-01 | 1 | 0.38 | 100% | 0.38 | 0.19 | 0.19 |
| | EU-12 Rad Class 2-01 | 1 | 3.64 | 100% | 3.64 | 0 | 3.64 |
| | EU-12 Rad Class 3-01 | 2 | 15.29 | 100% | 15.29 | 0 | 15.29 |
| | Totals | | 19.30 | 100% | 19.30 | 0.19 | 19.11 |
| EU-13 | EU-13 Rad Class 2-01 | 2 | 1.09 | 100% | 1.09 | 0 | 1.09 |
| | EU-13 Rad Class 3-01 | 3 | 16.03 | 100% | 16.03 | 0 | 16.03 |
| | Totals | | 17.12 | 100% | 17.12 | 0 | 17.12 |
| EU-14 | EU-14 Rad Class 3-01 | 3 | 17.08 | 100% | 17.08 | 0 | 17.08 |
| EU-15 | EU-15 Rad Class 3-01 | 3 | 18.68 | 100% | 18.68 | 0 | 18.68 |
| EU-16 | EU-16 Rad Class 3-01 | 3 | 19.65 | 100% | 19.65 | 0 | 19.65 |
| NA-01 | NA-01 Rad Class 2-01 | 2 | 0.10 | 100% | 0.10 | 0 | 0.10 |
| NA-02 | NA-02 Rad Class 2-01 | 2 | 0.68 | 100% | 0.68 | 0 | 0.68 |
| NA-03 | NA-03 Rad Class 1-01 | 1 | 0.213 | 100% | 0.68 | 0.19 | 0.49 |

**Table 4-5**
**Groundwater Summary and COI Screening Value Comparison**

| Analyte | Analyte Group | Units | Frequency of Detection | | | Maximum Concentration Detected | Sample ID of Maximum Concentration | Well ID of Maximum Concentration | Minimum Concentration Detected | Sample ID of Minimum Concentration | Well ID of Minimum Concentration | MCL (1/10 value) | Frequency of MCL Exceedance | | | PRG (1/10 value) | Frequency of PRG Exceedance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | VOC | ug/L | 373 | / | 2868 | 15000 | 9608544*22-8260 | RS-54 | 0.13 | RD-7 | RD-07 | 20 | 182 | / | 2868 | 173.22033898 | 65 | / | 2868 |
| 1,1,2,2-Tetrachloroethane | VOC | ug/L | 2 | / | 2870 | 1.5 | D1283004-8260B | RD-54A | 0.65 | 9602147*4-8260 | RD-28 | | | / | 2 | 0.005239864 | 2 | / | 2 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | VOC | ug/L | 383 | / | 1799 | 12000 | 1877 | SH-01 | 0.3 | RD-63_082107_01_L | RD-63 | 120 | 163 | / | 383 | 5917.985748 | 8 | / | 383 |
| 1,1,2-Trichloroethane | VOC | ug/L | 17 | / | 2869 | 4.5 | L67005-004-8260B | RS-54 | 0.28 | SH-04 (5/7/1997)-V | SH-04 | 0.5 | 10 | / | 17 | 0.018637778 | 17 | / | 17 |
| 1,1-Dichloroethane | VOC | ug/L | 527 | / | 2868 | 2800 | 9608544*22-8260 | RS-54 | 0.1 | VOC-2530 | RD-55B | 0.05 | 527 | / | 2868 | 0.19446411285 | 526 | / | 2868 |
| 1,1-Dichloroethene | VOC | ug/L | 642 | / | 2869 | 4600 | 9608544*22-8260 | RS-54 | 0.2 | VOC-753 | HAR-26 | 0.6 | 613 | / | 2869 | 13.518518519 | 279 | / | 2869 |
| 1,2,3-Trichloropropane | VOC | ug/L | 23 | / | 193 | 0.04 | RD-60_081505_01_D | RD-60 | 0.0011 | SH-02_090705_01_D | SH-02 | | | / | 23 | 0.000554223 | 23 | / | 23 |
| 1,2,3-Trichloropropene | VOC | ug/L | 1 | / | 1 | 80 | 1995 | SH-04 | 80 | 1995 | SH-04 | | | / | 1 | 0.217693837 | 1 | / | 1 |
| 1,2-Dibromo-3-chloropropane | VOC | ug/L | 1 | / | 214 | 0.0032 | SH-04_041205_01_D | SH-04 | 0.0032 | SH-04_041205_01_D | SH-04 | 0.02 | | / | 1 | 0.000158349 | 1 | / | 1 |
| 1,2-Dichloroethane | VOC | ug/L | 455 | / | 2869 | 250000 | VOC-3080 | SH-04 | 0.25 | SH-11 | SH-11 | | | / | 455 | 0.016329905 | 455 | / | 455 |
| 1,2-Dichloroethene | VOC | ug/L | 14 | / | 68 | 76 | PF005 | PZ-006E | 1 | PF313 | PZ-120 | | | / | 68 | | | / | 68 |
| 1,2-Dichloropropane | VOC | ug/L | 1 | / | 2815 | 2.3 | RD-60_030107_01_T | RD-60 | 2.3 | RD-60_030107_01_T | RD-60 | 0.5 | 1 | / | 1 | 0.030790151 | 1 | / | 1 |
| 1,4-Dichlorobenzene | VOC | ug/L | 7 | / | 2708 | 2 | VOC-2493 | RD-54A | 0.12 | RD-67_110702_01 | RD-67 | 0.5 | 3 | / | 7 | 0.032320432 | 7 | / | 7 |
| Acetone | VOC | ug/L | 128 | / | 2024 | 36000 | RD-55A_110702_03 | RD-55A | 1 | VOC-1593 | RD-08 | | | / | 2024 | 547.5 | 6 | / | 2024 |
| Acrylonitrile | VOC | ug/L | 1 | / | 727 | 42 | 9708476*8-8260A | RD-64 | 42 | 9708476*8-8260A | RD-64 | | | / | 1 | 0.001108445 | 1 | / | 1 |
| Benzene | VOC | ug/L | 105 | / | 2328 | 15 | VOC-3140 | SH-07 | 0.18 | RD-56B_082902_01 | RD-56B | 0.1 | 105 | / | 2328 | 0.01108445443 | 105 | / | 2328 |
| Bromodichloromethane | VOC | ug/L | 16 | / | 2866 | 170 | VOC-3078 | SH-03 | 0.31 | SSFL-RD54A-P7 | RD-54A | | | / | 16 | 0.008526503 | 16 | / | 16 |
| Bromoform | VOC | ug/L | 1 | / | 2869 | 41 | VOC-3078 | SH-03 | 41 | VOC-3078 | SH-03 | | | / | 1 | 0.85103208 | 1 | / | 1 |
| Bromomethane | VOC | ug/L | 3 | / | 2867 | 4 | VOC-1619 | RD-08 | 0.7 | L84516-002 | SH-04 | | | / | 3 | 0.866101695 | 2 | / | 3 |
| Carbon Tetrachloride | VOC | ug/L | 299 | / | 2869 | 29000 | VOC-3088 | SH-04 | 0.1 | VOC-2587 | RD-63 | 0.05 | 299 | / | 299 | 0.007389636 | 299 | / | 299 |
| Chloroethane | VOC | ug/L | 6 | / | 2867 | 6 | 9505346*2-8010 | RD-21 | 0.1 | VOC-2587 | RD-63 | | | / | 6 | 0.382222567 | 4 | / | 6 |
| Chloroform | VOC | ug/L | 431 | / | 2869 | 71000 | VOC-3083 | SH-04 | 0.1 | VOC-2587 | RD-63 | | | / | 431 | 0.052837367 | 431 | / | 431 |
| cis-1,2-Dichloroethene | VOC | ug/L | 901 | / | 2524 | 810 | RD-55A_110702_02 | RD-55A | 0.13 | RD-67_110702_01 | RD-67 | 0.6 | 801 | / | 2524 | 6.0833333333 | 450 | / | 2524 |
| Dibromochloromethane | VOC | ug/L | 12 | / | 2812 | 190 | VOC-3078 | SH-03 | 0.28 | SSFL-RD7-P9 | RD-07 | | | / | 12 | 0.011791973 | 12 | / | 12 |
| Ethylbenzene | VOC | ug/L | 13 | / | 2332 | 43 | VOC-3025 | RS-54 | 0.14 | 9611501*1-8260 | RD-16 | 30 | 4 | / | 2332 | 0.12208623637 | 13 | / | 2332 |
| Methyl ethyl ketone | VOC | ug/L | 27 | / | 1991 | 1300 | PF043 | PZ-013F | 2 | RD-58B_081202_03 | RD-58B | | | / | 1991 | 696.81818182 | 1 | / | 1991 |
| Methylene chloride | VOC | ug/L | 235 | / | 2871 | 440000 | VOC-3080 | SH-04 | 0.086 | HAR-14_050702_01 | HAR-14 | 0.5 | 204 | / | 2871 | 0.21189392532 | 234 | / | 2871 |
| m-Xylene | VOC | ug/L | 3 | / | 42 | 60 | 1975 | SH-04 | 4 | 1968 | SH-04 | | | / | 3 | 20.57337221 | 2 | / | 3 |
| m-Xylene & p-Xylene | VOC | ug/L | 10 | / | 1492 | 250 | 1961 | SH-04 | 0.21 | RD-58C_111902_01 | RD-58C | | | / | 1492 | | | / | 1492 |
| o-Xylene | VOC | ug/L | 8 | / | 1488 | 110 | 1762 | RS-54 | 0.1 | RD-67_110702_01 | RD-67 | | | / | 8 | 20.57337221 | 3 | / | 8 |
| Tetrachloroethene | VOC | ug/L | 369 | / | 2868 | 2100 | VOC-3080 | SH-04 | 0.1 | VOC-2587 | RD-63 | 0.5 | 339 | / | 2868 | 0.01040134961 | 369 | / | 2868 |
| Tetrahydrofuran | VOC | ug/L | 3 | / | 3 | 10 | 2729 | HAR-12 | 6 | 2736 | HAR-13 | | | / | 3 | 0.159905091 | 3 | / | 3 |
| Toluene | VOC | ug/L | 187 | / | 2332 | 1900 | VOC-3080 | SH-04 | 0.1 | RD-67_081707_01_L | RD-67 | 15 | 56 | / | 2332 | 57.631578947 | 35 | / | 2332 |
| trans-1,2-Dichloroethene | VOC | ug/L | 271 | / | 2863 | 410 | VOC-3182 | SH-09 | 0.1 | VOC-2587 | RD-63 | 1 | 190 | / | 271 | 12.16666667 | 102 | / | 271 |
| Trichloroethene | VOC | ug/L | 1594 | / | 2866 | 5000 | VOC-3079 | SH-04 | 0.1 | VOC-1791 | RD-16 | 0.5 | 1493 | / | 2866 | 0.13874264949 | 1593 | / | 2866 |
| Trichlorofluoromethane | VOC | ug/L | 19 | / | 2370 | 560 | 2108 | SH-07 | 0.37 | RD-58A_081506_01_T | RD-58A | 15 | 6 | / | 19 | 128.8235294 | 1 | / | 19 |
| Vinyl chloride | VOC | ug/L | 151 | / | 2866 | 3900 | VOC-3080 | SH-04 | 0.1 | VOC-2530 | RD-55B | 0.05 | 151 | / | 2866 | 0.00410535349 | 151 | / | 2866 |
| Xylenes, Total | VOC | ug/L | 11 | / | 691 | 3900 | 1727 | RS-54 | 0.59 | SH-04 (5/7/1997)-V | SH-04 | 175 | 5 | / | 691 | 121.66666667 | 5 | / | 691 |
| 1,2,4-Trichlorobenzene | SVOC | ug/L | 2 | / | 344 | 1.2 | SSFL-RD65-P6 | RD-65 | 1.2 | SSFL-RD65-P6 | RD-65 | 0.5 | 2 | / | 2 | 0.715686275 | 2 | / | 2 |
| 1,3,5-Trimethylbenzene | SVOC | ug/L | 1 | / | 170 | 2 | PF201 | PZ-122 | 2 | PF201 | PZ-122 | | | / | 1 | 1.232618196 | 1 | / | 1 |
| 1,4-Dioxane | SVOC | ug/L | 95 | / | 691 | 600 | HAR-14 (6/8/1993) | HAR-14 | 0.3 | SSFL-RD7-P9 | RD-07 | | | / | 95 | 0.249005683 | 95 | / | 95 |
| 2,4,6-Trichlorophenol | SVOC | ug/L | 3 | / | 260 | 1.7 | L69101-010 | SH-04 | 0.7 | SH-04 (2/8/1999)-C | SH-04 | | | / | 3 | 0.096045049 | 3 | / | 3 |
| 2-Chlorophenol | SVOC | ug/L | 1 | / | 262 | 10 | ACID-281 | WS-11 | 10 | ACID-281 | WS-11 | | | / | 1 | 3.041666667 | 1 | / | 1 |
| 2-Methylnaphthalene | SVOC | ug/L | | / | 63 | | | | | | | | | / | 63 | | | / | 63 |
| 4,6-Dinitro-o-cresol | SVOC | ug/L | 1 | / | 260 | 5 | RD-58B_051606_01_D | RD-58B | 5 | RD-58B_051606_01_D | RD-58B | | | / | 1 | 0.365 | 1 | / | 1 |
| Acenaphthene | SVOC | ug/L | | / | 275 | | | | | | | | | / | 275 | 36.5 | | / | 275 |
| Anthracene | SVOC | ug/L | | / | 273 | | | | | | | | | / | 273 | 182.5 | | / | 273 |
| Benzo(a)anthracene | SVOC | ug/L | | / | 275 | | | | | | | | | / | 275 | 0.00560262786 | | / | 275 |
| Benzo(a)pyrene | SVOC | ug/L | | / | 275 | | | | | | | 0.02 | | / | 275 | 0.00056026278 | | / | 275 |
| Benzo(b)fluoranthene | SVOC | ug/L | | / | 256 | | | | | | | | | / | 256 | 0.00560262786 | | / | 256 |
| Benzo(k)fluoranthene | SVOC | ug/L | 1 | / | 263 | 0.07 | PF229 | PZ-122 | 0.07 | PF229 | PZ-122 | | | / | 263 | 0.00560262786 | 1 | / | 263 |
| bis(2-Chloroethyl) ether | SVOC | ug/L | 12 | / | 266 | 540 | 2656 | RD-60 | 1 | BASE-295 | HAR-26 | | | / | 12 | 0.000443378 | 12 | / | 12 |
| bis(2-Ethylhexyl) phthalate | SVOC | ug/L | 28 | / | 269 | 390 | BASE-3 | SH-02 | 0.34 | HAR-14_050807_01_T | HAR-14 | 0.4 | 27 | / | 269 | 2.2410511451 | 23 | / | 269 |
| Chrysene | SVOC | ug/L | | / | 275 | | | | | | | | | / | 275 | 0.02117193935 | | / | 275 |
| Dibenzo(a,h)anthracene | SVOC | ug/L | | / | 275 | | | | | | | | | / | 275 | 0.00163979352 | | / | 275 |
| Diethyl phthalate | SVOC | ug/L | 9 | / | 269 | 5 | G94-11-178-24 | RD-13 | 0.06 | PF232 | PZ-099 | | | / | 269 | 2920 | | / | 269 |
| Di-n-butyl phthalate | SVOC | ug/L | 19 | / | 267 | 36 | BASE-28 | SH-05 | 0.1 | PF232 | PZ-099 | | | / | 267 | 365 | | / | 267 |
| Fluoranthene | SVOC | ug/L | | / | 275 | | | | | | | | | / | 275 | 146 | | / | 275 |

**Table 4-5**
**Groundwater Summary and COI Screening Value Comparison**

| Analyte | Analyte Group | Units | Frequency of Detection | | | Maximum Concentration Detected | Sample ID of Maximum Concentration | Well ID of Maximum Concentration | Minimum Concentration Detected | Sample ID of Minimum Concentration | Well ID of Minimum Concentration | MCL (1/10 value) | Frequency of MCL Exceedance | | | PRG (1/10 value) | Frequency of PRG Exceedance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluorene | SVOC | ug/L | | / | 275 | | | | | | | | | / | 275 | 24.333333333 | | / | 275 |
| Indeno(1,2,3-cd)pyrene | SVOC | ug/L | | / | 267 | | | | | | | | | / | 267 | 0.00560262786 | | / | 267 |
| Kepone | SVOC | ug/L | 1 | / | 32 | 0.11 | L84362-001 | HAR-14 | 0.11 | L84362-001 | HAR-14 | | | / | 1 | 0.000420197 | 1 | / | 1 |
| Naphthalene | SVOC | ug/L | 11 | / | 363 | 16 | PF001 | PZ-006A | 0.06 | PF096 | PZ-037 | | | / | 363 | 0.00923704536 | 11 | / | 363 |
| Nitrobenzene | SVOC | ug/L | 25 | / | 258 | 380 | BASE-14 | SH-04 | 2.6 | BASE-39 | SH-08 | | | / | 25 | 0.339534884 | 25 | / | 25 |
| Pentachlorophenol | SVOC | ug/L | 2 | / | 276 | 3 | 9502312*42 | RD-13 | 2 | L9902185-009 | RD-13 | 0.1 | 2 | / | 2 | 0.083001894 | 2 | / | 2 |
| Pyrene | SVOC | ug/L | | / | 212 | | | | | | | | | / | 212 | 18.25 | | / | 212 |
| Aldrin | Pesticides | ug/L | 1 | / | 32 | 0.37 | SH-04 (2/8/1999)-A | SH-04 | 0.37 | SH-04 (2/8/1999)-A | SH-04 | | | / | 1 | 0.00039548 | 1 | / | 1 |
| Aroclor 1242 | PCBs | ug/L | | / | 34 | | | | | | | | | / | 34 | | | / | 34 |
| Aroclor 1248 | PCBs | ug/L | | / | 34 | | | | | | | | | / | 34 | | | / | 34 |
| Aroclor 1254 | PCBs | ug/L | | / | 34 | | | | | | | | | / | 34 | 0.00336157671 | | / | 34 |
| Aroclor 1260 | PCBs | ug/L | | / | 34 | | | | | | | | | / | 34 | | | / | 34 |
| Aluminum, Dissolved | Inorganic | ug/L | | / | 11 | | | | | | | 100 | | / | 11 | 3650 | | / | 11 |
| Aluminum, Total | Inorganic | ug/L | 12 | / | 28 | 4400 | RD-55A_021207_01H_T | RD-55A | 115 | PF084 | PZ-041 | 100 | 12 | / | 28 | 3650 | 1 | / | 28 |
| Antimony | Inorganic | ug/L | 12 | / | 35 | 16 | PF229 | PZ-122 | 0.04 | HAR-14 (2/9/1999)-A | HAR-14 | 0.6 | 1 | / | 35 | 1.46 | 1 | / | 35 |
| Antimony, Dissolved | Inorganic | ug/L | 65 | / | 272 | 5.4 | RS-18_050203_01 | RS-18 | 0.051 | RD-54C_021207_01_T | RD-54C | 0.6 | 23 | / | 272 | 1.46 | 12 | / | 272 |
| Arsenic | Inorganic | ug/L | 11 | / | 35 | 8.9 | PF143 | PZ-056 | 0.72 | RD-34A_081507_01_TOT_T | RD-34A | 1 | 4 | / | 35 | 0.000711444800 | 11 | / | 35 |
| Arsenic, Dissolved | Inorganic | ug/L | 63 | / | 409 | 19 | L69251-008 | RS-18 | 0.27 | RD-34C | RD-34C | 1 | 31 | / | 409 | 0.000711445 | 63 | / | 409 |
| Barium | Inorganic | ug/L | 31 | / | 35 | 130 | RD-55A_021207_01H_T | RD-55A | 8.4 | PF182 | PZ-114 | 100 | 1 | / | 35 | 255.5 | | / | 35 |
| Barium, Dissolved | Inorganic | ug/L | 375 | / | 410 | 340 | SH-04_041403_01 | SH-04 | 5.9 | Trace-193 | RD-54C | 100 | 27 | / | 410 | 255.5 | 4 | / | 410 |
| Beryllium | Inorganic | ug/L | 4 | / | 37 | 0.5 | SH-04 (2/8/1999)-A | SH-04 | 0.01 | HAR-14 (2/9/1999)-A | HAR-14 | 0.4 | 2 | / | 37 | 7.3 | | / | 37 |
| Beryllium, Dissolved | Inorganic | ug/L | 11 | / | 286 | 1.8 | 9708553*7 | RD-57 | 0.042 | RD-34B_021505_01_D | RD-34B | 0.4 | 1 | / | 286 | 7.3 | | / | 286 |
| Boron | Inorganic | ug/L | 22 | / | 26 | 1840 | PF227 | PZ-120 | 0 | WS-11 (9/6/1956) | WS-11 | | | / | 26 | 730 | 2 | / | 26 |
| Boron, Dissolved | Inorganic | ug/L | 45 | / | 77 | 580 | RS-54_021507_01_T | RS-54 | 20 | COMMON-83 | RD-34C | | | / | 77 | 730 | | / | 77 |
| Cadmium | Inorganic | ug/L | 13 | / | 39 | 2.5 | RS-54_052407_01_TOT_T | RS-54 | 0.06 | HAR-14 (2/9/1999)-A | HAR-14 | 0.5 | 6 | / | 39 | 1.825 | 3 | / | 39 |
| Cadmium, Dissolved | Inorganic | ug/L | 62 | / | 409 | 6.1 | Trace-31 | RS-54 | 0.015 | RD-54C_110504_01_D | RD-54C | 0.5 | 25 | / | 409 | 1.825 | 16 | / | 409 |
| Chromium | Inorganic | ug/L | 23 | / | 35 | 85 | RD-55A_021207_01H_T | RD-55A | 0.73 | PF179 | PZ-104 | 5 | 4 | / | 35 | | | / | 35 |
| Chromium, Dissolved | Inorganic | ug/L | 80 | / | 412 | 88 | Trace-81 | RD-21 | 0.23 | RD-54B_082102_01 | RD-54B | 5 | 34 | / | 412 | | | / | 412 |
| Cobalt | Inorganic | ug/L | 20 | / | 35 | 170 | RS-54_021507_01H_T | RS-54 | 0.18 | RD-55A_081407_01_TOT_T | RD-55A | | | / | 35 | 73 | 2 | / | 35 |
| Cobalt, Dissolved | Inorganic | ug/L | 129 | / | 149 | 230 | RS-54_090605_01_D | RS-54 | 0.058 | RD-08_112002_01 | RD-08 | | | / | 149 | 73 | 6 | / | 149 |
| Copper | Inorganic | ug/L | 25 | / | 35 | 250 | RD-60_030107_01H_T | RD-60 | 0.7 | HAR-14 (2/9/1999)-A | HAR-14 | 130 | 1 | / | 35 | 146 | 1 | / | 35 |
| Copper, Dissolved | Inorganic | ug/L | 148 | / | 275 | 150 | RD-60_052406_01_D | RD-60 | 0.19 | L81117-004 | RD-33C | 130 | 1 | / | 275 | 146 | 1 | / | 275 |
| Cyanides | Inorganic | ug/L | 10 | / | 195 | 360 | L9802582-001 | RS-54 | 4.2 | RD-58C_111902_01 | RD-58C | 15 | 6 | / | 10 | 73 | 1 | / | 10 |
| Iron | Inorganic | ug/L | 55 | / | 110 | 27000 | RD-55A_021207_01H_T | RD-55A | 20 | Trace-131 | RD-34B | | | / | 55 | 1095 | 10 | / | 55 |
| Iron, Dissolved | Inorganic | ug/L | 100 | / | 136 | 5100 | RD-60_052406_01_D | RD-60 | 3.9 | L81065-003 | RD-15 | | | / | 100 | 1095 | 26 | / | 100 |
| Lead | Inorganic | ug/L | 25 | / | 39 | 18 | RD-60_030107_01H_T | RD-60 | 0.073 | HAR-14_050806_01_D | HAR-14 | 1.5 | 15 | / | 39 | | | / | 39 |
| Lead, Dissolved | Inorganic | ug/L | 215 | / | 415 | 120 | 9608399*11 | RD-56A | 0.04 | RD-92_031606_01_D | RD-92 | 1.5 | 141 | / | 415 | | | / | 415 |
| Manganese | Inorganic | ug/L | 29 | / | 30 | 3100 | RD-55A_021207_01H_T | RD-55A | 4.1 | RD-34A_022807_01H_T | RD-34A | | | / | 30 | 87.6 | 8 | / | 30 |
| Manganese, Dissolved | Inorganic | ug/L | 194 | / | 214 | 18400 | Trace-1 | SH-04 | 0.13 | L69251-008 | RS-18 | | | / | 214 | 87.6 | 51 | / | 214 |
| Mercury | Inorganic | ug/L | 3 | / | 38 | 0.43 | SH-04 (5/6/2000)-B | SH-04 | 0.06 | PF085 | PZ-041 | 0.2 | 2 | / | 38 | 1.095 | | / | 38 |
| Mercury, Dissolved | Inorganic | ug/L | 10 | / | 410 | 0.8 | Trace-193 | RD-54C | 0.069 | SH-04_041403_01 | SH-04 | 0.2 | 7 | / | 410 | 1.095 | | / | 410 |
| Molybdenum | Inorganic | ug/L | 20 | / | 25 | 78 | PF227 | PZ-120 | 0.71 | RD-86_082907_01_TOT_T | RD-86 | | | / | 25 | 18.25 | 8 | / | 25 |
| Molybdenum, Dissolved | Inorganic | ug/L | 127 | / | 235 | 88 | PZ-114_052307_01_T | PZ-114 | 0.31 | RD-34A_022106_01_D | RD-34A | | | / | 235 | 18.25 | 13 | / | 235 |
| Nickel | Inorganic | ug/L | 24 | / | 39 | 700 | RS-54_021507_01H_T | RS-54 | 0.52 | HAR-14_050806_01_D | HAR-14 | 10 | 9 | / | 39 | 73 | 2 | / | 39 |
| Nickel, Dissolved | Inorganic | ug/L | 129 | / | 275 | 990 | RS-54_090605_01_D | RS-54 | 0.27 | RD-33B_021103_01 | RD-33B | 10 | 26 | / | 275 | 73 | 18 | / | 275 |
| Perchlorate | Inorganic | ug/L | 59 | / | 401 | 56 | SSFL-RD54A-P3 | RD-54A | 0.562 | PF237 | PZ-051 | | | / | 59 | 0.365 | 59 | / | 59 |
| Selenium | Inorganic | ug/L | 17 | / | 35 | 18 | PF232 | PZ-099 | 0.57 | RD-86_052407_01_TOT_T | RD-86 | 5 | 6 | / | 35 | 18.25 | | / | 35 |
| Selenium, Dissolved | Inorganic | ug/L | 112 | / | 410 | 80 | L69251-008 | RS-18 | 0.27 | L73106-006 | RD-56B | 5 | 11 | / | 410 | 18.25 | 2 | / | 410 |
| Silver | Inorganic | ug/L | 16 | / | 37 | 3.9 | WS-07 (2/6/1984)-FD | WS-07 | 0.07 | SH-04 (5/6/2000)-B | SH-04 | | | / | 37 | 18.25 | | / | 37 |
| Silver, Dissolved | Inorganic | ug/L | 16 | / | 410 | 23 | 9702696*10 | RD-22 | 0.032 | RD-54B_082205_01_D | RD-54B | | | / | 410 | 18.25 | 3 | / | 410 |
| Strontium, Dissolved | Inorganic | ug/L | 54 | / | 54 | 2200 | Trace-117 | RD-33B | 178 | Trace-105 | RD-27 | | | / | 54 | 2190 | 1 | / | 54 |
| Thallium | Inorganic | ug/L | 4 | / | 34 | 0.24 | HAR-14_050806_01_D | HAR-14 | 0.02 | SH-04 (2/8/1999)-A | SH-04 | 0.2 | 1 | / | 34 | 0.2409 | | / | 34 |
| Thallium, Dissolved | Inorganic | ug/L | 28 | / | 274 | 3.7 | RD-91_032504_01_DM | RD-91 | 0.062 | RD-34C | RD-34C | 0.2 | 16 | / | 274 | 0.2409 | 14 | / | 274 |
| Vanadium | Inorganic | ug/L | 16 | / | 34 | 37 | PF232 | PZ-099 | 0.95 | RD-86_052407_01_TOT_T | RD-86 | 2 | 8 | / | 34 | 3.65 | 4 | / | 34 |
| Vanadium, Dissolved | Inorganic | ug/L | 59 | / | 149 | 6.3 | L84516-002 | SH-04 | 0.11 | RD-58A (11/02/2001) | RD-58A | 2 | 10 | / | 149 | 3.65 | 4 | / | 149 |
| Zinc | Inorganic | ug/L | 22 | / | 35 | 2000 | RD-60_080607_01_TOT_T | RD-60 | 3 | HAR-14 (2/9/1999)-A | HAR-14 | | | / | 35 | 1095 | 3 | / | 35 |
| Zinc, Dissolved | Inorganic | ug/L | 257 | / | 279 | 9800 | RD-60_052406_01_D | RD-60 | 2.7 | PZ-056_031606_01_D | PZ-056 | | | / | 279 | 1095 | 95 | / | 279 |
| 1,3-Dinitrobenzene | Explosive | ug/L | 8 | / | 122 | 43 | 3019 | SH-04 | 30 | 3175 | SH-04 | | | / | 8 | 0.365 | 8 | / | 8 |

**Table 4-5**
**Groundwater Summary and COI Screening Value Comparison**

| Analyte | Analyte Group | Units | Frequency of Detection | | | Maximum Concentration Detected | Sample ID of Maximum Concentration | Well ID of Maximum Concentration | Minimum Concentration Detected | Sample ID of Minimum Concentration | Well ID of Minimum Concentration | MCL (1/10 value) | Frequency of MCL Exceedance | | | PRG (1/10 value) | Frequency of PRG Exceedance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| n-Nitrosodimethylamine | Explosive | ug/L | 49 | / | 408 | 1300 | HAR-14_041503_01 | HAR-14 | 0.0121 | HAR-22_081605_01_P | HAR-22 | | | / | 49 | 0.000420197 | 49 | / | 49 |
| n-Nitrosodi-n-propylamine | Explosive | ug/L | 2 | / | 256 | 34 | BASE-291 | HAR-23 | 6 | G94-11-178-24 | RD-13 | | | / | 2 | 0.00096045 | 2 | / | 2 |
| n-Nitrosodiphenylamine | Explosive | ug/L | 2 | / | 257 | 70 | BASE-9 | SH-03 | 22 | BASE-112 | HAR-30 | | | / | 2 | 0.747017048 | 2 | / | 2 |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Dioxins | ug/L | 4 | / | 33 | 0.0046 | HAR-26_112002_01 | HAR-26 | 0.00047 | HAR-14_082807_36_SK | HAR-14 | | | / | 33 | 5.1716564887E | 4 | / | 33 |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | Dioxins | ug/L | 6 | / | 33 | 0.0116 | PZ-056_031606_01_D | PZ-056 | 0.00198 | HAR-14_082807_03_T | HAR-14 | | | / | 33 | | | / | 33 |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | Dioxins | ug/L | 1 | / | 33 | 0.0051 | RD-58A_112102_01 | RD-58A | 0.0051 | RD-58A_112102_01 | RD-58A | | | / | 33 | 5.1716564887E | 1 | / | 33 |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | Dioxins | ug/L | 5 | / | 33 | 0.006 | HAR-26_112002_01 | HAR-26 | 0.00096 | RD-58C_111902_01 | RD-58C | | | / | 33 | 5.1716564887E | 5 | / | 33 |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | Dioxins | ug/L | 2 | / | 33 | 0.0056 | HAR-26_112002_01 | HAR-26 | 0.0034 | RD-08_112002_01 | RD-08 | | | / | 33 | 5.1716564887E | 2 | / | 33 |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | Dioxins | ug/L | 4 | / | 33 | 0.0049 | HAR-26_112002_01 | HAR-26 | 0.00044 | HAR-14_050807_03_SK | HAR-14 | | | / | 33 | 5.1716564887E | 4 | / | 33 |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | Dioxins | ug/L | 2 | / | 33 | 0.0059 | HAR-26_112002_01 | HAR-26 | 0.0033 | RD-08_112002_01 | RD-08 | | | / | 33 | 5.1716564887E | 2 | / | 33 |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | Dioxins | ug/L | 2 | / | 33 | 0.0053 | HAR-26_112002_01 | HAR-26 | 0.0049 | RD-08_112002_01 | RD-08 | | | / | 33 | 5.1716564887E | 2 | / | 33 |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | Dioxins | ug/L | 2 | / | 33 | 0.0064 | HAR-26_112002_01 | HAR-26 | 0.0046 | RD-08_112002_01 | RD-08 | | | / | 33 | 5.1716564887E | 2 | / | 33 |
| 1,2,3,7,8-Pentachlorodibenzofuran | Dioxins | ug/L | 3 | / | 33 | 0.0068 | HAR-26_112002_01 | HAR-26 | 0.0046 | RD-58A_112102_01 | RD-58A | | | / | 33 | 1.0343312977E | 3 | / | 33 |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | Dioxins | ug/L | 1 | / | 33 | 0.005 | RD-08_112002_01 | RD-08 | 0.005 | RD-08_112002_01 | RD-08 | | | / | 33 | 5.1716564887E | 1 | / | 33 |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | Dioxins | ug/L | 2 | / | 33 | 0.0048 | HAR-26_112002_01 | HAR-26 | 0.0025 | RD-58A_112102_01 | RD-58A | | | / | 33 | 5.1716564887E | 2 | / | 33 |
| 2,3,4,7,8-Pentachlorodibenzofuran | Dioxins | ug/L | 2 | / | 31 | 0.0058 | HAR-26_112002_01 | HAR-26 | 0.0054 | RD-08_112002_01 | RD-08 | | | / | 31 | 1.0343312977E | 2 | / | 31 |
| 2,3,7,8-TCDD | Dioxins | ug/L | 5 | / | 45 | 0.0045 | RD-58A_112102_01 | RD-58A | 0.0000018 | RD-58B (10/30/2001) | RD-58B | 0.000003 | 4 | / | 5 | 5.17166E-08 | 5 | / | 5 |
| 2,3,7,8-TCDD TEQ | Dioxins | ug/L | 5 | / | 45 | 0.0045 | RD-58A_112102_01 | RD-58A | 0.0000018 | RD-58B (10/30/2001) | RD-58B | 0.000003 | 4 | / | 45 | | 5 | / | 45 |
| 2,3,7,8-TCDD TEQ - Total | Dioxins | ug/L | 4 | / | 24 | 0.00055 | HAR-14 (5/16/1995)-A | HAR-14 | 0.000000723 | SH-04_041205_01_D | SH-04 | 0.000003 | 3 | / | 24 | 5.17166E-08 | 4 | / | 24 |
| 2,3,7,8-Tetrachlorodibenzofuran | Dioxins | ug/L | 1 | / | 33 | 0.0024 | HAR-26_112002_01 | HAR-26 | 0.0024 | HAR-26_112002_01 | HAR-26 | | | / | 33 | 5.1716564887E | 1 | / | 33 |
| Heptachlorodibenzo-p-dioxins | Dioxins | ug/L | 4 | / | 22 | 0.0204 | PZ-056_031606_01_D | PZ-056 | 0.0012 | SH-04_120705_01_D | SH-04 | | | / | 22 | 5.1716564887E | 4 | / | 22 |
| Hexachlorodibenzo-p-dioxins | Dioxins | ug/L | 1 | / | 22 | 0.00136 | PZ-056_031606_01_D | PZ-056 | 0.00136 | PZ-056_031606_01_D | PZ-056 | | | / | 1 | 5.17166E-07 | 1 | / | 1 |
| Octachlorodibenzofuran | Dioxins | ug/L | 2 | / | 33 | 0.0114 | HAR-26_112002_01 | HAR-26 | 0.00844 | PZ-056_031606_01_D | PZ-056 | | | / | 33 | 0.00051716564 | 2 | / | 33 |
| Octachlorodibenzo-p-dioxin | Dioxins | ug/L | 10 | / | 34 | 0.55 | HAR-14 (5/16/1995)-A | HAR-14 | 0.00055 | HAR-14 (5/16/1995)-A | HAR-14 | | | / | 34 | 0.00051716564 | 10 | / | 34 |
| Pentachlorodibenzo-p-dioxins | Dioxins | ug/L | 1 | / | 22 | 0.0433 | RS-54_021507_01_T | RS-54 | 0.0433 | RS-54_021507_01_T | RS-54 | | | / | 22 | | | / | 22 |
| Actinium-228, Dissolved | Radionuclide | pCi/L | 237 | / | 241 | 354 | RD-27_20020822_F | RD-27 | -47 | Unknown | RD-24 | 0.5 | 205 | / | 241 | 2.39 | 196 | / | 241 |
| Actinium-228, Total | Radionuclide | pCi/L | 4 | / | 4 | 7.57 | RS-18_050203_01 | RS-18 | -9 | Unknown | RD-24 | 0.5 | 3 | / | 4 | 2.39 | 2 | / | 4 |
| Americium-241, Dissolved | Radionuclide | pCi/L | 5 | / | 5 | 16.4 | RD-23_19931106_F | RD-23 | 10.4 | RS-28_19931106_F | RS-28 | 1.5 | 5 | / | 5 | 0.0458 | 5 | / | 5 |
| Antimony-125, Dissolved | Radionuclide | pCi/L | 5 | / | 5 | 6.28 | RS-28_19931106_F | RS-28 | 2.35 | RS-18_19931106_F | RS-18 | 30 | | / | 5 | 0.928 | 5 | / | 5 |
| Cesium-134, Dissolved | Radionuclide | pCi/L | 328 | / | 332 | 109 | RD-27_20020822_F | RD-27 | -19 | RD-28_19940817_F | RD-28 | 8 | 107 | / | 332 | 0.113 | 274 | / | 332 |
| Cesium-134, Total | Radionuclide | pCi/L | 8 | / | 8 | 1.97 | RS-18_050203_01 | RS-18 | -1.4 | 349 | RD-27 | 8 | | / | 8 | 0.113 | 5 | / | 8 |
| Cesium-137, Dissolved | Radionuclide | pCi/L | 459 | / | 511 | 104 | RD-23_19910311_FD_F | RD-23 | -18 | RD-24_19890912_SS_F | RD-24 | | | / | 511 | | | / | 511 |
| Cesium-137, Total | Radionuclide | pCi/L | 22 | / | 22 | 4.7 | RD-25_19891031 | RD-25 | -11 | 354 | RD-28 | | | / | 22 | | 11 | / | 22 |
| Cobalt-60, Dissolved | Radionuclide | pCi/L | 348 | / | 352 | 83.5 | RD-27_20020822_F | RD-27 | -9 | RD-28_19940817_F | RD-28 | | | / | 352 | | | / | 352 |
| Cobalt-60, Total | Radionuclide | pCi/L | 11 | / | 11 | 5.9 | 141 | RD-07 | -1.6 | 160 | RD-13 | | | / | 11 | | 6 | / | 11 |
| Europium-152, Dissolved | Radionuclide | pCi/L | 84 | / | 84 | 7.52 | RD-21_19931106_F | RD-21 | -2.26 | RS-54_022306_03_S | RS-54 | 6 | 5 | / | 84 | 0.784 | 79 | / | 84 |
| Europium-152, Total | Radionuclide | pCi/L | 1 | / | 1 | 3.03 | RD-96_050906_01_UNFILTER | RD-96 | 3.03 | RD-96_050906_01_UNFILTER | RD-96 | 6 | | / | 1 | 0.784 | 1 | / | 1 |
| Europium-154, Dissolved | Radionuclide | pCi/L | 84 | / | 84 | 7.48 | RD-95 | RD-95 | -1.37 | RD-30_082905_03_S | RD-30 | 20 | | / | 84 | 0.462 | 80 | / | 84 |
| Europium-154, Total | Radionuclide | pCi/L | 1 | / | 1 | 3.51 | RD-96_050906_01_UNFILTER | RD-96 | 3.51 | RD-96_050906_01_UNFILTER | RD-96 | 20 | | / | 1 | 0.462 | 1 | / | 1 |
| Europium-155, Dissolved | Radionuclide | pCi/L | 5 | / | 5 | 7.68 | RD-21_19931106_F | RD-21 | 3.2 | RS-18_19931106_F | RS-18 | 60 | | / | 5 | 2.51 | 5 | / | 5 |
| Gross alpha, Decanted | Radionuclide | pCi/L | 3 | / | 3 | 8.3 | WS-07_19890723 | WS-07 | 6.6 | RD-07_19890722 | RD-07 | 1.5 | 3 | / | 3 | | | / | 3 |
| Gross alpha, Dissolved | Radionuclide | pCi/L | 730 | / | 732 | 100 | RD-19_19950215_F | RD-19 | -2.58 | RD-54C_022306_01_E | RD-54C | 1.5 | 669 | / | 730 | | | / | 730 |
| Gross alpha, Total | Radionuclide | pCi/L | 32 | / | 35 | 42.3 | RS-28_19890927 | RS-28 | -1 | RD-29_19890920 | RD-29 | 1.5 | 31 | / | 32 | | | / | 32 |
| Gross beta, Decanted | Radionuclide | pCi/L | 3 | / | 3 | 6.7 | ES-31_19890723 | ES-31 | 4.7 | WS-07_19890723 | WS-07 | 1.5 | 3 | / | 3 | | | / | 3 |
| Lead-210, Dissolved | Radionuclide | pCi/L | 178 | / | 179 | 3850 | RD-27_20020822_F | RD-27 | -130 | Unknown | RD-24 | | | / | 179 | 0.00375 | 176 | / | 179 |
| Lead-210, Total | Radionuclide | pCi/L | 6 | / | 6 | 320 | Unknown | RD-24 | -60 | Unknown | RD-24 | | | / | 6 | 0.00375 | 3 | / | 6 |
| Manganese-54, Dissolved | Radionuclide | pCi/L | 84 | / | 84 | 2.48 | RD-95 | RD-95 | -0.998 | RD-15_021606_03_S | RD-15 | 30 | | / | 84 | 2.09 | 6 | / | 84 |
| Plutonium-238, Dissolved | Radionuclide | pCi/L | 1 | / | 1 | -0.00077 | RD-13_19891031_F | RD-13 | -0.00077 | RD-13_19891031_F | RD-13 | 1.5 | | / | 1 | 0.0364 | | / | 1 |
| Plutonium-239/240, Dissolved | Radionuclide | pCi/L | 1 | / | 1 | 0.00239 | RD-13_19891031_2_F | RD-13 | 0.00239 | RD-13_19891031_2_F | RD-13 | 1.5 | | / | 1 | 0.0353 | | / | 1 |
| Potassium-40, Dissolved | Radionuclide | pCi/L | 325 | / | 327 | 1430 | RD-27_20020822_F | RD-27 | -110 | RD-28_19940817_F | RD-28 | 29.6 | 169 | / | 327 | 0.193 | 280 | / | 327 |
| Potassium-40, Total | Radionuclide | pCi/L | 7 | / | 7 | 75 | Unknown | RD-24 | -36 | Unknown | RD-24 | 29.6 | 3 | / | 7 | 0.193 | 6 | / | 7 |
| Radium-226, Dissolved | Radionuclide | pCi/L | 317 | / | 320 | 1340 | RD-27_20020822_F | RD-27 | -550 | RD-28_19940817_F | RD-28 | 0.5 | 240 | / | 320 | 0.0000816 | 290 | / | 320 |
| Radium-226, Total | Radionuclide | pCi/L | 10 | / | 10 | 32.5 | RS-18_050203_01 | RS-18 | -40 | Unknown | RD-24 | 0.5 | 5 | / | 10 | 0.0000816 | 7 | / | 10 |
| Radium-228, Dissolved | Radionuclide | pCi/L | 120 | / | 120 | 4.01 | RD-54B_082205_01_E | RD-54B | -0.104 | RS-11_022807_01_E | RS-11 | 0.5 | 89 | / | 120 | 0.00458 | 118 | / | 120 |
| Radium-228, Total | Radionuclide | pCi/L | 5 | / | 5 | 1.61 | RD-29_19891208 | RD-29 | 0.726 | RS-28_19891101 | RS-28 | 0.5 | 5 | / | 5 | 0.00458 | 5 | / | 5 |
| Ruthenium-106, Dissolved | Radionuclide | pCi/L | 5 | / | 5 | 34 | RD-22_19931121_F | RD-22 | 7.91 | RS-18_19931106_F | RS-18 | 3 | 5 | / | 5 | | | / | 5 |
| Sodium-22, Dissolved | Radionuclide | pCi/L | 79 | / | 79 | 2.54 | RD-95 | RD-95 | -0.559 | RD-30_082905_03_S | RD-30 | 40 | | / | 79 | 0.495 | 72 | / | 79 |
| Sodium-22, Total | Radionuclide | pCi/L | 1 | / | 1 | 1.18 | RD-96_050906_01_UNFILTER | RD-96 | 1.18 | RD-96_050906_01_UNFILTER | RD-96 | 40 | | / | 1 | 0.495 | 1 | / | 1 |

**Table 4-5**
**Groundwater Summary and COI Screening Value Comparison**

| Analyte | Analyte Group | Units | Frequency of Detection | | | Maximum Concentration Detected | Sample ID of Maximum Concentration | Well ID of Maximum Concentration | Minimum Concentration Detected | Sample ID of Minimum Concentration | Well ID of Minimum Concentration | MCL (1/10 value) | Frequency of MCL Exceedance | | | PRG (1/10 value) | Frequency of PRG Exceedance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thorium-228, Dissolved | Radionuclide | pCi/L | 50 | / | 54 | 0.6 | RS-18_19921215_F | RS-18 | -0.098 | RD-07_20000316_2_F | RD-07 | 1.5 | | / | 54 | 0.0159 | 27 | / | 54 |
| Thorium-228, Total | Radionuclide | pCi/L | 2 | / | 2 | 0.586 | RS-28_19891101 | RS-28 | 0.0404 | RD-14_19891031 | RD-14 | 1.5 | | / | 2 | 0.0159 | 2 | / | 2 |
| Thorium-230, Dissolved | Radionuclide | pCi/L | 48 | / | 54 | 1.28 | RS-54_20000315_F | RS-54 | -0.038 | RS-54_022306_01_E | RS-54 | 1.5 | | / | 54 | 0.0523 | 25 | / | 54 |
| Thorium-230, Total | Radionuclide | pCi/L | 2 | / | 2 | 0.147 | RS-28_19891101 | RS-28 | 0.00388 | RD-14_19891031 | RD-14 | 1.5 | | / | 2 | 0.0523 | 1 | / | 2 |
| Thorium-232, Dissolved | Radionuclide | pCi/L | 38 | / | 53 | 0.6 | RS-18_19921215_F | RS-18 | -0.0441 | RD-28-022304_03 | RD-28 | 1.5 | | / | 53 | 0.0471 | 7 | / | 53 |
| Thorium-232, Total | Radionuclide | pCi/L | 2 | / | 2 | 0.662 | RS-28_19891101 | RS-28 | 0.0136 | RD-14_19891031 | RD-14 | 1.5 | | / | 2 | 0.0471 | 1 | / | 2 |
| Total uranium, Dissolved | Radionuclide | pCi/L | 89 | / | 90 | 30.8 | RD-29_19891208_F | RD-29 | 0.018 | RD-54C_19990209_F | RD-54C | | | / | 90 | 0.73 | 87 | / | 90 |

**Table 4-6**
**Preliminary Selection of Surface Water CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Inorganic Chemicals** | | | | | | | | | | |
| 7440-02-0 | Nickel | ug/L | 52 | 1 | 1 | 7500 | 7500 | -- | 1 | a | Y |
| 7440-22-4 | Silver | ug/L | 0.1 | 1 | 1 | 9600 | 9600 | -- | 1 | a | Y |
| 7440-36-0 | Antimony | ug/L | 30 | 1 | 1 | 83 | 83 | -- | 1 | b | Y |
| 7440-38-2 | Arsenic | ug/L | 150 | 1 | 1 | 70 | 70 | -- | -- | a | N |
| 7440-39-3 | Barium | ug/L | 4 | 1 | 1 | 8000 | 8000 | -- | 1 | b | Y |
| 7440-42-8 | Boron | ug/L | 1.6 | 1 | 1 | 270 | 270 | -- | 1 | b | Y |
| 7440-43-9 | Cadmium | ug/L | 1.1 | 1 | 1 | 82 | 82 | -- | 1 | a | Y |
| 7440-47-3 | Chromium | ug/L | 74 | 1 | 1 | 12000 | 12000 | -- | 1 | a | Y |
| 7440-48-4 | Cobalt | ug/L | 23 | 1 | 1 | 220 | 220 | -- | 1 | b | Y |
| 7440-50-8 | Copper | ug/L | 9 | 1 | 1 | 35000 | 35000 | -- | 1 | a | Y |
| 7440-62-2 | Vanadium | ug/L | 20 | 1 | 1 | 100 | 100 | -- | 1 | b | Y |
| 7440-66-6 | Zinc | ug/L | 110 | 1 | 1 | 16000 | 16000 | -- | 1 | a | Y |
| 7487-94-7 | Mercury | ug/L | 0.012 | 1 | 1 | 24000 | 24000 | -- | 1 | a | Y |
| 7429-90-5 | Aluminum | ug/L | 87 | 1 | 1 | 32000 | 32000 | -- | 1 | b | Y |
| 7439-92-1 | Lead | ug/L | 2.5 | 1 | 1 | 1500 | 1500 | -- | 1 | a | Y |
| 7439-98-7 | Molybdenum | ug/L | 73 | 1 | 1 | 2100 | 2100 | -- | 1 | b | Y |
| | **Volatile Organic Compounds (VOCs)** | | | | | | | | | | |
| 100-41-4 | Ethylbenzene | ug/L | 90 | 1 | 1 | 7.4 | 7.4 | -- | -- | b | N |
| 108-88-3 | Toluene | ug/L | 2 | 1 | 1 | 16 | 16 | -- | 1 | b | Y |
| 1330-20-7 | Xylenes, Total | ug/L | 13 | 1 | 1 | 19 | 19 | -- | 1 | b | Y |
| 156-59-2 | cis-1,2-Dichloroethene | ug/L | 590 | 1 | 1 | 3 | 3 | -- | -- | b | N |
| 71-55-6 | 1,1,1-Trichloroethane | ug/L | 11 | 1 | 1 | 44 | 44 | -- | 1 | b | Y |
| 75-34-3 | 1,1-Dichloroethane | ug/L | 47 | 1 | 1 | 370 | 370 | -- | 1 | b | Y |
| 75-35-4 | 1,1-Dichloroethene | ug/L | 25 | 1 | 1 | 3.2 | 3.2 | -- | -- | b | N |
| 79-01-6 | Trichloroethene | ug/L | 2190 | 1 | 1 | 5.5 | 5.5 | -- | -- | a | N |
| | **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | |
| C14C20 | Diesel Range Organics (C14-C20) | ug/L | NV | 1 | 1 | 3300 | 3300 | -- | 1 | -- | Y |
| C20C30 | Diesel Range Organics (C20-C30) | ug/L | NV | 1 | 1 | 2200 | 2200 | -- | 1 | -- | Y |
| UKN046 | Kerosene Range Organics (C11-C14) | ug/L | NV | 1 | 1 | 720 | 720 | -- | 1 | -- | Y |

Notes:

ug/L: micrograms per liter

ESL: Ecological Screening Level

CPEC: Chemical of Potential Ecological Concern

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Table 3-2. September.

b: EPA. 2006. Region 3 BTAG Freshwater Screening Benchmarks. July. Accessed at: http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/R3_BTAG_FW_Benchmarks_07-06.pdf

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.
When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

**Table 4-7**
**Preliminary Selection of Groundwater Seep CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **General Chemistry** | | | | | | | | | | |
| UKN025 | Bicarbonate Alkalinity as CaCO3 | ug/L | NV | 60 | 60 | 1200000 | 378233 | 170360 | 60 | -- | Y |
| 24959-67-9 | Bromide | ug/L | NV | 60 | 37 | 8600 | 549 | 1088 | 37 | -- | Y |
| ALKC | Carbonate Alkalinity as CaCO3 | ug/L | NV | 60 | 8 | 24000 | 3500 | 4336 | 8 | -- | Y |
| 16887-00-6 | Chloride | ug/L | NV | 60 | 59 | 430000 | 81514 | 64530 | 59 | -- | Y |
| 16984-48-8 | Fluoride | ug/L | NV | 60 | 60 | 6400 | 998 | 1212 | 60 | -- | Y |
| 14797-55-8 | Nitrate-N | ug/L | NV | 59 | 11 | 940 | 144 | 198 | 11 | -- | Y |
| 14797-65-0 | Nitrite-N | ug/L | NV | 59 | 3 | 1600 | 114 | 205 | 3 | -- | Y |
| 14808-79-8 | Sulfate | ug/L | NV | 60 | 60 | 2200000 | 472551 | 452169 | 60 | -- | Y |
| E-10173 | Total Dissolved Solids | ug/L | NV | 17 | 17 | 2200000 | 1182941 | 480583 | 17 | -- | Y |
| | **Inorganic Chemicals** | | | | | | | | | | |
| 7440-70-2 | Calcium | ug/L | 116000 | 59 | 59 | 390000 | 136886 | 84427 | 30 | b | Y |
| 7439-95-4 | Magnesium | ug/L | 82000 | 59 | 59 | 250000 | 72663 | 55529 | 19 | b | Y |
| 7440-09-7 | Potassium | ug/L | 53000 | 59 | 59 | 23000 | 6083 | 4005 | -- | b | N |
| 7440-23-5 | Sodium | ug/L | 680000 | 59 | 59 | 430000 | 133136 | 80226 | -- | b | N |
| | **Volatile Organic Compounds (VOCs)** | | | | | | | | | | |
| 75-35-4 | 1,1-Dichloroethene | ug/L | 25 | 50 | 6 | 1.1 | 0.48 | 0.17 | -- | b | N |
| 67-64-1 | Acetone | ug/L | 1500 | 42 | 4 | 8.6 | 4.73 | 1.16 | -- | b | N |
| 71-43-2 | Benzene | ug/L | 370 | 49 | 1 | 13 | 0.545 | 1.82 | -- | b | N |
| 108-90-7 | Chlorobenzene | ug/L | 5 | 50 | 1 | 58 | 1.52 | 8.15 | 1 | a | Y |
| 156-59-2 | cis-1,2-Dichloroethene | ug/L | 590 | 50 | 12 | 440 | 59 | 133 | -- | b | N |
| 75-09-2 | Methylene chloride | ug/L | 98.1 | 50 | 3 | 1.5 | 1.02 | 0.229 | -- | b | N |
| 127-18-4 | Tetrachloroethene | ug/L | 84 | 49 | 1 | 1.4 | 0.347 | 0.161 | -- | a | N |
| 108-88-3 | Toluene | ug/L | 2 | 50 | 2 | 2.89 | 0.465 | 0.484 | 2 | b | Y |
| 156-60-5 | trans-1,2-Dichloroethene | ug/L | 970 | 50 | 10 | 18 | 2.85 | 5.64 | -- | b | N |
| 79-01-6 | Trichloroethene | ug/L | 2190 | 50 | 9 | 200 | 17 | 44 | 7 | a | Y |
| 75-01-4 | Vinyl chloride | ug/L | 930 | 50 | 6 | 1.1 | 0.358 | 0.159 | -- | b | N |

Notes:

ug/L: micrograms per liter

ESL: Ecological Screening Level

CPEC: Chemical of Potential Ecological Concern

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Table 3-2. September.

b: EPA. 2006. Region 3 BTAG Freshwater Screening Benchmarks. July. Accessed at: http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/R3_BTAG_FW_Benchmarks_07-06.pdf

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.

When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

**Table 4-8**
**Preliminary Selection of Sediment CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dioxins** | | | | | | | | | | |
| 1746-01-6 | TCDD-TEQ (Total all) | mg/kg | NV | 12 | 11 | 3.17864E-05 | 1.24E-05 | 1.26E-05 | 11 | -- | Y |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | mg/kg | NV | 6 | 5 | 2.34E-05 | 1.91E-05 | 5.70E-06 | 5 | -- | Y |
| 30402-15-4 | Pentachlorodibenzofurans | mg/kg | NV | 1 | 1 | 3.90E-05 | 3.90E-05 | -- | 1 | -- | Y |
| 3268-87-9 | Octachlorodibenzo-p-dioxin | mg/kg | NV | 6 | 6 | 0.0124 | 9.15E-03 | 3.28E-03 | 6 | -- | Y |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | mg/kg | NV | 6 | 6 | 9.57E-04 | 7.39E-04 | 2.39E-04 | 6 | -- | Y |
| 37871-00-4 | Heptachlorodibenzo-p-dioxins | mg/kg | NV | 1 | 1 | 8.77E-04 | 8.77E-04 | -- | 1 | -- | Y |
| 38998-75-3 | Heptachlorodibenzofurans | mg/kg | NV | 1 | 1 | 4.23E-04 | 4.23E-04 | -- | 1 | -- | Y |
| 39001-02-0 | Octachlorodibenzofuran | mg/kg | NV | 6 | 6 | 3.14E-04 | 2.52E-04 | 7.85E-05 | 6 | -- | Y |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | mg/kg | NV | 6 | 5 | 1.13E-05 | 1.08E-05 | 5.81E-06 | 5 | -- | Y |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | mg/kg | NV | 6 | 5 | 6.04E-06 | 5.94E-06 | 3.04E-06 | 5 | -- | Y |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | mg/kg | NV | 6 | 5 | 1.33E-05 | 8.65E-06 | 2.65E-06 | 5 | -- | Y |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | mg/kg | NV | 6 | 5 | 1.49E-05 | 1.25E-05 | 4.16E-06 | 5 | -- | Y |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | mg/kg | NV | 6 | 5 | 5.48E-06 | 3.97E-06 | 8.90E-07 | 5 | -- | Y |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | mg/kg | NV | 6 | 5 | 5.50E-06 | 4.90E-06 | 2.62E-06 | 5 | -- | Y |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | mg/kg | NV | 6 | 5 | 4.50E-06 | 6.43E-06 | 6.80E-06 | 5 | -- | Y |
| 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | mg/kg | NV | 6 | 5 | 4.23E-05 | 3.26E-05 | 9.76E-06 | 5 | -- | Y |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | mg/kg | NV | 6 | 5 | 6.45E-06 | 8.05E-06 | 6.95E-06 | 5 | -- | Y |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | mg/kg | NV | 6 | 6 | 1.20E-04 | 9.68E-05 | 3.00E-05 | 6 | -- | Y |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | mg/kg | NV | 6 | 5 | 5.33E-06 | 7.26E-06 | 7.25E-06 | 5 | -- | Y |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | mg/kg | NV | 6 | 5 | 1.78E-06 | 6.04E-06 | 1.12E-05 | 5 | -- | Y |
| | **General Chemistry** | | | | | | | | | | |
| 14797-55-8 | Nitrate-N | mg/kg | NV | 6 | 6 | 6 | 3.4 | 1.89 | 6 | -- | Y |
| 16887-00-6 | Chloride | mg/kg | NV | 3 | 3 | 23 | 15 | 7.50 | 3 | -- | Y |
| 16984-48-8 | Fluoride | mg/kg | NV | 3 | 3 | 0.5 | 0.3 | 0.2 | 3 | -- | Y |
| E-10195 | Total Organic Carbon | mg/kg | NV | 8 | 8 | 62800 | 36154 | 24854 | 8 | -- | Y |
| | **Inorganic Chemicals** | | | | | | | | | | |
| 63705-05-5 | Molecular Sulfur | mg/kg | NV | 5 | 5 | 4 | 2.74 | 1.41 | 5 | -- | Y |
| 7429-90-5 | Aluminum | mg/kg | NV | 5 | 5 | 28800 | 23320 | 4634 | 5 | -- | Y |
| 7439-89-6 | Iron | mg/kg | 20000 | 6 | 6 | 40600 | 32912 | 5678 | 6 | b | Y |
| 7439-92-1 | Lead | mg/kg | 35 | 62 | 58 | 89.6 | 12 | 13 | 2 | a | Y |
| 7439-95-4 | Magnesium | mg/kg | NV | 6 | 6 | 9330 | 7674 | 1230 | 6 | -- | Y |
| 7439-96-5 | Manganese | mg/kg | 460 | 7 | 7 | 668 | 471 | 91 | 2 | b | Y |
| 7439-98-7 | Molybdenum | mg/kg | NV | 34 | 8 | 2.1 | 1.08 | 0.737 | 8 | -- | Y |
| 7440-02-0 | Nickel | mg/kg | 18 | 62 | 62 | 25.8 | 8.65 | 5.42 | 4 | a | Y |
| 7440-22-4 | Silver | mg/kg | 1 | 61 | 17 | 5.9 | 1.66 | 1.30 | 16 | a | Y |
| 7440-28-0 | Thallium | mg/kg | NV | 61 | 5 | 6.3 | 1.49 | 1.79 | 5 | -- | Y |
| 7440-36-0 | Antimony | mg/kg | 2 | 5 | 5 | 1.9 | 1.58 | 0.249 | -- | b | N |
| 7440-38-2 | Arsenic | mg/kg | 5.9 | 63 | 53 | 24 | 3.54 | 3.11 | 5 | a | Y |
| 7440-39-3 | Barium | mg/kg | NV | 34 | 34 | 183 | 70 | 36 | 34 | -- | Y |
| 7440-41-7 | Beryllium | mg/kg | NV | 62 | 28 | 1.2 | 0.415 | 0.231 | 28 | -- | Y |
| 7440-42-8 | Boron | mg/kg | NV | 2 | 2 | 9.4 | 8.1 | 1.84 | 2 | -- | Y |
| 7440-43-9 | Cadmium | mg/kg | 0.6 | 62 | 13 | 4.6 | 0.592 | 0.546 | 7 | a | Y |
| 7440-47-3 | Chromium | mg/kg | 37.3 | 62 | 62 | 45 | 13 | 8.37 | 2 | a | Y |
| 7440-48-4 | Cobalt | mg/kg | 50 | 34 | 34 | 14.8 | 5.71 | 3.14 | -- | b | N |
| 7440-50-8 | Copper | mg/kg | 34 | 62 | 62 | 110 | 21 | 24 | 13 | a | Y |
| 7440-62-2 | Vanadium | mg/kg | NV | 34 | 34 | 63.8 | 25 | 14 | 34 | -- | Y |
| 7440-66-6 | Zinc | mg/kg | 123.1 | 62 | 62 | 1460 | 121 | 200 | 15 | a | Y |
| 7487-94-7 | Mercury | mg/kg | 0.15 | 21 | 14 | 1.3 | 0.352 | 0.373 | 14 | a | Y |
| 7782-49-2 | Selenium | mg/kg | 2 | 55 | 5 | 1 | 0.581 | 0.366 | -- | b | N |

**Table 4-8**
**Preliminary Selection of Sediment CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | |
| 11097-69-1 | Aroclor 1254 | mg/kg | 0.023 | 3 | 2 | 0.094 | 6.20E-02 | 3.67E-02 | 2 | a | Y |
| 31508-00-6 | PCB-118 | mg/kg | NV | 6 | 6 | 0.096 | 2.01E-02 | 3.74E-02 | 6 | -- | Y |
| 32598-10-0 | PCB-66 | mg/kg | NV | 6 | 6 | 0.019 | 4.12E-03 | 7.34E-03 | 6 | -- | Y |
| 32598-13-3 | PCB-77 | mg/kg | NV | 6 | 6 | 0.0094 | 1.87E-03 | 3.70E-03 | 6 | -- | Y |
| 35065-27-1 | PCB-153 | mg/kg | NV | 6 | 6 | 0.072 | 1.56E-02 | 2.78E-02 | 6 | -- | Y |
| 35065-29-3 | PCB-180 | mg/kg | NV | 6 | 6 | 0.022 | 5.07E-03 | 8.38E-03 | 6 | -- | Y |
| 35065-30-6 | PCB-170 | mg/kg | NV | 6 | 6 | 0.011 | 2.54E-03 | 4.19E-03 | 6 | -- | Y |
| 35068-28-2 | PCB-138 | mg/kg | NV | 6 | 6 | 0.13 | 2.83E-02 | 5.02E-02 | 6 | -- | Y |
| 35693-99-3 | PCB-52 | mg/kg | NV | 6 | 6 | 0.042 | 8.37E-03 | 1.65E-02 | 6 | -- | Y |
| 37680-65-2 | PCB-18 | mg/kg | NV | 6 | 3 | 0.0025 | 9.40E-04 | 1.35E-03 | 3 | -- | Y |
| 37680-73-2 | PCB-101 | mg/kg | NV | 1 | 1 | 0.0049 | 4.90E-03 | -- | 1 | -- | Y |
| 38380-07-3 | PCB-128 | mg/kg | NV | 6 | 6 | 0.033 | 7.23E-03 | 1.27E-02 | 6 | -- | Y |
| 38380-08-4 | PCB-156 | mg/kg | NV | 6 | 6 | 0.0143 | 3.07E-03 | 5.54E-03 | 6 | -- | Y |
| 39635-31-9 | PCB-189 | mg/kg | NV | 6 | 4 | 0.00077 | 1.75E-04 | 2.95E-04 | 4 | -- | Y |
| 40186-72-9 | PCB-206 | mg/kg | NV | 6 | 6 | 0.0043 | 1.00E-03 | 1.63E-03 | 6 | -- | Y |
| 41464-39-5 | PCB-44 | mg/kg | NV | 6 | 6 | 0.023 | 4.56E-03 | 9.06E-03 | 6 | -- | Y |
| 52663-68-0 | PCB-187 | mg/kg | NV | 6 | 6 | 0.0075 | 1.78E-03 | 2.84E-03 | 6 | -- | Y |
| 52663-72-6 | PCB-167 | mg/kg | NV | 6 | 6 | 0.0058 | 1.55E-03 | 2.20E-03 | 6 | -- | Y |
| 52663-78-2 | PCB-195 | mg/kg | NV | 6 | 6 | 0.001 | 2.50E-04 | 3.76E-04 | 6 | -- | Y |
| 57465-28-8 | PCB-126 | mg/kg | NV | 6 | 6 | 0.0015 | 3.10E-04 | 5.85E-04 | 6 | -- | Y |
| 65510-44-3 | PCB-123 | mg/kg | NV | 6 | 6 | 0.00099 | 2.37E-04 | 3.74E-04 | 6 | -- | Y |
| 69782-90-7 | PCB-157 | mg/kg | NV | 6 | 6 | 0.003 | 6.77E-04 | 1.15E-03 | 6 | -- | Y |
| 7012-37-5 | PCB-28 | mg/kg | NV | 6 | 4 | 0.0027 | 9.00E-04 | 1.20E-03 | 4 | -- | Y |
| 70362-50-4 | PCB-81 | mg/kg | NV | 6 | 6 | 0.00098 | 2.12E-04 | 3.78E-04 | 6 | -- | Y |
| 74472-37-0 | PCB-114 | mg/kg | NV | 6 | 6 | 0.0014 | 3.02E-04 | 5.41E-04 | 6 | -- | Y |
| E-16015 | PCB-90/101 | mg/kg | NV | 5 | 5 | 0.12 | 2.86E-02 | 5.13E-02 | 5 | -- | Y |
| 32598-14-4 | PCB-105 | mg/kg | NV | 6 | 6 | 0.041 | 8.69E-03 | 1.59E-02 | 6 | -- | Y |
| 32774-16-6 | PCB-169 | mg/kg | NV | 6 | 2 | 0.00007 | 2.16E-05 | 2.43E-05 | 2 | -- | Y |
| 34883-43-7 | PCB-8 | mg/kg | NV | 6 | 4 | 0.00032 | 8.57E-05 | 1.18E-04 | 4 | -- | Y |
| | **Pesticides** | | | | | | | | | | |
| 72-54-8 | 4,4'-DDD | mg/kg | 0.002 | 1 | 1 | 0.2 | 0.2 | -- | 1 | a | Y |
| | **Volatile Organic Compounds (VOCs)** | | | | | | | | | | |
| 100-41-4 | Ethylbenzene | mg/kg | 1.1 | 57 | 1 | 0.1 | 0.0234 | 0.0240 | -- | b | N |
| 108-88-3 | Toluene | mg/kg | 1.22 | 57 | 5 | 3.6 | 0.161 | 0.610 | 2 | c | Y |
| 127-18-4 | Tetrachloroethene | mg/kg | 0.468 | 57 | 3 | 0.33 | 0.0318 | 0.0555 | -- | b | N |
| 1330-20-7 | Xylenes, Total | mg/kg | 0.433 | 32 | 3 | 0.52 | 0.0618 | 0.105 | 1 | c | Y |
| 136777-61-2 | m,p-Xylenes | mg/kg | NV | 25 | 1 | 0.001 | 0.0048 | 0.0008 | 1 | -- | Y |
| 540-59-0 | 1,2-Dichloroethene | mg/kg | NV | 26 | 2 | 0.12 | 0.0460 | 0.0220 | 2 | -- | Y |
| 67-64-1 | Acetone | mg/kg | 0.0099 | 8 | 8 | 0.1 | 0.0479 | 0.0357 | 7 | c | Y |
| 71-43-2 | Benzene | mg/kg | 0.142 | 57 | 2 | 0.0083 | 0.0226 | 0.0219 | -- | c | N |
| 71-55-6 | 1,1,1-Trichloroethane | mg/kg | 0.0302 | 37 | 2 | 0.4 | 0.0265 | 0.0905 | 2 | b | Y |
| 75-09-2 | Methylene chloride | mg/kg | 0.159 | 37 | 6 | 4.2 | 0.219 | 0.906 | 2 | c | Y |
| 75-34-3 | 1,1-Dichloroethane | mg/kg | 0.000575 | 2 | 2 | 0.13 | 0.110 | 0.0283 | 2 | c | Y |
| 79-01-6 | Trichloroethene | mg/kg | 0.0969 | 57 | 5 | 1 | 0.0574 | 0.168 | 4 | b | Y |

**Table 4-8**
**Preliminary Selection of Sediment CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Semi-Volatile Organic Compounds (SVOCs)** | | | | | | | | | | |
| 100-42-5 | Styrene | mg/kg | 0.559 | 54 | 1 | 0.004 | 0.0234 | 0.0223 | -- | b | N |
| 106-44-5 | p-Cresol | mg/kg | 0.67 | 49 | 2 | 0.15 | 0.2555 | 0.0926 | -- | b | N |
| 117-81-7 | bis(2-Ethylhexyl) phthalate | mg/kg | 0.18 | 26 | 4 | 0.24 | 0.171 | 0.0205 | 2 | b | Y |
| 120-12-7 | Anthracene | mg/kg | 0.085 | 6 | 5 | 0.011 | 0.00723 | 0.0026 | -- | a | N |
| 129-00-0 | Pyrene | mg/kg | 0.053 | 10 | 10 | 0.59 | 0.184 | 0.172 | 8 | a | Y |
| 191-24-2 | Benzo(ghi)perylene | mg/kg | 0.17 | 28 | 10 | 0.46 | 0.162 | 0.0843 | 4 | b | Y |
| 192-97-2 | Benzo(e)pyrene | mg/kg | NV | 5 | 5 | 0.04 | 0.0278 | 0.00991 | 5 | -- | Y |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | mg/kg | 0.017 | 10 | 10 | 0.43 | 0.132 | 0.138 | 10 | b | Y |
| 205-99-2 | Benzo(b)fluoranthene | mg/kg | 10.4 | 54 | 8 | 0.54 | 0.254 | 0.118 | -- | c | N |
| 206-44-0 | Fluoranthene | mg/kg | 0.111 | 10 | 10 | 0.8 | 0.193 | 0.229 | 5 | a | Y |
| 207-08-9 | Benzo(k)fluoranthene | mg/kg | 0.24 | 27 | 5 | 0.034 | 0.143 | 0.0585 | -- | b | N |
| 218-01-9 | Chrysene | mg/kg | 0.057 | 9 | 9 | 0.42 | 0.111 | 0.140 | 3 | a | Y |
| 50-32-8 | Benzo(a)pyrene | mg/kg | 0.032 | 9 | 9 | 0.24 | 0.0997 | 0.101 | 6 | a | Y |
| 53-70-3 | Dibenzo(a,h)anthracene | mg/kg | 0.033 | 6 | 4 | 0.014 | 0.0095 | 0.0040 | -- | b | N |
| 56-55-3 | Benzo(a)anthracene | mg/kg | 0.032 | 7 | 7 | 0.24 | 0.0541 | 0.0831 | 2 | a | Y |
| 65-85-0 | Benzoic acid | mg/kg | NV | 49 | 1 | 0.052 | 1.26 | 0.456 | 1 | -- | Y |
| 83-32-9 | Acenaphthene | mg/kg | 0.016 | 6 | 3 | 0.0048 | 0.0052 | 0.0015 | -- | a | N |
| 84-74-2 | Di-n-butyl phthalate | mg/kg | 6.47 | 49 | 1 | 0.086 | 0.260 | 0.0943 | -- | b | N |
| 85-01-8 | Phenanthrene | mg/kg | 0.042 | 7 | 7 | 0.28 | 0.0770 | 0.0927 | 4 | a | Y |
| 85-68-7 | Butyl benzyl phthalate | mg/kg | 10.9 | 49 | 4 | 0.22 | 0.241 | 0.0883 | -- | b | N |
| 86-73-7 | Fluorene | mg/kg | 0.019 | 6 | 4 | 0.0075 | 0.0054 | 0.0020 | -- | a | N |
| 91-20-3 | Naphthalene | mg/kg | 0.16 | 6 | 3 | 0.0055 | 0.0048 | 0.0021 | -- | a | N |
| UKN102 | Benzo (b+k) fluoranthene (Total) | mg/kg | NV | 1 | 1 | 0.1 | 0.100 | -- | 1 | -- | Y |
| UKN105 | Unknown | mg/kg | NV | 105 | 105 | 100 | 8.11 | 20 | 105 | -- | Y |
| | **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | |
| 68334-30-5 | Petroleum Hydrocarbons | mg/kg | NV | 1 | 1 | 230 | 230 | -- | 1 | -- | Y |
| UKN114 | TRPH | mg/kg | NV | 6 | 6 | 1500 | 553 | 533 | 6 | -- | Y |

Notes:

mg/kg: milligrams per kilogram

ESL: Ecological Screening Level

CPEC: Chemical of Potential Ecological Concern

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Table 3-2. September.

b: EPA. 2006. Region 3 BTAG Freshwater Sediment Screening Benchmarks. August. Accessed at: http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fwsed/R3_BTAG_FW_Sediment_Benchmarks_8-06.pdf

c: EPA. 2003. Region 5 RCRA Ecological Screening Levels. August. Accessed at: http://www.epa.gov/reg5rcra/ca/ESL.pdf

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.
When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

**Table 4-9**
**Preliminary Selection of Soil (0-2 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dioxins** | | | | | | | | | | | |
| 1746-01-6 | TCDD-TEQ (Total all) | mg/kg | NV | 1.823E-07 | 217 | 104 | 0.000664472 | 1.64E-05 | 8.08E-05 | 104 | -- | Y |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | mg/kg | 0.000043 | 4.20709E-06 | 120 | 68 | 0.000472 | 1.74E-05 | 6.36E-05 | 5 | a (1) | Y |
| 30402-14-3 | Tetrachlorodibenzofurans | mg/kg | NV | NV | 120 | 75 | 0.000218 | 2.17E-05 | 4.49E-05 | 75 | -- | Y |
| 30402-15-4 | Pentachlorodibenzofurans | mg/kg | NV | NV | 120 | 78 | 0.00135 | 4.76E-05 | 1.68E-04 | 78 | -- | Y |
| 3268-87-9 | Octachlorodibenzo-p-dioxin | mg/kg | 0.12 | 0.00018927 | 120 | 103 | 0.295 | 9.77E-03 | 4.07E-02 | 3 | a (1) | Y |
| 34465-46-8 | Hexachlorodibenzo-p-dioxins | mg/kg | NV | NV | 120 | 86 | 0.00596 | 2.43E-04 | 9.18E-04 | 86 | -- | Y |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | mg/kg | 0.00096 | 0.000013 | 120 | 90 | 0.0265 | 9.34E-04 | 3.65E-03 | 14 | a (1) | Y |
| 36088-22-9 | Pentachlorodibenzo-p-dioxins | mg/kg | NV | NV | 120 | 51 | 0.00055 | 2.88E-05 | 9.49E-05 | 51 | -- | Y |
| 37871-00-4 | Heptachlorodibenzo-p-dioxins | mg/kg | NV | 1.82943E-05 | 120 | 94 | 0.0553 | 1.86E-03 | 7.05E-03 | 94 | -- | Y |
| 38998-75-3 | Heptachlorodibenzofurans | mg/kg | NV | NV | 120 | 84 | 0.0272 | 6.80E-04 | 3.17E-03 | 84 | -- | Y |
| 39001-02-0 | Octachlorodibenzofuran | mg/kg | 0.097 | 0.00018927 | 120 | 73 | 0.0147 | 4.04E-04 | 1.77E-03 | -- | a (1) | N |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | mg/kg | **0.000045** | 4.92541E-05 | 120 | 51 | 0.000242 | 1.13E-05 | 3.90E-05 | 4 | a (1) | Y |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | mg/kg | **0.0000044** | 4.92541E-06 | 120 | 40 | 0.0000949 | 5.01E-06 | 1.68E-05 | 10 | a (1) | Y |
| 41903-57-5 | Tetrachlorodibenzo-p-dioxins | mg/kg | NV | NV | 120 | 43 | 0.00014 | 7.16E-06 | 2.24E-05 | 43 | -- | Y |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | mg/kg | 0.0000044 | 1.82943E-06 | 120 | 54 | 0.0000151 | 1.69E-06 | 3.22E-06 | 12 | a (2) | Y |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | mg/kg | **0.00043** | 0.000492541 | 120 | 49 | 0.000486 | 1.65E-05 | 6.35E-05 | 1 | a (1) | Y |
| 55684-94-1 | Hexachlorodibenzofurans | mg/kg | NV | NV | 120 | 84 | 0.0105 | 2.61E-04 | 1.21E-03 | 84 | -- | Y |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | mg/kg | 0.0000098 | 2.74219E-06 | 120 | 48 | 0.0000308 | 2.77E-06 | 6.39E-06 | 6 | a (1) | Y |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | mg/kg | 0.0001 | 0.00000059 | 120 | 38 | 0.0000113 | 9.95E-07 | 2.31E-06 | -- | a (1) | N |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | mg/kg | 0.000054 | 4.92541E-05 | 120 | 51 | 0.000106 | 5.05E-06 | 1.66E-05 | 3 | a (1) | Y |
| 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | mg/kg | **0.000046** | 4.92541E-05 | 120 | 74 | 0.00121 | 4.06E-05 | 1.66E-04 | 10 | a (1) | Y |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | mg/kg | **0.000049** | 4.92541E-05 | 120 | 55 | 0.000275 | 9.72E-06 | 3.68E-05 | 3 | a (1) | Y |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | mg/kg | **0.00049** | 0.000492541 | 120 | 67 | 0.00568 | 1.64E-04 | 7.14E-04 | 4 | a (1) | Y |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | mg/kg | **0.000047** | 4.92541E-05 | 120 | 54 | 0.00015 | 7.98E-06 | 2.44E-05 | 4 | a (1) | Y |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | mg/kg | **0.000043** | 4.92541E-05 | 120 | 48 | 0.0000339 | 1.69E-06 | 5.05E-06 | -- | a (1) | N |
| | **Explosives** | | | | | | | | | | | |
| 4165-60-0 | Nitrobenzene-d5 | mg/kg | NV | NV | 8 | 8 | 0.017 | 0.0109 | 0.00364 | 8 | -- | Y |
| | **General Chemistry** | | | | | | | | | | | |
| 14797-55-8 | Nitrate-N | mg/kg | NV | NV | 10 | 2 | 1.7 | 5.99 | 5.75 | 2 | -- | Y |
| 14808-79-8 | Sulfate | mg/kg | NV | NV | 1 | 1 | 12 | 12 | -- | 1 | -- | Y |
| 16887-00-6 | Chloride | mg/kg | NV | NV | 10 | 7 | 36 | 12 | 12 | 7 | -- | Y |
| 16984-48-8 | Fluoride | mg/kg | NV | 6.7 | 44 | 40 | 5.69 | 2.02 | 1.21 | 40 | -- | Y |
| | **Inorganic Chemicals** | | | | | | | | | | | |
| 18540-29-9 | Hexavalent Chromium | mg/kg | **0.2** | 17.12442068 | 2 | 1 | 0.21 | 0.205 | 0.00707 | 1 | a (3) | Y |
| 7429-90-5 | Aluminum | mg/kg | **12** | 20000 | 201 | 201 | 31100 | 13704 | 5266 | 201 | a (1) | Y |
| 7439-89-6 | Iron | mg/kg | **200** | 28000 | 51 | 51 | 25100 | 17167 | 3895 | 51 | b | Y |
| 7439-92-1 | Lead | mg/kg | **0.013** | 150 | 264 | 263 | 27000 | 140 | 1677 | 263 | a (2) | Y |
| 7439-93-2 | Lithium | mg/kg | NV | 1560 | 56 | 49 | 35 | 23 | 4.84 | 49 | -- | Y |
| 7439-95-4 | Magnesium | mg/kg | **4.4** | NV | 44 | 44 | 12300 | 4244 | 1714 | 44 | c | Y |
| 7439-96-5 | Manganese | mg/kg | **29** | 689.5047475 | 51 | 51 | 907 | 275 | 119 | 51 | a (1) | Y |
| 7439-98-7 | Molybdenum | mg/kg | **0.11** | 33.80193559 | 136 | 98 | 5.9 | 0.561 | 0.617 | 97 | a (1) | Y |
| 7440-02-0 | Nickel | mg/kg | **0.1** | 144.4403515 | 257 | 252 | 130 | 14 | 12 | 252 | a (1) | Y |
| 7440-09-7 | Potassium | mg/kg | NV | 6400 | 136 | 136 | 11000 | 3369 | 1529 | 136 | -- | Y |
| 7440-22-4 | Silver | mg/kg | **0.54** | 42.75256223 | 187 | 111 | 615 | 12 | 62 | 48 | a (1) | Y |
| 7440-23-5 | Sodium | mg/kg | NV | 110 | 158 | 155 | 6900 | 376 | 1043 | 155 | -- | Y |
| 7440-28-0 | Thallium | mg/kg | **1.4** | 5.16 | 123 | 107 | 3.3 | 0.404 | 0.510 | 6 | a (1) | Y |
| 7440-36-0 | Antimony | mg/kg | **0.095** | 8.7 | 104 | 77 | 870 | 13 | 97 | 72 | a (1) | Y |

**Table 4-9**
**Preliminary Selection of Soil (0-2 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7440-38-2 | Arsenic | mg/kg | **1.9** | 15 | 201 | 192 | 350 | 5.33 | 25 | 177 | a (1) | Y |
| 7440-39-3 | Barium | mg/kg | **15** | 1403.775616 | 249 | 248 | 1000 | 95 | 102 | 247 | a (1) | Y |
| 7440-41-7 | Beryllium | mg/kg | **5** | 1.1 | 246 | 199 | 1.4 | 0.564 | 0.209 | -- | a (1) | N |
| 7440-42-8 | Boron | mg/kg | **9.2** | 380.5009236 | 91 | 61 | 31.8 | 5.80 | 4.57 | 7 | a (1) | Y |
| 7440-43-9 | Cadmium | mg/kg | **0.0045** | 5.34708729 | 166 | 146 | 20 | 0.843 | 1.84 | 146 | a (2) | Y |
| 7440-47-3 | Chromium | mg/kg | 930 | 207.9393939 | 259 | 259 | 79.1 | 19 | 8.87 | -- | a (1) | N |
| 7440-48-4 | Cobalt | mg/kg | **8.9** | 159.2344708 | 246 | 245 | 15 | 6.60 | 2.21 | 42 | a (1) | Y |
| 7440-50-8 | Copper | mg/kg | **1.1** | 265.3990807 | 260 | 260 | 634 | 20 | 57 | 260 | a (2) | Y |
| 7440-62-2 | Vanadium | mg/kg | **1.5** | 62 | 246 | 246 | 78 | 33 | 11 | 246 | a (1) | Y |
| 7440-66-6 | Zinc | mg/kg | **21** | 1321.172077 | 260 | 260 | 4630 | 148 | 437 | 259 | a (1) | Y |
| 7440-67-7 | Zirconium | mg/kg | NV | 8.6 | 66 | 50 | 6.6 | 2.87 | 1.38 | 50 | -- | Y |
| 7440-70-2 | Calcium | mg/kg | NV | NV | 44 | 44 | 38300 | 5271 | 6542 | 44 | -- | Y |
| 7487-94-7 | Mercury | mg/kg | **0.1** | 23.5 | 303 | 223 | 35 | 0.675 | 3.21 | 80 | a (3) | Y |
| 7782-49-2 | Selenium | mg/kg | **0.17** | 31.28037389 | 84 | 56 | 5 | 0.798 | 1.08 | 56 | a (1) | Y |
| UKN052 | Methyl Mercury | mg/kg | **0.17** | NV | 3 | 2 | 0.00362 | 0.00174 | 0.00181 | -- | a (2) | N |
| | **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | |
| 11096-82-5 | Aroclor 1260 | mg/kg | **0.077** | NV | 252 | 46 | 7.8 | 0.198 | 1.04 | 22 | a (1) | Y |
| 11097-69-1 | Aroclor 1254 | mg/kg | 0.077 | 0.013168988 | 254 | 65 | 2.2 | 0.0610 | 0.216 | 30 | a (1) | Y |
| 12672-29-6 | Aroclor 1248 | mg/kg | **0.016** | NV | 248 | 6 | 0.34 | 0.00681 | 0.0393 | 6 | a (1) | Y |
| 31508-00-6 | PCB-118 | mg/kg | **0.0082** | NV | 1 | 1 | 0.026 | 0.026 | -- | 1 | a (1) | Y |
| 32598-10-0 | PCB-66 | mg/kg | NV | NV | 1 | 1 | 0.0011 | 0.0011 | -- | 1 | -- | Y |
| 32598-13-3 | PCB-77 | mg/kg | **0.00028** | NV | 1 | 1 | 0.0015 | 0.0015 | -- | 1 | a (2) | Y |
| 32598-14-4 | PCB-105 | mg/kg | **0.0085** | NV | 1 | 1 | 0.012 | 0.012 | -- | 1 | a (1) | Y |
| 34883-43-7 | PCB-8 | mg/kg | NV | NV | 1 | 1 | 0.00001 | 0.00001 | -- | 1 | -- | Y |
| 35065-27-1 | PCB-153 | mg/kg | NV | NV | 1 | 1 | 0.023 | 0.023 | -- | 1 | -- | Y |
| 35065-29-3 | PCB-180 | mg/kg | NV | NV | 1 | 1 | 0.0062 | 0.0062 | -- | 1 | -- | Y |
| 35065-30-6 | PCB-170 | mg/kg | NV | NV | 1 | 1 | 0.0037 | 0.0037 | -- | 1 | -- | Y |
| 35068-28-2 | PCB-138 | mg/kg | NV | NV | 1 | 1 | 0.054 | 0.054 | -- | 1 | -- | Y |
| 35693-99-3 | PCB-52 | mg/kg | NV | NV | 1 | 1 | 0.0031 | 0.0031 | -- | 1 | -- | Y |
| 38380-07-3 | PCB-128 | mg/kg | NV | NV | 1 | 1 | 0.014 | 0.014 | -- | 1 | -- | Y |
| 38380-08-4 | PCB-156 | mg/kg | **0.0026** | NV | 1 | 1 | 0.0061 | 0.0061 | -- | 1 | a (1) | Y |
| 39635-31-9 | PCB-189 | mg/kg | **0.02** | NV | 1 | 1 | 0.00029 | 0.00029 | -- | -- | a (1) | Y |
| 40186-72-9 | PCB-206 | mg/kg | NV | NV | 1 | 1 | 0.00011 | 0.00011 | -- | 1 | -- | Y |
| 41464-39-5 | PCB-44 | mg/kg | NV | NV | 1 | 1 | 0.00019 | 0.00019 | -- | 1 | -- | Y |
| 52663-68-0 | PCB-187 | mg/kg | NV | NV | 1 | 1 | 0.0015 | 0.0015 | -- | 1 | -- | Y |
| 52663-72-6 | PCB-167 | mg/kg | **0.12** | NV | 1 | 1 | 0.002 | 0.002 | -- | -- | a (1) | Y |
| 52663-78-2 | PCB-195 | mg/kg | NV | NV | 1 | 1 | 0.00012 | 0.00012 | -- | 1 | -- | Y |
| 53469-21-9 | Aroclor 1242 | mg/kg | **0.079** | NV | 252 | 1 | 0.0234 | 0.00125 | 0.00733 | -- | a (1) | Y |
| 57465-28-8 | PCB-126 | mg/kg | **0.000014** | NV | 1 | 1 | 0.00073 | 0.00073 | -- | 1 | a (1) | Y |
| 65510-44-3 | PCB-123 | mg/kg | **0.0075** | NV | 1 | 1 | 0.00029 | 0.00029 | -- | -- | a (1) | Y |
| 69782-90-7 | PCB-157 | mg/kg | **0.0025** | NV | 1 | 1 | 0.0012 | 0.0012 | -- | -- | a (1) | Y |
| 70362-50-4 | PCB-81 | mg/kg | **0.00014** | NV | 1 | 1 | 0.00029 | 0.00029 | -- | 1 | a (2) | Y |
| 74472-37-0 | PCB-114 | mg/kg | **0.00088** | NV | 1 | 1 | 0.00044 | 0.00044 | -- | -- | a (1) | Y |
| E-16015 | PCB-90/101 | mg/kg | NV | NV | 1 | 1 | 0.022 | 0.022 | -- | 1 | -- | Y |
| | **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | |
| 100-41-4 | Ethylbenzene | mg/kg | 210 | 3.84 | 137 | 4 | 0.008 | 0.00413 | 0.0128 | -- | a (1) | Y |
| 108-88-3 | Toluene | mg/kg | **2.5** | 232 | 137 | 18 | 0.42 | 0.0113 | 0.0440 | -- | a (1) | Y |
| 108-90-7 | Chlorobenzene | mg/kg | **40** | 99.13675196 | 137 | 2 | 0.003 | 0.00403 | 0.0129 | -- | a (3) | N |

**Table 4-9**
**Preliminary Selection of Soil (0-2 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 109-66-0 | n-Pentane | mg/kg | NV | NV | 1 | 1 | 0.025 | 0.025 | -- | 1 | -- | Y |
| 110-62-3 | Pentanal | mg/kg | **2400** | NV | 1 | 1 | 0.019 | 0.019 | -- | -- | a (1) | N |
| 111-71-7 | Heptanal | mg/kg | NV | NV | 1 | 1 | 0.006 | 0.006 | -- | 1 | -- | Y |
| 123-72-8 | Butanal | mg/kg | NV | NV | 1 | 1 | 0.006 | 0.006 | -- | 1 | -- | Y |
| 127-18-4 | Tetrachloroethene | mg/kg | 2.1 | 0.026456244 | 137 | 1 | 0.1 | 0.00506 | 0.0162 | -- | a (1) | N |
| 1330-20-7 | Xylenes, Total | mg/kg | **64** | 757.5567265 | 41 | 11 | 0.08 | 0.0157 | 0.0219 | -- | a (1) | Y |
| 208-96-8 | Acenaphthylene | mg/kg | **750** | NV | 213 | 3 | 0.007 | 0.0232 | 0.0472 | -- | a (1) | Y |
| 540-59-0 | 1,2-Dichloroethene | mg/kg | **0.784** | NV | 17 | 1 | 0.12 | 0.0120 | 0.0379 | -- | d | N |
| 5989-27-5 | d-Limonene | mg/kg | NV | NV | 1 | 1 | 0.017 | 0.0170 | -- | 1 | -- | Y |
| 66-25-1 | Hexanal | mg/kg | **2400** | NV | 3 | 3 | 0.06 | 0.0313 | 0.0251 | -- | a (1) | N |
| 67-64-1 | Acetone | mg/kg | **43** | 206.9239934 | 106 | 14 | 5.2 | 0.208 | 0.870 | -- | a (1) | N |
| 71-43-2 | Benzene | mg/kg | 4.3 | 0.091478738 | 137 | 2 | 0.001 | 0.0040 | 0.0129 | -- | a (1) | Y |
| 71-55-6 | 1,1,1-Trichloroethane | mg/kg | 4300 | 469 | 139 | 2 | 2 | 0.0448 | 0.284 | -- | a (1) | N |
| 75-09-2 | Methylene chloride | mg/kg | 4.05 | 0.526319863 | 137 | 15 | 0.28 | 0.0246 | 0.0768 | -- | d | N |
| 75-69-4 | Trichlorofluoromethane | mg/kg | **300** | 302.4637741 | 96 | 1 | 0.9 | 0.0113 | 0.0976 | -- | a (1) | N |
| 76-22-2 | Camphor | mg/kg | NV | NV | 1 | 1 | 0.006 | 0.006 | -- | 1 | -- | Y |
| 78-93-3 | Methyl ethyl ketone | mg/kg | 7600 | 257.0050987 | 91 | 10 | 120 | 2.67 | 18 | -- | a (1) | N |
| 79-01-6 | Trichloroethene | mg/kg | 3 | 0.032629733 | 137 | 2 | 0.22 | 0.00756 | 0.0282 | -- | a (1) | N |
| 79-92-5 | Camphene | mg/kg | NV | NV | 1 | 1 | 0.006 | 0.006 | -- | 1 | -- | Y |
| 80-56-8 | .alpha.-Pinene | mg/kg | NV | NV | 1 | 1 | 0.005 | 0.005 | -- | 1 | -- | Y |
| 98-01-1 | 2-Furancarboxaldehyde | mg/kg | NV | 19.64263047 | 3 | 3 | 0.007 | 0.00667 | 0.000577 | 3 | -- | Y |
| 99-87-6 | p-Cymene | mg/kg | NV | NV | 47 | 2 | 0.0019 | 9.2E-05 | 0.000378 | 2 | -- | Y |
| UKN002 | 1,2,4-Methenoazulene, Decahydro-1,5,5,8A | mg/kg | NV | NV | 1 | 1 | 0.014 | 0.014 | -- | 1 | -- | Y |
| | **Semi-Volatile Organic Compounds (SVOCs)** | | | | | | | | | | | |
| 117-81-7 | bis(2-Ethylhexyl) phthalate | mg/kg | 4.9 | 1.975626174 | 141 | 39 | 0.72 | 0.0505 | 0.113 | -- | a (2) | N |
| 117-84-0 | Di-n-octyl phthalate | mg/kg | **39** | 328.8690985 | 84 | 1 | 0.06 | 0.0219 | 0.0548 | -- | a (2) | N |
| 120-12-7 | Anthracene | mg/kg | **2.4** | 2324.043337 | 213 | 16 | 8.2 | 0.0676 | 0.616 | 1 | a (2) | Y |
| 129-00-0 | Pyrene | mg/kg | **18** | 241.8092704 | 213 | 55 | 27 | 0.376 | 2.85 | 2 | a (3) | Y |
| 14167-59-0 | Tetratriacontane | mg/kg | NV | NV | 1 | 1 | 0.457 | 0.457 | -- | 1 | -- | Y |
| 191-24-2 | Benzo(ghi)perylene | mg/kg | **6.4** | NV | 212 | 30 | 90 | 0.708 | 7.07 | 2 | a (1) | Y |
| 192-97-2 | Benzo(e)pyrene | mg/kg | NV | NV | 1 | 1 | 0.172 | 0.172 | -- | 1 | -- | Y |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | mg/kg | 5.8 | 0.035353094 | 212 | 31 | 77 | 0.623 | 6.09 | 2 | a (1) | Y |
| 198-55-0 | Perylene | mg/kg | NV | NV | 1 | 1 | 0.0981 | 0.0981 | -- | 1 | -- | Y |
| 205-99-2 | Benzo(b)fluoranthene | mg/kg | 5.6 | 0.035353094 | 212 | 42 | 26 | 0.294 | 2.38 | 2 | a (1) | Y |
| 206-44-0 | Fluoranthene | mg/kg | **38** | 318.6035903 | 213 | 50 | 32 | 0.367 | 2.79 | -- | a (3) | Y |
| 207-08-9 | Benzo(k)fluoranthene | mg/kg | 5.8 | 0.191970103 | 211 | 32 | 15 | 0.204 | 1.55 | 2 | a (1) | Y |
| 218-01-9 | Chrysene | mg/kg | 2.4 | 1.91180638 | 213 | 49 | 22 | 0.229 | 1.81 | 2 | a (1) | Y |
| 24887-75-0 | Androstane | mg/kg | NV | NV | 1 | 1 | 1.52 | 1.52 | -- | 1 | -- | Y |
| 3386-33-2 | Octadecane, 1-chloro- | mg/kg | NV | NV | 1 | 1 | 0.428 | 0.428 | -- | 1 | -- | Y |
| 50-32-8 | Benzo(a)pyrene | mg/kg | 5.6 | 0.003535309 | 212 | 37 | 31 | 0.337 | 2.81 | 2 | a (1) | Y |
| 53-70-3 | Dibenzo(a,h)anthracene | mg/kg | 5.6 | 0.003767219 | 212 | 18 | 0.14 | 0.0225 | 0.0438 | -- | a (1) | Y |
| 55193-56-1 | Eicosane, 10-methyl- | mg/kg | NV | NV | 1 | 1 | 3.55 | 3.55 | -- | 1 | -- | Y |
| 56-55-3 | Benzo(a)anthracene | mg/kg | 5.6 | 0.035353094 | 213 | 34 | 16 | 0.156 | 1.26 | 1 | -- | Y |
| 57-10-3 | Palmitic acid | mg/kg | NV | NV | 1 | 1 | 0.503 | 0.503 | -- | 1 | -- | Y |
| 593-45-3 | Octadecane | mg/kg | NV | NV | 2 | 2 | 0.326 | 0.291 | 0.0502 | 2 | -- | Y |
| 601-53-6 | Cholestan-3-one, (5.beta.)- | mg/kg | NV | NV | 1 | 1 | 0.792 | 0.792 | -- | 1 | -- | Y |
| 629-93-6 | Octadecane, 1-iodo- | mg/kg | NV | NV | 1 | 1 | 1.09 | 1.09 | -- | 1 | -- | Y |
| 630-02-4 | n-Octacosane | mg/kg | NV | NV | 3 | 3 | 0.448 | 0.292 | 0.145 | 3 | -- | Y |

**Table 4-9**
**Preliminary Selection of Soil (0-2 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | mg/kg | **2.5** | 455.6453917 | 213 | 4 | 0.049 | 0.0236 | 0.0472 | -- | a (2) | Y |
| 83-46-5 | .beta.-Sitosterol | mg/kg | NV | NV | 1 | 1 | 0.193 | 0.193 | -- | 1 | -- | Y |
| 84-66-2 | Diethyl phthalate | mg/kg | 6900 | 3439.64711 | 141 | 9 | 0.017 | 0.0149 | 0.0508 | -- | a (1) | N |
| 84-74-2 | Di-n-butyl phthalate | mg/kg | **0.49** | 799.6070108 | 141 | 41 | 0.27 | 0.0312 | 0.0619 | -- | a (2) | N |
| 85-01-8 | Phenanthrene | mg/kg | **1.3** | NV | 213 | 43 | 14 | 0.180 | 1.23 | 4 | a (2) | Y |
| 85-68-7 | Butyl benzyl phthalate | mg/kg | 340 | 14 | 84 | 1 | 0.13 | 0.0232 | 0.0566 | -- | a (1) | N |
| 86-73-7 | Fluorene | mg/kg | **1.6** | 310.4470503 | 213 | 4 | 0.013 | 0.0209 | 0.0431 | -- | a (2) | Y |
| 87-86-5 | Pentachlorophenol | mg/kg | **6** | NV | 76 | 1 | 0.058 | 0.00311 | 0.0101 | -- | a (3) | N |
| 90-12-0 | 1-Methyl naphthalene | mg/kg | NV | NV | 74 | 4 | 0.39 | 0.0372 | 0.0601 | 4 | -- | Y |
| 91-20-3 | Naphthalene | mg/kg | 210 | 1.65 | 230 | 22 | 0.64 | 0.0110 | 0.0502 | -- | a (1) | Y |
| 91-57-6 | 2-Methylnaphthalene | mg/kg | **210** | NV | 159 | 16 | 0.78 | 0.0315 | 0.0793 | -- | a (1) | N |
| UKN001 | (1R,2R,8S,8Ar)-8-hydroxy-1-(2-hydroxyeth | mg/kg | NV | NV | 1 | 1 | 0.442 | 0.442 | -- | 1 | -- | Y |
| UKN003 | 1,2-Benzisothiazole, 3-(hexahydro-1H-aze | mg/kg | NV | NV | 1 | 1 | 0.341 | 0.341 | -- | 1 | -- | Y |
| UKN004 | 11,13-Dimethyl-12-tetradecen-1-ol acetat | mg/kg | NV | NV | 1 | 1 | 0.159 | 0.159 | -- | 1 | -- | Y |
| UKN005 | 1-Bromo-4-bromomethyldecane | mg/kg | NV | NV | 1 | 1 | 0.584 | 0.584 | -- | 1 | -- | Y |
| UKN006 | 1H-Indene, 2-butyl-5-hexyloctahydro- | mg/kg | NV | NV | 2 | 2 | 0.425 | 0.405 | 0.0276 | 2 | -- | Y |
| UKN007 | 1H-Indene, 5-butyl-6-hexyloctahydro- | mg/kg | NV | NV | 3 | 3 | 1.58 | 0.847 | 0.654 | 3 | -- | Y |
| UKN008 | 1-Isopropenyl-4,5-dimethylbicyclo[4.3.0] | mg/kg | NV | NV | 1 | 1 | 0.8343 | 0.834 | -- | 1 | -- | Y |
| UKN009 | 1-Naphthalenecarboxaldehyde, Oxime, (e)- | mg/kg | NV | NV | 2 | 2 | 0.022 | 0.016 | 0.00849 | 2 | -- | Y |
| UKN010 | 2,2,6-Trimethyl-1-(2-methyl-cyclobut-2-e | mg/kg | NV | NV | 1 | 1 | 0.41 | 0.41 | -- | 1 | -- | Y |
| UKN011 | 2,6,10,14,18,22-Tetracosahexaene, 2,6,10 | mg/kg | NV | NV | 1 | 1 | 0.219 | 0.219 | -- | 1 | -- | Y |
| UKN013 | 2-Dodecen-1-yl(-)succinic anhy, 1 | mg/kg | NV | NV | 4 | 4 | 0.483 | 0.37 | 0.0955 | 4 | -- | Y |
| UKN016 | 4,4,6a,6b,8a,11,12,14b-Octamethyl-1,4,4a | mg/kg | NV | NV | 2 | 2 | 1.15 | 0.670 | 0.680 | 2 | -- | Y |
| UKN018 | 5.alpha.-Cholest-22-ene, (Z)- | mg/kg | NV | NV | 1 | 1 | 0.49629 | 0.496 | -- | 1 | -- | Y |
| UKN019 | 6-Isopropenyl-4,8a-dimethyl-4a,5,6,7,8,8 | mg/kg | NV | NV | 3 | 3 | 0.50833 | 0.340 | 0.148 | 3 | -- | Y |
| UKN020 | 7-(1,3-Dimethylbuta-1,3-dienyl)-1,6,6-tr | mg/kg | NV | NV | 1 | 1 | 0.50298 | 0.503 | -- | 1 | -- | Y |
| UKN021 | 8-Fluoro-1-Benzosuberone | mg/kg | NV | NV | 1 | 1 | 0.21 | 0.21 | -- | 1 | -- | Y |
| UKN023 | Androstane, (5.beta.)- | mg/kg | NV | NV | 2 | 2 | 1.58 | 1.03 | 0.774 | 2 | -- | Y |
| UKN024 | Benzene, 1-Fluoro-4-[(4-Methylphenyl)sul | mg/kg | NV | NV | 2 | 2 | 0.018 | 0.0155 | 0.00354 | 2 | -- | Y |
| UKN026 | Bicyclo[2.2.1]heptane-2,5-dione, 1,7,7-t | mg/kg | NV | NV | 1 | 1 | 0.319 | 0.319 | -- | 1 | -- | Y |
| UKN032 | Cyclopropane carboxamide, 2-cyclopropyl- | mg/kg | NV | NV | 1 | 1 | 1.29 | 1.29 | -- | 1 | -- | Y |
| UKN033 | Cyclotetradecane, 1,7,11-trimethyl-4-(1- | mg/kg | NV | NV | 2 | 2 | 0.366 | 0.341 | 0.0354 | 2 | -- | Y |
| UKN034 | Decahydro-8a-ethyl-1,1,4a,6-tetramethyln | mg/kg | NV | NV | 1 | 1 | 0.196 | 0.196 | -- | 1 | -- | Y |
| UKN035 | D-Homoandrostane, (5.alpha.,13.alpha.)- | mg/kg | NV | NV | 4 | 4 | 2.29 | 0.983 | 0.891 | 4 | -- | Y |
| UKN037 | Ethaneperoxoic Acid, 1-cyano-2-phenyl-1- | mg/kg | NV | NV | 2 | 2 | 0.013 | 0.012 | 0.00141 | 2 | -- | Y |
| UKN038 | Heptadecane, 9-octyl-, 1 | mg/kg | NV | NV | 2 | 2 | 2.09 | 1.40 | 0.980 | 2 | -- | Y |
| UKN039 | Hexadecane, 2-methyl- | mg/kg | NV | NV | 1 | 1 | 0.96 | 0.96 | -- | 1 | -- | Y |
| UKN049 | Methanone, (3-Chlorophenyl)(4-chlorophen | mg/kg | NV | NV | 1 | 1 | 0.007 | 0.007 | -- | 1 | -- | Y |
| UKN051 | Methyl 5-methyl-2-ethenyl-cyclohexane-1- | mg/kg | NV | NV | 1 | 1 | 0.45713 | 0.457 | -- | 1 | -- | Y |
| UKN053 | Naphthalene, decahydro-1,6-dimethyl-4-(1 | mg/kg | NV | NV | 1 | 1 | 0.83568 | 0.836 | -- | 1 | -- | Y |
| UKN056 | n-Eicosane | mg/kg | NV | NV | 10 | 10 | 0.80143 | 0.471 | 0.165 | 10 | -- | Y |
| UKN062 | Oxalic acid, isobutyl heptadecyl ester | mg/kg | NV | NV | 1 | 1 | 0.392 | 0.392 | -- | 1 | -- | Y |
| UKN063 | Pentadec-7-ene, 7-bromomethyl- | mg/kg | NV | NV | 1 | 1 | 0.395 | 0.395 | -- | 1 | -- | Y |
| UKN064 | Pentadecane, 8-heptyl- | mg/kg | NV | NV | 1 | 1 | 0.343 | 0.343 | -- | 1 | -- | Y |
| UKN065 | Pentadecane, 8-hexyl- | mg/kg | NV | NV | 1 | 1 | 0.868 | 0.868 | -- | 1 | -- | Y |
| UKN068 | Phosphinous Chloride, (2,2-Dimethylpropy | mg/kg | NV | NV | 2 | 2 | 0.053 | 0.035 | 0.0255 | 2 | -- | Y |
| UKN070 | Pyridine, 4-[5-(2-methoxyphenyl)-[1,3,4] | mg/kg | NV | NV | 2 | 2 | 0.95804 | 0.794 | 0.233 | 2 | -- | Y |
| UKN071 | Pyridine-3-carboxamide, oxime, N-(2-trif | mg/kg | NV | NV | 2 | 2 | 1.0363 | 0.865 | 0.243 | 2 | -- | Y |

**Table 4-9**
**Preliminary Selection of Soil (0-2 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UKN073 | Spiro[4.5]decan-7-one, 1,8-dimethyl-8,9- | mg/kg | NV | NV | 1 | 1 | 0.254 | 0.254 | -- | 1 | -- | Y |
| UKN074 | Stigmast-4-en-3-one | mg/kg | NV | NV | 2 | 2 | 0.593 | 0.463 | 0.184 | 2 | -- | Y |
| UKN075 | Stigmastane | mg/kg | NV | NV | 1 | 1 | 0.368 | 0.368 | -- | 1 | -- | Y |
| UKN076 | tetratetracontane, 1 | mg/kg | NV | NV | 1 | 1 | 0.377 | 0.377 | -- | 1 | -- | Y |
| UKN086 | Tritetracontane | mg/kg | NV | NV | 3 | 3 | 0.783 | 0.581 | 0.218 | 3 | -- | Y |
| UKN105 | Unknown | mg/kg | NV | NV | 609 | 608 | 10 | 0.333 | 0.746 | 608 | -- | Y |
| UKN106 | Heptacosane | mg/kg | NV | NV | 2 | 2 | 0.74168 | 0.667 | 0.105 | 2 | -- | Y |
| UKN107 | Heptadecane | mg/kg | NV | NV | 2 | 2 | 0.271 | 0.224 | 0.0665 | 2 | -- | Y |
| UKN108 | Nonadecane | mg/kg | NV | NV | 1 | 1 | 0.154 | 0.154 | -- | 1 | -- | Y |
| UKN109 | Heneicosane | mg/kg | NV | NV | 1 | 1 | 1.28 | 1.28 | -- | 1 | -- | Y |
| UKN110 | Tricosane | mg/kg | NV | NV | 1 | 1 | 0.351 | 0.351 | -- | 1 | -- | Y |
| | **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | |
| 68334-30-5 | Petroleum Hydrocarbons | mg/kg | NV | NV | 1 | 1 | 36 | 36 | -- | 1 | -- | Y |
| C14C20 | Diesel Range Organics (C14-C20) | mg/kg | NV | NV | 97 | 12 | 1200 | 55 | 185 | 12 | -- | Y |
| C15C20 | Diesel Range Organics (C15-C20) | mg/kg | NV | NV | 66 | 7 | 16.5 | 5.79 | 4.17 | 7 | -- | Y |
| C20C30 | Diesel Range Organics (C20-C30) | mg/kg | NV | NV | 97 | 41 | 8300 | 181 | 916 | 41 | -- | Y |
| C21C30 | Diesel Range Organics (C21-C30) | mg/kg | NV | NV | 36 | 20 | 107 | 10 | 18 | 20 | -- | Y |
| C8C11 | Diesel Range Organics (C8-C11) | mg/kg | NV | NV | 36 | 1 | 1.71 | 3.55 | 2.06 | 1 | -- | Y |
| E-10140 | Oil content | mg/kg | NV | NV | 3 | 3 | 1100 | 406 | 601 | 3 | -- | Y |
| GRO | Gasoline Range Organics | mg/kg | NV | NV | 1 | 1 | 5 | 5 | -- | 1 | -- | Y |
| GRO8-11 | Gasoline Range Organics (C8-C11) | mg/kg | NV | NV | 127 | 7 | 42 | 22 | 54 | 7 | -- | Y |
| GRO9-22 | Gasoline Range Organics (C9-C22) | mg/kg | NV | NV | 12 | 11 | 64 | 12 | 24 | 11 | -- | Y |
| UKN030 | C21-C30 Lubricant | mg/kg | NV | NV | 30 | 13 | 71 | 18 | 20 | 13 | -- | Y |
| UKN040 | High Boiling Petroleum Hydrocarbon | mg/kg | NV | NV | 11 | 5 | 75 | 20 | 31 | 5 | -- | Y |
| UKN046 | Kerosene Range Organics (C11-C14) | mg/kg | NV | NV | 97 | 2 | 89 | 26 | 62 | 2 | -- | Y |
| UKN057 | Oil Range Organics (C22-C40) | mg/kg | NV | NV | 2 | 1 | 5 | 2.55 | 3.46 | 1 | -- | Y |
| UKN077 | Total Extractable Hydrocarbons C15-C28 | mg/kg | NV | NV | 1 | 1 | 30 | 30 | -- | 1 | -- | Y |
| UKN079 | Total Extractable Hydrocarbons C16-C28 | mg/kg | NV | NV | 1 | 1 | 80 | 80 | -- | 1 | -- | Y |
| UKN080 | Total Extractable Hydrocarbons C18-C28 | mg/kg | NV | NV | 1 | 1 | 30 | 30 | -- | 1 | -- | Y |
| UKN114 | TRPH | mg/kg | NV | NV | 6 | 5 | 120 | 59 | 47 | 5 | -- | Y |

Notes:

mg/kg: milligrams per kilogram
ESL: Ecological Screening Level
CPEC: Chemical of Potential Ecological Concern
DCGL: Derived Concentration GuideLine

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Tables 3-3 through 3-5. SRAM terrestrial mammal, terrestrial avian, terrestrial invertebrate ecological screening values. September.
  a (1): Mammal
  a (2): Avian
  a (3): Invertebrate

b: EPA. 2001. Region 4 Recommended Ecological Screening Values for Soil. WSRC-TR-98-00110. Accessed at: http://www.epa.gov/region4/waste/ots/epatab4.pdf

c: EPA. 1995. Revised Region 3 BTAG Screening Values. August 9.

d: EPA. 2003. Region 5 RCRA Ecological Screening Levels. August. Accessed at: http://www.epa.gov/reg5rcra/ca/ESL.pdf

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.

When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

For the selection of detection limits during future sampling, the human health DCGL should be used unless the ESL is lower. The bolded ESLs are lower than the corresponding DCGLs.

In general, the DCGL (human health risk assessment) was selected as the lower of the agricultural or residential values. However, if background was higher than the lower of the agricultural or residential values, it was selected as the DCGL.

**Tabe 4-10**
**Preliminary Selection of Soil (2-4 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dioxins** | | | | | | | | | | | |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | mg/kg | 4.30E-05 | 4.20709E-06 | 20 | 5 | 0.000031 | 2.32E-06 | 7.33E-06 | -- | a (1) | N |
| 30402-14-3 | Tetrachlorodibenzofurans | mg/kg | NV | NV | 20 | 8 | 0.000027 | 3.26E-06 | 6.93E-06 | 8 | -- | Y |
| 30402-15-4 | Pentachlorodibenzofurans | mg/kg | NV | NV | 20 | 7 | 0.000032 | 5.13E-06 | 1.01E-05 | 7 | -- | Y |
| 3268-87-9 | Octachlorodibenzo-p-dioxin | mg/kg | 1.20E-01 | 1.89E-04 | 20 | 10 | 0.0064 | 0.000674 | 0.00162 | -- | a (1) | N |
| 34465-46-8 | Hexachlorodibenzo-p-dioxins | mg/kg | NV | NV | 20 | 6 | 0.00056 | 3.96E-05 | 0.000130 | 6 | -- | Y |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | mg/kg | 9.60E-04 | 1.30E-05 | 20 | 10 | 0.000657 | 6.99E-05 | 0.000186 | -- | a (1) | N |
| 36088-22-9 | Pentachlorodibenzo-p-dioxins | mg/kg | NV | NV | 20 | 4 | 0.00011 | 7.37E-06 | 2.65E-05 | 4 | -- | Y |
| 37871-00-4 | Heptachlorodibenzo-p-dioxins | mg/kg | NV | 1.82943E-05 | 20 | 10 | 0.0014 | 1.50E-04 | 3.96E-04 | 10 | -- | Y |
| 38998-75-3 | Heptachlorodibenzofurans | mg/kg | NV | NV | 20 | 10 | 0.000527 | 4.09E-05 | 1.21E-04 | 10 | -- | Y |
| 39001-02-0 | Octachlorodibenzofuran | mg/kg | 9.70E-02 | 1.89E-04 | 20 | 8 | 0.000267 | 2.63E-05 | 6.74E-05 | -- | a (1) | N |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | mg/kg | **4.50E-05** | 4.92541E-05 | 20 | 3 | 0.000027 | 1.96E-06 | 6.75E-06 | -- | a (1) | N |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | mg/kg | **4.40E-06** | 4.92541E-06 | 20 | 4 | 0.000011 | 7.81E-07 | 2.67E-06 | 1 | a (1) | Y |
| 41903-57-5 | Tetrachlorodibenzo-p-dioxins | mg/kg | NV | NV | 20 | 4 | 0.000022 | 1.62E-06 | 5.32E-06 | 4 | -- | Y |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | mg/kg | 4.40E-06 | 1.82943E-06 | 20 | 3 | 0.0000013 | 1.86E-07 | 4.25E-07 | -- | a (2) | N |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | mg/kg | **4.30E-04** | 4.93E-04 | 20 | 3 | 0.00001 | 1.25E-06 | 3.22E-06 | -- | a (1) | N |
| 55684-94-1 | Hexachlorodibenzofurans | mg/kg | NV | NV | 20 | 6 | 0.000216 | 2.00E-05 | 5.37E-05 | 6 | -- | Y |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | mg/kg | 9.80E-06 | 2.74219E-06 | 20 | 3 | 0.0000049 | 4.53E-07 | 1.27E-06 | -- | a (1) | N |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | mg/kg | 1.00E-04 | 5.90E-07 | 20 | 4 | 0.0000014 | 1.72E-07 | 4.15E-07 | -- | a (1) | N |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | mg/kg | 5.40E-05 | 4.92541E-05 | 20 | 3 | 0.00000185 | 2.48E-07 | 5.61E-07 | -- | a (1) | N |
| 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | mg/kg | **4.60E-05** | 4.92541E-05 | 20 | 6 | 0.000031 | 3.21E-06 | 8.59E-06 | -- | a (1) | N |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | mg/kg | **4.90E-05** | 4.92541E-05 | 20 | 5 | 0.0000063 | 8.37E-07 | 1.93E-06 | -- | a (1) | N |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | mg/kg | **4.90E-04** | 4.93E-04 | 20 | 9 | 0.0000949 | 9.52E-06 | 2.41E-05 | -- | a (1) | N |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | mg/kg | **4.70E-05** | 4.92541E-05 | 20 | 5 | 0.000023 | 1.72E-06 | 5.39E-06 | -- | a (1) | N |
| 1746-01-6 | TCDD-TEQ (Total all) | mg/kg | NV | 1.823E-07 | 29 | 10 | 0.000033662 | 2.25E-06 | 7.19E-06 | 10 | -- | Y |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | mg/kg | **4.30E-05** | 4.92541E-05 | 20 | 4 | 0.0000034 | 3.05E-07 | 8.35E-07 | -- | a (1) | N |
| | **Explosives** | | | | | | | | | | | |
| 4165-60-0 | Nitrobenzene-d5 | mg/kg | NV | NV | 4 | 4 | 0.013 | 0.0105 | 0.00311 | 4 | -- | Y |
| | **General Chemistry** | | | | | | | | | | | |
| 16984-48-8 | Fluoride | mg/kg | NV | 6.7 | 6 | 6 | 3.4 | 2.41 | 0.685 | 6 | -- | Y |
| | **Inorganic Chemicals** | | | | | | | | | | | |
| 18540-29-9 | Hexavalent Chromium | mg/kg | **0.2** | 17.12442068 | 2 | 1 | 0.3 | 0.161 | 0.197 | 1 | a (3) | Y |
| 7429-90-5 | Aluminum | mg/kg | **12** | 20000 | 46 | 46 | 27000 | 13727 | 5369 | 46 | a (1) | Y |
| 7439-89-6 | Iron | mg/kg | **200** | 28000 | 15 | 15 | 26700 | 16394 | 6454 | 14 | b | Y |
| 7439-92-1 | Lead | mg/kg | **0.013** | 150 | 54 | 54 | 260 | 17.4 | 45.1 | 54 | a (2) | Y |
| 7439-93-2 | Lithium | mg/kg | NV | 1560 | 1 | 1 | 23 | 23.0 | -- | 1 | -- | Y |
| 7439-95-4 | Magnesium | mg/kg | **4.4** | NV | 15 | 15 | 10800 | 4309 | 2325 | 15 | c | Y |
| 7439-96-5 | Manganese | mg/kg | **29** | 689.5047475 | 15 | 15 | 526 | 265 | 114 | 14 | a (1) | Y |
| 7439-98-7 | Molybdenum | mg/kg | **0.11** | 33.80193559 | 25 | 13 | 7.5 | 1.18 | 1.92 | 13 | a (1) | Y |
| 7440-02-0 | Nickel | mg/kg | **0.1** | 144.4403515 | 54 | 50 | 65.4 | 12.4 | 8.63 | 50 | a (1) | Y |
| 7440-09-7 | Potassium | mg/kg | NV | 6400 | 22 | 21 | 6200 | 2678 | 1266 | 21 | -- | Y |
| 7440-22-4 | Silver | mg/kg | **0.54** | 42.75256223 | 38 | 12 | 13 | 2.55 | 3.69 | 9 | a (1) | Y |
| 7440-23-5 | Sodium | mg/kg | NV | 110 | 26 | 26 | 629 | 194 | 167 | 26 | -- | Y |
| 7440-28-0 | Thallium | mg/kg | **1.4** | 5.16 | 24 | 15 | 2.1 | 0.835 | 0.734 | 4 | a (1) | Y |
| 7440-36-0 | Antimony | mg/kg | **0.095** | 8.7 | 14 | 8 | 3.3 | 0.875 | 1.03 | 8 | a (1) | Y |
| 7440-38-2 | Arsenic | mg/kg | **1.9** | 15 | 46 | 44 | 14 | 4.37 | 2.74 | 38 | a (1) | Y |
| 7440-39-3 | Barium | mg/kg | **15** | 1403.775616 | 55 | 55 | 190 | 86.4 | 30.4 | 54 | a (1) | Y |
| 7440-41-7 | Beryllium | mg/kg | 5 | 1.1 | 55 | 36 | 0.96 | 0.633 | 0.219 | -- | a (1) | N |
| 7440-42-8 | Boron | mg/kg | **9.2** | 380.5009236 | 12 | 10 | 14 | 9.41 | 2.61 | 5 | a (1) | Y |

**Tabe 4-10**
**Preliminary Selection of Soil (2-4 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7440-43-9 | Cadmium | mg/kg | **0.0045** | 5.34708729 | 25 | 9 | 1.9 | 0.593 | 0.628 | 9 | a (2) | Y |
| 7440-47-3 | Chromium | mg/kg | 930 | 207.9393939 | 55 | 55 | 43.5 | 18.0 | 7.71 | -- | a (1) | N |
| 7440-48-4 | Cobalt | mg/kg | **8.9** | 159.2344708 | 54 | 54 | 12 | 6.77 | 2.10 | 10 | a (1) | Y |
| 7440-50-8 | Copper | mg/kg | **1.1** | 265.3990807 | 55 | 54 | 130 | 13.5 | 16.8 | 54 | a (2) | Y |
| 7440-62-2 | Vanadium | mg/kg | **1.5** | 62 | 55 | 55 | 61 | 32.5 | 11.0 | 54 | a (1) | Y |
| 7440-66-6 | Zinc | mg/kg | **21** | 1321.172077 | 56 | 56 | 140 | 53.7 | 20.9 | 55 | a (1) | Y |
| 7440-67-7 | Zirconium | mg/kg | NV | 8.6 | 2 | 2 | 4 | 3.15 | 1.20 | 2 | -- | Y |
| 7440-70-2 | Calcium | mg/kg | NV | NV | 15 | 14 | 6870 | 2488 | 1517 | 14 | -- | Y |
| 7487-94-7 | Mercury | mg/kg | **0.1** | 23.5 | 59 | 30 | 2.7 | 0.187 | 0.438 | 10 | a (3) | Y |
| 7782-49-2 | Selenium | mg/kg | **0.17** | 31.28037389 | 21 | 7 | 2.2 | 1.13 | 0.741 | 7 | a (1) | Y |
| | **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | |
| 11096-82-5 | Aroclor 1260 | mg/kg | **0.077** | NV | 24 | 3 | 0.2 | 0.0191 | 0.0559 | 2 | a (1) | Y |
| 11097-69-1 | Aroclor 1254 | mg/kg | 0.077 | 0.013168988 | 24 | 2 | 0.11 | 0.00605 | 0.0252 | 1 | a (1) | Y |
| | **Volatile Organic Hydrocarbons (VOCs)** | | | | | | | | | | | |
| 100-41-4 | Ethylbenzene | mg/kg | 210 | 3.84 | 45 | 1 | 0.1 | 0.0116 | 0.0257 | -- | a (1) | Y |
| 108-88-3 | Toluene | mg/kg | **2.5** | 232 | 45 | 3 | 3.6 | 0.252 | 0.883 | 2 | a (1) | Y |
| 127-18-4 | Tetrachloroethene | mg/kg | 2.1 | 0.026456244 | 45 | 2 | 0.33 | 0.0289 | 0.0782 | -- | a (1) | N |
| 1330-20-7 | Xylenes, Total | mg/kg | **64** | 757.5567265 | 14 | 4 | 0.52 | 0.110 | 0.181 | -- | a (1) | Y |
| 540-59-0 | 1,2-Dichloroethene | mg/kg | **0.784** | NV | 7 | 1 | 0.05 | 0.0250 | 0.0354 | -- | d | N |
| 67-64-1 | Acetone | mg/kg | **43** | 206.9239934 | 32 | 4 | 0.032 | 0.0822 | 0.182 | -- | a (1) | N |
| 71-55-6 | 1,1,1-Trichloroethane | mg/kg | 4300 | 469 | 45 | 2 | 0.41 | 0.0375 | 0.107 | -- | a (1) | N |
| 75-09-2 | Methylene chloride | mg/kg | 4.05 | 0.526319863 | 45 | 4 | 4.2 | 0.328 | 1.03 | 1 | d | Y |
| 75-34-3 | 1,1-Dichloroethane | mg/kg | 210 | 2.75 | 45 | 2 | 0.13 | 0.0156 | 0.0331 | -- | a (1) | N |
| 79-01-6 | Trichloroethene | mg/kg | 3 | 0.032629733 | 45 | 2 | 1 | 0.0745 | 0.241 | -- | a (1) | N |
| UKN067 | Phenol, 4-(Aminomethyl)-2-Methoxy- | mg/kg | NV | NV | 1 | 1 | 0.058 | 0.0580 | -- | 1 | -- | Y |
| | **Semi-Volatile Organic Compounds (SVOCs)** | | | | | | | | | | | |
| 120-12-7 | Anthracene | mg/kg | **2.4** | 2324.043337 | 60 | 4 | 4 | 0.161 | 0.638 | 1 | a (2) | Y |
| 129-00-0 | Pyrene | mg/kg | **18** | 241.8092704 | 60 | 12 | 21 | 1.18 | 3.71 | 1 | a (3) | Y |
| 132-64-9 | Dibenzofuran | mg/kg | 62 | 15.21894258 | 14 | 1 | 0.28 | 0.0953 | 0.117 | -- | a (3) | N |
| 191-24-2 | Benzo(ghi)perylene | mg/kg | **6.4** | NV | 60 | 7 | 4.7 | 0.292 | 0.859 | -- | a (1) | Y |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | mg/kg | 5.8 | 0.035353094 | 60 | 4 | 6.4 | 0.359 | 1.08 | 1 | a (1) | Y |
| 205-99-2 | Benzo(b)fluoranthene | mg/kg | 5.6 | 0.035353094 | 60 | 8 | 16 | 1.01 | 3.16 | 3 | a (1) | Y |
| 206-44-0 | Fluoranthene | mg/kg | **38** | 318.6035903 | 60 | 10 | 25 | 1.27 | 4.23 | -- | a (3) | Y |
| 207-08-9 | Benzo(k)fluoranthene | mg/kg | 5.8 | 0.191970103 | 60 | 7 | 15 | 0.875 | 2.96 | 2 | a (1) | Y |
| 218-01-9 | Chrysene | mg/kg | 2.4 | 1.91180638 | 60 | 6 | 13 | 0.621 | 2.37 | 3 | a (1) | Y |
| 2216-33-3 | 3-Methyloctane | mg/kg | NV | NV | 1 | 1 | 0.29 | 0.290 | -- | 1 | -- | Y |
| 2489-86-3 | Naphthalene, 1-(2-Propenyl)- | mg/kg | NV | NV | 2 | 2 | 1.1 | 0.572 | 0.747 | 2 | -- | Y |
| 50-32-8 | Benzo(a)pyrene | mg/kg | 5.6 | 0.003535309 | 60 | 7 | 15 | 0.748 | 2.45 | 2 | a (1) | Y |
| 53-70-3 | Dibenzo(a,h)anthracene | mg/kg | 5.6 | 0.003767219 | 60 | 4 | 2.2 | 0.201 | 0.659 | -- | a (1) | Y |
| 56-55-3 | Benzo(a)anthracene | mg/kg | 5.6 | 0.035353094 | 60 | 8 | 14 | 0.796 | 2.46 | 2 | a (1) | Y |
| 83-32-9 | Acenaphthene | mg/kg | **2.5** | 455.6453917 | 60 | 5 | 0.9 | 0.0795 | 0.162 | -- | a (2) | Y |
| 85-01-8 | Phenanthrene | mg/kg | **1.3** | NV | 60 | 12 | 11 | 0.651 | 1.92 | 6 | a (2) | Y |
| 86-73-7 | Fluorene | mg/kg | **1.6** | 310.4470503 | 60 | 5 | 0.92 | 0.079 | 0.161 | -- | a (2) | Y |
| 872-50-4 | 1-Methyl-2-Pyrrolidinone | mg/kg | NV | NV | 1 | 1 | 0.3 | 0.300 | -- | 1 | -- | Y |
| 91-20-3 | Naphthalene | mg/kg | 210 | 1.65 | 60 | 6 | 0.14 | 0.0119 | 0.0253 | -- | a (1) | Y |
| 91-57-6 | 2-Methylnaphthalene | mg/kg | 210 | NV | 35 | 5 | 0.04 | 0.0482 | 0.0771 | -- | a (1) | Y |
| UKN017 | 4-Picoline, 2-(ethylthio)- | mg/kg | NV | NV | 1 | 1 | 0.029 | 0.0290 | -- | 1 | -- | Y |
| UKN056 | n-Eicosane | mg/kg | NV | NV | 1 | 1 | 0.276 | 0.276 | -- | 1 | -- | Y |
| UKN068 | Phosphinous Chloride, (2,2-Dimethylpropy | mg/kg | NV | NV | 1 | 1 | 2.7 | 2.70 | -- | 1 | -- | Y |

## Tabe 4-10
## Preliminary Selection of Soil (2-4 ft bgs) CPECs for Ecological Receptors

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UKN086 | Tritetracontane | mg/kg | NV | NV | 1 | 1 | 0.287 | 0.287 | -- | 1 | -- | Y |
| UKN105 | Unknown | mg/kg | NV | NV | 302 | 302 | 400 | 2.37 | 23.4 | 302 | -- | Y |
| | **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | |
| C14C20 | Diesel Range Organics (C14-C20) | mg/kg | NV | NV | 33 | 6 | 480 | 227 | 1165 | 6 | -- | Y |
| C20C30 | Diesel Range Organics (C20-C30) | mg/kg | NV | NV | 31 | 14 | 82000 | 2688 | 14720 | 14 | -- | Y |
| GRO | Gasoline Range Organics | mg/kg | NV | NV | 1 | 1 | 4000 | 4000 | -- | 1 | -- | Y |
| GRO8-11 | Gasoline Range Organics (C8-C11) | mg/kg | NV | NV | 38 | 2 | 10 | 185 | 1086 | 2 | -- | Y |
| GRO9-22 | Gasoline Range Organics (C9-C22) | mg/kg | NV | NV | 1 | 1 | 0.2 | 0.2 | -- | 1 | -- | Y |
| UKN029 | C21 - C22 | mg/kg | NV | NV | 1 | 1 | 78 | 78 | -- | 1 | -- | Y |
| UKN030 | C21-C30 Lubricant | mg/kg | NV | NV | 6 | 3 | 76 | 17.6 | 28.6 | 3 | -- | Y |
| UKN043 | Hydrocarbons C22-C30 | mg/kg | NV | NV | 2 | 2 | 300 | 188 | 159 | 2 | -- | Y |
| UKN046 | Kerosene Range Organics (C11-C14) | mg/kg | NV | NV | 31 | 2 | 94 | 227 | 1201 | 2 | -- | Y |
| UKN057 | Oil Range Organics (C22-C40) | mg/kg | NV | NV | 1 | 1 | 4000 | 4000 | -- | 1 | -- | Y |
| UKN114 | TRPH | mg/kg | NV | NV | 1 | 1 | 25 | 25 | -- | 1 | -- | Y |

Notes:

mg/kg: milligrams per kilogram

ESL: Ecological Screening Level

CPEC: Chemical of Potential Ecological Concern

DCGL: Derived Concentration GuideLine

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Tables 3-3 through 3-5. SRAM terrestrial mammal, terrestrial avian, terrestrial invertebrate ecological screening values. September.

a (1): Mammal

a (2): Avian

a (3): Invertebrate

b: EPA. 2001. Region 4 Recommended Ecological Screening Values for Soil. WSRC-TR-98-00110. Accessed at: http://www.epa.gov/region4/waste/ots/epatab4.pdf

c: EPA. 1995. Revised Region 3 BTAG Screening Values. August 9.

d: EPA. 2003. Region 5 RCRA Ecological Screening Levels. August. Accessed at: http://www.epa.gov/reg5rcra/ca/ESL.pdf

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.
When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

For the selection of detection limits during future sampling, the human health DCGL should be used unless the ESL is lower. The bolded ESLs are lower than the corresponding DCGLs.

In general, the DCGL (human health risk assessment) was selected as the lower of the agricultural or residential values. However, if background was higher than the lower of the agricultural or residential values, it was selected as the DCGL.

**Table 4-11**
**Preliminary Selection of Soil (4-6 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dioxins** | | | | | | | | | | | |
| 1746-01-6 | TCDD-TEQ (Total all) | mg/kg | NV | 1.823E-07 | 41 | 22 | 0.000051733 | 2.92E-06 | 9.33E-06 | 22 | -- | Y |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | mg/kg | 0.000043 | 4.20709E-06 | 22 | 9 | 0.000026 | 3.21E-06 | 6.67E-06 | -- | a (1) | N |
| 30402-14-3 | Tetrachlorodibenzofurans | mg/kg | NV | NV | 20 | 10 | 0.00025 | 5.43E-05 | 8.13E-05 | 10 | -- | Y |
| 30402-15-4 | Pentachlorodibenzofurans | mg/kg | NV | NV | 20 | 10 | 0.0002 | 3.36E-05 | 5.58E-05 | 10 | -- | Y |
| 3268-87-9 | Octachlorodibenzo-p-dioxin | mg/kg | 0.12 | 0.00018927 | 22 | 19 | 0.0099 | 0.000580 | 0.00210 | -- | a (1) | N |
| 34465-46-8 | Hexachlorodibenzo-p-dioxins | mg/kg | NV | NV | 20 | 13 | 0.00053 | 6.08E-05 | 1.37E-04 | 13 | -- | Y |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | mg/kg | 0.00096 | 0.000013 | 22 | 15 | 0.00087 | 6.75E-05 | 1.98E-04 | -- | a (1) | N |
| 36088-22-9 | Pentachlorodibenzo-p-dioxins | mg/kg | NV | NV | 20 | 9 | 0.00012 | 1.70E-05 | 3.36E-05 | 9 | -- | Y |
| 37871-00-4 | Heptachlorodibenzo-p-dioxins | mg/kg | NV | 1.82943E-05 | 20 | 19 | 0.0029 | 0.000213 | 0.000661 | 19 | -- | Y |
| 38998-75-3 | Heptachlorodibenzofurans | mg/kg | NV | NV | 20 | 14 | 0.00038 | 3.15E-05 | 9.10E-05 | 14 | -- | Y |
| 39001-02-0 | Octachlorodibenzofuran | mg/kg | 0.097 | 0.00018927 | 22 | 14 | 0.00023 | 1.65E-05 | 5.25E-05 | -- | a (1) | N |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | mg/kg | **0.000045** | 4.92541E-05 | 22 | 7 | 0.000016 | 1.76E-06 | 4.12E-06 | -- | a (1) | N |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | mg/kg | **0.0000044** | 4.92541E-06 | 22 | 5 | 0.000012 | 1.50E-06 | 3.37E-06 | 1 | a (1) | Y |
| 41903-57-5 | Tetrachlorodibenzo-p-dioxins | mg/kg | NV | NV | 20 | 9 | 0.000092 | 1.25E-05 | 2.65E-05 | 9 | -- | Y |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | mg/kg | 0.0000044 | 1.82943E-06 | 22 | 10 | 0.000012 | 2.38E-06 | 4.03E-06 | 2 | a (2) | Y |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | mg/kg | **0.00043** | 0.000492541 | 22 | 7 | 0.0000018 | 3.25E-07 | 4.96E-07 | -- | a (1) | N |
| 55684-94-1 | Hexachlorodibenzofurans | mg/kg | NV | NV | 20 | 14 | 0.00031 | 2.77E-05 | 7.41E-05 | 14 | -- | Y |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | mg/kg | 0.0000098 | 2.74219E-06 | 22 | 8 | 0.000017 | 2.49E-06 | 4.76E-06 | 1 | a (1) | Y |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | mg/kg | 0.0001 | 0.00000059 | 22 | 8 | 0.000014 | 1.89E-06 | 3.83E-06 | -- | a (1) | N |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | mg/kg | 0.000054 | 4.92541E-05 | 22 | 7 | 0.000017 | 2.18E-06 | 4.72E-06 | -- | a (1) | N |
| 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | mg/kg | **0.000046** | 4.92541E-05 | 22 | 9 | 0.000044 | 5.09E-06 | 1.13E-05 | -- | a (1) | N |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | mg/kg | **0.000049** | 4.92541E-05 | 22 | 12 | 0.000022 | 2.14E-06 | 5.29E-06 | -- | a (1) | N |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | mg/kg | **0.00049** | 0.000492541 | 22 | 12 | 0.00014 | 1.24E-05 | 3.36E-05 | -- | a (1) | N |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | mg/kg | **0.000047** | 4.92541E-05 | 22 | 9 | 0.000024 | 2.81E-06 | 6.32E-06 | -- | a (1) | N |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | mg/kg | **0.000043** | 4.92541E-05 | 22 | 9 | 0.0000082 | 7.49E-07 | 1.97E-06 | -- | a (1) | N |
| | **Explosives** | | | | | | | | | | | |
| 4165-60-0 | Nitrobenzene-d5 | mg/kg | NV | NV | 3 | 3 | 0.012 | 0.0103 | 0.00153 | 3 | -- | Y |
| | **General Chemistry** | | | | | | | | | | | |
| 16984-48-8 | Fluoride | mg/kg | NV | 6.7 | 5 | 5 | 4.4 | 3.08 | 1.13 | 5 | -- | Y |
| | **Inorganic Chemicals** | | | | | | | | | | | |
| 7429-90-5 | Aluminum | mg/kg | **12** | 20000 | 43 | 42 | 27800 | 14553 | 6029 | 42 | a (1) | Y |
| 7439-89-6 | Iron | mg/kg | **200** | 28000 | 14 | 13 | 25900 | 15979 | 6231 | 13 | b | Y |
| 7439-92-1 | Lead | mg/kg | **0.013** | 150 | 71 | 68 | 1900 | 182 | 443 | 68 | a (2) | Y |
| 7439-93-2 | Lithium | mg/kg | NV | 1560 | 2 | 2 | 24 | 20.4 | 5.16 | 2 | -- | Y |
| 7439-95-4 | Magnesium | mg/kg | **4.4** | NV | 13 | 13 | 6250 | 3984 | 973 | 13 | c | Y |
| 7439-96-5 | Manganese | mg/kg | **29** | 689.5047475 | 14 | 14 | 567 | 230 | 128 | 13 | a (1) | Y |
| 7439-98-7 | Molybdenum | mg/kg | **0.11** | 33.80193559 | 11 | 8 | 4.3 | 1.16 | 1.32 | 8 | a (1) | Y |
| 7440-02-0 | Nickel | mg/kg | **0.1** | 144.4403515 | 49 | 49 | 100 | 16.8 | 15.4 | 49 | a (1) | Y |
| 7440-09-7 | Potassium | mg/kg | NV | 6400 | 20 | 19 | 3150 | 1976 | 754 | 19 | -- | Y |
| 7440-22-4 | Silver | mg/kg | **0.54** | 42.75256223 | 22 | 6 | 169 | 14.4 | 43.5 | 4 | a (1) | Y |
| 7440-23-5 | Sodium | mg/kg | NV | 110 | 29 | 28 | 645 | 265 | 191 | 28 | -- | Y |
| 7440-28-0 | Thallium | mg/kg | **1.4** | 5.16 | 10 | 8 | 4 | 1.12 | 1.30 | 2 | a (1) | Y |
| 7440-36-0 | Antimony | mg/kg | **0.095** | 8.7 | 15 | 14 | 22 | 7.45 | 8.63 | 14 | a (1) | Y |
| 7440-38-2 | Arsenic | mg/kg | **1.9** | 15 | 47 | 47 | 11 | 4.87 | 2.01 | 47 | a (1) | Y |
| 7440-39-3 | Barium | mg/kg | **15** | 1403.775616 | 45 | 44 | 918 | 149 | 180 | 44 | a (1) | Y |
| 7440-41-7 | Beryllium | mg/kg | 5 | 1.1 | 39 | 32 | 1.9 | 0.665 | 0.355 | -- | a (1) | N |
| 7440-42-8 | Boron | mg/kg | **9.2** | 380.5009236 | 6 | 6 | 11.8 | 7.2 | 2.8 | 1 | a (1) | Y |
| 7440-43-9 | Cadmium | mg/kg | **0.0045** | 5.34708729 | 16 | 15 | 630 | 55.9 | 167 | 15 | a (2) | Y |

**Table 4-11**
**Preliminary Selection of Soil (4-6 ft bgs) CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7440-47-3 | Chromium | mg/kg | 930 | 207.9393939 | 48 | 45 | 367 | 26.2 | 51.8 | -- | a (1) | N |
| 7440-48-4 | Cobalt | mg/kg | **8.9** | 159.2344708 | 39 | 37 | 12.2 | 6.76 | 2.14 | 4 | a (1) | Y |
| 7440-50-8 | Copper | mg/kg | **1.1** | 265.3990807 | 56 | 55 | 3500 | 169 | 653 | 55 | a (2) | Y |
| 7440-62-2 | Vanadium | mg/kg | **1.5** | 62 | 47 | 46 | 900 | 70.7 | 147 | 46 | a (1) | Y |
| 7440-66-6 | Zinc | mg/kg | **21** | 1321.172077 | 51 | 50 | 67000 | 1412 | 9369 | 50 | a (1) | Y |
| 7440-67-7 | Zirconium | mg/kg | NV | 8.6 | 3 | 2 | 5.2 | 4.20 | 1.18 | 2 | -- | Y |
| 7440-70-2 | Calcium | mg/kg | NV | NV | 14 | 14 | 8620 | 3157 | 2207 | 14 | -- | Y |
| 7487-94-7 | Mercury | mg/kg | **0.1** | 23.5 | 38 | 12 | 0.25 | 0.0573 | 0.0528 | 1 | a (3) | Y |
| 7782-49-2 | Selenium | mg/kg | **0.17** | 31.28037389 | 12 | 12 | 4.7 | 1.77 | 1.35 | 12 | a (1) | Y |
| | **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | |
| 11096-82-5 | Aroclor 1260 | mg/kg | **0.077** | NV | 31 | 3 | 49 | 2.13 | 10.2 | 1 | a (1) | Y |
| 11097-69-1 | Aroclor 1254 | mg/kg | 0.077 | 0.013168988 | 31 | 4 | 0.66 | 0.0566 | 0.166 | 3 | a (1) | Y |
| 12672-29-6 | Aroclor 1248 | mg/kg | **0.016** | NV | 31 | 6 | 1.9 | 0.178 | 0.478 | 6 | a (1) | Y |
| | **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | |
| 127-18-4 | Tetrachloroethene | mg/kg | 2.1 | 0.026456244 | 152 | 2 | 2.2 | 0.683 | 0.484 | 1 | a (1) | Y |
| 1330-20-7 | Xylenes, Total | mg/kg | **64** | 757.5567265 | 10 | 1 | 0.0006 | 0.0144 | 0.0243 | -- | a (1) | N |
| 136777-61-2 | m,p-Xylenes | mg/kg | **640** | NV | 146 | 1 | 0.0006 | 1.35 | 0.869 | -- | a (1) | N |
| 67-63-0 | Isopropanol | mg/kg | NV | NV | 4 | 3 | 427.5 | 107 | 214 | 3 | -- | Y |
| 67-64-1 | Acetone | mg/kg | **43** | 206.9239934 | 22 | 4 | 0.66 | 0.116 | 0.233 | -- | a (1) | N |
| 71-55-6 | 1,1,1-Trichloroethane | mg/kg | 4300 | 469 | 152 | 3 | 15 | 0.812 | 1.44 | -- | a (1) | N |
| 75-09-2 | Methylene chloride | mg/kg | 4.05 | 0.526319863 | 84 | 3 | 0.062 | 0.540 | 0.492 | -- | d | N |
| 75-69-4 | Trichlorofluoromethane | mg/kg | **300** | 302.4637741 | 148 | 2 | 4.5 | 0.727 | 0.565 | -- | a (1) | N |
| 79-01-6 | Trichloroethene | mg/kg | 3 | 0.032629733 | 158 | 9 | 210.97 | 3.32 | 20.4 | 4 | a (1) | Y |
| | **Semi-Volatile Organic Compounds (SVOCs)** | | | | | | | | | | | |
| 117-81-7 | bis(2-Ethylhexyl) phthalate | mg/kg | 4.9 | 1.975626174 | 32 | 7 | 0.089 | 0.0507 | 0.0608 | -- | a (2) | N |
| 129-00-0 | Pyrene | mg/kg | **18** | 241.8092704 | 54 | 7 | 0.59 | 0.398 | 1.73 | -- | a (3) | Y |
| 191-24-2 | Benzo(ghi)perylene | mg/kg | **6.4** | NV | 53 | 4 | 0.23 | 0.0954 | 0.347 | -- | a (1) | Y |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | mg/kg | 5.8 | 0.035353094 | 53 | 4 | 0.2 | 0.0944 | 0.347 | -- | a (1) | Y |
| 205-99-2 | Benzo(b)fluoranthene | mg/kg | 5.6 | 0.035353094 | 53 | 4 | 0.54 | 0.106 | 0.355 | -- | a (1) | Y |
| 206-44-0 | Fluoranthene | mg/kg | **38** | 318.6035903 | 54 | 7 | 0.8 | 0.405 | 1.73 | -- | a (3) | Y |
| 207-08-9 | Benzo(k)fluoranthene | mg/kg | 5.8 | 0.191970103 | 53 | 2 | 0.021 | 0.0917 | 0.352 | -- | a (1) | Y |
| 218-01-9 | Chrysene | mg/kg | 2.4 | 1.91180638 | 53 | 5 | 0.042 | 0.0933 | 0.352 | -- | a (1) | Y |
| 24887-75-0 | Androstane | mg/kg | NV | NV | 1 | 1 | 0.199 | 0.199 | -- | 1 | -- | Y |
| 3386-33-2 | Octadecane, 1-chloro- | mg/kg | NV | NV | 1 | 1 | 0.188 | 0.188 | -- | 1 | -- | Y |
| 4860-03-1 | Hexadecane, 1-chloro- | mg/kg | NV | NV | 1 | 1 | 0.341 | 0.341 | -- | 1 | -- | Y |
| 50-32-8 | Benzo(a)pyrene | mg/kg | 5.6 | 0.003535309 | 52 | 4 | 0.24 | 0.0362 | 0.0627 | -- | a (1) | Y |
| 56-55-3 | Benzo(a)anthracene | mg/kg | 5.6 | 0.035353094 | 53 | 4 | 0.24 | 0.0958 | 0.347 | -- | a (1) | Y |
| 593-45-3 | Octadecane | mg/kg | NV | NV | 1 | 1 | 0.392 | 0.392 | -- | 1 | -- | Y |
| 83-32-9 | Acenaphthene | mg/kg | **2.5** | 455.6453917 | 53 | 2 | 0.003 | 0.0911 | 0.352 | -- | a (2) | Y |
| 84-66-2 | Diethyl phthalate | mg/kg | 6900 | 3439.64711 | 34 | 1 | 0.002 | 0.950 | 2.77 | -- | a (1) | N |
| 84-74-2 | Di-n-butyl phthalate | mg/kg | **0.49** | 799.6070108 | 32 | 5 | 0.068 | 0.0394 | 0.0620 | -- | a (2) | N |
| 85-01-8 | Phenanthrene | mg/kg | **1.3** | NV | 52 | 5 | 0.28 | 0.0377 | 0.0671 | -- | a (2) | Y |
| 91-20-3 | Naphthalene | mg/kg | 210 | 1.65 | 52 | 3 | 0.032 | 0.00574 | 0.00888 | -- | a (1) | Y |
| 91-57-6 | 2-Methylnaphthalene | mg/kg | **210** | NV | 28 | 1 | 0.002 | 0.122 | 0.414 | -- | a (1) | Y |
| UKN012 | 28-Nor-17.alpha.(H)-hopane | mg/kg | NV | NV | 1 | 1 | 0.2 | 0.2 | -- | 1 | -- | Y |
| UKN014 | 2-Methyl-3-(3-methyl-but-2-enyl)-2-(4-me | mg/kg | NV | NV | 1 | 1 | 0.282 | 0.282 | -- | 1 | -- | Y |
| UKN019 | 6-Isopropenyl-4,8a-dimethyl-4a,5,6,7,8,8 | mg/kg | NV | NV | 1 | 1 | 0.252 | 0.252 | -- | 1 | -- | Y |
| UKN035 | D-Homoandrostane, (5.alpha.,13.alpha.)- | mg/kg | NV | NV | 2 | 2 | 0.296 | 0.225 | 0.100 | 2 | -- | Y |

## Table 4-11
## Preliminary Selection of Soil (4-6 ft bgs) CPECs for Ecological Receptors

| CAS Number | Analyte | Units | Most Conservative ESL | Human Health DCGL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UKN050 | Methanone, bis(2-Chlorophenyl)- | mg/kg | NV | NV | 1 | 1 | 0.004 | 0.004 | -- | 1 | -- | Y |
| UKN051 | Methyl 5-methyl-2-ethenyl-cyclohexane-1- | mg/kg | NV | NV | 1 | 1 | 0.223 | 0.223 | -- | 1 | -- | Y |
| UKN056 | n-Eicosane | mg/kg | NV | NV | 1 | 1 | 0.193 | 0.193 | -- | 1 | -- | Y |
| UKN073 | Spiro[4.5]decan-7-one, 1,8-dimethyl-8,9- | mg/kg | NV | NV | 1 | 1 | 0.202 | 0.202 | -- | 1 | -- | Y |
| UKN105 | Unknown | mg/kg | NV | NV | 146 | 146 | 4.8 | 0.163 | 0.539 | 146 | -- | Y |
| | **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | |
| 124-18-5 | Decane | mg/kg | NV | NV | 1 | 1 | 1.3 | 1.3 | -- | 1 | -- | Y |
| C14C20 | Diesel Range Organics (C14-C20) | mg/kg | NV | NV | 33 | 7 | 1500 | 62.0 | 261 | 7 | -- | Y |
| C20C30 | Diesel Range Organics (C20-C30) | mg/kg | NV | NV | 33 | 10 | 1000 | 61.8 | 193 | 10 | -- | Y |
| C21C30 | Diesel Range Organics (C21-C30) | mg/kg | NV | NV | 3 | 1 | 13.5 | 7.0 | 5.6 | 1 | -- | Y |
| E-10140 | Oil content | mg/kg | NV | NV | 1 | 1 | 500 | 500 | -- | 1 | -- | Y |
| GRO8-11 | Gasoline Range Organics (C8-C11) | mg/kg | NV | NV | 37 | | | 7.65 | 3.88 | -- | | N |
| UKN030 | C21-C30 Lubricant | mg/kg | NV | NV | 4 | 1 | 19 | 8.70 | 6.87 | 1 | -- | Y |
| UKN040 | High Boiling Petroleum Hydrocarbon | mg/kg | NV | NV | 5 | 1 | 11 | 11 | -- | 1 | -- | Y |
| UKN114 | TRPH | mg/kg | NV | NV | 4 | 3 | 192 | 60.3 | 87.9 | 3 | -- | Y |

Notes:

mg/kg: milligrams per kilogram

ESL: Ecological Screening Level

CPEC: Chemical of Potential Ecological Concern

DCGL: Derived Concentration GuideLine

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Tables 3-3 through 3-5. SRAM terrestrial mammal, terrestrial avian, terrestrial invertebrate ecological screening values. September.

a (1): Mammal

a (2): Avian

a (3): Invertebrate

b: EPA. 2001. Region 4 Recommended Ecological Screening Values for Soil. WSRC-TR-98-00110. Accessed at: http://www.epa.gov/region4/waste/ots/epatab4.pdf

c: EPA. 1995. Revised Region 3 BTAG Screening Values. August 9.

d: EPA. 2003. Region 5 RCRA Ecological Screening Levels. August. Accessed at: http://www.epa.gov/reg5rcra/ca/ESL.pdf

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.
When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

For the selection of detection limits during future sampling, the human health DCGL should be used unless the ESL is lower. The bolded ESLs are lower than the corresponding DCGLs.

In general, the DCGL (human health risk assessment) was selected as the lower of the agricultural or residential values. However, if background was higher than the lower of the agricultural or residential values, it was selected as the DCGL.

**Table 4-12**
**Preliminary Selection of Sump Soil CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Inorganic Chemicals** | | | | | | | | | | |
| 7429-90-5 | Aluminum | mg/kg | 12 | 2 | 2 | 10000 | 5900 | 5798 | 2 | a (1) | Y |
| 7439-92-1 | Lead | mg/kg | 0.013 | 3 | 3 | 510 | 287 | 193 | 3 | a (2) | Y |
| 7439-98-7 | Molybdenum | mg/kg | 0.11 | 3 | 3 | 1000 | 438 | 505 | 3 | a (1) | Y |
| 7440-02-0 | Nickel | mg/kg | 0.1 | 3 | 3 | 2000 | 714 | 1114 | 3 | a (1) | Y |
| 7440-22-4 | Silver | mg/kg | 0.54 | 2 | 2 | 1100 | 630 | 665 | 2 | a (1) | Y |
| 7440-36-0 | Antimony | mg/kg | 0.095 | 3 | 3 | 37 | 21 | 16 | 3 | a (1) | Y |
| 7440-38-2 | Arsenic | mg/kg | 1.9 | 3 | 3 | 27 | 22 | 5 | 3 | a (1) | Y |
| 7440-39-3 | Barium | mg/kg | 15 | 3 | 3 | 4100 | 1490 | 2261 | 3 | a (1) | Y |
| 7440-43-9 | Cadmium | mg/kg | 0.0045 | 3 | 3 | 35 | 14 | 19 | 3 | a (2) | Y |
| 7440-47-3 | Chromium | mg/kg | 930 | 3 | 3 | 2800 | 1116 | 1471 | 1 | a (1) | Y |
| 7440-48-4 | Cobalt | mg/kg | 8.9 | 3 | 3 | 71 | 36 | 31 | 3 | a (1) | Y |
| 7440-50-8 | Copper | mg/kg | 1.1 | 3 | 3 | 10000 | 4400 | 4887 | 3 | a (2) | Y |
| 7440-62-2 | Vanadium | mg/kg | 1.5 | 3 | 3 | 33 | 21 | 10 | 3 | a (1) | Y |
| 7440-66-6 | Zinc | mg/kg | 21 | 3 | 3 | 6300 | 4023 | 3196 | 3 | a (1) | Y |
| 7487-94-7 | Mercury | mg/kg | 0.1 | 3 | 3 | 260 | 111 | 129 | 3 | a (3) | Y |
| 7782-49-2 | Selenium | mg/kg | 0.17 | 1 | 1 | 15 | 15 | -- | 1 | a (1) | Y |
| | **Volatile Organic Compounds (VOCs)** | | | | | | | | | | |
| 100-41-4 | Ethylbenzene | mg/kg | 210 | 3 | 1 | 0.48 | 0.160 | 0.277 | -- | a (1) | N |
| 108-88-3 | Toluene | mg/kg | 2.5 | 3 | 1 | 0.77 | 0.257 | 0.445 | -- | a (1) | N |
| 1330-20-7 | Xylenes, Total | mg/kg | 64 | 2 | 1 | 1.4 | 0.700 | 0.990 | -- | a (1) | N |
| 156-59-2 | cis-1,2-Dichloroethene | mg/kg | 68 | 3 | 1 | 0.06 | 0.0200 | 0.0346 | -- | a (1) | N |
| 67-64-1 | Acetone | mg/kg | 43 | 3 | 1 | 0.35 | 0.117 | 0.202 | -- | a (1) | N |
| 71-55-6 | 1,1,1-Trichloroethane | mg/kg | 4300 | 3 | 1 | 3 | 1.00 | 1.73 | -- | a (1) | N |
| 75-00-3 | Chloroethane | mg/kg | 73 | 3 | 1 | 0.014 | 0.00467 | 0.00808 | -- | a (1) | N |
| 75-01-4 | Vinyl chloride | mg/kg | 0.73 | 3 | 1 | 0.07 | 0.0233 | 0.0404 | -- | a (1) | N |
| 75-34-3 | 1,1-Dichloroethane | mg/kg | 210 | 3 | 1 | 3.8 | 1.27 | 2.19 | -- | a (1) | N |
| 75-35-4 | 1,1-Dichloroethene | mg/kg | 0.29 | 3 | 1 | 0.38 | 0.127 | 0.219 | 1 | a (1) | Y |
| 79-01-6 | Trichloroethene | mg/kg | 3 | 3 | 1 | 0.42 | 0.140 | 0.242 | -- | a (1) | N |
| | **Semi-Volatile Organic Compounds (SVOCs)** | | | | | | | | | | |
| 117-81-7 | bis(2-Ethylhexyl) phthalate | mg/kg | 4.9 | 2 | 1 | 0.38 | 0.191 | 0.267 | -- | a (2) | N |
| 95-63-6 | 1,2,4-Trimethylbenzene | mg/kg | 640 | 3 | 1 | 0.012 | 0.00401 | 0.00692 | -- | a (1) | N |
| | **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | |
| C14C20 | Diesel Range Organics (C14-C20) | mg/kg | NV | 1 | 1 | 1600 | 1600 | -- | 1 | -- | Y |
| C20C30 | Diesel Range Organics (C20-C30) | mg/kg | NV | 1 | 1 | 1400 | 1400 | -- | 1 | -- | Y |

Notes:

mg/kg: milligrams per kilogram

ESL: Ecological Screening Level

CPEC: Chemical of Potential Ecological Concern

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Tables 3-3 through 3-5. SRAM terrestrial mammal, terrestrial avian, terrestrial invertebrate ecological screening values. September.

a (1): Mammal

a (2): Avian

a (3): Invertebrate

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.

When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

**Table 4-13**
**Preliminary Selection of Sump Water CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dioxins** | | | | | | | | | | |
| 1746-01-6 | TCDD-TEQ (Total all) | ug/L | NV | 12 | 6 | 0.025042 | 0.00556 | 0.00943 | 6 | -- | Y |
| 3268-87-9 | Octachlorodibenzo-p-dioxin | ug/L | NV | 6 | 6 | 0.471 | 0.162 | 0.155 | 6 | -- | Y |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | ug/L | NV | 6 | 3 | 0.0404 | 0.0137 | 0.0165 | 3 | -- | Y |
| 37871-00-4 | Heptachlorodibenzo-p-dioxins | ug/L | NV | 3 | 1 | 0.028 | 0.00934 | 0.0162 | 1 | -- | Y |
| 39001-02-0 | Octachlorodibenzofuran | ug/L | NV | 6 | 1 | 0.00726 | 0.00183 | 0.00362 | 1 | -- | Y |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | ug/L | NV | 6 | 1 | 0.00969 | 0.00162 | 0.00395 | 1 | -- | Y |
| | **General Chemistry** | | | | | | | | | | |
| E-10195 | Total Organic Carbon | ug/L | NV | 2 | 2 | 19000 | 17000 | 2828 | 2 | -- | Y |
| E-11778 | Hardness | ug/L | NV | 2 | 2 | 180000 | 165000 | 21213 | 2 | -- | Y |
| E-14506 | Alkalinity | ug/L | NV | 3 | 3 | 288000 | 264000 | 20881 | 3 | -- | Y |
| UKN025 | Bicarbonate Alkalinity as CaCO3 | ug/L | NV | 1 | 1 | 340000 | 340000 | -- | 1 | -- | Y |
| UKN090 | Nitrate-NO3 | ug/L | NV | 3 | 2 | 30000 | 10973 | 16517 | 2 | -- | Y |
| 14808-79-8 | Sulfate | ug/L | NV | 10 | 10 | 210000 | 137100 | 70276 | 10 | -- | Y |
| 16887-00-6 | Chloride | ug/L | NV | 11 | 11 | 54000 | 35473 | 11861 | 11 | -- | Y |
| 16984-48-8 | Fluoride | ug/L | NV | 5 | 3 | 600 | 500 | 71 | 3 | -- | Y |
| 71-52-3 | Bicarbonate | ug/L | NV | 7 | 7 | 350000 | 256000 | 78960 | 7 | -- | Y |
| E-10106 | BOD | ug/L | NV | 2 | 2 | 5300 | 4500 | 1131 | 2 | -- | Y |
| E-10128 | Nitrate/Nitrite as N | ug/L | NV | 2 | 2 | 1400 | 1400 | 0.00 | 2 | -- | Y |
| E-10162 | Total Suspended Solids | ug/L | NV | 2 | 1 | 16000 | 13000 | 4243 | 1 | -- | Y |
| E-10173 | Total Dissolved Solids | ug/L | NV | 8 | 8 | 2100000 | 600125 | 625547 | 8 | -- | Y |
| | **Inorganic Chemicals** | | | | | | | | | | |
| 7429-90-5 | Aluminum | ug/L | 87 | 6 | 5 | 32000 | 6746 | 14123 | 4 | b | Y |
| 7439-89-6 | Iron | ug/L | 1000 | 13 | 12 | 1060 | 488 | 306 | 1 | a | Y |
| 7439-92-1 | Lead | ug/L | 2.5 | 9 | 5 | 14 | 3.00 | 4.57 | 2 | a | Y |
| 7439-95-4 | Magnesium | ug/L | 82000 | 11 | 11 | 32000 | 18913 | 9249 | -- | b | N |
| 7439-96-5 | Manganese | ug/L | 120 | 13 | 11 | 580 | 124 | 160 | 3 | b | Y |
| 7439-98-7 | Molybdenum | ug/L | 73 | 9 | 4 | 2.7 | 6.06 | 3.70 | -- | b | N |
| 7440-02-0 | Nickel | ug/L | 52 | 18 | 6 | 15 | 11 | 6.64 | -- | a | N |
| 7440-09-7 | Potassium | ug/L | 53000 | 8 | 6 | 4300 | 3078 | 1487 | -- | b | N |
| 7440-22-4 | Silver | ug/L | 0.1 | 5 | 1 | 0.14 | 0.120 | 0.0283 | 1 | a | Y |
| 7440-23-5 | Sodium | ug/L | 680000 | 8 | 8 | 106000 | 56313 | 26387 | -- | b | N |
| 7440-28-0 | Thallium | ug/L | 4 | 4 | 1 | 0.6 | 0.350 | 0.354 | -- | a | N |
| 7440-36-0 | Antimony | ug/L | 30 | 11 | 3 | 2.6 | 3.39 | 3.83 | -- | b | N |
| 7440-38-2 | Arsenic | ug/L | 150 | 11 | 5 | 4.8 | 3.67 | 1.54 | -- | a | N |
| 7440-39-3 | Barium | ug/L | 4 | 15 | 15 | 200 | 50 | 44 | 15 | b | Y |
| 7440-41-7 | Beryllium | ug/L | 0.5 | 10 | 2 | 1.4 | 0.533 | 0.378 | 1 | a | Y |
| 7440-42-8 | Boron | ug/L | 1.6 | 8 | 7 | 170 | 121 | 26 | 7 | b | Y |
| 7440-43-9 | Cadmium | ug/L | 1.1 | 5 | 1 | 0.27 | 0.157 | 0.098 | -- | a | N |
| 7440-47-3 | Chromium | ug/L | 74 | 19 | 7 | 28 | 7.14 | 6.48 | -- | a | N |
| 7440-48-4 | Cobalt | ug/L | 23 | 9 | 1 | 7.2 | 5.97 | 3.51 | -- | b | N |
| 7440-50-8 | Copper | ug/L | 9 | 11 | 8 | 17 | 5.78 | 4.46 | 1 | a | Y |
| 7440-62-2 | Vanadium | ug/L | 20 | 9 | 5 | 60 | 13 | 18 | 1 | b | Y |
| 7440-66-6 | Zinc | ug/L | 110 | 18 | 12 | 91 | 26 | 21 | -- | a | N |
| 7440-70-2 | Calcium | ug/L | 116000 | 8 | 8 | 87000 | 56725 | 28104 | -- | b | N |
| 7782-49-2 | Selenium | ug/L | 5 | 5 | 2 | 1.45 | 1.38 | 0.106 | -- | a | N |

**Table 4-13**
**Preliminary Selection of Sump Water CPECs for Ecological Receptors**

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples Above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | |
| 31508-00-6 | PCB-118 | ug/L | NV | 4 | 4 | 0.64 | 0.480 | 0.131 | 4 | -- | Y |
| 32598-10-0 | PCB-66 | ug/L | NV | 4 | 2 | 0.26 | 0.200 | 0.0849 | 2 | -- | Y |
| 32598-14-4 | PCB-105 | ug/L | NV | 4 | 4 | 0.3 | 0.215 | 0.0592 | 4 | -- | Y |
| 32774-16-6 | PCB-169 | ug/L | NV | 4 | 1 | 0.17 | 0.0425 | 0.0850 | 1 | -- | Y |
| 34883-43-7 | PCB-8 | ug/L | NV | 4 | 2 | 0.16 | 0.0725 | 0.0846 | 2 | -- | Y |
| 35065-27-1 | PCB-153 | ug/L | NV | 4 | 4 | 0.68 | 0.453 | 0.162 | 4 | -- | Y |
| 35065-29-3 | PCB-180 | ug/L | NV | 4 | 1 | 0.21 | 0.210 | -- | 1 | -- | Y |
| 35065-30-6 | PCB-170 | ug/L | NV | 4 | 2 | 0.16 | 0.0700 | 0.0824 | 2 | -- | Y |
| 35068-28-2 | PCB-138 | ug/L | NV | 4 | 4 | 1.2 | 0.765 | 0.294 | 4 | -- | Y |
| 35693-99-3 | PCB-52 | ug/L | NV | 4 | 1 | 0.33 | 0.330 | -- | 1 | -- | Y |
| 37680-73-2 | PCB-101 | ug/L | NV | 1 | 1 | 0.44 | 0.440 | -- | 1 | -- | Y |
| 38380-07-3 | PCB-128 | ug/L | NV | 4 | 4 | 0.3 | 0.193 | 0.0741 | 4 | -- | Y |
| 38380-08-4 | PCB-156 | ug/L | NV | 4 | 2 | 0.14 | 0.0558 | 0.0684 | 2 | -- | Y |
| 40186-72-9 | PCB-206 | ug/L | NV | 4 | 1 | 0.062 | 0.0155 | 0.0310 | 1 | -- | Y |
| 41464-39-5 | PCB-44 | ug/L | NV | 4 | 1 | 0.15 | 0.150 | -- | 1 | -- | Y |
| 52663-68-0 | PCB-187 | ug/L | NV | 4 | 2 | 0.12 | 0.0495 | 0.0597 | 2 | -- | Y |
| 52663-72-6 | PCB-167 | ug/L | NV | 4 | 1 | 0.17 | 0.0425 | 0.0850 | 1 | -- | Y |
| 7012-37-5 | PCB-28 | ug/L | NV | 4 | 2 | 0.14 | 0.104 | 0.0516 | 2 | -- | Y |
| | **Volatile Organic Compounds (VOCs)** | | | | | | | | | | |
| 107-06-2 | 1,2-Dichloroethane | ug/L | 100 | 54 | 30 | 3200 | 211 | 539 | 14 | b | Y |
| 127-18-4 | Tetrachloroethene | ug/L | 84 | 54 | 30 | 50 | 6.25 | 7.75 | -- | a | N |
| 156-59-2 | cis-1,2-Dichloroethene | ug/L | 590 | 50 | 29 | 140 | 27 | 35 | -- | b | N |
| 156-60-5 | trans-1,2-Dichloroethene | ug/L | 970 | 53 | 1 | 0.5 | 2.30 | 2.51 | -- | b | N |
| 306-83-2 | 2,2-Dichloro-1,1,1-trifluoroethane | ug/L | NV | 3 | 3 | 82 | 55 | 32 | 3 | -- | Y |
| 56-23-5 | Carbon Tetrachloride | ug/L | 13.3 | 54 | 30 | 620 | 76 | 126 | 29 | b | Y |
| 67-64-1 | Acetone | ug/L | 1500 | 45 | 2 | 38 | 12 | 12 | -- | b | N |
| 67-66-3 | Chloroform | ug/L | 124 | 42 | 30 | 3500 | 292 | 605 | 22 | a | Y |
| 71-55-6 | 1,1,1-Trichloroethane | ug/L | 11 | 54 | 28 | 90 | 10 | 15 | 16 | b | Y |
| 75-09-2 | Methylene chloride | ug/L | 98.1 | 54 | 15 | 66 | 7.70 | 13 | -- | b | N |
| 75-27-4 | Bromodichloromethane | ug/L | NV | 54 | 2 | 1.8 | 2.40 | 2.45 | 2 | -- | Y |
| 75-34-3 | 1,1-Dichloroethane | ug/L | 47 | 54 | 29 | 60 | 16 | 16 | 4 | b | Y |
| 75-35-4 | 1,1-Dichloroethene | ug/L | 25 | 54 | 28 | 40 | 8.85 | 9.71 | 4 | b | Y |
| 7601-90-3 | Perchlorate | ug/L | NV | 47 | 1 | 6.9 | 3.15 | 2.91 | 1 | -- | Y |
| 76-13-1 | 1,1,2-Trichloro-1,2,2-trifluoroethane | ug/L | NV | 42 | 29 | 600 | 90 | 124 | 29 | -- | Y |
| 79-01-6 | Trichloroethene | ug/L | 2190 | 54 | 32 | 290 | 48 | 62 | -- | a | N |
| | **Semi-Volatile Organic Compounds (SVOCs)** | | | | | | | | | | |
| 206-44-0 | Fluoranthene | ug/L | 0.04 | 9 | 1 | 0.33 | 0.0980 | 0.155 | 1 | b | Y |
| 95-50-1 | 1,2-Dichlorobenzene | ug/L | 76.3 | 41 | 4 | 2.6 | 0.514 | 0.587 | -- | a | N |

Notes:

ug/L: micrograms per liter

ESL: Ecological Screening Level

CPEC: Chemical of Potential Ecological Concern

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Table 3-2. September.

b: EPA. 2006. Region 3 BTAG Freshwater Screening Benchmarks. July. Accessed at: http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/R3_BTAG_FW_Benchmarks_07-06.pdf

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.

When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

## Table 4-14
## Preliminary Selection of Soil Gas CPECs for Ecological Receptors

| CAS Number | Analyte | Units | Most Conservative ESL | Number of Usable Samples | Number of Detects | Maximum Detected Concentration | Average Concentration | Standard Deviation | Number of Samples above MCV | MCV Source | CPEC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | |
| 107-06-2 | 1,2-Dichloroethane | ug/m$^3$ | 42000 | 185 | 1 | 1500 | 0.835 | 0.356 | -- | a | N |
| 127-18-4 | Tetrachloroethene | ug/m$^3$ | 24000 | 187 | 6 | 3400 | 1.307 | 3.765 | -- | a | N |
| 156-59-2 | cis-1,2-Dichloroethene | ug/m$^3$ | 1900 | 115 | 3 | 15000 | 21.90 | 122.92 | 1 | a | Y |
| 156-60-5 | trans-1,2-Dichloroethene | ug/m$^3$ | 1900 | 114 | 2 | 157.55 | 4.59 | 22.98 | -- | a | N |
| 67-63-0 | Isopropanol | ug/m$^3$ | NV | 3 | 1 | 427.5 | 314.5 | 97.92 | 1 | -- | Y |
| 71-55-6 | 1,1,1-Trichloroethane | ug/m$^3$ | 38000 | 185 | 3 | 15000 | 0.947 | 1.26 | -- | a | N |
| 74-82-8 | Methane | ug/m$^3$ | NV | 44 | 12 | 27000 | 11.44 | 4.70 | 12 | -- | Y |
| 75-01-4 | Vinyl chloride | ug/m$^3$ | 560 | 74 | 1 | 26.47 | 1.52 | 5.29 | -- | a | N |
| 75-35-4 | 1,1-Dichloroethene | ug/m$^3$ | 600 | 78 | 6 | 10000 | 67.8 | 263.4 | 5 | a | Y |
| 75-69-4 | Trichlorofluoromethane | ug/m$^3$ | 90900 | 185 | 1 | 4500 | 0.876 | 0.440 | -- | a | N |
| 75-71-8 | Dichlorodifluoromethane | ug/m$^3$ | 91000 | 184 | 1 | 1100 | 0.838 | 0.348 | -- | a | N |
| 76-13-1 | 1,1,2-Trichloro-1,2,2-trifluoroethane | ug/m$^3$ | NV | 185 | 4 | 3500 | 3.95 | 1.97 | 4 | -- | Y |
| 79-01-6 | Trichloroethene | ug/m$^3$ | 6400 | 188 | 9 | 66000 | 172.2 | 1420.4 | 5 | a | Y |

Notes:

ug/m$^3$: micrograms per cubic meter

ESL: Ecological Screening Level

CPEC: Chemical of Potential Ecological Concern

MCV Sources:

a: MWH. 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan. Santa Susana Field Laboratory. Ventura County, California. Revision 2 – Final. September. Prepared for: The Boeing Company, National Aeronautics and Space Administration, U.S. Department of Energy. Table 3-3. SRAM terrestrial mammal inhalation ecological screening values. September.

NV: No value available

Reported average concentration includes the full detection limit for non-detected analytes.

When no ESL is available, any detection is considered an exceedence for the purpose of CPEC selection.

**Table 4-15**
**Comparison of Ecological Terrestrial and Aquatic Radionuclide Preliminary Remediation Goals to Human Health Preliminary Remediation Goals**

| Radionuclide of Potential Concern | Terrestial Water (pCi/L) | Aquatic Water (pCi/L) | Human Health Groundwater (pCi/L) | Terrestrial Soil (pCi/g) | Aquatic Sediment (pCi/g) | Human Health Rural Resident (pCi/g) | Human Health Resident (pCi/g) |
|---|---|---|---|---|---|---|---|
| Am-241 | 2.00E+05 | 4.38E+02 | **4.58E-01** | 4.00E+03 | 7.04E+05 | **2.0E+00** | **2.0E+00** |
| Ba-133 | 1.20E+03 | 6.76E+01 | **6.99E+00** | 6.67E+02 | 8.57E+04 | **1.8E-01** | **1.8E-01** |
| Cm-243/244 | 1.84E+05 | 6.63E+01 | **5.03E-01** | 4.06E+03 | 4.01E+06 | **3.5E-01** | **3.5E-01** |
| Co-60 | 1.00E+06 | 3.76E+03 | **3.03E+00** | 7.00E+02 | 1.49E+04 | **3.6E-02** | **3.6E-02** |
| Cs-134 | 3.26E+05 | 5.18E+02 | **1.13E+00** | 1.13E+01 | 2.28E+04 | **1.6E-01** | **1.6E-01** |
| Cs-137 | 6.00E+05 | 1.05E+03 | **1.57E+00** | 2.00E+01 | 4.93E+04 | **6.0E-02** | **6.0E-02** |
| Eu-152 | 2.55E+06 | 2.55E+04 | **7.84E+00** | 1.52E+03 | 3.06E+04 | **4.2E-02** | **4.2E-02** |
| Eu-154 | 2.00E+06 | 2.16E+04 | **4.62E+00** | 1.00E+03 | 2.59E+04 | **5.0E-02** | **5.0E-02** |
| Eu-155 | 3.00E+07 | 2.64E+05 | **2.51E+01** | 2.00E+04 | 3.18E+05 | **3.8E+00** | **3.8E+00** |
| Fe-55 | 1.00E+05 | 8.00E+02 | **5.52E+01** | 5.53E+04 | 6.51E+06 | **2.8E+03** | 2.9E+03 |
| H-3 | 2.00E+08 | 4.99E+09 | **1.44E+02** | 2.00E+05 | 7.04E+06 | **2.7E+00** | **2.7E+00** |
| I-129 | 5.70E+06 | 1.00E+06 | **3.22E-01** | 5.67E+03 | 4.93E+05 | **1.9E+00** | 2.5E+00 |
| K-40 | 1.93E+06 | 2.90E+03 | **1.93E+00** | 1.19E+02 | 5.80E+04 | **1.1E-01** | 1.4E-01 |
| Na-22 | 2.53E+01 | **3.56E+00** | 4.95E+00 | 1.64E+01 | 1.64E+04 | **8.7E-02** | **8.7E-02** |
| Ni-59 | 1.51E+05 | 3.58E+04 | **1.74E+02** | 2.68E+05 | 5.88E+06 | **2.1E+02** | 1.1E+03 |
| Ni-63 | 6.25E+04 | 1.47E+04 | **7.11E+01** | 1.04E+05 | 2.27E+06 | **9.5E+01** | 4.9E+02 |
| Np-237 | 6.49E+06 | 6.85E+01 | **7.07E-01** | 3.86E+03 | 7.86E+04 | **1.3E-01** | 1.4E-01 |
| Pb-210 | 2.92E+05 | 6.01E+02 | **3.75E-02** | 1.39E+03 | 9.18E+04 | **1.5E-01** | 4.5E-01 |
| Pu-238 | 1.89E+05 | 1.76E+02 | **3.64E-01** | 5.27E+03 | 3.95E+06 | **3.3E+00** | **3.3E+00** |
| Pu-239 | 2.00E+05 | 1.87E+02 | **3.53E-01** | 6.00E+03 | 7.04E+06 | **2.9E+00** | **2.9E+00** |
| Pu-240 | 5.13E+02 | **1.89E-01** | 3.53E-01 | 1.85E+01 | 4.00E+06 | **2.9E+00** | **2.9E+00** |
| Pu-241 | 1.07E+07 | 3.90E+03 | **2.71E+01** | 1.90E+05 | 7.69E+06 | **4.5E+02** | **4.5E+02** |
| Ra-226 | 8.00E+03 | 1.02E+01 | **8.16E-04** | 5.00E+01 | 1.45E+04 | **1.3E-02** | **1.3E-02** |
| Ra-228 | 7.00E+03 | 8.49E+00 | **4.58E-02** | 4.00E+01 | 2.90E+04 | **8.0E-02** | 8.5E-02 |
| Sb-125 | 6.97E+06 | 3.67E+05 | **9.28E+00** | 3.52E+03 | 7.04E+04 | **4.4E-01** | 4.6E-01 |
| Sr-90 | 5.00E+04 | 5.39E+04 | **6.44E-01** | 2.00E+01 | 3.52E+04 | **3.2E-01** | 3.9E+00 |
| Tc-99 | 2.00E+07 | 2.47E+06 | **1.73E+01** | 4.00E+03 | 4.69E+05 | **6.0E-03** | 9.6E+01 |
| Th-228 | 6.33E+04 | 3.74E+02 | **1.59E-01** | 5.30E+02 | 1.64E+04 | **1.5E-01** | **1.5E-01** |

**Table 4-15**
**Comparison of Ecological Terrestrial and Aquatic Radionuclide Preliminary Remediation Goals to Human Health Preliminary Remediation Goals**

| Radionuclide of Potential Concern | Terrestial Water (pCi/L) | Aquatic Water (pCi/L) | Human Health Groundwater (pCi/L) | Terrestrial Soil (pCi/g) | Aquatic Sediment (pCi/g) | Human Health Rural Resident (pCi/g) | Human Health Resident (pCi/g) |
|---|---|---|---|---|---|---|---|
| Th-230 | 4.52E+05 | 2.57E+03 | **5.23E-01** | 9.98E+03 | 2.74E+06 | **3.8E+00** | **3.8E+00** |
| Th-232 | 5.00E+04 | 3.04E+02 | **4.71E-01** | 2.00E+03 | 3.29E+06 | **3.4E+00** | **3.4E+00** |
| U-233/234 | 4.00E+05 | 2.02E+02 | **6.74E-01** | 5.00E+03 | 3.08E+06 | **4.7E+00** | 5.0E+00 |
| U-235 | 4.00E+05 | 2.17E+02 | **6.63E-01** | 3.00E+03 | 1.05E+05 | **2.0E-01** | **2.0E-01** |
| U-238 | 4.00E+05 | 2.23E+02 | **5.47E-01** | 2.00E+03 | 4.28E+04 | **7.5E-01** | 7.8E-01 |

Notes:
pCi/L: picoCuries per liter
pCi/g: picoCuries per gram
All data are QA complete.
For the selection of detection limits during future sampling, the lower of the ecological and human health PRGs should be used and are bolded.

**Table 4-16**
**Proposed Sampling Areas for Ecological Risk Assessment**

| | Terrestial Habitats | | | | | Aquatic Habitats | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SS | Soil Gas | Soil Invert | Terr Plant | Small Mammal | SW | SED | Aquatic Invert | Fish | Aquatic Plant |
| **EU 1-16 (for each)** | RAD/C | C | RAD/C | RAD/C | RAD/C | RAD/C | *NA* | *NA* | *NA* | *NA* |
| **Pond NE of Sodium Reactor Experimentall complex** | *NA* | *NA* | *NA* | *NA* | *NA* | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C |
| **"cattail area" in EU 3** | *NA* | *NA* | *NA* | *NA* | *NA* | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C |
| **Other Area IV locations** | *NA* | *NA* | *NA* | *NA* | *NA* | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C |
| **Buffer Area south of SRE** | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C |
| **Buffer Area north of SRE** | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C |
| **Arroyo Simi Area 1** | *NA* | *NA* | *NA* | *NA* | *NA* | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C |
| **Arroyo Simi Area 2** | *NA* | *NA* | *NA* | *NA* | *NA* | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C |
| **R-2 Pond (Area II)** | *NA* | *NA* | *NA* | *NA* | *NA* | RAD/C | RAD/C | RAD/C | RAD/C | RAD/C |

**Assumptions:** Each of the 16 EUs is sufficiently unique and large to support independent sampling

Aquatic sampling assumes presence of standing water for sufficient duration to support aquatic life

Sampling for specific receptor group (e.g., fish) assumes presence of of that group (e.g., fish)

Arroyo Simi Area 1 = integrator of watersheds draining EUs 6, 8, 10, and 11 (if water body present)

Arroyo Simi Area 2 = integrator of watersheds draining EUs 1 and 2 (if water body present)

Samples from the two buffer areas will be terrestrial only unless persistent aquatic conditions are present (e.g., stormwater or seep retention)

**Definitions:** RAD - radionuclide sampling

C - chemicals for ERA (full suite of analytes unless specified otherwise)
(bioaccumulative for biota; include hardness for SW (dissolved + total metals); include TOC for SS and SED)

SS - surface soil

Soil Gas - soil gas analyses from each of the three soil depth horizons, at each soil sampling location

Soil Invert - soil dwelling invertebrates (most likely earthworms)

Terr Plant - (above ground, unwashed; two sample types: (1) seeds & fruits and (2) leaves of dominant taxa (multiple taxa OK)

Small Mammal - deer mouse (or other mid-trophic level omnivore)

SW - surface water (includes stormwater and shallow groundwater that surfaces as seeps)

SED - sediment

Aq Invert - aquatic invertebrate - note taxa and relative dominance but composite all taxa for chemical analyis (to be used as "prey")

Fish - whole body small (<6 in. TL) omnivorous or invertivorous fish, multiple taxa OK but note taxa, composite of 3 fish/sample

Aq Plant - submerged, emergent, or floating macrophyte (most abundant taxa)

**Sample Numbers:** SS - up to 10 samples, depending on size of area/EU (at each location, collect samples from each of three depth intervals per SRAM)
One sample per soil depth horizon (e.g., 10 in 0-2'; 10 in 2-4'; 10 in 4-6')

Soil Gas - up to 10 samples, depending on size of area/EU (at each location, collect samples from each of three depth intervals per SRAM)
One sample per soil depth horizon (e.g., 10 in 0-2'; 10 in 2-4'; 10 in 4-6')

SED - up to 10 samples, depending on size of area (0 - 6 in depth)

SW - 3 depth integrated samples if lotic (e.g., flowing stormwater) or up to 10 depth-integrated samples if lentic (depending on size)

Soil Invert - up to 10 composite samples (depending on size of area) of same taxon, sufficient individuals to allow chemcial and rad analyses

Small Mammal - up to 10 composite samples (depending on size of area) of 3 individuals per composite, mixed taxa OK

Terr Plant (seeds/fruits) - up to 10 composite (seeds and fruits) samples (depending on size of area) of common taxa, sufficient volume to allow chemcial and rad analyses

Terr Plant (leaves) - up to samples (depending on size of area) of same taxon, sufficient volume to allow chemcial and rad analyses

Fish - up to 10 composite samples (depending on size of area), multiple taxa OK, sufficient individuals to allow chemcial and rad analyses (e.g., 3 fish per composite)

Aq Invert - up to 10 composite samples (depending on size of area) of mixed taxa, sufficient volume to allow chemcial and rad analyses

Aq Plant - up to 10 samples (depending on size of area) of common taxa, sufficient volume to allow chemcial and rad analyses

## Table 4-17
## Remaining Buildings Data Gap Analysis

| Site | MARSSIM Class | Summary of Historical Radiological Survey Information | Data Gap |
|---|---|---|---|
| Radioactive Material Handling Facility (RMHF) General | Class 1 | Existing concrete foundations data are necessary to evaluate potential future use. | Radiological surface characterization of building concrete foundations. |
| 4006 (Includes 4616) | Class 3 | No known existing building radiological characterization information. | Collect final set of swipe and fixed measurement data plus dose rate results. Volumetric samples not considered unless contamination identified. |
| 4009 Critical Experiments Building | Class 1 | Rockwell International performed a 1988 survey collecting total and removable beta and alpha measurements plus external gamma radiation levels, and performed gamma spec on some volumetric samples. These data are supplemented by followup surveys in 1990 and 1995, again including beta, alpha, and gamma spec analysis. Speciation for non-gamma-emitting radionuclides was not performed. | Quantification of non-gamma emitters represents a data gap. Existing data are adequate for risk analysis of identified contaminants, though transfer of of hard-copy results to useable format may be necessary. |
| 4011 Radiation Instrument Calibration Laboratory | Class 3 | Rockwell International performed a 1998 survey collecting total and removable beta and alpha measurements plus external gamma radiation levels, and performed gamma spec on some volumetric samples. Speciation for non-gamma-emitting radionuclides was not performed. | Quantification of non-gamma emitters represents a data gap. Existing data are adequate for risk analysis of identified contaminants, though transfer of of hard-copy results to useable format may be necessary. |

## Table 4-17
## Remaining Buildings Data Gap Analysis

| Site | MARSSIM Class | Summary of Historical Radiological Survey Information | Data Gap |
|---|---|---|---|
| 4019 SNAP System Nuclear Qualification Test Facility | Class 1 | The 1999 report by Boeing summarizes finding of prior investigations and documents results of total and removable beta and alpha measurements plus external gamma radiation levels. Gamma spec or speciation for non-gamma-emitting radionuclides was not performed. | Volume of existing gross data are adequate for risk analysis, though transfer of of hard-copy results to useable format may be necessary. Speciation of contaminants required. |
| 4021 (RMHF); Laundry and Hot and Cold Change Room | Class 1 | Structure be surveyed and decontaminated at the time of RMHF closure and data unavailable for risk analysis. | Collect swipe and fixed measurement data plus dose rate results. Also target ductwork, where accessible. Can use other RMHF data to estimate isotopic distributions. |
| 4022 (RMHF); Nuclear Fuel and Radioactive Waste Storage | Class 1 | The 2007 investigation included measurement of beta and alpha total and removable activity, external gamma radiation levels, and volumetric sampling for a broad range of analytes (see detailed result sin Cabrera 2007). However, the total beta/alpha survey was limited to certain areas given the high level of residual gamma radiation near the west wall (up to 140 mR/hr). Regardless of this limitation in "statis measurements", the available data are sifficient for risk analysis. | No additional data required for the data gap analysis. |
| 4024 SNAP Environmental Test Facility | Class 1 | Areva 2008 confirmation report summarized data from direct beta, contact gamma, and 1 meter exposure rate measurements in addition to smear samples for removable contamination on surfaces and material samples for isotopic analysis. A MARSSIM-based final status survey plan and subsequent report will be developed separately to demonstrate successful decommisisoning of identified residual contamination (AREVA 2008). | No additional data required for the data gap analysis. |

## Table 4-17
## Remaining Buildings Data Gap Analysis

| Site | MARSSIM Class | Summary of Historical Radiological Survey Information | Data Gap |
|---|---|---|---|
| 4044 (RMHF) Clean shop and support lab | Class 3 | Served various roles including that of a clean shop, a health physics office, and a break room. The health physics office has been used as a counting area for removable contamination measurements and storage and use of calibration sources. Although no other regulated radiological materials were managed specifically in this building it is considered radiologically impacted (ontamination potenital considered low). Swipe data available from routine health physics operations (2008 e-mail from Philip Rutherford). | Collect final set of swipe and fixed measurement data plus dose rate results. Also target ductwork, where accessible. Volumetric samples not considered unless contamination identified. |
| 4055 Nuclear Material Development Facility | Class 1 | ORAU 1997 final status survey report presents total and removable verification data for comparison to NRC license requirements. Volumetric data were collected from paint and soils adjacent to the building, though for a limited list of analytes. | Isotopic distributions must be estimated given limited analytical results representing increased uncertainty for risk analysis and potential data gap |
| 4075 (RMHF); radioactive waste storage | Class 1 | The 2007 investigation included measurement of beta and alpha total and removable activity, external gamma radiation measurements, and volumetric sampling for a broad range of analytes (see detailed results in Cabrera 2007). There is a large volume of systematic data suitable for risk analysis. | No additional data required for the data gap analysis. |
| 4100 Fast Critical Experiment Laboratory | Class 1 | Systematic fixed and removable activity for beta and apha radiation, plus gamma radiation measuremets identified no contaimination, as summarized in the 1980 Rockwell International report. Subsequent quarterly surveys suppliment this dataset though reuse necessitates resurvey (Rutherford 2008). | Collect final set of swipe and fixed measurement data plus dose rate results. Also target ductwork, where accessible. Volumetric samples not considered unless contamination identified. |
| 4563 (RMHF); Open-walled Storage Area | Class 1 | The 2007 investigation included measurement of beta and alpha total and removable activity, external gamma radiation measurements, and volumetric (smear) sampling for tritium analysis (see detailed results in Cabrera 2007). Non-tritium speciation was not performed though data from other RMHF buildings may be used to estimate isotopic distributions. Available data are sufficient for risk analysis. | No additional data required for the data gap analysis. |

## Table 4-17
## Remaining Buildings Data Gap Analysis

| Site | MARSSIM Class | Summary of Historical Radiological Survey Information | Data Gap |
|---|---|---|---|
| 4621 (RMHF); Contaminated Equipment Storage | Class 1 | The 2007 investigation included measurement of beta and alpha total and removable activity, external gamma radiation measurements, and volumetric sampling for a broad range of analytes (see detailed results in Cabrera 2007). There is a large volume of systematic data suitable for risk analysis. | No additional data required for the data gap analysis. |
| 4658 (RMHF); Former Guard Shack | Class 3 | The 2007 investigation included measurement of beta and alpha total and removable activity, external gamma radiation measurements, and volumetric (smear) sampling for tritium analysis (see detailed results in Cabrera 2007). Non-tritium speciation was not performed though data from other RMHF buildings may be used to estimate isotopic distributions. Available data are sufficient for risk analysis. | No additional data required for the data gap analysis. |
| 4665 (RMHF); Oxidation Facility and Non-radiactive Waste Storage | Class 3 | The 2007 investigation included measurement of beta and alpha total and removable activity, external gamma radiation measurements, and volumetric sampling for a broad range of analytes (see detailed results in Cabrera 2007). There is a large volume of systematic data suitable for risk analysis. | No additional data required for the data gap analysis. |
| 4688 (RMHF); Open-walled Cleaning Station and Radioactive Materials Storage | Class 1 | A limited number of static measurements identified significant beta activity. No smear data were collected though on metal sample was colelcted from the roof (see results in Cabrera 2007). The limited dataset represents a datagap for risk analysis. ` | Fixed and removable beta and alpha data plus gamma radiation level data are required for risk analysis. |

# Section 5
# Summary of Data Gap Findings

This section provides an overall summary of the findings of the data gap analysis for Area IV. The data gap analysis was based on the GIS data base and reports developed by Boeing and its contractors through January 2008. It is recognized that investigations of some locations of Area IV are ongoing with proposed sampling under the RFI. Those efforts will be considered as part of the development of the FSAP for the proposed field sampling investigation resulting from this gap analysis. However, data collected through the ongoing RCRA sampling efforts will be recognized as data gaps until that data is demonstrated to meet the data requirements described in this gap report.

**Table 5-1** provides a summary of the data gap analysis findings. The text that follows provides summary details of the data needs.

**Table 5-1 Summary of Data Gap Analysis Findings**

| Media Evaluated | Data Gap |
|---|---|
| Soil | Additional chemical and radionuclide data are required for determining risks to human health and ecological receptors. Data are also required for characterization and delineation of the extent of contamination for analysis of risk-based alternatives in the *SSFL Area IV EIS*. |
| Gamma Walkover Survey | The data gap proposal is to conduct a 100% gamma walkover survey of all accessible portions of Area IV, adjacent areas identified to be impacted, drainages down gradient of Area IV, and groundwater seeps. |
| Groundwater | Data are needed to define horizontal and vertical extent of contamination, both for areas where extent is not adequately defined and in areas with no groundwater sampling data. Data on the hydrologic properties of the aquifers are also needed for evaluation of alternatives in the EIS. |
| Groundwater Seeps | Radionuclide and chemical data are needed to understand the fate and transport of groundwater contaminants and assess human and ecological receptor exposure pathways. Seeps will be sampled if water is available during the field sampling program. Regardless of the presence of water during the field effort, a gamma walkover survey will be performed. |
| Soil Vapor | While additional data are not required for the EIS per se, additional soil gas data may be considered in the Field Sampling Program to optimize the location of groundwater monitoring wells and to support the human health and ecological risk assessments. |
| Surface Water | Surface water quality for Area IV is currently |

**Table 5-1 Summary of Data Gap Analysis Findings**

| Media Evaluated | Data Gap |
|---|---|
| | being assessed under the SSFL's National Pollutant Discharge Elimination System (NPDES) permit. For the most part, this data is adequate for EIS purposes. Surface water chemical and radionuclide data from ponds and drainages internal to Area IV are required for assessment of risk to ecological receptors. Surface water characterization and confirmation samples will be collected during field sampling, if it is present. |
| Sediment | Sediment chemical and radionuclide data from ponds and drainages internal to Area IV are required for assessment of risk to ecological receptors. |
| Ecological Receptors | Biological tissue chemical and radionuclide data are required for assessment of risk to ecological receptors. |
| Air | No data gaps for air were identified. |
| Buildings | Radionuclide data for building surfaces are incomplete. Additional data for buildings are required for human health risk assessment. |
| Bedrock | Chemical and radionuclide analytical data, including aquifer physical and natural chemistry data are required. |
| Background | Accepted background data for radionuclides are needed for surface soil, near surface soil, and subsurface soil; metals and dioxin in subsurface soil; and radionuclides, metals and dioxin in sediment, surface water, groundwater and bedrock. These data should be collected from media in both geologic formations found at the site. |

# 5.1 Soil

## 5.1.1 Chemical Analysis Data Gap

Two approaches were used to evaluate the data requirements for conducting risk-based alternative evaluations in the *SSFL Area IV EIS*. These include the evaluation of data needed to perform a human health risk assessment consistent with CERCLA and determination of the data necessary to define the nature and extent of contamination for alternatives evaluation.

The risk assessment data gap evaluation was based on the statistical evaluation of the data required for a CERCLA risk assessment for each of the 16 EUs. As with the entire soil data gap approaches, the data gap was determined to be the difference between the statistically determined requirement and the existing data that met screening criteria.

The nature and extent evaluation of soil data requirements focused on delineation requirements for the approximately 250 chemical use areas identified for Area IV. Existing data were plotted for the chemical use areas and color coded as to where the results exceeded screening criteria. A review of the distribution of the sample results was used to identify the required additional samples. The data gap is the difference between the data needs and the existing data meeting screening criteria. Because this approach involved evaluating a large number of use areas, this approach resulted in identification of a greater number of samples than did the risk assessment approach.

The screening of the existing data by the screening criteria was performed on an individual constituent (e.g., COI) by constituent basis. Existing data for many constituents at each study location were found to be adequate for the purpose of use of the individual constituents in either a risk assessment or defining contamination extent. However, because some individual constituents did not pass screening criteria, many of the locations evaluated required some additional sampling due to the "data gap" introduced by specific COIs. In addition, because there is limited subsurface soil data, defining vertical contamination depth is a gap for locations with identified surface soil contamination.

The specific requirements for collecting samples to fill the data gap will be specified in the FSAP for the proposed field sampling investigation of Area IV. It is expected as part of development of the FSAP, proposed sample locations and depths will be refined. Sample numbers are also expected to change as part of sampling investigation development as refinements between chemical use and SU data needs are identified, overlaps in data requirements between adjacent areas are determined, and the final evaluation of data to define extent of contamination is made.

### 5.1.2 Radionuclides Gap Analysis Approach

For radionuclides, MARSSIM principles were adapted to determine statistically, the number of samples required for a human risk assessment and determining extent of contamination. For surface soil, the MARRSIM delineation used EUs and SUs as a basis for determining the number of required samples. Under MARSSIM, the total number of samples required per SU was statistically calculated based on SU classification. The screening of the existing data determined what portions of the existing data were usable to address the sample needs and the difference between the required data and available data became the data gap. To verify that the existing data were properly located for purposes of the EIS analyses, the distribution of the results was also reviewed. The MARSSIM analysis determined that approximately 600 samples would be required to define the extent of contamination for all SUs. Screening of samples and data gap determination for radionuclides was similar to that of the chemical COIs. The actual number of samples and the locations where the samples will be collected will be determined during development of the FSAP.

## 5.2 SSFL Area IV Gamma Walkover Survey

Gamma walkover surveys (GWS) are a part of the MARSSIM recommended site investigation approach for radionuclides. The GWS involves passing over the ground an instrument capable of detecting gamma emissions from radioactive materials. A GWS is performed as a field screening tool to locate areas with radionuclide contamination above background levels that then can be target areas for soil sampling. Nearly 100% of the accessible portions of Area IV have been subject to some level of ground survey in support of building removals. However, several of the surveys were not performed to MARSSIM guidelines or using recommended detection instrumentation. As part of the evaluation of existing data, reports describing the prior GWS were reviewed for compliance with MARSSIM principles. Areas with completed and acceptable surveys were identified. The data gap analysis then focused on the location of process areas where radioactive materials were used that lacked or had insufficient coverage. To date, MARSSIM-compliant walkover surveys have been completed for a total of about 10 acres. Although MARSSIM guidelines specify 100% coverage of impacted areas only (impacted areas are defined as locations with known or suspected radionuclide contamination), due to a level of uncertainty regarding past activities within Area IV overall, the recommendation from the data gap study is to perform a 100% GWS of all accessible portions of Area IV that lack MARSSIM compliant surveys.

## 5.3 Groundwater

To determine groundwater COIs, existing groundwater data were sorted by detected COIs and screened against human health MCLs (background data for groundwater do not exist) and analytical detection limits compared to the MCLs. Based on the data base screening, tritium was the most frequently observed radionuclide and the solvents TCE, 1,2-DCE, and 1,1-DCE the chemicals most frequently observed.

The groundwater data gap evaluation then focused on the current extent of groundwater contamination, both vertically and horizontally. Included in this evaluation was a review of process and chemical use areas and locations where solvents were reported in soil gas. Locations where groundwater contamination extent did not appear to be bounded by the existing well network or where no wells are present to identify groundwater contamination were targeted as potential data gaps. Existing hydrolgeologic data were also reviewed for use in completing groundwater characterization for both nature and extent and for understanding aquifer properties necessary to evaluate groundwater cleanup alternatives in the EIS. Based on the reviews, the data gap analysis supported recommendations for site investigative well point, new monitoring wells, and collection of aquifer properties (bedrock and water chemistry) data. The proposed groundwater investigation will be refined during development of the FSAP.

## 5.4 Groundwater Seeps

Data collected at groundwater seeps can aid in determining the fate and transport of contaminants in groundwater and to assess the potential human health and ecological exposure pathways for the respective risk assessments. However, most seeps exhibit water during and immediately following the rainy season and thus data for seeps are limited. The requirement to sample seeps will be incorporated into the field sampling investigation designed to address the overall data gaps presented in this report. Therefore, all identified seep locations will be visited during the field program and sampled for radionuclide and chemical COIs should sufficient water be present. All seep locations will also be subject to a gamma walkover survey to assess the presence of any radionuclides above background.

## 5.5 Soil Vapor

Collection of additional soil vapor data will be a consideration for the field sampling investigation, particularly for the potential placement of monitoring wells. It is recognized that under the RFI program collection of additional soil gas samples is proposed. These data coupled with the overall needs for the data gap investigation as refined during the development of the FSAP will be used to determine specific needs for additional soil gas samples.

## 5.6 Surface Water

Surface water sampling for most site drainages is being conducted under the SSFL NPDES permit program. Data collected under the NPDES program is deemed sufficient for site characterization for the discharge points of Area IV. As noted under Section 5.8 – Ecological Receptors, there are internal Area IV drainages leading to ponds in other SSFL areas with limited or no data. If present during the field sampling program, surface water will be collected and analyzed for radionuclide and chemical COIs. Also, to collect data on the complete list of the data gap program COIs, NPDES monitoring points will also be sampled should sufficient rainfall occur during the field sampling investigation.

## 5.7 Sediment

Contamination extent associated with NPDES monitored drainages appears to be bounded by existing sample results. However, as discussed in Section 4.7, there are internal drainages to Area IV that lack sediment data. These drainages become a data gap and will require sampling for radionuclide and chemical COIs.

## 5.8 Ecological Receptors

Similar to the approach applied to soils for the human health risk assessment data evaluation, the existing data base was reviewed for chemical and radionuclide data collected from soil (0 to 2 feet, 2 to 4 feet, 4 to 6 feet), sediment, surface water, groundwater seep, sump soil, sump water, and soil gas. These data were screened by ecological receptor ESLs to determine if they were acceptable for use in the ERA. Laboratory detection limits for chemicals and radionuclides in a given medium were

screened to identify data meeting requirements for the ERA. Ecological EPECs were determined for any COI whose maximum concentration exceeded an ESL.

The ecological ESLs were also compared with human health PRGs to determine whether data proposed to be collected for the human health risk assessment would also be applicable to the ERA. This comparison was performed to prevent collection of duplicate data. This evaluation determined that the sampling effort proposed for the human health risk assessment would be sufficient for use and the ERA and the ERA data gap evaluation focused on data requirements for other media.

The evaluation of the other media for ERA purposes indicated chemical and radionuclide data are needed for on site drainages (water and sediment) and ponds that received runoff leaving Area IV (See **Figure 5-1**). Data for radionuclides are also needed from groundwater seeps downgradient from Area IV to assess this pathway and risk to ecological receptors.

Biological tissue data does not exist for Area IV. To address the ERA evaluation of COI uptake and bioaccumulation, the ecological data gap analysis identified a need to collect biological tissue samples. This includes the need to analyze biota tissue samples with a full range of chemical and radionuclide COIs. At total of 10 samples per biological media are recommended. These include terrestrial and aquatic plant, terrestrial and aquatic invertebrate, fish, and small mammal samples.

As with the proposed soil and groundwater field sampling investigation to address their respective data gaps, the data requirements for the ERA will be described in the FSAP. Refinements to the data needs for the ERA will be identified during the development of the FSAP.

## 5.9 Air

The review of air monitoring data indicates that sufficient ambient data exist for Area IV. To assess risks for the EIS relative to decommissioning and demolishing of buildings and removal of soil, building data and soil data collected during the proposed field sampling investigation will be used. Therefore no additional air sampling is proposed at this time. This finding does not include the possible need to sample air in the breathing zone of site workers involved in the field sampling investigation.

## 5.10 Buildings

Existing reports were reviewed to evaluate the history of use and investigation of remaining site buildings. This review determined that a limited data gap exists. This data gap consists of a need for building surface contamination data (i.e., fixed point measurements, radiological scan surveys, and removable contamination data) for about 12 buildings. In addition, isotopic ratios to be applied to contaminant levels as an integral part of the preparation of human health risk assessments are not generally

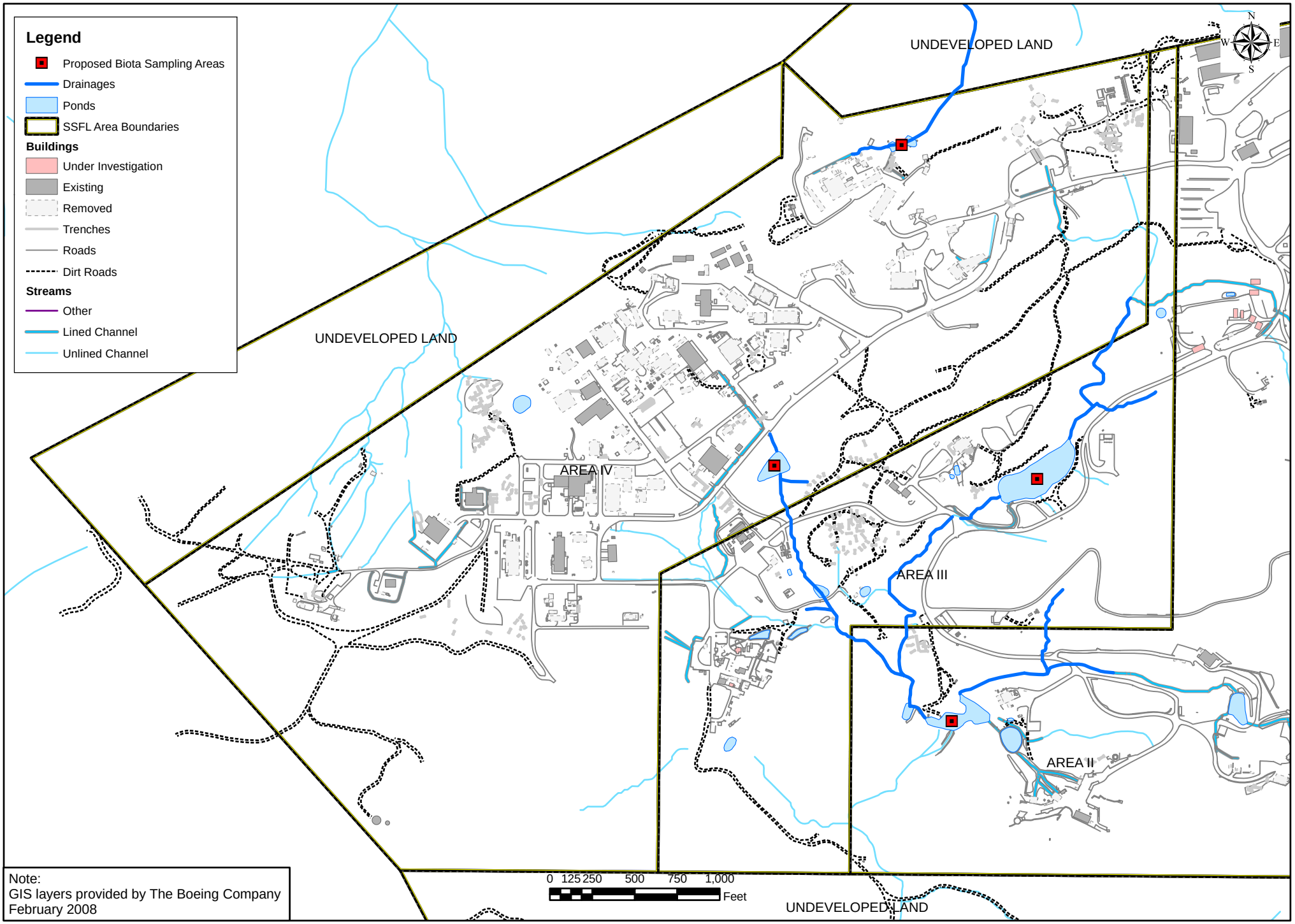
available for remaining buildings. The buildings to be sampled and sampling protocols will be specified in the FSAP.

## 5.11 Background Values

Background values for metals and dioxin in soil have been agreed upon by regulatory agencies for SSFL, although there is not a similar set of background values for subsurface soil. The radionuclide background used for this data gap analysis was based on existing offsite surface soil data. These data may be useful for establishment of agreed upon future radionuclide background values. However, establishment of separate background values for each of the two geological formations is desirable and additional surface soil data may be useful for that purpose. Also, there currently is no background data for radionuclides at depth for near surface and subsurface soils, sediment, rocks, surface water, and groundwater. Therefore, the data gaps include additional background sample analysis for radionuclides and chemicals for these matrices.

## 5.12 Bedrock

The data gap analysis of bedrock samples determined that very little bedrock data has been collected to date for chemical and radionuclide COI characterization. In addition, bedrock aquifer properties are needed for groundwater cleanup remedy evaluations. Therefore bedrock data are a data gap for completing Area IV site characterization. Bedrock samples will be required at locations where chemical and radionuclide vertical extent of contamination is needed and from borings for wells drilled into bedrock. The locations and evaluations of bedrock samples will be described in the FSAP.




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 5-1
Internal Drainages and Ponds Considered
for Biota Sampling Program

# Section 6
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CDM a Joint Venture with SAIC & DSO

# Area IV Santa Susana Field Laboratory

## Environmental Impact Statement (Area IV SSFL EIS)

### Appendices



Subject: **Task Order: DE-AT30-08CC60021/ET17**
**Draft Gap Analysis Report**

Deliverable Number: 02
Submitting to: Dave Hincks, DCO
Submitted by: John Wondolleck
Submittal Date: June 1, 2008

Prepared by: John Wondolleck
Distributed to: David Hincks, DCO
Stephanie G. Jennings, DCOR

Office Of Environmental Management
safety ❖ performance ❖ cleanup ❖ closure

# Appendix A

# SSFL Area IV
# General Chemical Use Overview

# Appendix A
# SSFL Area IV General Chemical Use Overview

Appendix A contains the table, *SSFL Area IV General Chemical Use Overview*. This table provides a crosswalk of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) that are being addressed under the Santa Susana Field Laboratory (SSFL) Resource Conservation and Recovery Act (RCRA) Corrective Action Program and their corresponding exposure unit location, which will be evaluated for the SSFL Area IV Environmental Impact Statement (EIS). A general description of operations and chemical uses for each of the SWMUs/AOCs is also provided, however, the table does not detail all chemical use areas within SSFL Area IV. The reader should refer to specific documents supporting the SSFL RCRA Corrective Action Program (e.g., RCRA Facility Assessment Report [SAIC, 1994], published RCRA Facility Investigation (RFI) reports, etc.) for additional information related to historic operations and chemical uses in SSFL Area IV.

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-01 | SWMU 7.4 | Old Conservation Yard (OCY) [DOE] | <u>Storage Areas</u><br>• Operational from early 1960s to early 1980s; OCY used for storage (five areas) of salvageable materials; storage and pumping of diesel fuel oil; debris areas containing construction debris and empty containers (5-gallon cans and 55-gallon drums) or storage of burned telephone poles; transformers<br>• Former Rocketdyne Conservation Yard<br>• Former Atomics International (AI) Conservation Storage Yard<br>• Former North Slope Storage Area<br>• Former Container Storage Area<br>• Hundreds of drums stored during 1970s<br>• Soil samples collected in 1988 showed up to 4,000 mg/kg hydrocarbons, 6 mg/kg methylene chloride, and 7.1 mg/kg vinyl chloride; $^{137}$Cs found up to 200 pCi/g<br>• Four metal containers of radiologically contaminated dirt excavated in 1989 |
| EU-01 | SWMU 7.4 | Old Conservation Yard (OCY) [DOE] | <u>Fueling Areas</u><br>• Former Fueling Area at Bldg. 4320 (pump house)<br>• 20,000-gallon fuel oil/diesel UST (UT-28); removed in 1988 (clean closure)<br>• Two 1.5-million gallon capacity diesel fuel oil ASTs surrounded by 6- to 13-ft high earthen berms – AST 4731 built in 1977 and AST 4732 built in 1981; both tanks were removed in 1999<br>• 400 gallons of diesel fuel were spilled adjacent to UT-28 in 1982; impacted soils were excavated to a depth of 4-5 ft below ground surface in a natural depression east of Bldg. 4320; soil contaminated with 4,000 ppm hydrocarbons in the heavy oil range (C22 – C40) detected within the excavation<br>• Piping from 1.25 million gallon diesel product tanks was removed; underlying; 100 cu. yards of soil excavated during tank removal |
| EU-01 | SWMU 7.4 | Old Conservation Yard (OCY) [DOE] | <u>Debris Areas (Southeast OCY)</u><br>• Former Telephone Pole Storage Area<br>• Northern and Southern Debris Areas |
| EU-01 | SWMU 7.4 | Old Conservation Yard (OCY) [DOE] | <u>Debris Area (North Slope)</u><br>• North Slope Debris Area “A”; PCBs were detected at 24,000 ppm<br>• North Slope Debris Area “B” |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-01 | SWMU 7.4 | Old Conservation Yard (OCY) [DOE] | Transformer Areas<br>• Southeast Transformer Area<br>• Transformer Area 4737 |
| EU-01 | SWMU 7.4 | Old Conservation Yard (OCY) [DOE] | Downslope Drainage Areas<br>• Former SRE Pond Discharge Pipeline<br>• Topographic Low Spot, Downslope Area |
| EU-02 | SWMU 7.8 | New Conservation Yard (NCY) [Boeing] | New Construction Yard<br>• Began operation in 1978 for storage of used nonhazardous equipment and drums prior to their potential salvage; a low-background alpha/beta counting laboratory; and document incineration<br>• Stained soil and a potential asbestos gasket observed during VSI<br>• May 1988 DOE survey indicated small areas of visible stained soil and dead vegetation<br>• Soil samples collected in 1988 indicated toluene contamination at 0.11 mg/kg at the 1-1.5 ft level |
| EU-02 | SWMU 7.8 | New Conservation Yard (NCY) [Boeing] | Ash Pile |
| EU-03 | Area IV AOC | Sodium Reactor Experiment (SRE) Complex Area [Boeing] | SCE Steam Power Plant<br>• Located approx. 1,000 ft northeast of Bldg. 4143<br>• Site was used for nuclear power reactor and supporting operations; Southern California Edison (SCE) power plant operations; hot oil/sodium component cleaning;<br>• Sampling conducted in 1992 detected $^{137}$Cs (0.24 – 0.30 pCi/g [dry]) and $^{90}$Sr (0.08 – 0.09 pCi/g [dry]); gross beta activity was detected in a surface water sample at 4.9 pCi/L |
| EU-03 | Area IV AOC | Sodium Reactor Experiment (SRE) Complex Area [Boeing] | Building 4003 Leach Field (AI-Z1) |
| EU-03 | Area IV AOC | Sodium Reactor Experiment (SRE) Complex Area [Boeing] | Transformer Areas<br>• Transformer Area 4963<br>• Transformer Area (South of Bldg. 4003) |
| EU-03 | Area IV AOC | Sodium Reactor Experiment (SRE) Complex Area [Boeing] | Oil Stain (at Building 4003) |
| EU-03 | Area IV AOC | Sodium Reactor Experiment (SRE) Complex Area [Boeing] | Downslope Drainage and Pond Areas<br>• SRE Pond Influent Channels (lined)<br>• SRE Pond<br>• Drainage Downslope of SRE Pond |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-04 | SWMU 7.2 | Hazardous Waste Management Facility (HWMF) [DOE] | Buildings 4133 and 4654<br>• Built in 1978 originally as a drum storage yard<br>• Equipment stored in area during 1960s and 1970s<br>• RCRA permit issued by DHS in December 1983<br>• Designed for reaction of waste materials containing metallic sodium as well as wastes containing impurities such as sodium-potassium (NaK) alloys and hydrides and alkali metals<br>• Drainage from scrubber (NaOH) went to a UST that was removed in 1987<br>• Soil samples collected in 1988 showed gross beta up to 51.6 pCi/g, Na up to 6,900 mg/kg, and K up to 11,000 mg/kg; pH high in soil<br>• Groundwater (1990) high in Na and K<br>• Freon and chlorinated solvents |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Buildings 4030/4035<br>• Used as a counting room and workshop, purchasing office, traffic, warehousing, and shipping and receiving; housed the Van de Graff accelerator 1960-1966<br>• Documented spills of diesel, sodium chromate, and nickel chloride<br>• Chemical usage: diesel fuel, metals (incl. hexavalent chromium), and other inorganic compounds |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4030 Leach Field (AI-Z3)<br>• Received sanitary waste from Bldg. 4030/4035<br>• Assumed to have same chemical uses as Bldg. 4030/4035 |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4073 Kinetics Experiment Water Boiler (KEWB) Reactor Test Building<br>• Decontaminated in 1968 and removed in 1975<br>• Chemical usage: uranyl sulfate (fuel) |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4074<br>• Built in 1958 and used as an X-ray film processing facility for KEWB; later used as a storage area; demolished in 1995<br>• Chemical usage: metals |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4083 Reactor Kinetics Control Building |
| EU-04 | Area IV AOC | Building 4064 Leach Field [DOE] | Building 4064 Leach Field (AI-Z2) |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4093<br>• Used as a reactor building between 1956 and 1980 for the L-85 Reactor (also known as the AE-6 Reactor and the Water Boiler Neutron Source Reactor), for reactor operator training, and as a neutron source; later used for storage<br>• Reactor fuel consisted of a highly enriched uranyl sulfate dissolved in water and contained in a spherical graphite-reflected stainless steel core<br>• Three incidents of possible releases: 1959 (fission gas release to air), 1982 (U-235 contaminated rinse water released to floor and concrete shield block), and 1995 (radioactive HEPA filter found in pile of debris) |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4093 Leach Field<br>• Leach field received sanitary waste from Bldg. 4093 until 1961; leach field was removed in 1999<br>• Chemical usage: metals<br>• Previous sampling detected metals at concentrations below screening levels; no further investigation is required for metals |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4103 Reactor Kinetics Lab and Storage |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4123<br>• Used for temporary storage of radiological waste material |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4453 Neutron Radiography<br>• Used for neutron radiography and reactor fuel (uranyl sulfate) handling |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4641<br>• Used for shipping and receiving, including radiological materials through 1985<br>• Very small quantities of mercury (0.1 gal.) were released in 1996 and 1997<br>• Chemical usage: solvents (temporarily stored at bldg. before being delivered to other buildings) and metals |
| EU-04 | Area IV AOC | DOE Unaffiliated Features [DOE] | Building 4037<br>• Chemical usage: 1,4-dioxane, diesel, hydraulic oil, waste oils, and metals |
| EU-04 | Area IV AOC | DOE Leach Fields 1 [DOE] | Substation Area<br>• Located north of Bldg. 4641<br>• Chemical usage: PCBs |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-05 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Coal Storage Area<br>• Chemical usage: solvents, oil, PCBs, metals, and waste construction debris (incl. asbestos) |
| EU-05 | SWMU 7.11 | Building 4029 Reactive Metal Storage Yard [DOE] | • RCRA-permitted, bermed, and concrete-based container storage area for radioactive, reactive (sodium metal, lithium hydride), and mixed wastes<br>• Underground cold traps contain sodium metal |
| EU-05 | Area IV AOC | Southeast Drum Storage Yard [Boeing] | Southeast Drum Storage Yard<br>• 50-100 drums stored in this area in the early 1960s; remained operational until 1968<br>• Drums may have been associated with the Apollo Program |
| EU-05 | Area IV AOC | DOE Leach Fields 1 [DOE] | Transformer Pole<br>• Three transformers located at the intersection of G and 11 Streets (A305)<br>• Chemical usage: PCBs |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-06 | SWMU 7.6 | Radioactive Materials Handling/Disposal Facility (RMHF) [DOE] | • Handling, treatment, and storage of high-activity and low-level radioactive wastes and materials (U, $^{137}$Cs, $^{90}$Sr, $^{85}$Kr, $^{147}$Pm, and Pu); mixed wastes include mercury, TRU lead, sodium, and ethylene glycol<br>• Bldg. 4021 – 200-gal UST for rinse water removed in 1972 and associated piping removed in 1985/1986; radioactive spill occurred outside Bldg. 21; 5-gal container of metallic sodium in storage during VSI<br>• Bldg. 4022 – storage facility for high-level radioactive materials/waste and mixed waste; contains 8,000-gal UST; revised Part A Appl. submitted in 1989; 2-L container of radioactive Hg and 9-pound container of silicon oil in storage during VSI<br>• Bldg. 4075 – storage of low-level radioactive waste and mixed waste; interim storage of transuranic waste; revised Part A Appl. submitted<br>• Bldg. 4621 – storage of mixed waste; revised Part A Appl. submitted; 700-gal container of waste antifreeze in storage during VSI<br>• Bldg. 4665 – Emergency Decontam. Supplies Storage<br>• Bldg. 4688 – Hazardous Materials Storage Shed<br>• Drainage Pond – collected drainage from RMDF; pond has been sealed with coated asphalt to prevent leakage<br>• Bldg. 4021 Leach Field (AI-Z5) – operated 1959-1961 for sanitary waste water from the radioactive waste processing area located at the west end of Bldg. 4021; RMDF radioactive water processing system leaked to RMDF leach field in 1962/1963; approx. 36,000 ft$^3$ excavated to bedrock in 1978 and cracks in the bedrock sealed with tar and backfilled [radioactive contam. was present down to at least 10 ft below bedrock surface]; subsurface found contaminated with low levels of toluene, methylene chloride, MEK, total xylenes, and ethylbenzene<br>• Documented radiological releases in 1978 (2) and 1979 |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-06 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Building 4005<br>• Built in 1958 for non-nuclear thermodynamic characteristics testing of proposed coolants for organic moderated reactor experiments and Piqua reactors; converted during mid-1960s for fabrication of enriched uranium carbide fuel; used from 1972-1986 as a pilot plant for molten salt combustion (Molten Salt Test Facility)<br>• Release of contaminated smoke to bldg. from fire in 1967, but no release outside of bldg.<br>• Six spills reported at the facility, which included molten salt in carbonate or slurry form, water-tar solutions, and coal ash in solution with sodium bicarbonate; all releases were to the R-2 Ponds<br>• Chemical usage: VOCs (e.g., benzene), TPH, PCBs, coal dust, coke, metals (e.g., chromium), cyanide, and silica, and sodium carbonate<br>• Previous sampling detected metals at concentrations above screening levels |
| EU-06 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Building 4027<br>• Used as a vibration and shock test facility beginning in 1961 and then as a nonradiological hazardous waste storage facility (“The Yard”); demolished in 2003<br>• Hydraulic fluid spill (30 gal.) in 1992<br>• Chemical usage: beryllium, waste oil, contaminated waste solids, batteries, paint waste, flammable waste, caustics, corrosives, debris, and wastewater |
| EU-06 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Building 4032<br>• Constructed in 1962 as a space environmental test facility for a thermal vacuum system and developing the fuel rod control system; used as a Liquid Metal Development Laboratory from 1970s to 1984; demolished in 2003<br>• Tank UT-22 has been removed<br>• Chemical usage: kerosene, PCBs, lead paint, and asbestos |
| EU-06 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Building 4042<br>• Used as a general test and lithium hybrid shield fabrication building in support of the SNAP program beginning in 1963; also used for sodium-aerosol and related technology tests; used for liquid metal technology work after support work for SNAP tests ceased; demolished in 2003<br>• Chemical usage: alcohol, lithium, and storage of unknown chemicals |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-06 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | <u>Building 4049 and Former Coal Gasification PDU Process Area</u><br>• Bldg. 4049 used as a control center in the 1950s to 1960s to support the SNAP program; hydraulic test facility control center beginning in 1960; Piqua Test Loops control center from 1968-1977; designated as a control and test center for the PDU in 1977; bldg. inactive by 1988<br>• PDU used for testing thermodynamic characteristics of proposed coolants for organic moderated reactors and for designing a coal gasification system to demonstrate the technical feasibility of producing sulfur-free, low-BTU product gas by partial combustion of coal (1977-1981); demolished in 1991<br>• Process generated a "green liquor" wastewater (approx. 80,000 gallons) that contained organics, sulfur compounds, and ash; the green liquor was filtered, the ash was disposed, the sulfur was stripped and removed as sodium sulfate, and the sodium was recycled<br>• In 1979, molten salt with 500-1,000 gallons of water, which contained cyanide and some metals, spilled from a tank into storm channels that drain into the R-2A Discharge Pond<br>• Chemical usage: terphenyl organics, Freon, solvents, surfactants, oil and grease, SVOCs, lead paint, metals (e.g., aluminum, lithium, manganese, iron), boron, cyanide, green liquor, sodium hydroxide, caustics, sulfate, mercaptans, and asbestos<br>• Previous sampling detected metals and PCBs at concentrations above screening levels |
| EU-06 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | <u>Substation 4742</u> |
| EU-06 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | <u>PDU Bag House</u><br>• Chemical usage: benzene, toluene, xylene, aromatic hydrocarbons, chloromines, hexachlorobenzene, coal, coal dust, coke, chromium, heavy metals, PCBs, cyanide, green liquor, silica, calcium carbonate, sodium carbonate, molten salt carbonate<br>• Previous sampling detected VOCs at concentrations above soil gas screening levels |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-06 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | PDU Catchment Basin<br>• Chemical usage: benzene, toluene, xylene, aromatic hydrocarbons, chloromines, hexachlorobenzene, coal, coal dust, coke, chromium, heavy metals, PCBs, cyanide, green liquor, silica, calcium carbonate, sodium carbonate, molten salt carbonate<br>• Previous sampling detected VOCs at concentrations above soil gas screening levels |
| U-06 | Area IV AOC | DOE Leach Fields 1 [DOE] | Building 4023 Liquid Metals and Analytical Chemistry Lab<br>• Supported the SNAP reactor during the 1960s and 1970s; contained a small sodium loop to study radioactive contamination transport (Mn-54 and Co-60); a second section was built in 1976, which was used as storage, a setup room, and an analytical chemistry laboratory; bldg. demolished in 1999<br>• A mercury spill (0.1 gal.) was documented at this bldg. in 1997<br>• Two incidents of possible release of sodium containing Mn-54 in 1980 and 1981<br>• Chemical usage: mercury, cadmium, lithium chloride, and potassium chloride |
| EU-06 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Building 4024<br>• Chemical usage: PCBs and uses associated with a small chemistry laboratory.<br>• SNAP support building. |
| EU-06 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Building 4025<br>• Chemical usage: acetic acid, potassium permanganate, sodium bisulfide, ammonium carbonate, ethylene diamine tetra acetic acid (EDTA), and ferrous sulfate |
| EU-06 | Area IV AOC | DOE Unaffiliated Features [DOE] | Building 4625<br>• Used for component storage |
| EU-07 | SWMU 6.9 | Environmental Effects Laboratory (EEL) [Boeing] | EEL Cryogenic Laboratory and Test Cells (Building 3271)<br>• Constructed in 1964 and used for testing various materials (such as carbon and stainless steel) under high-pressure hydrogen conditions<br>• Previous sampling indicated elevated VOC soil gas concentrations |
| EU-07 | SWMU 6.9 | Environmental Effects Laboratory (EEL) [Boeing] | Hazardous Materials Storage Pad<br>• A small area nearby was excavated (2 to 3 $yd^3$) in 1993 where elevated petroleum hydrocarbons were detected |
| EU-07 | SWMU 6.9 | Environmental Effects Laboratory (EEL) [Boeing] | Tanks<br>• Hydraulic oil and other tanks |
| EU-07 | SWMU 6.9 | Environmental Effects Laboratory (EEL) [Boeing] | Northern Transformer Area<br>• Previous sampling indicated elevated PCB concentrations |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-07 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | 17th Street Drainage Area<br>• Received waste runoff from the entire PDU area<br>• Chemical usage: benzene, toluene, xylene, aromatic hydrocarbons, chloromines, hexachlorobenzene, coal, coal dust, coke, chromium, iron, heavy metals, PCBs, cyanide, green liquor, silica, calcium carbonate, sodium carbonate, molten salt carbonate<br>• Previous sampling detected TPH, SVOCs, PCBs, and metals at concentrations above screening levels |
| EU-07 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Buildings 4007 and 4008<br>• Used for chemical and flammable materials storage (1958-1990s) [many of the containers were badly corroded]; Bldg. 4008 also used as a machine shop and Electric Laser Laboratory; transformer located at Bldg. 4008<br>• Chemical usage: acetone, denatured alcohol, oils and lubricants, PCBs, amerzine, morpholine, hydrazine, lithium hydride, sodium hydride powder, salts, limestone, and cement |
| EU-07 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Building 4011<br>• Used for non-nuclear programs support, aerospace assembly and component manufacturing, calibration and repair of radiological instrumentation (1984-1996), communications equipment storage, administrative offices, as a machine shop, and as an x-ray development laboratory (1966)<br>• Two ASTs (AT-05 and AT-06), which contained propane and fuel oil, were located near this bldg.<br>• Three radiological incidents occurred (1960, 1985, and 1994)<br>• Chemical usage: VOCs (e.g., acetone), TPH, metals, and acetic acid |
| EU-07 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Building 4011 Leach Field (AI-Z9)<br>• Received sanitary waste from Bldg. 4011; leach field removed in 2000<br>• Chemical usage: VOCs (e.g., acetone), TPH, metals, and acetic acid |
| EU-07 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Building 4171<br>• Used for electronic equipment storage and as an X-Ray Room (1960s-2000)<br>• Chemical usage: silver and aluminum |
| EU-07 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Building 4172<br>• Used as an X-Ray Room and for the storage of sealed sources (1970s-2000)<br>• A tank was located at Bldg. 4172 (contents unknown)<br>• Chemical usage: VOCs, metals, aluminum sulfate, hydroquinone, potassium hydroxide, and sulfuric acid |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-07 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Building 4611<br>• Used for spray painting<br>• Chemical usage: VOCs |
| EU-07 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Substation 4711 |
| EU-07 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Transformer Pole D-5 |
| EU-08 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Building 4006<br>• Non-nuclear sodium laboratory until 1999<br>• Tetralin fire in 1959; sodium fire in 1987; mercury spill in sink (1992)<br>• Chemical usage: tritium titanium foils, mercury, tetralin, and gasoline storage in USTs |
| EU-08 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Building 4402<br>• Operated as a nonradiological facility prior to 1967; used for sodium testing and solvent storage; bldg. has been demolished<br>• Chemical usage: solvents |
| EU-08 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Building 4616<br>• Cooling tower for Bldg. 4006<br>• 2,000 gal. of water treated with sodium nitrate base chemical was drained to a pit located in the coal yard south of Bldg. 4005 due to a power outage in 1986<br>• Chemical usage: coolant (sodium nitrate) |
| EU-08 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Substation 4706<br>• Substation 4706 is owned by Southern California Edison |
| EU-08 | SWMU 7.10 | Coal Gasification Process Development Unit (PDU) [Boeing] | Building 4005/4006 Leach Field (AI-Z8)<br>• Received sanitary wastes from various laboratories and work areas in Bldgs. 4005 and 4006; disconnected and abandoned in 1960-1961; drain lines and tanks were removed in 2001 at the same time the septic tanks were removed<br>• Contamination not detected during previous sampling; however, VOCs and PCBs not investigated |
| EU-08 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Sodium Component Test Installation (SCTI) Pump Station<br>• Fuel oil was pumped from AST 4735<br>• Chemical usage: fuel oil |
| EU-08 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | Parking Lot 4502<br>• Used for temporary storage/drying of coal<br>• Chemical usage: coal |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-08 | Area IV AOC | Boeing Area IV Leach Fields [Boeing] | AST 4735<br>• 87,000-gal. tank used to store fuel oil between 1977 and 1999<br>• Chemical usage: fuel oil |
| EU-08 | Area IV AOC | DOE Leach Fields 2 [DOE] | Building 4010 (Power Demonstration Test Facility)<br>• Used for SNAP 2 and SNAP 8 Experimental Reactor Tests between 1959 and 1965<br>• Fueled by a hydrided zirconium-uranium alloy and controlled by moveable parts in a beryllium reflector sleeve shielded by lithium hydride; tritium production during operation of experimental reactors and weapons testing; water with hydrazine was used in the cooling water loop to reduce corrosion and scale build-up<br>• Five incidents of possible release: 04/30/61, 07/05/61, 01/01/64 (fission gas release), 06/11/64, and 10/19/65 (Co-60, Mn-54, and Fe-59 released in hi-bay area)<br>• NaK fire in reactor pit beneath the building in 1965<br>• Chemical usage: TCE, metals, and hydrazine |
| EU-08 | Area IV AOC | DOE Leach Fields 2 [DOE] | Building 4010/4012 Leach Field (AI-Z7)<br>• Received sanitary wastes from Bldg. 4010; location of leach field has not been identified<br>• Tritium and 1,1-DCE have been detected in wells downgradient of DOE Leach Fields 2<br>• Chemical usage: TCE, metals, and hydrazine |
| EU-08 | Area IV AOC | DOE Leach Fields 2 [DOE] | Building 4012<br>• Served as the SNAP Critical Test Facility No. 2 (1962-1968), Heavy Metal Reflected Fast Spectrum Reactor (1970-1972), ETEC X-ray Facility and storage (1979-1992); demolished in 2003<br>• Low nuclear power experiments were performed to collect critical data for the design of SNAP reactor cores for higher power operation; operations and control rooms demolished in 1986 to build the ETEC Sodium Component Test Installation Power Pak section of the Cogeneration Project<br>• Chemical usage: metals |
| EU-08 | Area IV AOC | DOE Leach Fields 2 [DOE] | Building 4013<br>• Used for component assembly and packaging of SNAP 10A, SNAP 2, and SNAP 8 flight systems after 1962; thermal transient and mechanical testing and stress testing for seismic events were also performed<br>• Spills of hydraulic oil (200 gal. in 1996) and oil (100 gal. in 1989 and 55 gal. in 1996) were reported<br>• Chemical usage: TPH, PCBs, and metals |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-08 | Area IV AOC | DOE Leach Fields 2 [DOE] | Substation Areas<br>• Five substations: 4708A/4708B, 4713, 4756, eastern side of Bldg. 4010, and western side of Bldg. 4010<br>• Chemical usage: PCBs |
| EU-08 | Area IV AOC | DOE Leach Fields 2 [DOE] | ASTs<br>• EMGEN (fuel oil), EMSTG (oil), T-L01 (oil), TCF-1 (hydrazine), TCF-2 (morpholine), and TCF-3 (sulfuric acid) |
| EU-08 | Area IV AOC | DOE Leach Fields 2 [DOE] | Air Compressor Pad/Cooling Water Pipelines<br>• Water with hydrazine was used in the cooling water loop to reduce corrosion and scale build-up<br>• Chemical usage: hydrazine |
| EU-08 | Area IV AOC | Systems for Nuclear Auxiliary Power (SNAP) [DOE] | Building 4057<br>• Served as the Liquid Metals Engineering Center (LMEC) laboratory, which housed two sodium test rigs from 1961-1998, and became a records room after 1998; contained outdoor chemical storage area<br>• Chemical usage: TCE, alcohol, oil, paint, and Dowanol |
| EU-08 | Area IV AOC | Systems for Nuclear Auxiliary Power (SNAP) [DOE] | Building 4059 (Former SNAP Reactor Facility) and Associated French Drain<br>• Built in 1963 as a test facility for SNAP system reactors and operated until 1964; SNAP Prototype Reactor operated in 1969; converted for the Large Leak Test Rig Sodium Test Program in 1973; demolition activities completed in 2004<br>• In 1983, groundwater that had seeped into the building was found to be contaminated with $^{60}Co$<br>• In 1986, groundwater discharge from the standpipe connected to the building's french drain contained PCE (540 ppb), TCE (19 ppb), and trans-1,2-DCE (68 ppb)<br>• Tritium was detected in groundwater (1,890 pCi/L) from a french drain around the western part of the building<br>• In 1992, sediment samples from the watershed associated with Bldg. 4059 contained tritium, $^{137}Cs$, and $^{238}Pu$<br>• In 1981, a 75-gal. Dowanol (diethylene glycol monoethyl ether) spill occurred<br>• Chemical usage: VOCs (e.g., TCE, PCE, 1,2-DCE, Freon), kerosene, metals (incl. Hg, NaK), and liquid nitrogen |
| EU-08 | Area IV AOC | Systems for Nuclear Auxiliary Power (SNAP) [DOE] | Building 4358<br>• Used as a chemical storage building in support of SCTL, SCTI, and Kalina; bldg. was moved in 1978 from its original location (northwest of Bldg. 4656) to its former location (south of Bldg. 4026); demolished in 2003 |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-08 | Area IV AOC | Systems for Nuclear Auxiliary Power (SNAP) [DOE] | Building 4360<br>• Used as chemical storage for SCTI<br>• Chemical usage: combustible liquids, acids, and bases |
| EU-08 | Area IV AOC | Systems for Nuclear Auxiliary Power (SNAP) [DOE] | Building 4459<br>• Used as an uninterruptible power supply (UPS) from 1963-1992 and contained a large diesel generator; used for non-radiological storage from 1992-2003; also stored R/A (radioactive) waste containers during Bldg. 4059 demolition activities<br>• Chemical usage: flammables |
| EU-08 | Area IV AOC | Systems for Nuclear Auxiliary Power (SNAP) [DOE] | Building 4626<br>• Used to store barrels of radioactive sand |
| EU-08 | Area IV AOC | Systems for Nuclear Auxiliary Power (SNAP) [DOE] | Substation/Transformer Area<br>• Bldgs. 4719 and 4757 transformers<br>• Chemical usage: PCBs |
| EU-08 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Buildings 4026, 4226, 4426, and 4826<br>• Chemical usage: hydrocarbons, ammonia, Deworals sodium, and Dowanol |
| EU-08 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Buildings 4334<br>• Chemical usage: turbine lube oil, compressor oil, greases, lubricants, aqueous ammonia, anhydrous ammonia |
| EU-08 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Buildings 4355<br>• Chemical usage: oils, acids/bases, and general chemical storage |
| EU-08 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Building 4357<br>• Constructed approx. 1958 and used as a supply storage building for SCTI; also used as the Pump Bearing Test Facility Control Building for LMEC and ETEC; demolished in 2002<br>• Propellants for rocket motor tests were mixed and processed at Bldg. 4357<br>• Chemical usage: metals |
| EU-08 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Buildings 4358<br>• Served as storage for igniters that contained ammonium, magnesium, potassium perchlorates, and lube oil<br>• Chemical usage: oil, metals, and perchlorate |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-08 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Building 4457<br>• Used for proof and performance testing of sodium-lubricated bearings used in large sodium pumps through the 1970s<br>• Three concrete sumps beneath the building were backfilled with soil and capped with concrete<br>• Chemical usage: solvents, lubricants, waste oils (TPH), metals, acids, and bases<br>• Lateral and vertical extent of metals above screening levels and vertical extent of VOCs in soil have not been defined |
| EU-08 | Area IV AOC | Hazardous Materials Storage Area (HMSA) [DOE] | Substation 4726<br>• PCBs |
| EU-08 | Area IV AOC | DOE Unaffiliated Features [DOE] | Buildings 4356, 4361, and 4656<br>• Chemical usage: hydrazine, morpholine, diesel, PCBs, metals, and sulfuric acid |
| EU-09 | SWMU 7.7 | Rockwell International Hot Laboratory (RIHL) [DOE] | Building 4020 Rockwell International Hot Laboratory (RIHL) and Leach Field (AI-Z12)<br>• Used for preparation and shipment of irradiated reactor fuel for reprocessing from 1959-1989.<br>• A hydraulic lift/machine shop was located within RIHL<br>• Contamination in the Hot Lab from fuel decladding projects include radionuclide constituents characteristic of spent fuel such as transuranics ($^{239\text{-}241}$Pu, $^{241}$Am, and $^{252}$Cf) and fission products ($^{60}$Co, $^{137}$Cs, and $^{90}$Sr)<br>• Bldg. 4020, the concrete foundation, and surrounding asphalt-covered support areas were removed between 1989-1998<br>• Past practices of outdoor storage and/or dispensing solvents may have resulted in soil contamination; documented TCE release at northwest corner of bldg.<br>• Chemical usage: alcohols, solvents (e.g., TCE), oil-related materials, acids, and metals |
| EU-09 | SWMU 7.7 | Rockwell International Hot Laboratory (RIHL) [DOE] | Substation Area (4720) |

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-09 | Area IV AOC | Building 4065 Metals Laboratory Clarifier [DOE] | Building 4065 Vacuum Test Fac./Chemical and Met. Analysis Lab. and Clarifier<br>• Constructed in 1963 as a Vacuum Test Facility; used as a Chemical and Metallographic Analysis Laboratory after 1974; demolished in 1999<br>• Wastes were piped via below-grade pipes in a concrete trench to clarifier (removed in 2000) at southeast side of bldg.; clarifier effluent piped to Area 3 Sewage Treatment Plant via underground pipeline<br>• Chemical usage: solvents (1,1,1,-TCA and TCE), petroleum hydrocarbons (kerosene), metals, acids, and bases<br>• Previous sampling detected mercury at concentrations above screening levels in one shallow soil sample (downslope from former clarifier and former UT-76)<br>• Petroleum hydrocarbon-impacted soil exists at the former metals clarifier and UT-76 (up to 1,500 mg/kg)<br>• VOCs and metals exceed groundwater screening levels in near-surface groundwater (downgradient well PZ-005); upgradient site (SNAP) believed to be potential source |
| EU-09 | Area IV AOC | Building 4065 Metals Laboratory Clarifier [DOE] | Building 4062 Non-Nuclear Reactor Qualification Test Building<br>• Constructed in 1963 and demolished in 1999 |
| EU-09 | Area IV AOC | Building 4065 Metals Laboratory Clarifier [DOE] | Building 4066 Instrument Repair and Calibration Bldg.<br>• Constructed in 1963 and demolished in 1999<br>• A release of battery acid reportedly occurred at bldg. in 1991<br>• Chemical usage: small quantities of hazardous substances were at bldg. |
| EU-09 | Area IV AOC | Building 4065 Metals Laboratory Clarifier [DOE] | UST Areas (UT-70 and UT-76)<br>• Contained fuel oil for emergency generators<br>• Both tanks have been removed |
| EU-09 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4055 (Nuclear Materials Development Facility)<br>• Also used as a chemistry laboratory (1967-1979)<br>• Activities included analytical chemistry and research for uranium-plutonium scrap pellet recycling programs; fission research on microscopic dispersion of tungsten in uranium-plutonium fuel; mixed uranium-plutonium oxide pellets for irradiation tests; liquid metal fast breeder reactors; demonstration of reduced transuranic solid waste with the use of a molten salt combustor; non-radiological research; and research, development, and production work with alpha-emitting and/or highly radiotoxic nuclear and radioisotopic fuels<br>• Three incidents of radiological releases<br>• Chemical usage: solvents, metals, adhesives, and coatings |

# Appendix A – SSFL Area IV General Chemical Use Overview

| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-09 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4374<br>• Used for non-nuclear liquid metal heat transfer loops testing (1956-1996)<br>• Chemical usage: solvents and metals |
| EU-09 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4383 (Instrumentation Building and Assembly and Testing Building) and Leach Field (AI-Z10)<br>• Liquid Metal Engineering Center Assembly and Testing and Construction Staging<br>• Leach field received sanitary waste from bldg.; removed in 2000<br>• Chemical usage: VOCs and metals<br>• Vertical extent of elevated metals concentrations in soil (leach field) from previous sampling not defined |
| EU-09 | Area IV AOC | DOE Leach Fields 3 [DOE] | Substation and Transformer Areas<br>• Substations: 4707, 4755, 4883A, 4883B, Pole A324 (three pole-mounted transformers near southeastern corner of Bldg. 4373 Leach Field)<br>• Chemical usage: PCBs |
| EU-09 | Area IV AOC | DOE Leach Fields 3 [DOE] | USTs<br>• UT-12/UT-55 (TPH) [removed in 1986], UT-72 (TPH and mercury) [removed in 1999]<br>• Mercury detected at elevated concentrations in surrounding soil during UT-72 removal; lateral extent of TPH contamination (up to 14,000 mg/kg in 1995) at UT-12 not defined |
| EU-09 | Area IV AOC | DOE Unaffiliated Features [DOE] | Buildings 4461 (Sodium Pump Test Facility Motor Generator Building), 4463 (Sodium Cleaning and Handling Facility), 4628, and 4662<br>• Includes Substations 4760A, 4760B, and 4762<br>• Chemical usage: solvents, TPH, PCBs, and metals |
| EU-10 | SWMU 7.1 | Building 4056 Landfill [DOE] | Building 4056 Landfill and Southern Debris Area<br>• Landfill created in early 1960s; covered in 1969<br>• 89 drums removed from top of landfill in 1980/1981; drums contained oils, alcohols, sodium and sodium reaction products, grease, phosphoric acid, and asbestos.<br>• Soil samples taken showed O&G up to 1,100 mg/kg<br>• Well RD-7 installed south of the landfill in 1985 showed 130 ppb TCE |
| EU-10 | SWMU 7.1 | Building 4056 Landfill [DOE] | B056 Excavation Debris Area |
| EU-10 | SWMU 7.1 | Building 4056 Landfill [DOE] | B100 Discharge Area |

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| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-10 | SWMU 7.5 | Building 4100 Trench [DOE] | <u>Building 100 Trench Disposal Area</u><br>• Consisted of three elongated pits (60-100 ft long x 20-40 ft wide x 2-6 ft deep); overall area measures 100 ft x 100 ft<br>• Extensive scrap metal, asbestos-containing materials, charred wood, and ash were found in the trench and were removed during on-site investigation activities in 1999/2000<br>• Western portion of trench site identified as potential upgradient source area for dioxins in soil and surface water (NPDES Outfall 007)<br>• VOCs have been detected in cross-gradient and downgradient near-surface groundwater wells; source is believed to be SNAP site area |
| EU-10 | SWMU 7.5 | Building 4100 Trench [DOE] | <u>Building 100 Advanced Epithermal Thorium Reactor (AETR) and Fast Critical Experiment Lab (FCEL)</u><br>• Constructed in 1960; still present on-site<br>• Twenty different reactor core configs. (thorium and uranium-fueled) studied in Bldg. 100; reactor tests with high-energy (fast) neutrons conducted at the FCEL; program stopped in 1974<br>• Decontaminated and decommissioned for unrestricted use in 1980<br>• High bay currently used as a high-energy Computer Aided Tomography (CAT) facility<br>• Labs are used by Radiation Safety for radioactive sample counting and instrument calibration<br>• Dioxins were detected in shallow soil west of Bldg. 100 and in stormwater at NPDES Outfall 007<br>• Bldg. 100 Discharge Area identified as potential source for VOCs in well RD-91 (Chatsworth) |
| EU-10 | SWMU 7.5 | Building 4100 Trench [DOE] | <u>Building 4100 Leach Field</u><br>• Located east of Bldg. 4100; received sanitary sewage from Bldg. 4100<br>• Excavation activities in 2001 indicated the septic system had previously been removed |
| EU-10 | SWMU 7.5 | Building 4100 Trench [DOE] | <u>Hummocky Areas (Northern and Western)</u><br>• Metals exceed background levels and ecological RBSLs in southern portion of Western Hummocky Area; background level exceedances observed to date have been attributed to shale on-site |

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| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-11 | SWMU 7.3 | Building 4886 Former Sodium Disposal Facility (FSDF) [DOE] | South of Former Disposal Area<br>• Facility used for treatment of residual Na and Na/K on equipment by reactions with water<br>• Site included two disposal ponds, a western debris area, and a concrete pool used for treatment; areas were excavated to bedrock and backfilled with clean soil<br>• Site also included a steam lance, one channel debris area, and a former pistol range<br>• Chemical usage: solvents, kerosene, hydrocarbons, PCBs/terphenyls, Na, and Na/K |
| EU-11 | SWMU 7.3 | Building 4886 Former Sodium Disposal Facility (FSDF) [DOE] | Former Drum Debris Area |
| EU-11 | SWMU 7.3 | Building 4886 Former Sodium Disposal Facility (FSDF) [DOE] | FSDF Pistol Range |
| EU-11 | Area IV AOC | Building 4009 Leach Field | • Bldg. 4009 contained two nuclear facilities, an organic modulated reactor (OMR), and a sodium graphite reactor (SGR)<br>• Solar concentrator facility located to the south<br>• Leach field (AI-Z11) received discharge of sanitary wastes prior to 1961 and operational liquids prior to 1967<br>• Chemical usage: terphenyls, PCBs, kerosene, diesel, solvents, Na, and Al |
| EU-12 | Area IV AOC | Pond Dredge Area [Boeing] | Pond Dredge Area<br>• Used in the 1960s to place pond dredge materials from the Silvernale Reservoir and the R-2 Ponds<br>• Characterized by hummocky terrain that may include piles of pond dredge and construction debris.<br>• Site may contain a depleted uranium slug that was dropped from a helicopter<br>• Previous sampling detected metals at concentrations above screening levels |
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4353 (Organics Reactor Development Building / Diffusion Coating Experiment Building / Hypersonic Flow Test Facility) and Leach Field (AI-Z15)<br>• Used for sodium mass transfer studies during the 1960s, reactor research and development, and explosives storage<br>• Leach field received sanitary waste from bldg.; removed in 2001<br>• Chemical usage: energetics and perchlorate<br>• Vertical extent of elevated metals concentrations in soil (leach field) from previous sampling not defined |

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| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4363 (Mechanical Component Development and Counting Building) and Leach Field (AI-Z14)<br>• Used as a metallurgical research and development laboratory for examination of post-test SRE components between 1957 and 1963; used for storage after 1963<br>• Leach field received sanitary waste from bldg.; removed in 2002<br>• Contamination resulting from work on a contaminated sodium component from the SRE Core I accident (1959; uranium and mixed fission products)<br>• Chemical usage: solvents, kerosene, tetralin, naphthalene, metals, and NaK<br>• Vertical extent of elevated metals concentrations in soil (leach field) from previous sampling not defined |
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4373 and Leach Field (AI-Z13)<br>• Used to manufacture high-energy rocket fuels, test large rocket engines (1954-1956), and conduct SNAP reactor criticality tests (1957-1963); used as a sodium heat transfer facility in 1960 and storage of heat transfer equipment after 1964<br>• Pump Bearing Facility – used for proof and performance testing of sodium lubricated bearings for the Liquid Metal Fast Breeder Reactor prototype pumps and main heat transfer pumps of the Fast Flux Test<br>• Leach field received sanitary waste from bldg.; removed in 2000<br>• Chemical usage: solvents, TPH, metals (incl. Be, Hg, Na), perchlorate, and propellants<br>• Previous sampling detected metals at concentrations above screening levels |
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Buildings 4375, 4874, and 4875<br>• Used for testing SNAP control rod assemblies for the Piqua Organic Moderated Reactor (OMR) from late 1950s to approx. 1968; later used for barrel storage (unknown contents) |
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4473 (Hydraulic Test Instrumentation Facility)<br>• Used for hydraulic testing of pipes, pumps, and other loop components |
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4854 (Radiation Fuel Gauge Test Structure) |
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4863 (Hydraulic Test Loop)<br>• Used for hydraulic testing of pipes, pumps, and other loop components |

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| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Building 4873 (Fuel Rod Test Tower [1967] and Hydraulic Test Laboratory) |
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | Substation Areas<br>• Substation: 4853<br>• Chemical usage: PCBs |
| EU-12 | Area IV AOC | DOE Leach Fields 3 [DOE] | USTs<br>• UT-75 (TPH and VOCs) [removed in 2001], UST north of Bldg. 4363 (fuel oil) |

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| Exposure Unit ID | RFI SWMU/AOC ID | RFI SWMU/AOC Description | General Areas and Chemical Uses |
|---|---|---|---|
| EU-13 | SWMU 7.9 | Empire State Atomic Development Authority (ESADA) Chemical Storage Yard [Boeing] | • Sodium-water tests were conducted (1964-1968) at Bldg. 4814 (removed in 1991), a large leak injector device (LLID), where heated sodium, high-pressure water, and steamed flowed via tubes and piping to a test section to simulate tube failure in a sodium graphite reactor (SGR)<br>• Prior to its use as a practice shooting range, the former ESADA Pistol Range was used for testing zirconium hydride ($ZrH_2$) covered surrogate pellets at the Isotope Impact Test Device (Bldg. 4820) from 1966-1973<br>• A former pistol range was constructed in the southeastern portion of the site in an area formerly used for surrogate fuel pellet testing where shot gun and hand gun rounds were fired at targets placed in front of an earthen berm; pistol range operations ceased in 1995; approx. 8,500 pounds of lead shot were used at the ESADA Pistol Range during 1980-1995<br>• A portion of the ESADA Former Storage Yard (the southern storage area) was used for storage (1970s – 1983) of more than 500 drums containing Dowanol glycol ethers/ethanol and empty drums; over 400 of the drums contained denatured ethanol, some of which were known to have leaked, and approx. 120 drums contained Dowanol PM (propylene glycol methyl ether), which was nearly saturated with sodium<br>• Approx. 100 empty drums were located in the northern storage area, which were removed in 1983<br>• Two horizontal ASTs were removed from the northern portion of the ESADA site; one of the tanks (AT-15) was an 8,000-gallon stainless steel former Process Development Unit tank that had contained “green liquor” containing organic compounds, sulfur compounds, and ash<br>• Soil samples collected in 1988 at the site did not indicate any levels exceeding federal or state standards; however, subsequent RFI sampling detected metals (e.g., aluminum, antimony, arsenic, and lead) at concentrations above screening levels<br>• A groundwater well was installed but was too dry to yield any samples |

# Appendix B

# Historical Site Assessment Summary

# Appendix B
# Historical Site Assessment Summary

The document entitled *Historical Site Assessment of Area IV, Santa Susana Field Laboratory, Ventura County, California*, was prepared by Sapere Consulting, Inc. and Boeing for DOE in 2005. This HSA focused only on radionuclide contamination and was developed to summarize the operational history of Area IV for both the DOE and Boeing from a radiological perspective. The purpose was to identify areas of radiological operations, compile information on prior radiological cleanups and releases and to identify further actions needed to ensure that the radiological cleanup of Area IV is completed.

The DOE and Boeing evaluated 272 numbered structures (collectively referred to as "sites") and any other areas of radionuclide contamination that existed in Area IV since its establishment in 1953. This was to ensure all areas where any types of operations were performed in Area IV were evaluated for radiological impact. To evaluate each site, a site summary was prepared using operational records, incident reports, site maps, decommissioning reports and personnel interviews. The site summaries include information about historical and current use and information about the management and use of regulated radiological materials at the site. Based on the information presented in the site summaries, all sites were classified either as radiologically-impacted or non-impacted. Sites that had any indication of management or use of regulated radiological material were classified as impacted. A summary of the information contained in the site summaries is contained in this appendix.

The information contained in the this appendix was used as a basis for developing the process knowledge for classifying various areas of Area IV as Class 1, Class 2, and Class 3 as defined by MARSSIM. Although Boeing and DOE concluded that some portions of Area IV were non-impacted, the approach used here was to assume that all portions of Area IV were impacted and are Class 3 at a minimum. The classifications assigned to different regions of Area IV in the HSA were not used as a basis for assigning classifications in this data gap analysis.

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4113 | No | 4511 | A | EU-01 | See 4511 | None |
| 4114 | No | | A | EU-01 | Decontamination trailer designed for but not used as a RAD Decon station for personnel involved in an accident. | None |
| 4313 | No | the OCY | A | EU-01 | See OCY | |
| 4511 | No | | A | EU-01 | Site 4511 Parking Lot At Main Gate, Includes Building 4113, Guard Shack; Includes Building 4623, Guard Shack; Constructed prior to 1962, Site 4511 served as a parking lot for personnel working in the Old Conservation Yard (OCY) and adjacent areas. The parking lot is no longer in use. There are no Use Authorizations and no Incident Reports associated with Parking Lot 4511. A radiological survey of the Old Energy Systems Group (ESG) Salvage Yard (Old), Rocketdyne Barrel Storage/Conservation Yard and New Salvage Yard was conducted in 1988. Scope/ Purpose: In 1988, the ESG Salvage Yard (also known as the OCY), Barrel Storage/Conservation Yard and former location of 4113 were surveyed for fixed and removable alpha/beta contamination. Ambient gamma exposure rate measurements were taken in the Storage Yards. Soil samples were collected because radioactivity was indicated by exposure rate measurements in the southwest corner of the Barrel Storage/ Conservation Yard. Background: 15 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. Average Ambient Gamma: 14.3 µR/hr. Survey results were below the acceptable limits. | None |
| 4623 | No | 4511 | A | EU-01 | See 4511 | None |
| Old Conservation Yard (OCY) | Yes | | A | EU-01 | Supported research & development and nuclear related work; materials storage yard for Plant Services Dept; parking area for trailers & other vehicles; Radioactive materials not deliberately dumped or placed in area; Radioactive spill from leaking barrels in 1976; Contaminated soil, asphalt, barrels, pallets removed; area cleaned and surveyed; mixed fission products believed to be contaminant; Rad survey found potential contamination; soil samples collected found average Cs-137 concentration at 81 pCi/g above DCGL of 60.3 pCi/g; site remediated, additional soil samples showed Cs-137 concentration now 13.1 pCi/g; during 1993 final verification survey, composite soil sample indicated Cs-137 (0.6 pCi/g), non-detect for Sr-90 and 1.4 pCi/g for U-238. 2002 twenty-seven soil samples ranged from non-detect to 2.7 pCi/g (gross Cs-137). | Cs-137, U-238, Sr-90 |
| 4320 | No | | C | EU-01 | Fuel Oil Control/Pump Building; no Use Authorizations or Incident Reports associated with building. | None |
| 4731 | No | | C | EU-01 | Fuel Oil Storage Tank; no Use Authorizations or Incident Reports associated with building. | None |
| 4732 | No | | C | EU-01 | Fuel Oil Storage Tank; no Use Authorizations or Incident Reports associated with building. | None |
| 4583-Old ESG Storage Yard | Yes | | C | EU-01 | Supported nuclear related work; excess salvageable materials from nuclear related programs kept here; U and mixed fission products occasionally found; Rad survey found area below acceptable limits. | None |
| 4583-New Salvage Yard | No | | B | EU-02 | Supported Research & Development and nuclear related work; clean, salvageable, non-radioactive material removed from Old Conservation Yard and Old ESG Storage Yard moved here; no RAD materials stored here; nearby drainage gulley carried surface runoff from Sodium Reactor Experiment to catch pond. RAD survey found area below acceptable limits. | None |
| 4040 | Yes | | D | EU-02 | Building 4040 Protective Services Control Center, Contaminated Medical Facility, Facilities and Industrial Engineering, Office Supply Storage, Energy Technology Engineering Center (ETEC) Equipment Storage, Includes Building 4624, Fire Truck Canopy. Constructed in 1960 as an office building, Building 4040 housed a health physics counting lab for an unspecified period of time. Demolished in 1997. Building 4040, housed sealed check sources and a laboratory low-background alpha/beta counting system, used for counting air samples and wipe samples. Such activities would have been permitted under a blanket use authorization for health physics to use radiation-counting equipment.2 Sealed sources were checked annually to ensure that no leaks had occurred. There are no additional Use Authorizations and no Incident Reports associated with Building 4040. Direct frisk surveys were performed in February 1996 and survey results were below the acceptable limits. A smear survey was performed in February 16, 1996 and the survey results were below the acceptable limits (Acceptable Limits: 20 dpm/100 cm2 alpha, 100 dpm/100cm2 beta). Ambient gamma was measured in 4040 on February 20, 1996. Levels between 10 µR/hr and 12 µR/hr were detected. Direct frisk survey were performed in May 1, 1997, and survey results were below the acceptable limits (NDA). (HSA) | None |
| 4540 | No | | D | EU-02 | Site 4540, Parking Lot. Parking Lot 4540 was located directly south of Building 4040 and was used by personnel working in the building. Following the demolition of Building 4040 in 1997, Parking Lot 4540 was no longer used. There are no Use Authorizations and no Incident Reports associated with Parking Lot 4540. Radiological surveys specific to Building 4540 have not been conducted. (HSA) | None |
| 4624 | No | 4040 | D | EU-02 | See 4040 | See 4040 |
| 4783 | No | 4014 | E | EU-03 | See 4014 | |
| 4063 | No | | F | EU-03 | Initially used as an electronics shop, later as a maintenance service building for non-radiological equipment. Also was used as a storage building and housed non-radiological equipment. No User Authorizations and no Incident Reports associated with Building 4063. Survey results for mixed fission were below the acceptable limits. (HSA) | None |
| 4273 | Yes | | F | EU-03 | Building 4273 was a protective clothing storage and the Radioactive Laundry area. Contaminated laundry from the Sodium Reactor Experiment (SRE), the Engineering Test Building (ETB) and the Radioactive Materials Disposal Facility (RMDF) was brought to Building 4273 and shipped off-site for cleaning. Minor contamination incidents and spills may have occurred in Building 4273. Because contaminated protective clothing was stored in this facility, contamination may have been spread during operation. A 1988 radiological survey showed survey results below the acceptable limits. (HSA) | None |
| 4283 | Yes | | F | EU-03 | See 4273 | See 4273 |
| 4316 | No | 4273 | F | EU-03 | See 4273 | See 4273 |
| 4003 | Yes | | G | EU-03 | SRE Support Complex; Building used to assemble fuel for Sodium Reactor Experiment (SRE); used for the analysis of SNAP fuel burn-up samples and the evaluation of irradiation experiments. Following initial decontamination activities, the building was used as a non-radioactive storage building; sewer lines suspected of contamination were removed in September 1982. Radioactive material was managed at this facility in the form of uranium, thorium, transuranics, mixed fission products, and Co-60 and other activation products. Incidents that could have involved releases of radioactivity to the environment: On December 22, 1959, a contractor removed a radioactive exhaust stack without notifying Health Physics. On September 2, 1969, laboratory equipment and portions of the floor were found to be contaminated (though the method of contamination is not clear). All affected areas were decontaminated and there was no evidence that contamination was tracked outside of Building 4003 . On November 9, 1989, an incoming shipment of radioactive laser parts arrived from Stanford University without labels or authorization. Upon examination, the shipment was found not to exceed a safe level of radioactivity. A 1988 radiological survey indicated the area contained no measurable residual radioactivity. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |
| 4041 | Yes | | G | EU-03 | SRE Support Complex; Building used as a storage area for contaminated equipment and packaged radiological material; was also used for interim storage of Rad waste prior to shipment for disposal. A 1982 interim post remedial action survey found four locations exceeded acceptable limits; locations exceeding release limits were decontaminated before the end of the survey. The 1984 ANL independent verification survey indicated Building 4041 and its surrounding area were decontaminated to below the limits specified in the draft American National Standards Institute (ANSI) Standard N13.12 and the Nuclear Regulatory Commission (NRC) guidelines dated 1982. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |
| 4143 | See 4013 | | G | EU-03 | SRE Reactor a high-temperature, sodium-cooled, graphite-moderated reactor between 1957 and 1964. Sites 4413 and 4894 through 4898 are concrete pads associated with Building 4143. They were only given separate designations on the 1962 Industrial Planning Map; subsequent maps include them as a part of Building 4143. Deactivation activities resulting in a “stored-in-place” configuration were conducted between 1967 and 1968. Decommissioning of the SRE began in 1974 and continued through 1983. Demolished in 1999. Demolition included the removal of the reactor and surrounding soil and concrete, as well as underground structures.; Radioactive material was managed at this facility in the forms of fuel and fission products. Several incidents may have resulted in releases to the environment. On June 4, 1959, an explosion resulting from an unexpected hydrogen-oxygen reaction blew a fuel element undergoing sodium cleaning out of the wash cell. Surveys indicated that no measurable release of radiation outside the building occurred. On July 12, 1959, depletion in coolant flow due to blockage resulted in overheating and damage to 13 of 43 fuel elements in the reactor core. Sufficient damage was sustained on these assemblies to cause failure of cladding on all seven rods and some iron uranium eutectic was molten for a short period of time in the reactor.3,4 Between | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232, H-3 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| | | | | | 5,000 and 10,000 curies of mixed fission product were released and contained in the primary sodium system. Recently, it was calculated that approximately 28 curies of Kr-85 were released to the environment. On March 12, 1960, a contaminated sodium fire broke out in the sodium service vault. Personnel were unable to put out the fire with the standard suppression equipment, so the vault was sealed and purged with argon. Once the fire was extinguished, surveys indicated that no significant contamination had been released (e.g., an air sample during the fire measured 1.64 x 10-10 µCi/cc). On May 25, 1960, workers improperly removed a corescope from a gas lock for the reactor core, resulting in the release of gas containing mixed fission products from the core to the high bay. One worker was contaminated at a level of 1.2 mrad/hr; however, it is believed that no contaminated gas escaped the building. On June 9, 1960, failure of a gas lock for the reactor core resulted in the release of gas containing mixed fission products from the core to the high bay. Two workers were contaminated at a level of 5 mrad/hr; however, it is believed that no contaminated gas escaped the building. On April 10, 1961, a contaminated sodium fire broke out in a 30-gallon drum in the sodium service vault. Surveys of the vault and of the ventilation system indicated that no release in excess of allowable limits occurred as a result of the fire. On May 12, 1961, a steam cleaning operation contaminated a concrete pad. Contamination was as high as 1,200 dpm/100 cm2. The contaminated area was decontaminated following completion of steam cleaning activities. On October 20, 1962, several employees were contaminated while cutting core heaters and packaging them as radioactive waste for disposal. After completing the work, the employees changed out of the protective clothing without being properly surveyed. The contaminated employees then contaminated most doorknobs in the lower level of the SRE building (measured at 300 dpm/100 cm2) and a large area of the floor (contamination levels of up to 600 dpm/100 cm2 were measured). One contaminated employee went outside for lunch, but it is not known if he spread Group GS SFL Area IV HSA (May 2005 Final) G-17 contamination outside the building. Upon discovery of the contamination a short time later, the employees and the building were decontaminated to acceptable levels (30 dpm/100 cm2 for the building). On June 21, 1964, a component cleaning operation resulted in a high level of contamination (up to 150,000 dpm/100 cm2) being spread throughout the west end of the high bay. On March 19, 1964, 3,550 gallons of water were dumped from two liquid waste storage tanks. After approximately 24 hours, it was determined that the water released was contaminated with approximately 58 mCi of irradiated corrosion products. The SRE Retention Pond captured this contaminated water, preventing its spread. On December 18, 1964, workers engaged in the transfer, cutting, and storage of controls rod and safety rod lower thimbles contaminated the high bay area. Smear surveys measured beta-gamma levels of up to 3,000 dpm/100 cm2. The area was decontaminated and no contamination was thought to have escaped the high bay. On January 14, 1965, employees, and potentially the SRE high bay, were contaminated while moving an irradiated beryllium temperature probe with the high bay crane. Two workers each received 3.1 rem exposures during the operation. On December 8, 1967, radioactive water was discovered in 8-inch pipes that penetrated the maintenance cell floor. On October 23, 1976, core gas escaped during removal of an instrument thimble contaminating the high bay area. Removable contamination levels were found to be as high as 10,000 dpm/100 cm2. The area was decontamination to acceptable levels. On August 1, 1977, while workers were moving the cold trap, the bottom fell off, contaminating the floor. Contamination levels were found to be as high as 50,000 dpm. On August 10, 1977, the storage pit containing reactor vessel segments leaked water. Although the exact release point was uncertain, elevated radiation levels were founds in soil at the east end of the storage pit. It was estimated that approximately 0.6 Ci were released to the soil. On September 23, 1977, work in the SRE high bay contaminated the floor of that area. Prior to detection of the contamination, workers walked through the area, transporting the contamination out of the high bay. On November 14, 1977, workers overfilled a liquid transfer tank, spilling radioactive liquid on the ground outside the SRE facility. Surveys and soil sampling indicate all radionuclide concentrations meet the site-wide release criteria. (HSA) | |
| 4153 | No | | G | EU-03 | SRE Sodium Service Building contained the sodium service system. Records do not indicated that radioactive materials were handled in Building 4153. Surveys conducted of the Building indicated the building was below the acceptable limits. (HSA) | None |
| 4163 | Yes | | G | EU-03 | SRE Support Complex; West end of building designated for repair of radiologically contaminated equipment; east end was used for construction of wooden shipping containers and non-nuclear support work. It contained a pipe shop and a machine shop. Various RAD incidents occurred which may have resulted in releases to the environment. On December 7, 1964, an employee cut into a contaminated glove box, which began to smoke. This smoke, containing high airborne radiation, was released from the glove box, contaminating several workers. On December 21, 1964, an employee used a skill saw to cut into a contaminated wooden crib used in the disposition of the SRE Main Intermediate Heat Exchanger. Contaminated sawdust from cutting became airborne; however, surveys following the incident indicate no release above acceptable levels occurred. On November 1, 1966, cleaning of a primary sodium valve resulted in an explosion and spread of Cs-137, Na-22, Sr-90 and Y-90 airborne contamination at a level of 2 x 10-9 µC/cc. Following this incident, Building 4163 was decontaminated to acceptable levels. Most surveys and samples had results below the acceptable limits. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |
| 4183 | No | | G | EU-03 | Fire Pump Building for the SRE complex no records indicate that radioactive material was handled in Building 4183. Radiological surveys results indicated results below the acceptable limits. (HSA) | None |
| 4184 | No | | G | EU-03 | SRE Battery Room and Diesel Generator Canopy. Not likely radioactive material was handled in the Building. All survey results were below the allowable limits. (HSA) | None |
| 4505 | No | | G | EU-03 | Served as a storage area near SRE. There are no records of what was stored here; however, given the proximity to SRE, radiological materials may have been stored here. It is not believed that radioactive material was handled here. Radiological surveys indicate the results were below acceptable limits. (HSA) | None |
| 4653 | Yes | | G | EU-03 | SRE Support Complex; Building 4653 Interim Radioactive Waste Vault served as a liquid and gaseous RAD waste holdup and decay system. All liquid waste generated by the reactor program was directed to this facility prior to final disposal. Radioactive waste was present at this facility mainly in the form of mixed fission products and activation products. Decon work included removal of buried tanks and associated pipes, removal of contaminated soil and scabbing of contaminated concrete within one of the vaults. Radiological surveys found the area to be below acceptable limits. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |
| 4683 | No | 4143 | G | EU-03 | See 4143 | See 4143 |
| 4684 | No | | G | EU-03 | Steam Generator Pad. Facility contained non-radioactive systems associated with the production of electricity by Southern California Edison. Radiological material was not handled at Building 4684. Survey results were below allowable limits. (HSA) | |
| 4686 | Yes | | G | EU-03 | Temporary Hot Waste Storage. This facility was used to store irradiated core components. Radioactive waste was present at this facility, primarily in the form of activation products and some mixed fission products. Radiological surveys in 1978 and again in 1984 had survey results below the acceptable limits for both surveys. (HSA) | None |
| 4687 | Yes | | G | EU-03 | Site 4687 was used as the loading dock for Building 4041. Since radioactive components and waste were stored in Building 4041, most likely RAD components and waste were likely handled on the loading dock. A 1982 interim post remedial action survey found Site 4687 exceeded acceptable limits for residual contamination. Locations exceeding release limits were decontaminated before the end of the survey. A 1984 independent verification survey indicated Site 4687 and its surrounding area was decontaminated to below acceptable limits. (HSA) | None |
| 4689 | Yes | | G | EU-03 | SRE Support Complex. Interim Storage of Contaminated Items. Facility was used as a storage area for potentially contaminated items from the SRE complex. Radioactive waste in the form of activation products and mixed fission products was likely present at this facility. This facility was totally removed prior to the SRE decommissioning. Contaminated blacktop located under and around the building was removed and the area was repaved. Radiological surveys in 1978 and 1984 shown results below the allowable limits. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |
| 4693 | No | 4003 | G | EU-03 | See 4003 | See 4003 |
| 4695 | Yes | | G | EU-03 | SRE Cold Trap Vault stored and trapped impurities for the SRE sodium system, including radiological materials. During the course of reactor operations, several primary sodium leaks and fires occurred within the vault. Radioactive materials were handled in this building because of its direct association with SRE activities. Based on preliminary surveys and process history, it was determined that Site 4695 was contaminated. As a result the total below-grade structure was removed and the area was backfilled and paved. In 1983, a radiological survey determined the land where Building 4695 had been located was acceptably free of contamination. (HSA) | None |
| 4703 | Yes | | G | EU-03 | Building 4703 was a water tower that stored emergency cooling water for the Edison Company steam generator portion of the Sodium Reactor Program. Radiological materials were not handled at Building 4703. A 1978 radiological survey found the area was acceptably free of contamination. This was confirmed by a 1984 independent verification survey. Building 4703 was destroyed in a brushfire prior to 1978. The remaining portion was removed in 1998. (HSA) | None |
| 4723 | Yes | | G | EU-03 | Site 4723; Sodium Cleaning Pad; Steam Cleaning Pad; Site was used for radiological sodium cleaning operations for equipment and materials associated with SRE. An incident occurred on March 19, 1960 when employees were steam cleaning of radioactive sodium pipe, causing contamination of the area. The contaminated concrete was chipped away from the pad surface and put in barrels for disposal. Contaminated soil was excavated and packaged for disposal as well. Following decontamination, the pad was fenced to limit access to the cleaning pad. Survey results indicated Building 4723 | None |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| | | | | | and its surrounding area were decontaminated to below allowable limits. (HSA) | |
| 4724 | Yes | | G | EU-03 | Hot Oil Sodium Cleaning Facility was used for cleaning large pipes and assemblies from the secondary loop of the SRE reactor. There was a buildup of contamination from mixed fission products over the lifetime of the facility. Readings of a few mR/hr could be detected in several locations along the floor. Most of this activity was located inside a small trench along the west wall. Prior to 1978, the metal diamond-plate floor was cut free in an attempt to remove this contamination. Contamination could be detected in the underlying concrete at that time. Following decontamination activities, surveys found the area was acceptably free of contamination and below the allowable limits. (HSA) | None |
| 4733 | Yes | | G | EU-03 | Sodium Cleaning Pad for the SRE complex. It is not likely radioactive materials were handled at Building 4733. Radiological surveys found the area was below allowable limits. (HSA) | None |
| 4743 | Yes | | G | EU-03 | Building 4743 housed a Tetralin Heat Exchanger for SRE no known radioactive materials were handled at this facility. Radiological surveys found the area to be below allowable limits. (HSA) | None |
| 4753 | Yes | | G | EU-03 | SRE Primary Fill Tank Vault. Radioactive materials were handled in this facility. Based on preliminary surveys and process history, it was determined Building 4753 was contaminated. The total below-grade structure was removed and the area was backfilled and paved. In 1983, a radiological survey of the region was conducted as part of the Building 4143 survey. The survey found that the area was acceptably free of contamination and recommended it be released for unrestricted use. An independent verification survey in 1984 indicated the are was below allowable limits. (HSA) | None |
| 4773 | Yes | | G | EU-03 | SRE Support Complex; SRE Drainage Control Dam and Retention Pond; Waste Water Impound Dam; Radiological Materials were not deliberately dumped in the pond; however, SRE site records indicate two spills that could have potentially affected the pond. In the 1960s, liquid waste storage tanks near Building 4653 overflowed. The spill appeared to be confined to the local area and was cleaned up quickly. On March 19, 1964, 3,550 gallons of test water were drained from liquid waste tanks at the SRE, sending radioactively contaminated solutions to the SRE Retention Pond and consequently to the Area II Delta Ponds. The total release did not exceed 60 mCi.1 The concentration in the SRE pond was less than 2 pCi/cc, and less than 0.1 pCi/cc in the Delta Ponds. In 1979, the pond was drained and allowed to dry out. All areas of the pond bottom that read more than about 100 cpm above background or that exceeded 100 pCi/g gross detectable beta activity, were removed and disposed of as radioactive waste. Afterwards, soil samples were taken and the pond was returned to service. Radiological surveys indicated area was below allowable limits. In 1995 soil samples were taken in and around the SRE pond. The maximum level of cesium-137 detected was 2.4 pCi/g. In November 2002, twelve soil samples were taken in the SRE pond and in the drainage leading to the pond. Cesium-137 levels ranged from non-detect to 2.6 pCi/g. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |
| 4894 | Yes | 4143 | G | EU-03 | See 4143 | See 4143 |
| 4895 | Yes | 4143 | G | EU-03 | See 4143 | See 4143 |
| 4896 | Yes | 4143 | G | EU-03 | See 4143 | See 4143 |
| 4897 | Yes | 4143 | G | EU-03 | See 4143 | See 4143 |
| 4898 | Yes | 4143 | G | EU-03 | See 4143 | See 4143 |
| 4413 | No | 4013 | L | EU-03 | See 4013 | See 4013 |
| 4014 | No | | E | EU-04 | Sodium Storage Building used to store metallic sodium; no Use Authorizations and no Incident Reports associated with Building; Rad survey found area below acceptable limits. | None |
| 4030 | Yes | | E | EU-04 | Van de Graaff Accelerator - Built for research with a small accelerator neutron source; housed a Van de Graf accelerator until it was removed then used a site purchasing office and for traffic and warehousing. Regulated RAD materials were managed at this facility; COC is tritium; associated leachfield not located during D&D believed to be under Building 4641; No incident reports associated with Building 4030; during smear survey H-3 contamination detected; areas were decontaminated; 1988 survey showed results were below the acceptable limits; exterior soil samples showed average H-3 at 5.31 pCi/l in soil; 1996 Final Comprehensive Radiological Survey revealed survey results below the acceptable limits; DHS verification sampling in 1996 and 1998 supported release for unrestricted use. | H-3 |
| 4033 | No | 4053 | E | EU-04 | See 4053 | |
| 4035 | Yes | 4030 | E | EU-04 | See 4030 | |
| 4043 | No | 4053 | E | EU-04 | See 4053 | |
| 4046 | No | | E | EU-04 | Radiological materials not handled in this facility; no Use Authorizations and no Incident Reports associated with Building 4046. (HSA) | None |
| 4053 | No | | E | EU-04 | Served as Fire Department Service Building; No Use Authorization and no Incident Reports associated with Building 4053; no RAD surveys have been conducted. (HSA) | None |
| 4064 | Yes | | E | EU-04 | Fuel Storage Facility - vault to provide secure storage for non-irradiated, fissionable nuclear material (enriched U & Pu) used to make reactor fuel; enriched U powders and source material powder packages split into smaller units or combined into larger units in a glove box; Yard areas used to store 55-gal drums of LL enriched recoverable scrap; 1980s after all fissionable materials removed, used to store miscellaneous equipment and containers of RAD waste (principally soil). COCs include U isotopes, Pu, Th, activation products; initially sanitary wastewater discharged to local sewage system; Incident Reports - 1963 an area of soil and concrete was discovered to have elevated levels of radioactivity (Cs-134, 137); soil and concrete found to be contaminated with mixed fission products. Source of contamination not discovered but believed was result of a leak from a drum containing Seawolf submarine reactor fuel pins. The area was excavated reducing the contamination to an acceptable level. 1964 discovered a can of uranium carbide had oxidized inside the shipping container (“birdcage”), causing the lid of the can to blow open and the bottom of the can to warp resulting in alpha radiation levels on the concrete dock to increase from less than 1 dpm/100 cm2 (clean level) up to 200 dpm/100 cm2. 1970 a significant increase in alpha radioactivity detected on vegetation in the Side Yard revealed that a 55-gallon drum containing $U_{308}$ had been opened outside on a piece of plastic sheeting. $U_{3O8}$ was visible on the sheeting and its was believed that some had been dispersed by wind in the area, contaminating the vegetation. The plastic sheeting was removed and appropriately dispositioned. Various surveys and sampling over the years has revealed contaminated areas in the side yard with elevated levels of Cs-137. Each time remediation was performed on the contaminated area. The final verification survey conducted in 1998 showed exposure rates were below the acceptable limit. Also the soil samples revealed the Cs-137 levels were below the DCGL. (HSA) | Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154 |
| 4333 | No | 4513 | E | EU-04 | See 4513 | |
| 4513 | No | | E | EU-04 | Asphalt Parking lot between Buildings 4064 and 4030. All the facilities surrounding the parking lot handled radioactive material or radiologically contaminated equipment. No known contamination incidents occurred. A radiological survey in 1988 by Rocketdyne showed survey results were below the acceptable limits. (HSA) | None |
| 4535 | Yes | | E | EU-04 | Asphalt parking lot between Buildings 4641 and 4030. All the facilities surrounding the parking lot handled radioactive material or radioactively contaminated equipment. No known contamination incidents occurred, but radioactive contaminants were suspect in this area because of operational history. A 1988 radiological survey by Rocketdyne showed survey results were below the acceptable limits. (HSA) | None |
| 4641 | Yes | | E | EU-04 | See 4030; Building 4641 served as a transfer point for all SSFL incoming and outgoing shipments including radioactive materials. RAD shipments were handled on the outdoor dock only and were never stored in the warehouse. A radiation detector alarm installed in the dock never triggered. Radioactive materials were no longer handled after 1985. Survey results were below acceptable limits. (HSA) | None |
| 4864 | Yes | 4064 | E | EU-04 | See 4064 | |
| 4XXX | No | 4030 and 4641 | E | EU-04 | | |
| 4763 | No | 4063 | F | EU-04 | See 4063 | See 4063 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4133 | No | | G | EU-04 | Hazardous Waste Treatment/Management Facility; Building 4133 was physically transferred to its present location in 1977. It was previously labeled as Building 4724, Contaminated Sodium Facility. Prior to its move, it was surveyed for radiological contamination and released for unrestricted use. The are no Use Authorizations and no Incident Reports associated with Building 4133. Soil samples collected in 1988 were below soil release limits. In 2000, survey of the interior and exterior of the building including surrounding soil was conducted. All release criteria were met. (HSA) | Am-241, Cs-137, Ra-226, Th, U |
| 4654 | Yes | | G | EU-04 | SRE Support Complex - Building 4654 Interim Storage Facility constructed to store dummy and spent fuel elements, shipping/storage casks and radiological waste generated at the SRE, the Organic Moderated Reactor (OMR) and SNAP programs. During excavation, a hydraulic hammer mounted on a backhoe punctured one of the storage tubes. The storage tube and surrounding area were surveyed and found to be free of contamination. Several incidents are recorded for this facility that could have involved releases of radioactivity to the environment. On January 23, 1962, contamination from equipment stored outside spread from inside the fenced area to asphalt outside the fence. Samples indicated contamination levels ranged from 2 mrad/hr to 17 mrad/hr. No decontamination was conducted. On July 5, 1979, contaminated shipping casks stored in the area were found to be emitting high levels of radiation (up to 35 mR/hr). During D&D soil samples were taken and while most were found to contaminated with Cs-137 all contamination was found to be below 2.0 pCi/g. In 1988 additional soil samples were analyzed for gross alpha and gross beta. Results were below soil release limits, however some appeared higher that background. In 2003 22 soil samples were collected in Grid Blocks S-19 and T-19, neighboring Building 4654. It was suspected this area was used for storage of materials from SRE operations. Cs-137 ranged from non-detect to 4 p/Ci/g; also analyzed for Am-241 (all non-dect), Co-60 (21 non-detect, 1 0.5 p/Ci/g), Pu-238 (all non-detect), Pu-239 (21 non-detect, one sample 0.04 pCi/g), and Sr-90 (two samples were 1.2 and 0.9 pCi/g, the rest were non-detect). Uranium and thorium were at background levels. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |
| 4073 | Yes | | H | EU-04 | KEWB Reactor. Constructed in the early 1950s, the KEWB reactor was a small graphite-encased research reactor that used a water solution of uranyl sulfate as fuel. The “A” Core (spherical) went critical on July 13, 1956, and was removed in August of 1959. The “B” Core (cylindrical) went critical March 1960. Operations halted in 1966. In 1968 the fuel was drained and decontamination began. Demolished in 1975. Activities included the following: Demolition of all non-concrete portions of 4073; Removal of the tank system; Backfilling the remaining floor and walls with asphalt rubble and covering it with six feet of earth; Grading and re-vegetating of the site. The site was released for unrestricted use on March 3, 1976, by the Energy Research and Development Administration (ERDA). The reactor had a capacity of 50 kWt, but did not normally operate at full power; the majority of reactor operations were conducted at a power level of 1 kWt or less. Reactor fuel for the KEWB reactor was U-235 dissolved as uranyl sulfate in solution. The radionuclides of concern are Co-60, Cs-137, Eu-152, Eu-154, Sr-90, U-238 and U-235. Two incidents associated occurred in Building 4073 that resulted in employee exposure, and could have resulted in a potential release to the environment. On February 10, 1958, KEWB reactor operators received weekly exposures greater than 300 mrem while performing core maintenance activities. Upon further investigation, it was concluded that the elevated levels were a result of dosimeter error, and that actual exposures were within permissible levels. From April 1 to June 30, 1961, a research engineer conducting KEWB reactor core experiments received a quarterly exposure to gamma and neutron radiation at levels greater than 3 rem. These core experiments were required for successful termination of the KEWB Program and resulted in high radiation levels in the reactor room, and consequently caused the employee’s exposure. The employee was aware of his high cumulative exposure in early May; however, due to the importance of the tests and lack of other qualified operators, he continued to conduct “unreflected” core experiments without prior approval to exceed the 3 rem quarterly limit. In July 1975, Rocketdyne performed a surface scan of the KEWB site to confirm that no radiological contamination remained. The survey found no levels of beta-gamma surface contamination above the measured background (0.15 – 0.25 mrad/hr). Survey results were below acceptable limits. In 1976, Rocketdyne performed a final radiological survey during decontamination and demolition (D&D) of the facility and published results in the final D&D report. Survey results found that all remaining surfaces were decontaminated to levels as low as reasonably achievable; in all cases below the levels for future unrestricted use (removable contamination of 20 dpm/100cm2α or 100 dpm/100cm2β). Survey results were below the acceptable limits. In May 1983, Argonne National Laboratories performed a post-remediation radiological survey. The survey performed a surface scan to determine ambient gamma exposure rate and low-level radiation level. Also, soil samples were taken and analyzed for gamma radiation and uranium. The survey found no measurements above background. Background is relatively high (40 µR/hr and 8,000 cts/min) due to shine from nearby Building 4021 and Building 4022. The survey concluded that the site could be released for unrestricted use. In August 1988, Rocketdyne performed a surface scan measuring ambient gamma exposure rate to ensure no contamination existed as a result of radioactive materials movement. Mean exposure rate: 17.4 ± 0.96 µR/hr (–0.2 ± 0.96 µR/hr when corrected for background). Background: 17.0 µR/hr. Acceptable limit: 5.0 µR/hr above background. Survey results were below the acceptable limits. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241 |
| 4074 | No | | H | EU-04 | Building 4074 Storage Building, KEWB Film Processing Building. Constructed in 1958, Building 4074 was constructed to serve as a storage and film processing building where personnel processed photographic oscillograph paper for KEWB. Ownership transferred from AEC to Rockwell in 1972. The Nuclear Regulatory Commission (NRC) licensed the facility on January 5, 1972 (R-118 Docket No. 50-375). Demolished in 1980. The foundation and any remaining concrete were left in place. Released for unrestricted use and NRC license terminated March 19, 1987. There are no Use Authorizations and no Incident Reports associated with Building 4074. In 1985, Rocketdyne conducted a final radiological survey, releasing the final report in March 1986. (The survey included Buildings 4073, 4074, 4083, 4084, 4093, 4453 and 4453). Soil samples showed no evidence of radioactivity due to facility operations. Maximum average alpha: 17.2 dpm/100cm2 (limit is 5,000 dpm/100cm2). Maximum average beta: 1,987 dpm/100cm2 (limit is 5,000 dpm/100cm2). The maximum ambient exposure rate was originally found to be 23.1 µR/hr (limit is 18.9 µR/hr). The ambient exposure rates over the limit were attributed to the nearby Radioactive Materials Disposal Facility (RMDF) and do not represent residual contamination. The survey found that measured radiation levels were below acceptable limits, making the site acceptable for unrestricted use. NRC conducted a decommissioning inspection in 1987. Results of the inspection determined the maximum exposure rate to be below the limit of 5 µR/hr above background, meeting the criteria for unrestricted use. (HSA) | None |
| 4083 | Yes | | H | EU-04 | Building 4083 Reactor Kinetics Control Building, Office and Laboratory Building, Includes Building 4103, Reactor Kinetics Lab and Storage. Constructed in 1958, Building 4083 was constructed to serve as the control building for the KEWB reactor. Ownership transferred from the Atomic Energy Commission (AEC) to Rockwell in 1972. NRC Licensed the facility January 5, 1972 (R-118 Docket No. 50-375). In the early 1970s, Building 4083 was modified to include the Reactor Kinetics Lab and Storage (Building 4103), changing the footprint of Building 4083. Demolished in 1980. The foundation and any remaining concrete were left in place. Building 4083 was released for unrestricted use by NRC and the NRC license was terminated March 19, 1987. There are no Use Authorizations and no Incident Reports that may have resulted in a release to the environment associated with Building 4083 or Building 4103. In 1985, Rocketdyne conducted a final radiological survey, releasing the final report in March 1986. (The survey included buildings 4073, 4074, 4083, 4084, 4093, 4453 and 4453). Soil samples showed no evidence of radioactivity due to facility operations. Maximum average alpha: 17.2 dpm/100cm2 (limit is 5,000 dpm/100cm2). Maximum average beta: 1,987 dpm/100cm2 (limit is 5,000 dpm/100cm2). The maximum ambient exposure rate was originally found to be 23.1 µR/hr (limit is 18.9 µR/hr). The ambient exposure rates over limit were attributed to the nearby RMDF and do not represent residual contamination. The survey found that measured radiation levels are below acceptable limits, making the site acceptable for unrestricted use. NRC conducted a decommissioning inspection in 1987. Results of the inspection determined the maximum exposure rate to be below the limit of 5 µR/hr above background meeting the criteria for unrestricted use. (HSA) | None |
| 4093 | Yes | | H | EU-04 | L-85 Reactor. Building 4093, Neutron Radiography Building, AE-6 Reactor, Includes Site 4893, Pad (AE-6). Constructed in 1958, Building 4093 was constructed to house the AE-6 Reactor. The AE-6 Reactor was originally called the Water Boiler Neutron Source (WBNS) reactor. Built in 1952 in Downey, CA, the WBNS had a maximum power of 0.5 Wt.The WBNS was modified to produce a maximum power of 3 kWt and moved to Santa Susana Field Laboratory (SSFL), where it was referred to as the AE-6 Reactor. Ownership was transferred from AEC to Rockwell in 1972, and the reactor was renamed L-85. The NRC licensed the facility in 1972 (R-118 Docket No. 50-375) and it operated until February 29, 1980. Demolition began in 1982 with removal of uranyl sulfate. The rest of the building, excluding the foundation, was demolished in 1995. The sanitary leachfield for Building 4093 was removed in 1999. The site was released for unrestricted use by NRC and the NRC license was terminated March 19, 1987. Reactor fuel for the L-85/AE-6 reactor consisted of U-235 (93.11% enrichment), dissolved as uranyl sulfate in 12.5l of 0.35 molar H2SO4 solution. The radionuclides of concern are Co-60, Cs-137, Eu-152, Eu-154, Sr-90, U-238 and U-235. There have been three incidents associated with Building 4093 that may have resulted in a release to the environment. On March 25, 1959, fission gas was released into the air, contaminating part of the high bay and employees. Contamination levels were measured from 7.5 mR/hr to 13 mR/hr. On July 30, 1982, rinse water contaminated with 5 ml of U-235 was spilled during the fuel draining operation, contaminating an employee and an area of the high bay floor. The area was partially decontaminated at the time and fully decontaminated during facility decommissioning. On May 24, 1995, a radioactive high efficiency particulate air (HEPA) filter was found in a pile of debris. The filter was taken to RMHF, where it was packaged for disposal as low-level radioactive waste. In 1985, Rocketdyne conducted a final radiological survey, releasing the final report in March 1986. (The survey included buildings 4073, 4074, 4083, 4084, 4093, 4453, and 4453). Soil samples showed no evidence of radioactivity due to facility operations. Maximum average alpha: 63.0 dpm/100cm2 (limit is 5,000 dpm/100cm2). Maximum average beta: 3102 dpm/100cm2 (limit is 5,000 dpm/100cm2). The maximum ambient exposure rate was originally found to be 21.3 µR/hr (limit is 18.9 µR/hr). The concrete was removed from areas measuring over the limit and the re-survey showed them all to be under the limit, with the highest measurement at 18.2 µR/hr. Survey results were below the acceptable limits. Oak Ridge Associated Universities conducted a confirmatory survey in 1986; the final report was released in December 1986. (The survey included Buildings 4073, 4084, 4093 and 4453.) The survey concluded that the L-85 reactor building (4093) had been remediated to the existing NRC criteria with the exception of exposure rate criteria. Restoration of the remediated area would reduce the exposure rate to the levels | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| | | | | | established by the Dismantling Order. NRC conducted a decommissioning inspection in 1987. The results of the inspection determined the maximum exposure rate to be below the limit of 5 µR/hr above background, meeting the criteria for unrestricted use. In 1999, confirmatory samples collected after the removal of the septic tank found no detectable activity (limit was 20 dpm/100cm2 for alpha and 100 dpm/100 cm2 for beta). (HSA) | |
| 4103 | Yes | 4083 | H | EU-04 | See 4083 | See 4083 |
| 4123 | Yes | | H | EU-04 | Building 4123 KEWB Waste Storage Building. Constructed in the early 1950s, Building 4123 was used for the temporary storage of radiological waste material and was demolished in 1975. On March 3, 1976, the ERDA released the land on which Building 4123 had been located for unrestricted use. There are no Use Authorizations and no Incident Reports associated with Building 4123. In 1975, Rocketdyne performed a final radiological survey during D&D of the facility, publishing the results in the final D&D report in 1976. The survey found that all remaining surfaces were decontaminated to levels as low as reasonably achievable, and in all cases below the levels for future unrestricted use (removable contamination of 20 dpm/100cm2α or 100dpm/100cm2β). The survey concluded that the site was free of radioactivity except for normal background. In July 1975, Rocketdyne performed a surface scan of the KEWB site to validate that no radiological contamination remained. The survey found no levels of beta-gamma surface contamination above the measured background (0.15 – 0.25 mrad/hr). In May 1983, Argonne National Laboratories performed a post remediation radiological survey to verify that the site was free of radioactivity except for normal background. The survey performed a surface scan to determine the ambient gamma exposure rate and low-level radiation level. Also soil samples were collected and analyzed for gamma radiation and uranium. The survey found no measurements above background. Background is relatively high (40 µR/hr and 8,000 cts/min) due to the shine from nearby Buildings 4021 and 4022. The survey concluded that the site could be released for unrestricted use. In August 1988, Rocketdyne performed a surface scan of the terrains measuring the ambient gamma exposure rate to ensure no contamination exists as a result of radioactive materials movement. Mean ambient gamma: 17.4 ± 0.96 µR/hr. Background: 17.0 µR/hr. Acceptable limit: 5.0 µR/hr above background. Survey results were below the acceptable limits. (HSA) | None |
| 4453 | Yes | | H | EU-04 | Building 4453 AE-6 Fuel Handling Building was constructed in 1958. Fuel for the L-85 reactor in the form of uranyl sulfate was handled in Building 4453. Ownership of Building 4453 was transferred from AEC to Rockwell in 1972. The NRC licensed the facility on January 5, 1972 (R-118 Docket No. 50-375). Demolished in 1980. The foundation and concrete remain. Building 4453 was released for unrestricted use by NRC and the NRC license terminated March 19, 1987. Fuel for the L-85 reactor in the form of uranyl sulfate was handled in Building 4453. Accordingly, the contaminant of concern is uranium. There are no Use Authorizations associated with Building 4453. No incidents in which contamination may have been released the environment occurred in Building 4453. In 1985, Rocketdyne conducted a final radiological survey, releasing the final report in March 1986. (The survey included Buildings 4073, 4074, 4083, 4084, 4093, 4453 and 4453). Soil samples showed no evidence of radioactivity due to facility operations. Maximum average alpha: 17.2 dpm/100cm2 (limit is 5,000 dpm/100cm2). Maximum average beta: 1987 dpm/100cm2 (limit is 5,000 dpm/100cm2). The maximum ambient exposure rate was originally found to be 23.1 µR/hr (limit is 18.9 µR/hr). The ambient exposure rates over the limit were attributed to the nearby RMDF and do not represent residual contamination. Survey results were below the acceptable limits. NRC conducted a decommissioning inspection in 1987. Results of the inspection determined the maximum exposure rate to be below the limit of 5 µR/hr above background meeting the criteria for unrestricted use. (HSA) | None |
| 4523 | No | | H | EU-04 | Constructed in the 1950s, Site 4523 was a parking lot used by personnel working in L-85, KEWB and the adjacent facilities. Site 4523 was demolished. There are no Use Authorizations and no Incident Reports associated with Site 4523. Radiological surveys specific to Site 4523 have not been conducted.(HSA) | None |
| 4633 | No | | H | EU-04 | Site 4633 Reactor Cooling Water Pad was constructed prior to 1962. There is no record of activities associated with Site 4633. Demolished in the late 1980s. Regulated radiological materials were not handled in Site 4633. There are no Use Authorizations and no Incident Reports associated with Site 4633. Radiological surveys specific to Site 4633 have not been conducted. (HSA) | None |
| 4643 | Yes | | H | EU-04 | Building 4643 KEWB Exhaust Building was constructed in early the 1950s. Building 4643 was an exhaust building that provided ventilation for the KEWB reactor building and was demolished in 1975. The land on which Building 4643 was located was released for unrestricted use on March 3, 1976, by the ERDA. There are no Use Authorizations and no Incident Reports associated with Site 4643. In July 1975, Rocketdyne performed surface scans of the KEWB site to validate that no radiological contamination remained. The survey found no levels of beta-gamma surface contamination above the measured background (0.15 – 0.25 mrad/hr). The survey concluded that there was no radiation above background levels observed away from the site. In 1976, Rocketdyne performed a final radiological survey during D&D of the facility; the results were published in the final D&D report. The survey found that all remaining surfaces were decontaminated to levels as low as reasonably achievable; in all cases below the levels for future unrestricted use (removable contamination of 20 dpm/100cm2α or 100 dpm/100cm2β). The survey concluded that the site was free of radioactivity except for normal background. In May 1983, Argonne National Laboratories performed a post remediation radiological survey to verify that the site was free of radioactivity except for normal background. The survey performed a surface scan to determine the ambient gamma exposure rate and low-level radiation level. Soil samples were collected and analyzed for gamma radiation and uranium. The survey found no measurements above background. Background is relatively high (40 µR/h and 8,000 cts/min) due to the shine from nearby Buildings 4021 and 4022. The survey concluded that the site could be released for unrestricted use. On August 1988, Rocketdyne performed a surface scan of the terrain measuring ambient gamma exposure rates to ensure that no contamination existed as a result of radioactive materials movement. Mean ambient gamma: 17.4 ± 0.96 µR/hr. Background: 17.0 µR/hr. Acceptable limit: 5.0 µR/hr above background. The survey results found no contamination above background levels. (HSA) | None |
| 4893 | Yes | 4093 | H | EU-04 | See 4093 | See 4093 |
| 4563 | Yes | | I | EU-04 | Site 4563, Building 4633 Storage Yard; Covered Storage Area Neighboring Building 4075. Constructed in 1958, Site 4563 was a paved storage area at RMHF. The area is still in use as a storage area today, but no longer is designated as Building 4563. Instead, it is referred to as the "covered storage area neighboring Building 4075." Radioactive waste was stored here pending shipment to a disposal facility. The most probable contaminants of concern are uranium, plutonium, thorium isotopes and mixed fission products. There are no Incident Reports associated with Building 4563. There have been several surveys of the entire RMHF complex, including Building 4563, during its operation. The results of these surveys are summarized in the 4021 site summary. Routine quarterly radiological surveys are conducted in the area to verify that Building 4563 has not become contaminated above the limits established by 10 CFR 835.5. (HSA) | U, Th, Pu, mixed fission products |
| 4029 | Yes | | E | EU-05 | Radioactive Measurement Facility - Stored radioactive source materials (Ra-336, Co-60, PoBe, PuBe, and Cs-137) for instrument calibration; later used as non-radioactive hazardous materials storage building for alkali metals (Na, NaK, Li, LiH2) and alkali metal contaminated components; all below-grade enclosures were removed and disposed of as LLW, excavations were backfilled to allow for continued use of the facility; barrels with unknown contents stored outside building for a short time surveys found no detectable activity; two incidents have occurred; 1964 a leaking calibration source contaminated building and personnel with 24.8 mCi Ra-226; contamination primarily confined to source storage well and the source thimble; area outside the source holder was decontaminated and surveyed, damaged source was removed and sealed; 1970 encapsulation of a 4.6 Ci Cs-137 calibration source failed during use, becoming stuck in the storage well. External radiation level of the source estimated at 16R/hr one foot from the source. Soil samples collected in 1996 during final D&D effort, identified Pb-214(0.28 & 0.27 pCi/g) and K-40 (23.1 & 23.6 pCi/g); EPA conducted oversight verification survey in 2001; scans for fixed and removable for alpha and beta were included also 6 swipe samples and dust samples were collected from 2 ventilation ducts; COC was Ra-226 on floors and walls; no measurements indicated the presence of radionuclides above acceptable limits. | Ra-226, Cs-137, Pb-214, K-40 |
| 4185 | Yes | | G | EU-06 | Steam Generator Control Building for the SRE area. It is not likely that radioactive material was handled here. Radiological survey results were below the allowable limits. (HSA) | None |
| 4793 | No | | H, N | EU-06 | Building 4793 KEWB Electrical Building was constructed in the early 1950s. Building 4793 housed the heating and air conditioning systems for the KEWB reactor building and was demolished in 1975. The land on which Building 4793 was located was released for unrestricted use March 3, 1976, by the ERDA. There are no Use Authorizations and no Incident Reports associated with Building 4793. In 1975, Rocketdyne performed a final radiological survey during D&D of the facility; the results were published in the final D&D report in 1976. The survey found that all remaining surfaces were decontaminated to levels as low as reasonably achievable; in all cases below the levels for future unrestricted use (removable contamination of 20 dpm/100cm2α or 100 dpm/100cm2β). The survey concluded that the site was free of radioactivity except for normal background. In July 1975, Rocketdyne performed surface scans of the KEWB to confirm that no radiological contamination remained. The survey found no levels of beta-gamma surface contamination above the measured background (0.15 – 0.25 mrad/hr). The survey concluded that there was no radiation above background levels. In May 1983, Argonne National Laboratories performed a post remediation radiological survey to verify that the site was free of radioactivity except for normal background. The survey performed a surface scan to determine the ambient gamma exposure rate and low-level radiation levels. Soil samples were collected and analyzed for gamma radiation and uranium. The survey found no measurements above background. Background is relatively high (40 µR/hr and 8,000 cts/min) due to the shine from nearby Buildings 4021 and 4022. The survey concluded that the site could be released for unrestricted use. In August 1988, Rocketdyne performed surface scans measuring ambient gamma exposure rates to ensure that no contamination existed as a result of radioactive materials movement. Mean ambient gamma: 17.4 ± 0.96 µR/hr. Background: 17.0 µR/hr. Acceptable limit: 5.0 µR/hr above background. The survey found no contamination above background levels. (HSA) | None |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4021 | Yes | | I | EU-06 | RNHF. Building 4021, Radioactive Material Handling Facility (RMHF) Waste Decontamination and Packaging, Radioactive Material Disposal Facility (RMDF) Waste Decontamination and Packaging. Constructed in 1959, Building 4021 has been used during decommissioning programs to process waste materials from the Sodium Reactor Experiment (SRE), Southwest Experimental Fast Oxide Reactor (SEFOR), Experimental Breeder Reactor (EBR), Fermi Reactor, Systems for Nuclear Auxiliary Power (SNAP) and other on-site programs. Building 4021 is still active and continues to be used as a processing area for wastes from various on-site decontamination and decommissioning (D&D) programs. Radioactive materials were handled in Building 4021 primarily in the form of mixed fission products and fuels. Multiple incidents have occurred at this facility. The following are incidents which may have involved releases to the environment. On June 10, 1964, an explosion and fire broke out in a storage can as a result of a sodium reaction. Contaminated smoke caused increased levels of airborne contamination, though the smoke did not escape the building. On July 21, 1964, an explosion and fire broke out in a storage can as a result of a sodium reaction. Contaminated smoke caused increased levels of airborne contamination, though the smoke did not escape the building. On December 22, 1964, a component from the Sodium Reactor Experiment was taken to Building 4021 for decontamination. The component had water in it, which leaked when a plastic covering broke. As a result, a concrete pad, asphalt, and a forklift required decontamination. On May 13, 1965, the flocculation tower overflowed, spilling radioactive water onto equipment, the pad and the surrounding soil. On November 11, 1966, a water evaporator pan caught fire, causing the filters to plug and collapse. Sampling indicated that no significant release of radioactive materials occurred. On November 3, 1976, the leach field connected to the building was found to be contaminated at levels up to 200 mrad/hr. On February 15, 1978, the contaminated leach field flooded with rainwater, resulting in the release of water contaminated with Sr-90 at a level of 4 x 105 µCi/ml gross beta activity (A0064). On October 3, 1997, four concrete blocks in the parking lot were found to have beta contamination ranging from 100 to 800 counts per minute. The concrete blocks were decontaminated, resurveyed and released without radiological restrictions. The following activities occurred relating to the leach field associated with Building. The RMHF leach field was constructed in the spring of 1959 as a sanitary sewer leach field. In 1961, the leach field became unnecessary when the Area III sewage disposal system began accepting sanitary waste. In the fall of 1962 or spring of 1963, a valve to the RMHF radioactive water processing system was inadvertently left partially open and allowed an unknown amount of contaminated water to enter the leach field system. In 1976, contamination of the leach field was discovered and decontamination and removal plans were prepared. Levels of contamination were as high as 115,000 pCi/g. Decontamination and removal activities occurred from 1976 to 1978. Approximately 36,250 cubic feet of contaminated soil and sludge were shipped to radioactive waste disposal sites. An estimated 0.6 mCi of radioactive material remains sequestered in inaccessible recesses and three contaminated cracks in the bedrock. During January and February of 1978, heavy rains caused contaminated water to leach out of the soil (see incident A0064 referenced above). A special environmental survey of the RMHF area was performed in January 1966. Gross beta/gamma radioactivity concentrations for samples of soil, vegetation and water were obtained along the north fence (outside), the drum storage yard and in the ravine below the facility. The survey consisted of 17 soil samples, 12 vegetation samples, and 8 water samples. Gross beta gamma radioactivity ranged from: • 26 to 1005 pCi/gram beta-gamma in soil; • 161 to 70,680 pCi/gram beta-gamma in vegetation; • 30 to 30,400 pCi/liter beta-gamma in water; • In 1978, the leach field was surveyed at the end of decontamination activities. The survey consisted of 79 random soil samples taken from the surface of the leach field cover. Gross beta activities of the soil ranged from 15 to 46 pCi/g. A complete walk-through survey was also conducted. The maximum gamma exposure rate following backfill was 30 to 50 µR/hr, apparently from stored waste at the RMHF just a few hundred yards away. No contribution from the leach field itself could be detected. The site was left with a minor amount of radioactive material in three cracks in the sandstone rock (estimated 0.6 mCi). The cracks are over 10 feet below the surface and were sealed with bituminous asphalt mastic. Survey results indicated that the site was suitable for unrestricted use. In 1981 a survey was conducted to support the RMHF decommissioning. The survey indicated there were low levels of fixed and removable contamination on and in some portions of the RMHF asphalt and in the soil beneath the asphalt paving. There were also spot areas of contamination in the soil outside the north, west and south fence perimeters. There were 37 soil samples collected at the surface and 12 inches below the surface at each sample location and analyzed for gross beta/gamma activity. The activities of the soils at the surface ranged from 21 to 1143 pCi/g. The activity of the soil at 12" depth ranged from 20 to 104 pCi/g. In 1989, soil samples were collected around the RMHF Leach Field. In addition, boulders located on the north slope of the leach field backfill, leading down to, and including the ravine were surveyed for beta radiation. One boulder at the bottom of the ravine was emitting beta radiation above background levels. The highest level was 400,000 dpm/100cm2. 15 soils samples were collected from 6 areas surrounding the leach field. Gross alpha ranged from 28.9 to 313.1 pCi/g Gross beta ranged from 26.0 to 2121.0 pCi/g. In 2000, a survey of the RMHF and surrounding area was conducted. 23 soil samples were collected south, west, and north of the RMHF fenceline and analyzed for Cs-137: 13 samples were <MDA to 1 pCi/g; 6 samples were 1 to 10 pCi/g; 4 samples were 10 to 53 pCi/g; 6 samples were taken from the leach field area 5 samples were typical of background (<0.2 pCi/g); 1 sample was 1.2 pCi/g. In 2003, 49 soil samples were collected from a localized area outside the south fence of RMHF to characterize the area. Cs-137 was detected in most of the samples. The average Cs-137 concentration was 27 pCi/g, ranging from non-detectable to 124 pCi/g. Following excavation (~12 ft x ~50 ft x ~2 ft), six confirmation samples were collected and the average Cs-137 concentration was lowered to 3.75 pCi/g, ranging from 1.65 to 7.08 pCi/g. The entire RMHF facility, including Building 4021, will be surveyed and decontaminated for unrestricted use at the time of RMHF closure. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, H-3 |
| 4022 | Yes | | I | EU-06 | RNHF. Building 4022, RMDF Radioactive Vault Storage, RMHF Radioactive Vault Storage. Constructed in 1959, the vaults in Building 4022 have been used for the storage of SRE fuel, SEFOR fuel, EBR-II blanket assemblies, SRE decommissioned waste, plutonium, Fermi Reactor fuel, high-level radioactive waste and other waste from on-site decommissioning activities. Building 4022 is active, and continues to be used as a storage area for wastes from decommissioning activities throughout the site. The building also contains a compactor, which is used to size reduce low-level radioactive waste. Radioactive materials were handled in Building 4022 primarily in the form of mixed fission products and fuels. Multiple incidents were associated with this facility. The incidents involving a possible release to the environment were: On December 29, 1965, drums of contaminated sodium exploded in a rain storm and burned the outside of the building (A0588). On May 21, 1967, a drum of uranium carbide sludge exploded on a truck outside of the building, contaminating asphalt and evaporator equipment. Contamination levels ranged from 300 to 5,000 dpm/100 cm2. Decontamination of the asphalt and equipment was successful (A0615). On May 21, 1967, a 55-gallon drum containing uranium metal under CaCO3 was found burning in the RMHF storage yard. Workers believed the drum was likely to explode, so three rifle shots were fired into the drum to relieve the pressure building inside. The fire was successfully extinguished and the drum was left outside to cool overnight. It was then moved to Building 4021 for storage (A0616). On May 22, 1978, the sump pump stopped working and contaminated liquid flowed out of a holdup tank, contaminating asphalt, which later contaminated eight truck tires placed on the pavement. Both the tires and the asphalt were decontaminated (A0070). On August 14, 1979, a shipping box loaded on a waste truck for offsite disposal leaked radioactive liquid containing Cs-137 and Sr-90 on the asphalt outside RMHF. The area was successfully decontaminated shortly after the incident (A0314). Because of the operational and incident history of this building, as well as the entire RMHF facility, the building and its surroundings will be surveyed and decontaminated at the time of RMHF closure. There have been several surveys of the entire RMHF complex, including Building 4022, during its operation. The results of these surveys are summarized in the 4021 site summary. The entire RMHF facility, including Building 4022, will be surveyed and decontaminated for unrestricted use at the time of RMHF closure. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, H-3 |
| 4034 | No | | I | EU-06 | Building 4034, RMDF Office Building, RMHF Office Building. Constructed in 1961, Building 4034 was an office building for RMDF (which was later referred to as RMHF). The facility is active, and serves as the main office and point of entry for RMHF. There are no Use Authorizations and no Incident Reports associated with Building 4034. There have been several surveys of the entire RMHF complex, including Building 4034, during its operation. The results of these surveys are summarized in the 4021 site summary. Routine quarterly radiation surveys are conducted in this office building to verify that it has not become contaminated. (HSA) | None |
| 4044 | Yes | | I | EU-06 | Building 4044, RMDF Clean Shop, RMDF Support Lab, RMHF Support Lab. Constructed in the middle 1960s, Building 4044 has served various purposes throughout the life of the RMDF/RMHF including as a clean shop, health physics offices and as a break room. The facility is active and contains the break room and health physics offices for RMHF. The health physics offices in this building have been used as counting areas for removable contamination measurements and storage and use of calibration sources. No other regulated radiological materials were managed specifically in this building. There have been several surveys of the entire RMHF complex, including Building 4044, during its operation. The results of these surveys are summarized in the 4021 site summary. Routine daily and monthly radiological surveys are conducted in Building 4044 to verify that it has not become contaminated. (HSA) | None |
| 4075 | Yes | | I | EU-06 | Building 4075, RMDF Contaminated Equipment Storage Building, RMHF Contaminated Equipment Storage Building. Constructed in 1971, Building 4075 served as a storage area for radioactive waste prior to shipment to disposal sites. In approximately 2001, the building ceased to be used as a storage area and has since remained unused. Radioactive waste was stored in this building. Possible contaminants include uranium, thorium, plutonium isotopes and mixed fission products. The following is an incident which may have involved a release of contamination to the environment. On August 15, 1988, a forklift driver punctured a drum of radioactive sand. The sand spilled out onto the floor of Building 4075; however, surveys indicated that no detectable contamination occurred as a result (A0188). There have been several surveys of the entire RMHF complex, including Building 4075, during its operation. The results of these surveys are summarized in the 4021 site summary. Routine quarterly radiological surveys are conducted to verify that Building 4075 has not become contaminated above the limits established by 10 CFR 835. (HSA) | U, Th, Pu, mixed fission products |
| 4614 | Yes | | I | EU-06 | Site 4614, RMDF Drainage Sump (removed, replaced with tank), RMHF Drainage Sump, RMHF Holdup Pond. Constructed in the middle 1960s, Site 4614 served as a holdup pond for surface runoff from the RMDF/RMHF facility. Site 4614 is active. Radioactive contamination exists in the pond as a result of known spills that have occurred at the RMDF/RMHF. There have been two notable | Sr-90, Cs-137, mixed fission products |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
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| | | | | | radiological incidents associated with Site 4614. On January 17, 1979, leakage from the flocculation tower associated with Building 4021 contaminated the drainage ditch and the pond itself with less than 0.4 mCi of Sr-90 and Cs-137 (A0077). On January 9, 1980, a water hose broke, causing the Building 4021 tank to overflow, which then drained to the pond. This incident resulted in the released of about 100 gallons of liquid containing 1 x10-2 mCi of mixed fission products (A0080). There have been several surveys of the entire RMHF complex, including Site 4614, during its operation. The results of these surveys are summarized in the 4021 site summary. Due to operational history, Site 4614 is likely contaminated. Site 4614 is monitored and alarmed by a NaI gamma exposure meter. Any alarms result in immediate sampling of the water. All alarms in the past 14 years have been false alarms caused by power supply and telephone line problems during wet weather. No activity has been detected in the water. Water pumped from this pond into the Santa Susana Field Laboratory (SSFL) water reclamation system is ultimately sampled according to the National Pollutant Discharge Elimination System (NPDES) permit. During the dry season when the pond dries up, the sediment is removed from the lined pond and analyzed for contamination prior to being disposed of as radioactive waste. Low levels of Cs-137 are frequently found (e.g. 34 pCi/g in 2003). (HSA) | |
| 4621 | Yes | | I | EU-06 | Building 4621, RMDF Equipment, RMHF Equipment. Constructed in the middle 1960s, Building 4621was used to store contaminated equipment and materials for the RMDF (which later referred to as RMHF). Building 4621 is active. Radioactive material was stored in this facility, primarily in the form of mixed fission products from various site wastes. Use Authorization Series 107 authorized the storage of two Krypton-85 Aerosol Neutralizers at this location. One is specified to contain one µCi and the other two µCi. Both are gaseous and sealed in a Thermo-Systems Model 3012 Neutralizer. An incident occurred at this facility which may have involved a release to the environment. On September 4, 1975, a 132 mCi Ra-266 source was discovered lying on the ground outside Building 4621. The source was not labeled, nor was in it a shielded container. Following its discovery, the source was properly marked and stored in a secure condition (A0053). There have been several surveys of the entire RMHF complex, including Building 4621, during its operation. The results of these surveys are summarized in the 4021 site summary. Routine radiological surveys are conducted in Building 4621 to verify that the building has not become contaminated above the limits established by 10 CFR 835. (HSA) | Mixed fission products |
| 4622 | Yes | | I | EU-06 | Building 4622, RMDF Counting Building. Constructed prior to 1962, Building 4622 was used as a health physics counting area and was demolished in approximately 1976. Health physics samples of waste contained at the RMDF/RMHF facility were counted for radioactivity in this building. There are no Incident Reports associated with Building 4622. There have been several surveys of the entire RMHF complex, including Building 4622, during its operation. The results of these surveys are summarized in the 4021 site summary. During its use, routine radiological surveys were conducted in Building 4622 to verify that the building had not become contaminated above the limits established by DOE Order 5480.11. (HSA) | None |
| 4658 | No | | I | EU-06 | Building 4658, RMDF Guard Shack, RMHF Guard Shack. Constructed in the early 1980s, this building served as a guard shack for the RMDF. The facility's name was later changed to the RMHF. Throughout most of the 1980s, this facility was used as the main entrance point into the RMDF/RMHF facility. In the late 1980s, security measures no longer required the use of the guard shack as an entrance to the facility. The building still remains as an inactive structure. Radioactive materials were not managed specifically in this building, although fuels and wastes were managed at the RMDF/RMHF facility. There are no Incident Reports associated with Building 4658. There have been several surveys of the entire RMHF complex, including Building 4658, during its operation. The results of these surveys are summarized in the 4021 site summary. During its use, routine radiological surveys were conducted in Building 4658 to verify that the building had not become contaminated. (HSA) | None |
| 4663 | Yes | | I | EU-06 | Building 4663, RMDF Storage Area, RMHF Storage Area. Constructed in the late 1950s or early 1960s, Building 4663 was used for storage of materials. Demolished in the early 1970s; however, the remaining concrete pad serves as a storage area for non-radioactive material. Radioactive waste may have been stored at this facility. The most probable contaminants of concern are uranium, plutonium, thorium isotopes and mixed fission products. There are no Incident Reports associated with Building 4663. There have been several surveys of the entire RMHF complex, including Building 4663, during its operation. The results of these surveys are summarized in the 4021 site summary. During its use, routine radiological surveys were conducted in Building 4663 to verify that the building had not become contaminated above the limits established by DOE Order 5480.11. (HSA) | U, Pu, Th, mixed fission products |
| 4664 | Yes | | I | EU-06 | Building 4664, RMDF Low Level Waste Processing. Constructed in the middle 1960s, Building 4664 was used as a processing facility for low-level radioactive waste at the RMDF (which was later named RMHF). Demolished in the early 1980s. Radioactive waste and material were most likely stored or handled at this facility. The most probable contaminants of concern are uranium, plutonium, thorium isotopes and mixed fission products. The following is an incident which may have involved a release of contamination to the environment. On February 10, 1965, the evaporator system backed up and a flexible hose was blown from its connection, releasing approximately five gallons of radioactive contaminated liquid onto the asphalt. Decontamination of this area was performed immediately (A0362). There have been several surveys of the entire RMHF complex, including Building 4664, during its operation. The results of these surveys are summarized in the 4021 site summary. During its use, routine radiological surveys were conducted in Building 4664 to verify that the building had not become contaminated above the limits established by DOE Order 5480.11. (HSA) | U, Pu, Th, mixed fission products |
| 4665 | Yes | | I | EU-06 | Building 4665, RMDF Oxidation Facility, RMHF Equipment Storage. Constructed in the middle 1960s, Building 4665 was used as an oxidation facility for the RMDF (later renamed the RMHF). Building 4665 is still active as a non-radioactive storage area. Radioactive waste and material may have been stored or handled at this facility. The most probable contaminants of concern are uranium, plutonium, thorium isotopes, and mixed fission products. There are no Incident Reports associated with Building 4665. There have been several surveys of the entire RMHF complex, including Building 4665, during its operation. The results of these surveys are summarized in the 4021 site summary. Routine quarterly radiological surveys are conducted in Building 4665 to verify that it has not become contaminated. (HSA) | U, Pu, Th, mixed fission products |
| 4688 | Yes | | I | EU-06 | Building 4688, Auxiliary Skid Shack, RMDF Storage, RMHF Storage. Constructed in approximately 1962. Building 4688 was located northeast of the SRE complex. After 1962, Building 4688 no longer appears in this location. In 1967, a structure referred to as Building 4688 appears on an Industrial Planning Map in the RMHF complex. It is unclear whether the original structure was transferred to the second location or a new structure was built. Although no documentation exists on the building, its location indicates that it was likely used to support sodium cleaning activities at Building 4723. In the middle 1960s, this structure was moved to the RMHF complex and began use as a storage area, possibly for radioactive materials. This structure is currently active as a non-radioactive storage area. Radioactive material may have been stored under this structure. There are no Use Authorizations and no Incident Reports associated with Building 4688. There have been several surveys of the entire RMHF complex, including Building 4688, during its operation. The results of these surveys are summarized in the 4021 site summary. Building 4688 is included in routine quarterly radiological surveys of the RMHF. (HSA) | None |
| 4023 | Yes | | J | EU-06 | Building 4023 Liquid Metals Component Test Building, Corrosion Test Loop Includes Building 4742, Substation. The first section of Building 4023, constructed in 1962 (known as 023), housed a small sodium loop to conduct studies of radioactive contamination transport. The second section, constructed in 1976 (known as 23A), served as a storage and setup room as well as an analytical chemistry laboratory. In 1982, an Alnor Dew-Point Meter containing a 6.25 µCi Ra-226 source was brought to the facility to be disassembled, but the disassembly was never authorized or attempted and the instrument was removed intact in 1986. A 10 µCi Mn-54 sealed source, which was checked annually to ensure that no leaks had occurred, was stored in the building from 1983 to 1986. Sodium loop tests stopped in 1982 and the loop was dismantled and removed in 1986. At this point the connections to the tank were sealed and sinks were removed. In 1990 the high-efficiency particulate air (HEPA) filtration system and fume hoods were removed. The remainder of the radioactive liquid waste system (pipes, drains, tank) was removed in 1993. The majority of the contamination of Building 4023 was associated with drain lines and associated vent pipes, the holdup tank, the open top holdup tank pit, and a laboratory fume hood. The contaminants of concern associated with the activities at Building 4023 include: Co-60, Mn-54, Ni-63, Fe-55, Ta-182 and tritium. Limited amounts of Cs-137 and Sr-90 were also found. Use Authorization 105 was issued in 1976. It allowed the use of a small section of activated stainless steel Experimental Boilers Reactor fuel cladding in a small sodium test loop to gather data on transport characteristics of radiological contamination in sodium loops. There have been two incidents associated with Building 4023 that could have resulted in a release to the environment. On December 18, 1980, water reacted with non-neutralized sodium and surged out of the loop. The water leak resulted in contamination of the ceiling, walls and floor with maximum contamination levels of 1,000 dpm/100 cm2 of Mn-54 (A0084). On April 28, 1981, there was a minor sodium leak and fire, with Cs-137, Mn-54 and Co-60 as the principal radioactive isotopes contained in the loop at the time. The fire was extinguished with calcium carbonate. Smears of the loop and the floor showed no radioactive contamination (A0257). All drain lines in Building 4023 were connected to the waste holdup tank system. The lines were both above and below ground. In 1993, Rockwell/Rocketdyne conducted a final radiological survey to ensure compliance with acceptable contamination limits for activation products and mixed fission products and for ambient exposure rate. The scope of the survey included only the interior rooms of the building. Contamination limit criteria are as follows: For alpha and beta contamination: • Average contamination of ≤ 5,000 dpm/100 cm2. • Maximum of contamination ≤ 15,000 dpm/100 cm2. • Removable contamination of ≤ 1,000 dpm/100 cm2. For gamma contamination: • ≤ 5 µR/hr above background at 1 meter interior and exterior. Initial surface scans indicated an area within Building 4023 with elevated levels of Cs-137 requiring additional contamination. These locations were decontaminated and post-remedial action scans found surface activity to be below release limits. Observed detection limit ranges are as follows: Removable alpha: 2 dpm/100 cm2 to 9 dpm/100 cm2. Total beta: 252 dpm/100 cm2 to 373 dpm/100 cm2. Removable beta: 6 dpm/100 cm2 to 23 dpm/cm2. Net ambient gamma exposure rate: 0.49 µR/hr to 0.66 µR/hr. In 1994, ORISE conducted a verification survey using surface scans to confirm that remedial actions | Sr-90, Cs-137, Co-60, Eu-152, Eu-154 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
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| | | | | | have been effective in meeting established guidelines. No soil samples were taken, because the entire area around Building 4023 was paved. Scans inside the Building 4023 Control Room identified elevated direct radiation in two areas that required additional investigation. Rocketdyne personnel decontaminated the two areas and Environmental Survey and Site Assessment Program (ESSAP) personnel performed additional scans after the decontamination. Scans showed the beta surface activity was comparable to background levels. Final survey results for total surface activity levels inside Building 4023 were less than 66 to 400 dpm/100 cm2 for alpha and less that 1,400 to 6,700 dpm/100 cm2 for beta. Final survey results for activity levels on exterior surfaces, including the holdup waste tank vault, were less than 66 dpm/100 cm2 to 120 dpm/100 cm2 for alpha and less than 1,500 dpm/100 cm2 to 1,600 dpm/cm2 for beta. On August 28, 1997, the Radiological Health Branch (RHB) and the California Department of Health Services (DHS) conducted a confirmatory survey of Building 4023. A complete qualitative gamma scan of the facility and surrounding area was performed. Selected measurements of total and removable beta surface activity and local gamma exposure rates were also conducted. The survey results and laboratory analysis results confirmed the results of the final radiological survey in 1993 and the Oak Ridge Institute for Science and Education (ORISE) verification survey in 1994. (HSA) | |
| 4024 | Yes | | J | EU-06 | Building 4024 - S2DR, S10FS, SNAP Transient Test Facility Development Test Laboratory Systems for Nuclear Auxiliary Power (SNAP) Environmental Test Facility (SETF) Includes Building 4928, Cooling Tower Includes Building 4725, Substation. Constructed in 1960, Building 4024 was used for testing SNAP reactors in a simulated operational environment. It was enlarged in 1962 to provide a second control room and increased operating equipment area. Prototype reactor SNAP 2 Demonstration Reactor (S2DR) operated for 5,000 hours at 30 and 50 kWt in the east cell between April 1961 and December 1962. Prototype SNAP 10 Flight System (S10FS-3) reactor operated for 10,000 hours at about 40 kWt in the west cell between January 1965 and March 1966. SNAP Critical Assembly 4B, operated in the east cell for a short time at low power. SNAP Transient Test (SNAPTRAN-1) support reactor, also critical, operated in the east cell for a short time. Typically SNAPTRAN-1 was operated at low power, except for some pulsed operation. This reactor last operated in 1971. It was the last reactor to be tested in Building 4024. Potential radiological hazards are limited to the high bay area (including cell complex), electrical/mechanical support and yard areas. Two general areas of concern in the high bay are the cells and the S10FS-3 reactor support equipment room. The electrical/mechanical support area contains systems for gas and exhaust filtering, shield cooling water and a vacuum cleaner, all of which are potentially contaminated. As a result of exposure to neutrons escaping from the two operating reactors, the walls, ceiling, floor and remote handling equipment of the test cells were activated. There have been several incidents associated with Building 4024 that could have resulted in a release to the environment. On March 6, 1962, a welder was burned with NaK in the high bay (A0535). On February 19, 1970, maintenance workers unknowingly worked on contaminated general mills (A0634). In September 1978, prior to partial unrestricted release, surveys were conducted to ensure that the facility met unrestricted release criteria. No contamination in excess of 50 dpm/100 cm2 was found. No alpha activity was detected anywhere in Building 4024. Beta-gamma surface contamination limits were 0.1 mrad/hr, and the maximum beta-gamma surface contamination detected outside of the power vaults was 0.07 mrad/hr with an average background of 0.05 mrad/hr. Inside the power vaults, beta-gamma surface contamination was found to range from 0.5 mrad/hr to 2.5 mrad/hr. Inside the corridor to the power vaults, beta-gamma surface contamination ranged from 0.02 mrad/hr to 1.8 mrad/hr. Soil samples were collected in the yard and all samples were less than 30 pCi/g. Background is 20-30 pCi/g. Concrete cores drilled in the power vault walls and corridor were found to have a maximum specific activity of 818 pCi/g. The average specific activity was 103 pCi/g. All water samples from the drain pipe in the operating gallery, the hot waste storage vault, cooling system water waste holdup tanks, ground water during the removal of waste tanks and the vacuum cleaning line to the west power vault were below 2.2 x 10-7 µCi/ml, which is below the limit of 3 x 10-7 µCi/ml for Sr-90. On March 26, 1981, additional concrete sampling in the power vaults began to determine the amount of concrete they needed to remove to meet unrestricted release criteria. The survey indicated that 12 to 22 inches of concrete would need to be removed for surface radiation to meet the acceptable dose rate of 0.1 mrad/hr. Only two radionuclides, Co-60 and Eu-152, were found to contribute significantly to radiation greater than background. In September 1995, ORISE Conducted an independent verification survey. Surface scans were performed over 50 to 100% of accessible floors and lower walls (up to 2 meters) for alpha, beta and gamma activity. In the fan room, elevated direct beta radiation was identified. In all other areas, alpha, beta and gamma radiation were within the range of ambient site background. Surface activity measurements were conducted at 76 floor and wall locations. Excluding the power vaults, surface activity levels were less than 55 dpm/100 cm2 for alpha and ranged from less than 1,400 to 33,000 dpm/100 cm2 for beta. Removable alpha: less than 12 dpm/100 cm2. Removable beta: less than 16 dpm/100 cm2. Maximum beta-gamma total surface activity guideline (15,000 dpm/100 cm2) was exceeded in the hot gas compression room of Building 4024. Exposure rate measurements were made at four locations in Building 4024, but none were made in the power vaults. Excluding the power vaults, exposure rates ranged from 11 to 13 µR/hr. Background was 8 µR/hr. Interior exposure rates satisfy Department of Energy (DOE) and Nuclear Regulatory Commission (NRC) exposure rate guidelines. ORISE determined that existing documentation for Building 4024 was inadequate to support the determination that DOE guidelines for unrestricted release were met. Additional concrete core data taken in 2003 indicates activation with a maximum of 9.3 pCi/g of Co-60 and a maximum of 105 pCi/g of Eu-152. Measurable activation exists only within the inner 16 inches of concrete of the two power test cells. The power test vaults are restricted and have remained in surveillance and maintenance mode since September 1, 1978. Additional decontamination of Building 4024 is planned for FY 2004. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, H-3 |
| 4027 | No | | J | EU-06 | Building 4027, SNAP Engineering Development Laboratory, Former Weld Shop, SNAP Vibration and Shock Laboratory Includes Building 4727, Substation. Constructed in 1961, Building 4027 was used as a vibration and shock test facility in support of the SNAP program launch schedule. Following the end of support work for SNAP tests, Building 4027 was used as a nonradiological storage facility. Building 4027 was demolished in 2003. There are no Use Authorizations associated with Building 4027. No incidents occurred in Building 4027 that might have resulted in a release of contamination to the environment. Building 4027 may have been used for storing sealed radiography sources, which would have been checked annually to ensure that no leaks had occurred. As part of the DOE SSFL Site Survey, Building 4027 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. The high bay and storage portions of Building 4027 were surveyed as separate units due to variations in “ambient background.” o High Bay Maximum net gamma: 3.8 µR/hr (corrected for background and statistically tested against an acceptance limit of 5 µR/hr). Average net gamma: 0.46 µR/hr. Based on the median value of exposure rate measurements in the vicinity of Building 4027, the ambient background value for gross gamma was determined to be 9.09 µR/hr. All beta surface activity measurements made “for indication” showed no detectable activity. Based on the results of the interior survey of Building 4027, the conclusion was made that this area passes the criteria for unrestricted use. Storage Maximum net gamma: 2.8 µR/hr (corrected for background and statistically tested against an acceptance limit of 5µR/hr). Average net gamma: –1.26 µR/hr. Based on the median value of exposure rate measurements in the vicinity of Building 4027, the ambient background value for gross gamma was determined to be 17.40 µR/hr. All beta surface activity measurements made “for indication” showed no detectable activity. Based on the results of the exterior survey of Building 4027 and the storage yard, the conclusion was made that this area is not contaminated and passes the criteria for unrestricted use. (HSA) | None |
| 4032 | Yes | | J | EU-06 | Building 4032 Liquid Metal Development Lab (LMDL), Space Environmental Test Facility, Includes Building 4727, Substation. Constructed in 1962, Building 4032 was used as a space environmental test facility for a thermal vacuum system. Building 4032 was used for mock-ups using a radiological source to determine the positioning of non-radioactive rods for use in developing the fuel rod control system. After support work for SNAP tests ceased, Building 4032 was used as a sodium component and instrumentation test facility. Demolished in May 2003. From 1978 through 1983, Building 4032 was used for mock-ups using a radiological source to determine the positioning of non-radioactive rods for use in developing the fuel rod control system. During these experiments, under Use Authorization 118, a radiation source was used to determine the location, free fall time and acceleration of the articulated rod assembly of the Self Actuated Shutdown System-Articulated Control Assembly (SASS-ACA) test article. The source was 97.2 µCi of Co-60. The form was sealed source S/N 43014, which was checked annually to ensure no leakage occurred. During the 1988 beta survey, a stainless steel catch pan was found to be slightly contaminated with Co-60 at a level of about 25,000 dpm/100 cm2. The catchpan was most likely from Building 4059 or related to the SNAP facility and ended up in Building 4032 accidentally. The radioactivity was fixed in the steel and did not spread to surrounding areas. The pan was dispositioned as radioactive waste. As part of the DOE SSFL Site Survey, Building 4032 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. The maximum gamma exposure rate (corrected for background and statistically tested against an acceptance limit of 5 µR/hr) in Building 4032 was 4.4 µR/hr. The average value was 0.43 µR/hr. Based on the median value of exposure rate measurements in the vicinity of Building 4032, the ambient background value for gamma was determined to be 7.27 µR/hr. All beta surface activity measurements made “for indication” showed no detectable activity, except for the stainless steel catch pan described above. Based on the results of the survey of Building 4032, the conclusion was made that this area passes the criteria for unrestricted use. (HSA) | |
| 4037 | No | | J | EU-06 | See 4036 | See 4036 |
| 4042 | Yes | | J | EU-06 | Building 4042 Liquid Metal Fast Breeder Reactor (LMFBR) Development Testing, SNAP Shield Casting Facility, Includes Building 4742, Substation. Constructed in 1963, Building 4042 was used as a general test and lithium hybrid shield fabrication building in support of the SNAP program. The facility was also used for sodium-aerosol and related technology tests. After support work for SNAP tests ceased, Building 4042 was used for liquid metal technology work. Demolished in May 2003. Use Authorization 62 was obtained for a period of one year, from February 6, 1973, to February 6, 1974. The authorization was for 15,000 lbs of uranium in the form of UO2 powder for the Lower Axial Blanket Shielding Experiment. It is unclear whether this experiment was ever conducted. In the Site Survey | None |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
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| | | | | | Plan, Building 4042 was incorrectly listed as having a contaminated sodium test loop. This test loop was actually in Building 4023. As part of the DOE SSFL Site Survey, Building 4042 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. Measurements, including exposure rate measurements, were made in Building 4042. Maximum gamma: 4.4 µR/hr. (corrected for background and statistically tested against an acceptance limit of 5 µR/hr). Average gamma: 0.1 µR/hr. Based on the median value of exposure rate measurements in the vicinity of 4042, the ambient background value for gamma was determined to be 7.1 µR/hr. Maximum total-average alpha: 12.6 dpm/100 cm2 (statistically tested against an acceptance limit of 5,000 dpm/100 cm2). Average total-average alpha: 4.0 dpm/100cm2. Maximum removable alpha: 5.9 dpm/100 cm2 (statistically tested against an acceptance limit of 1,000 dpm/100 cm2). Average removable alpha: 0.5 dpm/100cm2. Maximum total-average beta: 1,200 dpm/100 cm2 (statistically tested against an acceptance limit of 5,000 dpm/100 cm2). Average total-average beta: 775 dpm/100cm2. Maximum removable beta: 15.4 dpm/100 cm2 (statistically tested against an acceptance limit of 1,000 dpm/100 cm2). Average removable beta: 2.8 dpm/100cm2. Based on the results of the survey of Building 4042, the conclusion was made that this area passes the criteria for unrestricted use. (HSA) | |
| 4524 | No | | J | EU-06 | Site 4524 Parking Lot. Constructed prior to 1962, Site 4524 served as a parking lot for personnel working in the SNAP area. Demolished in the middle 1960s.There are no Use Authorizations and no Incident Reports associated with Site 4524. Radiological surveys specific to Site 4524 have not been conducted. This area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. Survey results were below the acceptable limits. (HSA) | None |
| 4536 | No | | J | EU-06 | Site 4536 Parking Lot Includes Building 4836, Time Clock Includes Building 4636, Guard Shack. Constructed prior to 1962, Site 4536 was a parking lot for personnel working in the SNAP facility. Site 4536 is now used for storage of non-radiological equipment. There are no Use Authorizations and no Incident Reports associated with Site 4536. Radiological surveys specific to Site 4536 have not been conducted. This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995. Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. The survey found the area to be below acceptable limits. (HSA) | None |
| 4537 | No | | J | EU-06 | Site 4537 Parking Lot. Constructed prior to 1962, Site 4537 served as a parking lot for personnel working in the SNAP facility. Site 4537 is now used for storage of non-radiological equipment. There are no Use Authorizations and no Incident Reports associated with Site 4537. Radiological surveys specific to Site 4537 have not been conducted. This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995. Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. The survey found the area to be below acceptable limits. (HSA) | None |
| 4625 | No | | J | EU-06 | Building 4625 Non-Nuclear Component Storage Building. Constructed in approximately 1961, Building 4625 operated as a Non-Nuclear Component Storage Building. In 1964, an addition was built onto the adjacent Building 4027, filling the gap between Building 4027 and Building 4625. From that point on, Building 4625 was considered part of Building 4027 and no longer referred to separately. Building 4027 was built in 1961, and was used as a vibration and shock test facility in support of the SNAP program launch schedule. There is no record of any activities conducted in Building 4027 involving radioactive or nuclear materials, although Building 4027 may have been used for storing completely sealed radiography sources. After support work for SNAP tests ceased, Building 4027 was used as storage facility. Building 4625 was demolished in 2003. Building 4625/4027 is located in close proximity to RMHF; therefore, direct radiation and skyshine from RMHF affects ambient radiation conditions in the area. There are no Use Authorizations and no Incident Reports associated with Building 4625/4027. As part of the DOE SSFL Site Survey, Building 4625/4027 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. The high bay and storage portions of Building 4625/4027 were surveyed as separate units due to variations in ambient background. High Bay: Maximum net gamma: 3.8 µR/hr (corrected for background and statistically tested against an acceptance limit of 5 µR/hr). Average net gamma: 0.46 µR/hr. Based on the median value of exposure rate measurements in the vicinity of 4625/4027, the ambient background value for gross gamma was determined to be 9.09 µR/hr. All beta surface activity measurements made “for indication” showed no detectable activity. Based on the results of the interior survey of Building 4625/4027, the conclusion was made that this area passes the criteria for unrestricted use. Storage Maximum net gamma: 2.8 µR/hr (corrected for background and statistically tested against an acceptance limit of 5µR/hr). Average net gamma: –1.26 µR/hr. Based on the median value of exposure rate measurements in the vicinity of 4625/4027, the ambient background value for gross gamma was determined to be 17.40 µR/hr. All beta surface activity measurements made “for indication” showed no detectable activity. Based on the results of the exterior survey of Building 4625/4027 and the storage yard, the conclusion was made that this area is not contaminated and passes the criteria for unrestricted use. (HSA) | None |
| 4636 | No | 4536 | J | EU-06 | See 4536 | See 4536 |
| 4725 | No | Building 4024, 4025 | J | EU-06 | See 4024, 4025 | See 4024, 4025 |
| 4727 | No | Building 4027, 4032, 4036, 4037 | J | EU-06 | See 4027, 4032, 4036, 4037 | See 4027, 4032, 4036, 4037 |
| 4742 | No | Building 4042 | J | EU-06 | See 4023, 4042 | See 4023, 4042 |
| 4836 | No | 4536 | J | EU-06 | See 4536 | See 4536 |
| 4924 | No | 4025 | J | EU-06 | See 4025 | See 4025 |
| 4925 | No | 4025 | J | EU-06 | See 4025 | See 4025 |
| 4926 | No | 4025 | J | EU-06 | See 4025 | See 4025 |
| 4927 | No | | J | EU-06 | Building 4927 Nitrogen Storage Tank. Constructed prior to 1962, Building 4927 was most likely demolished in the 1970s, when the site began using a high-pressure nitrogen system. This involved piping in nitrogen from Area III, eliminating the need for most Area IV nitrogen storage tanks. Building 4927 was used to store nitrogen. Documents outlining which buildings the storage tank serviced could not be located; however, the Facility Area Plan of inert gas shows that the adjacent Building 4025 was serviced by high-pressure nitrogen system. Before the system was installed, Building 4927 most likely serviced Building 4025. There are no Use Authorizations and no Incident Reports associated with Building 4927. Radiological surveys specific to Building 4927 have not been conducted. This site was included in the Area IV Radiological Characterization Survey, conducted in 1994 through 1995. Scope/Purpose: Designed to locate and characterize any previously unknown areas of elevated radioactivity in Area IV. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. The survey found the area to be below acceptable limits. (HSA) | None |
| 4928 | Yes | 4024 | J | EU-06 | See 4024 | See 4024 |
| 4028 | Yes | | K | EU-06 | STR, STIR, LMFBR; Facility constructed to perform test on space reactor shields. Site 4811 became part of Building 4028 in the mid-60's and was a mechanical and electrical pad that held equipment directly supporting the STIR facility reactor. After STIR was decommissioned, Building 4028 was used to conduct research on the behavior of molten UO2. D&D conducted in 1988. Five incident associated with Building 4028 that could have resulted in a release to the environment. On July 17, 1963, an unmarked irradiated fission foil was moved in a private car to a clean office. On June 17, 1965, an employee received an extremity beta exposure resulting from the handling of a plastic bag sealed with green tape containing chemical samples which were irradiated for 1000 seconds at 1 Mw. On January 10, 1978, there was a small Uranium fire in the arc-melting furnace. On January 30, 1979, increased radioactivity was found in runoff water from Radioactive Materials Disposal Facility. The estimated total activity released to the pond was approximately 0.36 mCi of gross beta activity. On July 24, 1981, a contaminated crucible stored outside was exposed to elements. A site water runoff analysis was conducted as part of the D&D effort. It determined that there was no detectable activity. Additional surveys indicated results were below acceptable limits. DHS performed verification sampling in 1992. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, H-3 |
| 4504 | No | | K | EU-06 | Classified Scrap and Salvageable Steel (SS) Material Storage Area used to store classified scrap and SS. There are no incidents that could have resulted in releases to the environment associated with Building 4504. A final survey of the total facility conducted in 1988 after D&D was completed verified contamination levels were below acceptable limits. (HSA) | |
| 4811 | No | 4028 | K | EU-06 | See 4028 | See 4028 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4048 | No | | N | EU-06 | Plant Development Unit (PDU) Instrumentation facility. There are no Use Authorizations and no Incident Reports associated with Building 4048. Radiological surveys specific to Building 4048 have not been conducted. (HSA) | None |
| 4049 | Yes | | N | EU-06 | Building 4049 was used as a control center in the 1950s and 1960s to support the Systems for Nuclear Auxiliary Power (SNAP) Program. Beginning in 1960, Building 4049 was used as a hydraulic test facility control center. The outside test stand was used for tests with terphenyl organics and finned sinteredaluminum-product cladding materials, sodium-water reaction tests and a variety of sodium and NaK hydraulic tests. From 1968 to 1977, Building 4049 was used as a control center for Piqua Test Loops. In 1977, Building 4049 was designated as a control and test center for the PDU coal gasification process. By 1988, Building 4049 was secured and inactive. Demolished in 1999. Several incidents occurred in Building 4049 which could have resulted in a release to the environment. On March 31, 1960, a pipe containing High Boiler Residue (HBR) was opened, with HBR spilling onto someone's shoes and pant legs. Activated corrosion product (ACP) contamination levels were recorded at 500 dpm/100cm2. An incident occurred on April 1, 1960, during which an employee came in contact with a pipe containing a residue of HBR. It was not considered necessary to measure ACP contamination levels. Due to its proximity to Building 4005 which was known to be contaminated in certain locations, Building 4049 was included in the DOE SSFL Site Survey in 1988. Based on the results the Building 4049 was judged to be uncontaminated. (HSA) | None |
| 4005 | Yes | | O | EU-06 | Uranium Carbide Fuel Pilot Plant. Building 4005 was constructed for non-nuclear testing of thermodynamic characteristics of proposed coolants for the Organic Moderated Reactor Experiment and Piqua reactors. During the middle 1960s, Building 4005 was converted into a small-scale production facility to study the operations associated with manufacturing reactor fuel assemblies out of uranium carbide. The facility operated for a period of nine months during 1966-1967, first using depleted uranium, and later enriched uranium. In 1967, equipment was removed and surfaces decontaminated to permit nonradiological use of the building. Beginning in 1972, Building 4005 was used as the Molten Salt Test Facility, a nonnuclear test facility consisting of the Molten Salt Test Bed and the Process Demonstration Unit. Completion of removal of contaminated systems was completed in 1993. Previous decontamination efforts in the late 1970s involved removal of the underground radioactive liquid holdup tanks outside the building. The drain lines from the buildings were capped and left in place. The drain lines were removed during another decontamination effort in 1987. Demolished in 1996. Radioactive material in the form of depleted and enriched uranium was managed at this facility. Accordingly, the contaminant of concern for Building 4005 is uranium. During operation as the Uranium Carbide Fuel Pilot Plant, considerable difficulties were experienced with the air exhaust system scrubbers and filters, including a fire in 1967. Radiological contamination was restricted to the exhaust ducts. There have been several incidents associated with Building 4005 that could have resulted in a release to the environment. In January 30, 1967, a uranium fire occurred in a retention tank of a vacuum system. Tank ducting was burned through, allowing a release of contaminated smoke to the building. No release outside the building was thought to have occurred. On August 8, 1991, contaminated oil dripped from a radioactive exhaust duct, contaminating a concrete pad. The total activity for the spill was approximately 4 nCi, and all contamination was successfully cleaned up. Building 4005 was connected to a sanitary leach field by drain lines that extended from various laboratories and work areas in the building to two underground holding tanks. The leach field was disconnected and abandoned in 1960-61, when the Santa Susana Field Laboratory (SSFL) sewer treatment plant was constructed. It is not likely that the leach field, septic tanks and drain lines were impacted by radiological constituents because work involving regulated radiological materials did not begin until 1966. The drain lines and tanks were removed in 2001 at the same time the septic tanks were removed. Sampling of soil under drain lines, leach fields and septic tanks did not detect any contamination. Rocketdyne performed a characterization survey in 1987 to confirm that residual contamination remained in ventilation systems and drain lines. The survey showed that several areas were contaminated at levels above Department of Energy (DOE) release limits: room 113, room 110E, four remaining radioactive exhaust ducts and both radioactive exhaust filter plenums. Maximum beta levels: 107,954 dpm/100cm2 for the rooms (Acceptable limit is 1,000 dpm/100cm2). Maximum alpha levels: 2,467 dpm/100cm2 (Acceptable limit 1000 dpm/100cm2). Maximum beta levels: 6,302 dpm/100cm2 in the exhaust ducts (Acceptable limit 1000 dpm/100cm2). No other residual contamination was present. • Rocketdyne performed a final survey in September 1993. Derived concentration guideline levels (DCGLs) for soil were as follows: U-234 < 23.17 pCi/g (total). U-235 < 5.54 pCi/g (total). U-238 < 24.55 pCi/g (total). The survey found that Building 4005 and adjacent yards were acceptably free of contamination and recommended that the facility be released for unrestricted use. • Oak Ridge Institute for Science and Education (ORISE) and the California Department of Health Services (DHS) performed verification surveys in 1994. (HSA) | U-234, U-235, U-238 |
| 4705 | No | 4005 | O | EU-06 | See 4005 | See 4005 |
| 4036 | No | | J | EU-06 & EU-04 | Building 4036/4037, SNAP Office Buildings Includes Building 4727, Substation. Constructed in approximately 1962, Building 4037 appears distinctly only on the 1962 map. Thereafter, it is labeled as part of Building 4036. Building 4036/4037 operated as a non-nuclear office building for the SNAP program. Demolished in 1999. There are no Use Authorizations and no Incident Reports associated with Building 4036. Building 4036 did not require radiological controls during demolition. Radiological surveys specific to Building 4036 have not been conducted. (HSA) | None |
| 4025 | No | | J | EU-06 & EU-08 | Building 4025 Sodium Component Test Installation (SCTI) Maintenance and Storage, Remote Handling Mock-up Facility, Includes Building 4924, Substation; Includes Building 4925, Mechanical Equipment Slab; Includes Building 4926, Sodium Reactor Experiment (SRE) Mock-up Equipment Area; Includes Building 4725, Substation for 4024 and 4025. Constructed in 1959, Building 4025 was used for nuclear reactor remote handling and viewing mock-up work in support of the SNAP 2/10A and SNAP 8 tests. Building 4025 was not known to contain radioactive or nuclear materials. After support work for SNAP tests ceased, Building 4025 was used as a storage and warehouse facility. Demolished in September 1999. Building 4025 was located in close proximity to Radioactive Materials Handling Facility (RMHF), and direct radiation and skyshine from RMHF affected ambient radiation conditions in the area. An incident occurred on January 16, 1979, in which a radiograph operator's dosimeter read off-scale during gradiograph operation, indicating a potential personnel exposure. The radiograph operator's assistant was present at the time, and his dosimeter gave a normal reading. After processing of the off-scale dosimeter, it was determined that the operator had not been exposed to an unacceptable dose. No cause for the off-scale reading was determined (A0306). As part of the Department of Energy (DOE) Santa Susana Field Laboratory (SSFL) Site Survey, Building 4025 was surveyed to determine if any residual activity was accidentally left behind as a result of operations in support of the SNAP program. The inside and outside portions of Building 4025 were surveyed as separate units. Inside: Maximum net gamma: 3.6 µR/hr (corrected for background and statistically tested against an acceptance limit of 5µR/hr). Average net gamma: –0.43 µR/hr (corrected for background). Based on the median value of exposure rate measurements in the vicinity of 4025, the inside ambient background value for gross gamma was determined to be 11.8 µR/hr. All beta surface activity measurements made "for indication" showed no detectable activity. Based on the results of the interior survey of Building 4025, the conclusion was made that this area passed the criteria for unrestricted use. Outside: Maximum net gamma: 3.9 µR/hr (corrected for background and statistically tested against an acceptance limit of 5µR/hr). Average net gamma: –0.14 µR/hr. Based on the median value of exposure rate measurements in the vicinity of 4025, the outside ambient background value for gross gamma was determined to be 24.0 µR/hr. Based on the results of the exterior survey of Building 4025 and the storage yard, the conclusion was made that this area was not contaminated and passed the criteria for unrestricted use. (HSA) | None |
| 4007 | No | | Q | EU-07 | Building 4007, Sodium Storage Building. Constructed in 1958, Building 4007 was used for non-radiological hazardous materials storage. It was demolished in 1996. There are no Use Authorizations and no Incident Reports associated with Building 4007. Radiological surveys specific to Building 4007 have not been conducted. (HSA) | None |
| 4008 | No | | Q | EU-07 | Building 4008, Flammable Material Storage Building. Constructed in 1958, Building 4008 was used for storage of non-radiological flammable materials. It was demolished in 1996. There are no Use Authorizations and no Incident Reports associated with Building 4008. Radiological surveys specific to Building 4008 have not been conducted. (HSA) | None |
| 4011 | Yes | | R | EU-07 | Radiation Instrument, Calibration Laboratory, Building 4011: Warehouse Support, Administration and Services Building, Development Support Shop, Manufacturing Support Shop, Machine Shop/QA., Radiation Instrument Calibration Laboratory, Includes Building 4403, Traffic Dispatch Includes Building 4711, Substation. Constructed in 1958, Building 4011 was used to support various non-nuclear programs until 1984. From 1984 to 1996 the north section of the building was used for calibration and repair of radiation instrumentation. The Property Inventory and Control Department used the south section of the building. Building 4011 is currently used to house communications equipment. Radioactive sources for calibration were handled at the facility but most were sealed and checked annually to ensure no leakage occurred. The potential contaminants of concern are Cs-137, Co-60, Sr-90, Eu-152, Eu-154, thorium and uranium. There were three Radiological Incidents associated with Building 4011 that could have resulted in a release to the environment. On April 28, 1960, to the west of the building, an Organic Moderated Reactor Experiment (OMRE) shipping cask leaked during a leak test and spilled radioactive liquid on the ground (mixed fission products) (A0531). On April 13, 1985, a calibration source came loose from an actuator rod resulting in an exposure of Cs-137. A radiation survey indicated no contamination on any part of the rod (A0318). On December 6, 1994, the 28 Ci Cs-137 calibration source dislocated from the release pull rod. A radiation survey indicated normal background levels in the source containment box and on the release pull rod (A0658). Following removal of the septic tank, field line, tank, tank sludge, and the soils surrounding the tank, samples for gamma emitting radionuclides were collected and the remaining soil was found to be clean. In 1988, the lot across the street from the building was surveyed because it was often used as a dumpsite for dirt and had the potential for contamination. The field was surveyed for mixed fission products by measuring ambient gamma exposure rates. Ambient gamma limit: < 5 µR/hr above background (background was 15.3 µR/hr). Maximum ambient gamma exposure rate: 13 µR/hr. Survey results were below the acceptable limits. A soil sample collected at the northwest corner of the building during the 1996 Area IV Radiological Characterization Survey found elevated Cs-137. The level was 0.53 pCi/g. In 1998, Rocketdyne performed a final comprehensive radiological survey to measure total or | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| | | | | | removable surface activity on the walls, floors, ceilings, structural surfaces, concrete pads, sink traps and the roof. The walls, floors and ceilings were surveyed for total and removable alpha and beta activity and maximum alpha and beta activity. Floors were surveyed for ambient gamma readings in µR/hr at one meter. The limit criteria for surface contamination of alpha and beta-gamma emitters was (in dpm/100cm2). Sr-90, Th-natural, Th-232: <1,000 total and <200 removable; U-natural, U-235, U-238, and associated decay products: <5,000 total and <1,000 removable. Beta-gamma emitters: <5,000 total and <1,000 removable. Samples were collected from sludge in the sink traps for gamma spectroscopy analyses. The sludge was contaminated with low levels of uranium and the sink and trap were removed and disposed. An additional sludge sample was taken from a location several feet into the line and the sample met release criteria. Ambient gamma limit: <5.0 µR/hr at one meter from the surface. Survey results were below the acceptable limits. The California Department of Health Services (DHS) performed verification surveys in 1998 and concurred that the facility met release criteria. The Environmental Protection Agency (EPA) conducted an oversight verification survey in 2001 for alpha, beta, beta-gamma radiation (total and removable) and gamma radiation. Surveys were performed to a quality level equal to a final status survey as defined by the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). The contaminants of concern (COCs) for Building 4011 were mixed fission products, uranium, transuranic compounds, and activation and corrosion products. EPA also collected concrete core samples which were analyzed for photon-emitting isotopes. Acceptable limits for the survey were consistent with Nuclear Regulatory Commission (NRC) Regulatory Guide 1.86 and the proposed sitewide release criteria. Survey results were below the acceptable limits. EPA field measurements confirmed the conclusions reached by Rocketdyne. (HSA) | |
| 4171 | No | | R | EU-07 | Building 4171, X-Ray Building. Constructed in the middle 1960s, Building 4171 was used for storage of miscellaneous electronic equipment. It was demolished in 2000. There are no Use Authorizations and no Incident Reports associated with Building 4171. Radiological surveys specific to Building 4171 have not been conducted. (HSA) | Pu-238, Pu-239, Pu-240, Pu-241, |
| 4172 | No | | R | EU-07 | Building 4172, X-Ray Building. Constructed in the early 1970s. Building 4172 was used as an X-ray room and for storage of sealed sources that were checked every six months to ensure no leakage occurred. Demolished in 2000. Use Authorization Series 68, originally dated January 30, 1975, first permitted XRadiography in this building.4 Operations where subsequently permitted under Use Authorization Series 93, edition C, June 30, 1978.2 Both of these authorizations permitted the use of sealed sources for radiography. On April 13, 1977, a radiographer was exposed to radiation from a non-shielded source inside the X-ray room. It is unlikely any environmental contamination resulted from this incident (A0057). • Building 4172 was mistakenly listed on an NRC license. The building was deleted from that license in December of 1982. No leaking sealed sources were ever detected during the biannual leak check program. It is likely that a routine survey was performed in Building 4172 prior to demolition; however, record of such survey could not be located in the Radiation Safety Records Management System. (HSA) | Am-241, Co-60, Eu-152, Eu-154, |
| 4403 | No | 4011 | R | EU-07 | See 4011 | See 4011 |
| 4500 | No | | R | EU-07 | Building 4500, Gas Bottle Dock (Near Building 4011), Compressed Gas Bottle Storage Dock. Constructed in the middle1960s, Building 4500 was used as a storage area for portable gas containers, including argon,nitrogen, helium and various calibration gasses. By 1998, it was listed as “foundation only,” and left unused. The walls and foundation of Building 4500 are still in place. Building 4500 was used as a drop-off and pick-up point for suppliers. The high-pressure gas cylinders that were stored in Building 4500 were used through Area IV. There are no Use Authorizations and no Incident Reports associated with Building 4500. Radiological surveys specific to Building 4500 have not been conducted.(HSA) | Th-232 |
| 4521 | No | | R | EU-07 | Site 4521 Parking Lot. Constructed prior to 1962, Site 4521 served as a parking lot for personnel working in Building 4011 and the surrounding areas. It was demolished in the middle 1960s. There are no Use Authorizations and no Incident Reports associated with Site 4521. Radiological surveys specific to Site 4521 have not been conducted. (HSA) | None |
| 4611 | No | | R | EU-07 | Building 4611, Paint Spray Canopy. Constructed prior to 1962, Building 4611 was a non-radiological facility. It is assumed that this building was an open structure used for spray painting. A more detailed history could not be located. On the 1962 Industrial Planning Map, Building 4611 is near 4011. Building 4611 is last labeled on the 1981 map, although it continues to be drawn on subsequent Industrial Planning Maps. Building 4611 has been demolished. There are no Use Authorizations and no Incident Reports associated with Building 4611. Radiological surveys specific to Building 4611 have not been conducted. (HSA) | None |
| 4612 | No | | R | EU-07 | Building 4612, Maintenance Storage. Constructed prior to 1962, Building 4612 appears on the 1962 Industrial Planning Map. On the 1964 Industrial Planning Map, a new structure, Building 4171, is shown directly adjacent to Building 4612. Building 4612 is last labeled on the 1982 map, although it continues to be drawn on subsequent Industrial Planning Maps. Building 4612 has been demolished, most likely in 2000, at the same time as Building 4171. There are no Use Authorizations and no Incident Reports associated with Building 4612. Radiological surveys specific to Building 4612 have not been conducted. (HSA) | None |
| 4711 | No | 4011 | R | EU-07 | See 4011 | See 4011 |
| 4413 | Yes | 4143 | G | EU-08 | See 4143 | See 4143 |
| 4714 | No | | G, O | EU-08 | Building 4714 Research and Development Shop Work Area was used as an outdoor work area associated with Building 4163. Radiological materials were not handled at this facility. There are no Use Authorizations and non Incident reports associated with Building 4714. Results of the independent verification survey indicated the Building 4714 location was below allowable limits. (HSA) | None |
| 4010 | Yes | | L | EU-08 | S8ER; also includes Site 4807 Electrical Equipment Pad, Site 4808 Electrical Equipment Pad, and Site 4809, Air Blast Heat Exchanger Pad; Building 4010 was used for experimental reactor tests. Three incidents occurred in Building 4010 that could have resulted in a release to the environment. On April 30, 1961, it is known that an incident occurred, however, no details of the incident could be found. Incident Report dated June 27, 1961 referenced the April incident, but only indicated that the processing of samples from the April incident would be delayed. On January 1, 1964, fission product was released to the cover gas and NaK coolant as a result of cladding failure of SNAP-8 reactor fuel. On October 19, 1965, cutting of the control drum drive rods resulted in Co-60, Mn-54 and Fe-59 contamination in the high bay area. The level of contamination was found to be 200 mrad/hr, including 100 mR/hr due to gamma. The contamination was cleaned and no workers received an unacceptable exposure. Surveys were conducted prior, during, and following demolition to determine contamination levels were below acceptable limits. A FUSRAP Survey Group from Argonne National Laboratory found in 1979 and reconfirmed in 1981 the area continued to meet unrestricted release criteria. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241,Co-60, Eu-152, Eu-154, H-3 |
| 4012 | Yes | | L | EU-08 | SNAP Critical Test Facility, Heavy Metal Reflected Fast Spectrum Reactor, also operated as ETEC X-ray Facility and Storage. No incident Reports associated with Building 4012. Following D&D efforts, a comprehensive final radiological survey was completed. Results indicated that the facility was suitable for release without radiological restrictions. A 1996 verification survey by ORISE concluded that Building 4012 met DOE guidelines for unrestricted release. DHS performed confirmation survey in 1996. EPA conducted oversight verification survey in 2001 found the COCs for Building 4012 were mixed fission products, U, and activation products on the floors and walls. Acceptable limits for the survey were consistent with NRC regulatory guide. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241 |
| 4013 | No | | L | EU-08 | Thermal Transient Test Facility; Non-Nuclear Component Assembly and Packaging Building; SNAP System Assembly and Checkout Building Includes Building 4713, Substation; Includes Building 4823, Time Clock; Includes Building 4413, Uninterruptible Power Supply (UPS). Building was used to assemble non-nuclear SNAP 10A and SNAP 2 ground test and flight test systems and was subsequently used for thermal transient testing. Also used to simulate seismic events for the purpose of stress testing. No incidents occurred in the Building 4013 that might have resulted in a release of contamination to the environment. A interior radiological survey showed results were below the acceptable limits. (HSA) | None |
| 4019 | Yes | | L | EU-08 | SNAP Flight System Critical Facility; Acceptance Test Facility; ETEC Construction Staging and Computer Facility. Building 4019 was built to perform criticality acceptance test of SNAP reactors before they were delivered for launch. Building was reassigned for non-nuclear use in the 1970s and 1980s. All radioactive and nuclear material handled at the facility was fully encapsulated. One incident was reported that could have resulted in a release to the environment. On April 10, 1976, a quality assurance inspection personnel was unable to return a source material to the safe directly after use. It was later discovered that the source had detached from its travel cable and the source was reattached and returned to the safe. Release of contamination to the environment as a result of this incident was unlikely. Surveys in 1988, 1996, 1998 concluded that the facilities met the criteria for release to unrestricted use. In 2001, EPA conducted an oversight verification survey and collected concrete core samples which were analyzed for photon-emitting isotopes. EPA field measurements confirmed the conclusions of the previous surveys. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241 |
| 4228 | No | | L | EU-08 | Building 4228; Power Pak Facility; SCTI Co-Generation Plant; Includes Building 4708, Substation for Inbound Power ; Includes Site 4807, Electrical Equipment Pads; Includes Site 4808, Electrical Equipment Pads; Includes Site 4809, Air Blast Heat Exchanger Pad; Includes Building 4710, SCTI Power Pak Cooling Tower. The SCTI Power Pak facility was designed to harness the steam produced through SCTI’s sodium experiments and generate commercial electric power. There are no Use Authorizations and no Incident Reports associated with Building 4228. The SHEA Impact Review Checklist found the demolition of Building 4228 neither involved radioactive materials nor was conducted in a radiological area. This conclusion was confirmed by the release and demolition of Building 4012. (HSA) | None |
| 4708 | No | 4228 | L | EU-08 | See 4228 | See 4228 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4713 | No | 4012, 4013 | L | EU-08 | See 4013 | See 4013 |
| 4719 | No | 4019 | L | EU-08 | See 4019 | See 4019 |
| 4807 | Yes | 4010, 4228 | L | EU-08 | See 4010 | See 4010 |
| 4808 | Yes | 4010, 4228 | L | EU-08 | See 4010 | See 4010 |
| 4809 | Yes | 4010, 4228 | L | EU-08 | See 4010 | See 4010 |
| 4XXX | No | 4228 | L | EU-08 | | |
| 4710 | No | 4228 | L, CC | EU-08 | See 4228 | See 4228 |
| 4823 | No | 4013 | L,Q | EU-08 | See 4013 | See 4013 |
| 4059 | Yes | | M | EU-08 | S8DR, Large Leak Test Rig; Ground Prototype Test Facility; Includes Building 4759, Substation. Facility accommodated a vacuum system that simulated outer space. There have been a number of incidents associated with Building 4059 involving activities that could have resulted in a release to the environment. In 1969, S8DR fuel elements were found to be leaking hydrogen and fission products within the reactor core. A panel of experts was assembled to identify Group M M-2 SSFL Area IV HSA (May 2005 Final) the cause of the leak in order to correct the cause and to improve reactor design. On February 12, 1970, an absolute filter on vacuum cleaner ruptured, contaminating the area. On February 19, 1970, while an employee was cutting a NaK pipe, a NaK fire broke out in the Pipe Chase Room. When employees smothered the fire with calcium carbonate, a dense cloud of white smoke filled the room. To prevent the spread of smoke, the room was sealed and inspections of the exhaust duct filters indicated that no airborne activity was released. On August 12, 1988, torch cutting in Pipe Chase Room resulted in contamination of employees. All employees and the Pipe Chase Room were successfully decontaminated. On April 6, 1989, an employee dropped an open box of filters while changing the exhaust system filters. This resulted in a cloud of contaminated dust, causing high airborne activity. On January 17, 1991, during a routine spot-check survey in the electrical room, chips of contaminated soil were found on the floor. It appeared that the soil had become contaminated when battery liquid had leaked on the floor. The soil was removed and disposed of as radioactive waste. On February 25, 1991, torching operation generated high airborne activity in adjoining high bay. All activities were halted until activity dropped to a safe level. On December 3, 1992, an employee dosimeter went off scale during D&D operations. Further investigation indicated that the employee had not actually received an unacceptable exposure. On December 22, 1998, it was found that contamination of fork truck and gloves was due to naturally occurring radon daughters. A 1978 radiological survey by Rockwell Intl concluded the facility met the release criteria for unrestricted use with the exception of the reactor chamber pit, pipe chase room and vacuum equipment room. Smear surveys conducted in the equipment rooms, support areas and the vacuum equipment room measured removable beta gamma contamination levels of <50 dpm/100cm2 (limit is 1,000 dpm/100cm2). Removable contamination from an earlier survey in the reactor chamber pit measured Group M SSFL Area IV HSA (May 2005 Final) M-3 removable beta-gamma contamination levels from 50 dpm/100cm2 to 2,454 dpm/100cm2 (limit is 1,000 dpm/100cm2). Total surface contamination measurements taken in the pipe chase room showed levels ranging from 125 mrad/hr to 5 rad/hr (limit is 0.1 mrad/hr). An earlier survey conducted in the reactor chamber pit found levels ranging from 25 mrad/hr to 168,000 mrad/hr (limit is 0.1 mrad/hr). All other areas of the facility had total surface contamination measurements of 0.05 mrad/hr compared to a background level of 0.03 mrad/hr (limit is 0.1 mrad/hr). Water samples from the sand in the pipe chase room showed low levels of beta activity with a maximum of 1.1 x 10-6 µCi/ml. Groundwater samples showed less than 10-9 µCi/ml. Soil samples collected during the excavation activities showed a maximum activity of 23 pCi/g compared to a natural activity of 20 pCi/g. Concrete samples from the vacuum equipment room shield wall found activity less than 25 pCi/g. ORISE performed a radiological survey in 1995 to verify the Rockwell survey. The survey concluded that Rockwell had accurately assessed the radiological condition of the vault if the residual contamination present in the pipe chase room was accounted for in the residual radioactivity (RESRAD) pathway analysis. A survey by Boeing in 1999 concluded the Phase I of Building 4059 met the release criteria for unrestricted use. Additional surveys and sampling agreed with the conclusion. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, H-3 |
| 4459 | No | | M | EU-08 | Building 4459 Uninterruptible Power Supply (UPS); Energy Technology Engineering Center (ETEC) Storage. Building 4459 contained a large diesel generator and flywheel, which, in combination, were designed to function as a fail-proof back-up power source. By 1992, Building 4459 was being used for non-radiological storage. There are no Use Authorizations and no Incident Reports associated with Building 4459. Boeing, ORISE and DHS each performed radiological surveys of Building 4459 in conjunction with their surveys of Building 4059. The surveys confirmed that Building 4459 met the release criteria for unrestricted use. (HSA) | |
| 4759 | No | 4059 | M | EU-08 | See 4059 | See 4059 |
| 4639 | No | | Not Built | EU-08 | | |
| 4006 | Yes | | O | EU-08 | Sodium Laboratory. Building 4006 was operated as a non-nuclear sodium laboratory. Building 4006 closed for operations in 1999. The septic tank was removed in 2000. The leach field was removed in 2001. Building 4006 is still standing but no longer in use. Use Authorization No. 66, dated September 28, 1973, specified that Na would be added to canisters containing UO2 in Building 4006. Use Authorization No. 81, dated June 26, 1974, permitted the use of tritiated titanium foils as gas chromatograph detectors. The foils were declared excess in 1986 and removed from the building. Use Authorization No. 101, originally dated April 8, 1976, permitted the handling of 0.5 µCi of Mn-54 contained in sections of activated piping with frozen sodium. This piping was packaged in aluminum piping; the unpacking occurred in Building 4006. Radiological surveys specific to the interior of Building 4006 have not been conducted. A radiation survey conducted on the contents of the septic tank returned removable alpha levels <20 dpm/cm2 and removable beta levels <100 dpm/cm2. Total alpha and beta levels were non-detect. Soil sampling performed during excavation of the leachfield, drain lines and septic tank did not detect any contamination. (HSA) | |
| 4402 | No | | O | EU-08 | MMHD Experiment. Building 4402 was a non-radiological facility; a more detailed record of associated activities could not be located. Building 4402 has been demolished. There are no Use Authorizations and no Incident Reports associated with Building 4402. Radiological surveys specific to Building 4402 have not been conducted. (HSA) | None |
| 4506 | No | | O | EU-08 | Constructed in the 1960s, Site 4506 serves as a parking lot used by personnel working in Building 4006, 4005, 4024, 4025 and the adjacent facilities. Site 4506 is still in use. There are no Use Authorizations and no Incident Reports associated with Site 4506. Radiological surveys specific to Site 4506 have not been conducted. (HSA) | None |
| 4606 | No | | O | EU-08 | SRE Support Complex. Building 4606 Sodium Lab Instrument Building A, MHD Support Building, Hydrogen Recombiner Test, Includes Building 4816, Hydrogen Recombiner Test Canopy. Constructed in the 1960s, Building 4606 was used to test the capacity of the Hydrogen Recombiner, a device developed by Atomics International (AI) to mix hydrogen and regular air to create water, useful in an emergency situation if a reactor produced excess hydrogen. Building 4606 has been demolished. There are no Use Authorizations and no Incident Reports associated with Building 4606. Radiological surveys specific to Building 4606 have not been conducted. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Th-232 |
| 4607 | No | | O | EU-08 | Building 4607, Sodium Lab Instrument Building B, Storage. Constructed prior to 1962, Building 4607 was used for non-radiological storage and was demolished in the early 1970s. There are no Use Authorizations and no Incident Reports associated with Building 4607. Radiological surveys specific to Building 4607 have not been conducted. This area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. Survey results were below the acceptable limits. (HSA) | None |
| 4615 | No | | O | EU-08 | Building 4615 Combustion Test Facility. Constructed in the early 1980s, Building 4615 served as a non-radiological facility. A more detailed description of associated activities could not be located. Building 4615 has been demolished. There are no Use Authorizations and no Incident Reports associated with Building 4615. Radiological surveys specific to Building 4615 have not been conducted. (HSA) | None |
| 4616 | Yes | 4006 | O | EU-08 | See 4006 | See 4006 |
| 4704 | No | | O | EU-08 | Building 4704 Main Electrical. Constructed prior to 1962, Building 4704 is an inbound transformer adjacent to a station owned by Edison Power and was scheduled for demolition in 2004. There are no Use Authorizations and no Incident Reports associated with Building 4704. Radiological surveys specific to Building 4704 have not been conducted. (HSA) | None |
| 4706 | No | 4006 | O | EU-08 | See 4006 | See 4006 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4816 | No | 4606 | O | EU-08 | See 4606 | See 4606 |
| 4026 | No | | P | EU-08 | Building 4026 Large Component Test Loop Control Building Small Component Test Loop Control Building Sodium Component Test Laboratory Includes Building 4726, Substation Includes Building 4805, Time Clock Shack Includes Building 4426, Uninterruptible Power Supply (UPS) Constructed in 1958, Building 4026 was used for testing components of sodium-cooled, graphite moderated reactors under simulated reactor operating conditions. Building 4026 consisted of a component area, a test tower and control building structures. Initially, there were three sodium tanks, two above grade, and a drain tank located below grade in a concrete, steel plate lined pit. Building 4026 was first described as a Large Component Test Loop (LCTL) Building. By 1972, it was referred to as a Small Component Test Loop (SCTL) Building. By 1987, Building 4026 was designated as a Sodium Component Test Laboratory. Demolished in 1999. On October 3, 1979, following routine pipe-weld radiographic exposure, an iridium-192 source could not be retracted into the storage shield. Employees received no significant radiation exposures as a result of this problem (A0238). No historical evidence indicates that unsealed regulated radioactive materials were handled at the facility. Prior to removal of the SCTL drain tanks, sodium in the system was tested for radiological contamination and none was detected. (HSA) | None |
| 4226 | No | | P | EU-08 | Building 4226 SCTL Motor Generator (MG) Building. Constructed in the early 1980s, Building 4226 housed non-radiological hazardous materials. Demolished in 1998. There are no Use Authorizations and no Incident Reports associated with Building 4226. At demolition and prior to offload, liquid sodium from the building was tested for radioactivity and found to be free of contamination. (HSA) | None |
| 4293 | No | | P | EU-08 | Building 4293 Construction Shack. Constructed in approximately 1971. Although designated as a construction facility, Building 4293 served as a time clock station. Demolished in approximately 1977. There are no Use Authorizations and no Incident Reports associated with Building 4293. Radiological surveys specific to Building 4293 have not been conducted. This area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey. Background: 15.6 µR/hr. o Acceptable Limit: Less than 5 µR/hr above background. Survey results were below the acceptable limits. (HSA) | None |
| 4334 | No | | P | EU-08 | Building 4334 Kalina Control Room Constructed in the early 1990s, Building 4334 served as a control room for the Kalina facility. Demolished in 2003. There are no Use Authorizations and no Incident Reports associated with Building 4334. Radiological surveys specific to Building 4334 have not been conducted. (HSA) | None |
| 4335 | No | | P | EU-08 | Building 4335 Kalina Turbine Generator Room Constructed in the late 1980s or early 1990s, Building 4335 housed the turbine for the Kalina facility. Demolished in 2003. There are no Use Authorizations and no Incident Reports associated with Building 4335. Radiological surveys specific to Building 4335 have not been conducted. (HSA) | None |
| 4354 | No | | P | EU-08 | Building 4354 Control Element Test Structure Constructed in 1957, Building 4354 was a non-radiological facility used to test the mechanical systems by which control rods where moved in support of the Fast Breeder Reactor. Demolished in the middle 1980s. There are no Use Authorizations and no Incident Reports associated with Building 4354. Radiological surveys specific to Building 4354 have not been conducted. This area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. Survey results were below the acceptable limits. (HSA) | None |
| 4355 | No | | P | EU-08 | Building 4355 Sodium Component Test Installation Control Center Includes Building 4756, Substation Constructed in 1958, Building 4355 was used to monitor and control operations in Building 4356. Demolished in 2003. Use Authorization 117D, dated July 1, 1984, permitted the operation of Bowed Tubes Measurement. The authorization specified the use of a 1.0 µCi Co-60 sealed source that was checked annually to ensure no leakage occurred. During demolition in 2003, Building 4355 debris was surveyed daily for total and removable contamination. No radiological contamination was ever detected. (HSA) | None |
| 4356 | No | | P | EU-08 | Building 4356 Sodium Component Test Installation (SCTI) Includes Building 4656, Cooling Stacks Constructed in 1958, the primary purpose of Building 4356 was to generate steam from a sodium heat source. Demolished in 2002. Use Authorization Series 72, originally dated January 8, 1974, permitted the use of two 250 µCi Cs-137 sealed sources and one 100 µCi Cs-137 sealed source that were used as sodium level gauges. These sources were checked annually to ensure no leakage occurred. There has been one incident that could have resulted in a release to the environment associated with Building 4356. On October 9, 1974, during a semi-annual sealed source inspection and leak testing, a Cs-137 source was found to be missing. The source was found at an interior storage area where the source was leak tested. The source was confirmed to be intact and then stored appropriately (A0639). During demolition, Building 4356 debris was surveyed daily for total and removable contamination. No radiological contamination was ever detected. (HSA) | None |
| 4357 | No | | P | EU-08 | Building 4357 Heat Transfer Loop Control Building, Liquid Metal Engineering Center (LMEC) Pump Bearing Test Facility Control Building, Energy Technology Engineering Center (ETEC) Pump Bearing Test Facility Control Building, SCTI Supply Storage. Constructed in 1958, Building 4357 was first used as a Heat Transfer Loop Control Building and later a Pump Bearing Test Facility Control Building for LMEC and ETEC. By 1987, Building 4357 was a supply storage building for SCTI. The SCTI complex was a development test facility for liquid metal system components for the Department of Energy (DOE). The facility's mission was to provide a test site for the non-nuclear developmental testing of typical Liquid Metal Reactor (LMR) components, primarily steam generators. Demolished in 2002. There are no Use Authorizations and no Incident Reports associated with Building 4357. During demolition, Building 4357 debris was surveyed daily for total and removable contamination. No radiological contamination was ever detected. At demolition and prior to disposition, liquid sodium from the SCTI complex was tested for radioactivity and found to be free of contamination. (HSA) | None |
| 4358 | No | | P | EU-08 | Building 4358 Organics Reactor Development Building, Chemical Storage Building (SCTL, SCTI), Kalina Storage Building/Time Shack. Constructed in 1966, Building 4358 was initially used as a Chemical Storage Building and part of the SCTL support area. The function of the SCTL was to test components and instruments in a sodium environment. When SCTL was eliminated, Building 4358 became a storage building for SCTI and Kalina. The primary purpose of the SCTI was to test sodium-heated steam generators and sodium-to-sodium intermediate heat exchangers (IHX) under simulated sodiumcooled nuclear power plant operating conditions. Building 4358 was moved from its original location directly northwest of Building 4656 to a new location directly south of Building 4026 in approximately 1978. Demolished in 2003. There are no Use Authorizations or Incident Reports associated with Building 4358. During demolition, Building 4358 debris was surveyed daily for total and removable contamination. No radiological contamination was ever detected. At demolition and prior to disposition, liquid sodium from the SCTI complex was tested for radioactivity and found to be free of contamination. (HSA) | None |
| 4359 | No | | P | EU-08 | Building 4359 Compressor Building SCTI Compressor Building. Constructed in the 1970s, Building 4359 housed an air compressor for the SCTI facility. The SCTI complex was a development test facility for liquid metal system components for the DOE. The facility's mission was to provide a test site for the non-nuclear developmental testing of typical LMR components, primarily steam generators. Demolished in 2002. There are no Use Authorizations and no Incident Reports associated with Building 4359. During demolition, Building 4359 debris was surveyed daily for total and removable contamination. No radiological contamination was ever detected. At demolition and prior to offload, liquid sodium from the SCTI complex was tested for radioactivity and found to be free of contamination. (HSA) | None |
| 4360 | No | | P | EU-08 | Building 4360 Chemical Storage Building. Constructed in approximately 1987, Building 4360 was a chemical storage building part for SCTI, a development test facility for liquid metal system components for DOE designed to serve as a test site for the non-nuclear developmental testing of typical LMR components, primarily steam generators. Demolished in 1999. There are no Use Authorizations and no Incident Reports associated with Building 4360. Radiological surveys specific to Building 4360 have not been conducted. At demolition and prior to offload, liquid sodium from the SCTI complex was tested for radioactivity and found to be free of contamination. (HSA) | None |
| 4361 | No | | P | EU-08 | Building 4361 SCTI Hazardous Material Storage. Constructed in approximately 1992. Building 4361 first appears on Industrial Planning Maps in 1992, listed as the SCTI Hazardous Material Storage Building. Demolished in 2003. There are no Use Authorizations and no Incident Reports associated with Building 4361. During demolition, Building 4361 debris was surveyed daily for total and removable contamination. No radiological contamination was ever detected. At demolition and prior to offload, liquid sodium from the SCTI complex was tested for radioactivity and found to be free of contamination. (HSA) | None |
| 4362 | No | | P | EU-08 | Building 4362 Water Sampling Enclosure. Building 4362 was used to test the water that was used in the SCTI facility for purity. The SCTI complex was a development test facility for liquid metal system components for the DOE. The facility's mission was to provide a test site for the nonnuclear developmental testing of typical LMR components, primarily steam generators. Building 4362 was demolished in 2003. There are no Use Authorizations and no Incident Reports associated with Building 4362. During demolition, Building 4362 debris was surveyed daily for total and removable contamination. No radiological contamination was ever detected. At demolition and prior to offload, liquid sodium from the SCTI complex was tested for radioactivity and found to be free of contamination. (HSA) | None |
| 4392 | No | | P | EU-08 | Building 4392, SCTI Electrical Equipment. Constructed in approximately 1992, Building 4392 was an electrical equipment building for SCTI and Kalina. Building 4392 has been demolished. There are no Use Authorizations and no Incident Reports associated with Building 4392. Radiological surveys specific to Building 4392 have not been conducted. (HSA) | None |
| 4426 | No | 4026 | P | EU-08 | See 4026 | See 4026 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4457 | No | | P | EU-08 | Building 4457 Pump Bearing Test Structure Foundation Only. Constructed in approximately 1972, Building 4457 was used for proof and performance testing of sodium lubricated bearings used in large sodium pumps. In July of 1972, a shaft seal failed, causing oil to contaminate the sodium system. Attempts to clean and repair the system failed. Building 4457 was subsequently gutted and used for storage of waste oils from non-radiological facilities. By 1996, Building 4457 was listed as "foundation only." The foundation was removed in 1999. Regulated radiological materials were not handled in Building 4457. No Use Authorizations or Incident Reports involving radiation were associated with this building. Radiological surveys specific to Building 4457 have not been conducted. (HSA) | None |
| 4478 | No | | P | EU-08 | Building 4478, CDHC Office Support Trailer, SCTI Control Building Support Trailer, Support Trailer (LMEC). Initially, Building 4478 was used as a support trailer. It contained offices and was located directly east of Building 4020. According to Industrial Planning Maps, between 1967 and 1971, the structure was moved from its original location to a position northwest of Building 4656. By 1971, the building was used to service SCTI. The SCTI complex was a development test facility for liquid metal system components for the DOE and its predecessors. The facility's mission was to provide a test site for the non-nuclear developmental testing of typical LMR components, primarily steam generators. Sodium was the liquid metal used at the facility. Construction of the SCTI was started in 1959. The facility began operating in 1964 and operated through 1996 by ETEC and its predecessors. By 1981 Building 4478 was used for radioactive count analysis. Building 4478 has been demolished. There are no Use Authorizations and no Incident Reports associated with Building 4478. At demolition and prior to offload, liquid sodium from the SCTI complex was tested for radioactivity and found to be free of contamination. Since radiological materials were not handled in Building 4478 and no contamination occurred, no further tests were conducted. (HSA) | None |
| 4502 | No | | P | EU-08 | Site 4502 Parking Lot Includes Building 4806, Time Clock Includes Building 4657, Guard Shack. Constructed prior to 1962, Site 4502 served as a parking lot for personnel working in Building 4006 and the surrounding areas. Site 4502 was demolished. There are no Use Authorizations and no Incident Reports associated with Building 4502. Radiological surveys specific to Site 4502 have not been conducted. (HSA) | None |
| 4656 | No | 4356 | P | EU-08 | See 4356 | See 4356 |
| 4657 | No | 4502 | P | EU-08 | See 4502 | See 4502 |
| 4726 | No | 4026 | P | EU-08 | See 4026, 4826 | See 4026, 4826 |
| 4756 | No | 4355 | P | EU-08 | See 4355 | See 4355 |
| 4805 | No | 4026 | P | EU-08 | See 4026 | See 4026 |
| 4826 | No | | P | EU-08 | Building 4826 SCTL Test Facility Includes Building 4726, Substation. Constructed in 1958, Building 4826 was constructed to expand the testing capacities of Building 4026. Construction of the building consisted of adding a drain tank and enclosure to Building 4026. Building 4826 was designed to test components and instruments in a sodium environment. Demolished in 1998. There are no Use Authorizations and no Incident Reports associated with Building 4826. Results of a Building Reconnaissance Report conducted on July 1, 1996, found the building to be free of radiological contamination. At demolition and prior to offload, liquid sodium from the building was tested for radioactivity and found to be free of contamination. (HSA) | None |
| 4310 | No | | P, L | EU-08 | Building 4310 Portable Change Room. Constructed in the early 1960s, Building 4310 was used as a changing facility. Demolished in approximately 1973. There are no Use Authorizations and no Incident Reports associated with Building 4310. Radiological surveys specific to Building 4310 have not been conducted. This area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. Survey results were below the acceptable limits. (HSA) | None |
| 4501 | No | | Q | EU-08 | Site 4501 Parking Lot, Includes Building 4823, Time Clock. Constructed prior to 1962, Site 4501 was a parking lot at the corner of G Street and 17th Street. On the 1987 Industrial Planning Map the site is referred to as "Coil Storage." Site 4501 is now used as a storage yard. There are no Use Authorizations and no Incident Reports associated with Building 4501. Radiological surveys specific to Site 4501 have not been conducted. (HSA) | None |
| 17th St. Drainage Area | Yes | | Q | EU-08 | 17th Street Drainage. The 17th Street Drainage is a natural rainwater channel located south of the intersection of "G" Street and 17th Street. In 1962, a berm was constructed around the channel to provide a 30-foot by 30-foot hold-up pond. The pond cycled through periods of evaporative drying in summer and refilled during the rainy season; this caused the low-lying area to be marshy. Over time, the area became overgrown with shrubs and trees and filled with silt. In 1998, the entire drainage channel area was cleared of shrubs and trees. Characterization surveys performed in 1997 and 1998 identified elevated levels of Cs-137. As a result, remediation began during 1998, and a final status survey was performed. The principle contaminant of concern at the 17th Street Drainage Channel area was Cs-137. No other significant isotopes were found in the environment or soil without the adjoining presence of Cs-137. During the 1995 Area IV Radiological Survey, the pond area was inaccessible, so no samples were taken. Soil from the drainage channels to the north and south of the pond area was sampled and no contamination was found. In 1997, the pond area was accessible and several soil samples were taken. Two of the samples indicated Cs-137 at levels of 13.5 and 14.5 pCi/g. A radiation survey was then conducted in the areas to identify any locations above limits. In 1998, the original bermed pond area and all intakes and outlets were mapped and surveyed. Although exposure measurements did not exceed 3.4 µR/hr above the background level of 15 µR/hr at 1 meter, some elevated radiation measurements in localized areas at ground level were observed at a maximum of twice the background levels. All locations exceeding 5 µR/hr above background were identified. Soil samples in areas immediately north and immediately south of the berm indicated elevated levels of radionuclides. Cs-137 was found at 2 pCi/g, which was less than the cleanup standard of 9.2 pCi/g. Th-228 was found at 6 pCi/g, which was close to the cleanup standard limit. Uranium isotopes were found at 4 pCi/g, which was less than the cleanup standard of 30 pCi/g. All uranium samples resulted in ratios of uranium isotopes consistent with naturally occurring uranium. No processed or enriched uranium isotopes from fuel typically used at the Santa Susana Field Laboratory (SSFL) were found in this location. Although Th-228 was discovered at 6 pCi/g, its parent isotope Th-232 was found at background levels of 1 pCi/g. Since this specific thorium isotope was not processed or used at SSFL, the origin of elevated Th-228 is unknown. The majority of the soil samples did not exceed cleanup standards and did not pose a health risk; however, portions of the 17th Street Drainage area were excavated to attain levels as low as reasonably achievable (ALARA). On October 27, 1999, the Oak Ridge Institute of Science and Education (ORISE) Environmental Survey and Site Assessment Program (ESSAP) performed a verification survey of the 17th Street Drainage Area. Verification activities included document reviews, surface scans, exposure rate measurements and soil sampling. Cesium-137 ranged from non-detect to 1.6 pCi/g and exposure rate ranged from 15 to 19 µR/hr. DHS performed verification sampling in 1999. (HSA) | Cs-137 |
| 4735 | No | | R | EU-08 | 4735 Fuel Tank - 86,000-Gallon Fuel Oil Storage Day Tank. Constructed in 1977, Fuel Tank 4735 stored fuel that was pumped by the pump station to the Sodium Component Test Installation (SCTI) facility. Building 4320, the Fuel Oil Pump Building, filled the tank from the Fuel Tank Farm. Carbon steel piping connected the facilities. Bulk oil was removed in 1990 and Fuel Tank 4735 was cleaned in 1991. Demolished with the Fuel Tank Farm in 1999. There are no Use Authorizations and no Incident Reports associated with Fuel Tank 4735. Radiological surveys specific to Fuel Tank 4735 have not been conducted. Portions of this area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. Survey results were below the acceptable limits. (HSA) | None |
| 4038 | No | | V | EU-08 | Building 4038 is the Systems for Nuclear Auxiliary Power (SNAP) Office Building No. 2. It includes the ETEC Headquarters/ DOE Site Office, Liquid Metal Engineering Center (LMEC) Administration and Information, Energy Technology Engineering Center (ETEC) Administration, and is serviced by Substation 4757. Constructed in 1962, Building 4038 is 15,297 square feet and is constructed of a steel frame, roof and siding, anchored to a concrete floor. Beginning in December 2002 and continuing to the time of the HSA report, weekly entrance/exit radiation surveys are performed. No elevated radiation levels have been detected. (HSA) | |
| 4039 | Yes | | V | EU-08 | Building 4039 was the SNAP Administration Building. Constructed in 1964, Building 4039 was a single-story structure constructed of galvanized steel walls and roof that were anchored to a concrete slab floor. After Building 4039 became a counting laboratory in 2000, radiological surveys were performed weekly from April 14, 2000 through April 11, 2001. All wipe measurements were less than the minimum detectable activity (MDA). Alpha MDA ranged from 8-12 dpm/100cm2, beta MDA ranged from 15-20 dpm/100cm2. Prior to demolition in April 2003, the building was again surveyed using wipe samples, beta detectors and gamma exposure instruments. All wipe samples were less than the MDA, and all instrument readings were non-detect. (HSA) | |
| 4057 | No | | V | EU-08 | Building 4057 has housed Launch Handling & Mobile Equipment Development, LMEC Laboratory, Static Sodium Test Facility, ETEC General Test, and is serviced by Substation 4757. Constructed in 1961, Building 4057 was constructed of a steel frame, siding and roof anchored to a concrete slab. Building 4057 housed two sodium test rigs. Building 4057 was decommissioned for laboratory use in 1998 at which point it became a records room and was in use at the time of the HSA. In 2003, air sample media (filter papers) was discovered in a folder of records. Some of these filters had low levels of residual contamination; however, surveys of the drawer contents provided that none of the contamination had escaped from the envelope containing the filters. The majority of contaminated samples measured less than the Nuclear Regulatory Commission (NRC) Regulatory Guide 1.86 release limit of 1,000 dpm/100 cm2 for removable contamination. Based on survey results, the incident was deemed to be | |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| | | | | | an insignificant hazard. (HSA) | |
| 4626 | No | | V | EU-08 | Building 4626 has been the Equipment Storage Building, LMEC Inventory Storage, ETEC Inventory Storage, and the SNAP Storage Building. Constructed in 1963, Building 4626 has a roof height ranging from 15 to 25 feet with a steel frame, siding and roof anchored to a concrete slab. It was equipped with a 2-ton bridge. There are no Use Authorizations and no Incident Reports associated with Building 4626. Building 4626 was not used to store nuclear fuel or radioactive materials. A storage yard west of Building 4626 has been used to store barrels of activated sand from Building 4059 containing Eu and Co-60. A radiological survey of the storage yard was conducted and survey results were below the acceptable limits. (HSA) | |
| 4757 | No | 4038, 4057 | V | EU-08 | See 4038 and 4057. | |
| 4020 | Yes | | AA | EU-09 | Hot Laboratory - Building 4020 housed the Rockwell International Hot Laboratory, Component Development Hot Cell (CDHC), and includes Building 4323, Guard Building and Building 4720, Substation. It was constructed in 1959 for the remote handling of radioactive materials. The Hot Lab was used for the disassembly and examination of irradiated nuclear fuel assemblies from various nuclear reactors, the disassembly and examination of Systems for Nuclear Auxiliary Power (SNAP) Reactor core, analysis of irradiated test materials, manufacture and leak testing of sealed radioactive sources, and machining of radioactive Co-60. (HSA)<br><br>Building 4020 was used for decladding of irradiated Pu bearing fuels from off-site reactors from 1976 to 1986. Following, DOE began D&D of the facility. Between 1987 and 1991 decontamination efforts focused on the removal of general contamination from support areas, decontamination rooms and hot cells. Decontamination to support demolition occurred from 1992 to 1995, and the structure was demolished and backfilled in 1996. (HSA)<br><br>A number of incidents occurred during operation of the facility which may have resulted in a release to the environment. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154, Pm-147<br>(Final D&D Report)<br>Prior to D&D:<br>Alpha and beta contamination<br>Primarily old mixed fission products (137Cs, 90Sr, 147Pm) 60Co small amounts of uranium (< 0.01%)<br>trace amounts of plutonium<br><br>(Final Status Survey)<br>Cs-137, gamma emitting radionuclides, Sr-90, Am-241 isotopic Plutonium, isotopic Thorium, isotopic Uranium |
| 4323 | No | 4020 | AA | EU-09 | See 4020 | See 4020 |
| 4468 | Yes | | AA | EU-09 | Holdup Tank constructed in 1959 to support the operations of Building 4020 by receiving and storing radioactive effluent generated by the operation of the Hot Lab. The 3,000-gallon liquid waste tank was removed in 1994 after the drainage system was removed from the Hot Lab building. DOE approved the removal of RMMA for the Hot Lab facility in November of 1998, which included the holdup tank and leach pits. Demolished in 1997, with the surrounding soil excavated an additional 4 feet. (HSA) | |
| 4520 | No | | AA | EU-09 | Parking lot constructed 1959, served as the parking lot for the Hot Lab facility. Was demolished in 1996 as part of the Hot Lab D&D effort. (HSA) | See 4020 |
| 4720 | No | 4020 | AA | EU-09 | See 4020 | See 4020 |
| 4806 | No | 4502 | P, U | EU-09 | See 4502 | See 4502 |
| 4383 | No | | S | EU-09 | Building 4383, Instrumentation Building, Liquid Metal Engineering Center (LMEC) Assembly and Test Building, LMEC Construction Staging, Includes Building 4393, Tower at 4383 Includes Building 4883, Substation. Building 4383 first appears as the Instrumentation Building on the 1962 map. On the following map, in 1967, it is listed as the LMEC Assembly and Test Building. On the following 1971 map it is listed as the LMEC Construction Building and remains such until its final appearance on the 1975 map. It was demolished in the early 1980s. There are no Use Authorizations and no Incident Reports associated with Building 4383. Radiological surveys specific to Building 4383 have not been conducted. This area was covered as part of the 1994-1995 Area IV Radiological Characterization Survey. Background: 15.6 µR/hr. Acceptable Limit: Less than 5 µR/hr above background. Survey results were below the acceptable limits. (HSA) | None |
| 4393 | No | 4383 | S | EU-09 | See 4383 | See 4383 |
| 4482 | No | | S | EU-09 | Building 4482 Government Project Office. Constructed in 1968, Building 4482 served as an office building. Transferred off-site in 2000. Building 4482 was donated to the Wildlife Way Station, and later reclaimed. The trailer was then surveyed by both Boeing and the Los Angeles County Health Department and recommended for release for unrestricted use. There are no Use Authorizations and no Incident Reports associated with Building 4482. Boeing and the Los Angeles County Health Department conducted radiation surveys. Both surveys determined that the trailer was free of radiological contamination. (HSA) | None |
| 4484 | No | | S | EU-09 | Building 4484 Rest Room Trailer. Building 4484 was constructed in 1969. Building 4484 was used as office space. Transferred off-site in 2000. Building 4484 was donated to the Wildlife Way Station and later reclaimed. The trailer was then surveyed by both Boeing and the Los Angeles County Health Department and recommended for release for unrestricted use. There are no Use Authorizations and no Incident Reports associated with Building 4484. Boeing and the Los Angeles County Health Department conducted radiation surveys. Both surveys determined that the trailer was free of radiological contamination. (HSA) | None |
| 4485 | No | | S | EU-09 | Building 4485, LMEC Office Trailer. Constructed in 1968, Building 4485 was used as office space. Transferred off-site in 2000. Building 4485 was donated to the Wildlife Way Station and later reclaimed the trailer. The trailer was then surveyed by both Boeing and the Los Angeles County Health Department and recommended for release for unrestricted use. There are no Use Authorizations and no Incident Reports associated with Building 4485. Boeing and the Los Angeles County Health Department conducted radiation surveys. Both surveys determined that the trailer was free of radiological contamination. | None |
| 4486 | No | | S | EU-09 | Building 4486, LMEC Office Trailer. Building 4486 was constructed in 1968. Building 4486 was used as office space. Transferred off-site in 2000. Building 4486 was donated to Shandon High School and later reclaimed. The trailer was then surveyed by both Boeing and the Los Angeles County Health Department and recommended for release for unrestricted use. There are no Use Authorizations and no Incident Reports associated with Building 4486. Boeing and the Los Angeles County Health Department conducted radiation surveys. Both surveys determined that the trailer was free of radiological contamination. (HSA) | None |
| 4487 | No | | S | EU-09 | Building 4487, Energy Technology Engineering Center (ETEC) Engineering Building, Safety Health and Environmental Affairs (SHEA) Office. Constructed in 1981, Building 4487 was used for office space and was demolished in 2004. There are no Use Authorizations and no Incident Reports associated with Building 4487. Periodic surveys were conducted from December 2002 until Building 4487 was demolished. Entrance/exit surveys did not detect any radiological contamination. Radiological surveys and samples taken during excavation of the Building 4487 septic tank did not detect any radiological contamination. (HSA) | None |
| 4538 | No | | S | EU-09 | Site 4538 Parking lot for Buildings 4482-4486. Site 4538 was a parking lot used by personnel working in Buildings 4482-4486, all of which were office buildings. Demolished in 2000. There are no Use Authorizations and no Incident Reports associated with Site 4538. Radiological surveys specific to Site 4538 have not been conducted. (HSA) | None |
| 4883 | No | 4383 | S | EU-09 | See 4383 | See 4383 |
| 4461 | No | | T | EU-09 | Building 4461 Sodium Pump Test Facility (SPTF) Motor Generator Building. Constructed in 1977, Building 4461 housed the electrical equipment that powered the motors in SPTF. Building 4461 is still standing. There are no Use Authorizations and no Incident Reports associated with Building 4461. Radiological surveys specific to Building 4461 have not been conducted. (HSA) | None |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4462 | No | | T | EU-09 | Building 4462 SPTF Building Includes Building 4760, Substation. Constructed in 1974, Building 4462 was used to test sodium pumps. Scheduled for demolition in 2005-2006. There are no Use Authorizations associated with Building 4462. No incidents occurred in Building 4462 that might have resulted in a release to the environment. Radiological surveys specific to Building 4462 have not been conducted. (HSA) | None |
| 4463 | No | | T | EU-09 | Building 4463, Sodium Cleaning and Handling Facility Includes 4780, Substation. Constructed in 1974, Building 4463 was used to assemble, disassemble and clean pumps and other parts of the SPTF. Building 4463 is still standing. There are no Use Authorizations and no Incident Reports associated with Building 4463. Radiological surveys specific to Building 4463 have not been conducted. (HSA) | None |
| 4662 | No | | T | EU-09 | Site 4662 Small Parts Cleaning Pad. Constructed in approximately 1981, Site has been used for cleaning sodium off of parts in support of SPTF. Site 4662 is still in use. There are no Use Authorizations and no Incident Reports associated with Site 4662. Radiological surveys specific to Site 4662 have not been conducted. (HSA) | None |
| 4760 | No | 4462 | T | EU-09 | See 4462 | See 4462 |
| 4780 | No | 4463 | T | EU-09 | See 4463 | See 4463 |
| 4062 | No | | U | EU-09 | Constructed in 1963, Building 4062 operated as a non-nuclear support building for the ETEC program, serving as a storage facility for instrument calibration and was serviced by Substation 4762. Building 4062 was demolished in 1999. No radiological surveys specific to Building 4062 were conducted. (HSA) | |
| 4065 | Yes | | U | EU-09 | Constructed in 1963, Building 4065 initially operated as a vacuum test facility. After 1973, it served as a non-nuclear chemical laboratory that performed sodium research and was equipped with a scanning electron microscope. It was serviced by Substation 4762 and was demolished in 1999. Use Authorization Series 39 (tests for the SNAP program), 61 (fuel friction tests), 74 (analytical x-ray generator), 75 (gas chromatography detectors), and 164A (gas chromatograph probe) were issued from 1971 to 1996. Radiological surveys specific to Building 4065 were not conducted. Building 4065 did not require radiological controls during demolition. (HSA) | |
| 4066 | No | | U | EU-09 | Constructed in 1963, Building 4066 was used for calibrating and testing non-radiological equipment and was demolished in 1999. Building 4066 was serviced by Substation 4762 and Time Clock 4806. An incident occurred in October 1966, during which an in-line vacuum switch was removed from the tiltpour pumping system and hand carried by Atomics International (AI) personnel to the building. When the instrumentation technician opened the switch to calibrate it, a fine black powder (presumably U3O8) sifted out and onto his clothing and workbench. The area surrounding the workbench was subsequently decontaminated (A0599). Radiological surveys specific to Building 4066 were not conducted. (HSA) | |
| 4762 | No | 4062, 4065, 4066 | U | EU-09 | See 4062, 4065, and 4066. | |
| 4015 | No | | W | EU-09 | Building 4015 was Construction Staging Storage and includes Building 4707, Substation. It was constructed in 1974 in the same place as Parking Lot 4573, was used to store construction materials, and demolished in 2004. (HSA) | |
| 4343 | No | 4573 | W | EU-09 | See 4573 | |
| 4373 | Yes | | W | EU-09 | SNAP Critical Test Facility - Building 4373 was the Systems for Nuclear Auxiliary Power (SNAP) Critical Facility and includes Site 4848, Pad at Building 4373. Constructed in 1956, it was designed as a solid propellant mixing and casting facility; however, there is no evidence that it was ever used for this purpose. One test cell was modified for critical assembly research supporting the SNAP program by adding two feet of additional concrete shielding to two walls and installing a high-efficiency particulate air (HEPA) filter bank. In 1962 the SNAP critical tests concluded, and the facility was modified again to include a NaK test loop to support the SNAP Experimental Reactor. The other test loop programs carried out here were RuK test loops, boiling mercury test loops and boiling potassium loops. The facility has since been used intermittently for storage of non-radiological materials. It was demolished in 1999. (HSA)<br><br>Most nuclear or radioactive materials handled at Building 4373 were fully encapsulated. Only fissile material and activation foils produced low levels of radioactivity. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241; (Final Status Survey)<br>Ambient gamma exposure rates<br>Removable alpha/beta |
| 4374 | No | | W | EU-09 | Building 4374 was constructed in 1956 to test non-nuclear liquid metal heat transfer loops and was used as a support facility for Building 4373. It was located within the Building 4373 boundary fenceline. Building 4374 was abandoned with an old mercury test loop in place and demolished in 1996. (HSA) | (Final Status Survey)<br>Ambient gamma exposure rates Removable alpha/beta |
| 4573 | No | | W | EU-09 | Site 4573 was a Parking Lot and includes Building 4343, Time Clock. The parking lot was constructed in 1956 and served as a parking lot for personnel working in Buildings 4373 and 4055. It was removed in 1974 and Building 4015 was constructed on the former location of Site 4573. (HSA) | |
| 4707 | No | 4015 | W | EU-09 | See 4015 | |
| 4848 | Yes | 4373 | W | EU-09 | See 4373 | |
| 4055 | Yes | | X | EU-09 | NMDF - Building 4055 is the Nuclear Materials Development Facility (NMDF) and includes Building 4755, Substation and Building 4155, Control Center, Guard Shack. It was constructed in 1967 and from 1968-69, was used to support the Fast Flux Test Facility through analytical chemistry and research for uranium-plutonium scrap pellet recycling programs. Fission research on microscopic dispersion of tungsten in uranium plutonium fuel was also conducted at that time. For 7 months in 1970, the NMDF fabricated mixed uranium-plutonium oxide pellets for irradiation tests. The NMDF was then in standby until March 1974 when it was activated to participate in the Advanced Fuel Systems Program for liquid metal fast breeder reactors and to demonstrate reduced TRU solid waste with the use of a molten salt combustor. D&D efforts began in late 1979 and the entire building was stripped to the walls and decontaminated, equipment was disposed of as low-level waste, and the liquid waste and exhaust systems were removed. The facility is currently used for non-radiological research. (HSA) | U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241; (HSA), plutonium uranium, U and Pu decay and daughter products, primarily Am-241 |
| 4155 | Yes | 4055 | X | EU-09 | See 4055 | See 4055 |
| 4755 | Yes | 4055 | X | EU-09 | See 4055 | See 4055 |
| 4483 | No | | S | EU-09 & EU-07 | Building 4483, LMEC Office Trailers. Building 4483 was constructed in 1968 and was used for office space. Transferred off-site in 2000. Building 4483 was donated to the Wildlife Way Station and later reclaimed. The trailer was then surveyed by both Boeing and the Los Angeles County Health Department and recommended for release for unrestricted use. There are no Use Authorizations and no Incident Reports associated with Building 4483. Boeing and the Los Angeles County Health Department conducted radiation surveys. Both surveys determined that the trailer was free of radiological contamination. (HSA) | None |
| 4100 | Yes | | BB | EU-10 | Building 4100 houses the Advanced Epithermal Thorium Reactor (AETR), Fast Critical Experiment Laboratory (FCEL), and Radiation Safety and Computed Tomography and includes 4100, Trench and Building 4800/4710, Substation. It was constructed in 1960 and 20 reactor core configurations were studied here. Early reactors in the AETR were thorium or uranium fueled; later tests of reactors with highenergy (fast) neutrons were conducted at the FCEL. The program was terminated in 1974 and NRC terminated License CX-17 (for Building 4100) and released the building for unrestricted use in October 1980. (HSA)<br><br>After D&D the high bay was used for sodium fire suppression experiments. The high bay is currently used as a high energy Computer Aided Tomography (CAT) facility. The labs are used by Radiation Safety for a radioactive sample counting lab and instrument calibration facility. (HSA)<br><br>The trench next to the building which was used to burn construction debris and is regulated under RCRA for soil contamination, but it is unlikely that any regulated radiological materials were disposed of there. (HSA) | Alpha<br>Beta-gamma |
| 4510 | No | | BB | EU-10 | Site 4510 served as a parking lot for personnel working in Building 4100 and the surrounding areas and is now an open field. (HSA) | |
| 4800 | No | 4100 | BB | EU-10 | See 4100 | See 4100 |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4100 Trench | No | 4100 | BB | EU-10 | AETR Test Facility (1960-1974), Radiation Instrument Calibration and Radiological Sample Counting Laboratory (1985-present) See 4100 | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Th-232, Co-60, Eu-152, Eu-154, H-3; See 4100 |
| 4009 | Yes | | CC | EU-10 | OMR Critical Facility, SGR Critical Facility. Building 4009 was constructed in 1958 and housed the Organic Moderated Reactor (OMR), Sodium Graphite Reactor (SGR), and includes Buildings 4709, Substation. The OMR was a low-power critical experiment facility for testing reactor geometries and fuel elements in a reactor moderated and cooled by organic liquids. The SGR was a low-power critical experiment facility for testing fuel and sodium configurations in a reactor cooled by sodium and moderated by graphite. There were two incidents at the facility that may have resulted in releases to the environment. In 1967, all equipment associated with the OMR and SGR was removed. (HSA)<br><br>In the 1980s and early 1990s the facility was used for storage and testing of Rocketdyne's In-Service Inspection (ISI) equipment. In the late 1980s, the west high bay was used for high-energy rate forging (HERF) that included handling of high-enriched uranium. Eight hundred pounds of depleted uranium was stored in the facility and shipped off site in the early 1990s. (HSA) | Sr-90, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Co-60, Eu-152, Eu-154; (Final Status Survey), U-238, Th-232, U-235, K-40, Cs-137, Cs-134 Co-60 |
| 4509 | No | | CC | EU-10 | Site 4509 served as a parking lot for personnel working in Building 4009 and the surrounding area. (HSA) | |
| 4709 | No | 4009 | CC | EU-10 | See 4009 | See 4009 |
| 4056 Landfill | No | | V | EU-10 | The 4056 Landfill is a 160,000-square-foot fenced area directly north of Building 4100. Constructed prior to 1962, the landfill served as a disposal area for construction and excavation materials from Building 4056 (never constructed). Soil that was removed from the proposed site of Building 4056 was placed in the landfill. The 4056 Landfill was later used as a disposal area for non-radiological facilities. There are no Use Authorizations and no Incident Reports associated with the 4056 Landfill. In 1988, Rockwell International conducted a radiological survey with results that were below the acceptable levels. During the 1996 Area IV Radiological Characterization Survey, soil samples were taken at two different locations in the vicinity of Building 4056. None of the measurements were distinguishable from background. In 2003, a Global Positioning System (GPS) radiation scanning cart was used to map radiation levels at the site. No elevated radiation was observed. And no contamination was detected in subsequent soil sampling and trenching. (HSA) | |
| 4425 | No | | DD | EU-11 | Solar Concentrator Facility was constructed in the middle 1980s and used in experiments aimed at harnessing solar power. This building was a 25 kWt parabolic dish-Sterling engine generator, which consisted of a mirrored parabolic dish concentrator, 10.7 m in diameter, and a solar receiver. (HSA) | |
| 4885 | No | | EE | EU-11 | Pistol Range constructed prior to 1962 and demolished in the early 1980s. Building 4885 consisted of four or five covered shooting stations on a concrete pad and a downfield berm. (HSA) | |
| 4886 | Yes | | EE | EU-11 | Sodium Disposal Facility was constructed in the early to middle 1950s. From 1956 to 1978, the facility was used to clean non-radioactive metallic sodium and NaK from various scrap test components before they were disposed. It was also used to treat non-radioactive waste sodium and NaK and to burn nonradioactive combustible liquid waste, such as oils. Building 4886 consisted of a large, rectangular pit filled with water. The site has been remediated and re-vegetated. (HSA)<br><br>The facility was not designed to use or store radioactive materials; however, during the course of normal treatment and disposal operations, radioactive materials were inadvertently introduced into the facility, which resulted in contamination of the soil. (HSA) | (Final Status Survey) Gamma Radiation Survey Detected Gamma Spectroscopy: K-40, Sr-90, Cs-137, Th-232, Ac-228, Th-228, Pb-212, U-238, Th-234, U-234, Th-230, Pb-214, Bi-214, U-235 |
| 4173 | No | | Y | EU-12 | This area was a sodium storage pad in 1962. By 1967, it was being used as Gammagraph X-ray site. This pad housed a sealed gamma-emitting source used for X-ray purposes. It has been demolished. The gamma-emitting source (which was checked annually to ensure no leakage occurred) was used and stored on a concrete pad. There is no evidence that a permanent building ever existed in this location. On April 25, 1978, the stand supporting the uranium collimator was accidentally pushed over on its side, causing damage to the source guide tube. The source guide tube was replaced and two employees received two mrem of exposure in the process. (HSA) | |
| 4363 | Yes | | Y | EU-12 | Mechanical Component Development and Counting Building - Transferred from the Rocketdyne Division to the Atomics International (AI) Division in 1956-1957 to support expansion of the AI activities at SSFL. The Mechanical Component Development and Counting Building and was used for sodium systems in support of the Sodium Reactor Experiment (SRE) from before 1959 until 1963. Building 4363 likely had a radioactivity counting room which may have been moved from the Engineering Test Building Annex in 1957. Building 4363 has been used primarily for storage since 1963. A decontamination effort was conducted in 1995. Building 4363 was demolished in 2001; the sanitary leachfield system was removed in 2002. (HSA) | (Final Status Survey) uranium mixed fission and activation products, Cs-137 low enrichment uranium (2.75%), Sr-90, Alpha, beta, and gamma activity |
| 4375 | Yes | | Y | EU-12 | The building was constructed in 1959 as a test shelter for outside control-rod test towers (Sites 4874 and 4875). This building was used to support the SNAP program, but was not involved in nuclear work. After the building was abandoned, barrels that may have contained radioactive material were stored in the surrounding area. The building was demolished in 1999. (HSA) | (HSA) Ambient gamma exposure rates |
| 4473 | No | | Y | EU-12 | The Hydraulic Test Facility was used to conduct preliminary tests on piping, pumps and other loop components. Water was used, because it has a similar flow rate to liquid sodium. The tests where designed so the researchers could examine descriptors such as fatigue rates and results such as fracturing of components. The Hydraulic Test Instrumentation Building was the control center for the Hydraulic Test Loop (Building 4863). The building was demolished in 2003. (HSA) | |
| 4575 | Yes | | Y | EU-12 | Site 4575 was a parking lot located west of Building 4375. Building 4375 was used as a non-nuclear control center for testing SNAP control rod assemblies. Building 4375 was used to support the SNAP program, but was not involved in nuclear work. After the building was abandoned, barrels that may have contained radioactive material were stored in the surrounding area, which may have included Parking Lot 4575. Site 4575 has been removed. (HSA) | (HSA) Ambient gamma exposure rates |
| 4863 | No | | Y | EU-12 | The Hydraulic Test Facility was constructed in approximately 1961 used as a preliminary test for piping, pumps and other loop components. This facility combined pressure, temperature and different water in its testing. Water was used because it has a similar flow rate to liquid sodium. The tests where designed such that the researchers could examine descriptors such as fatigue rates and results such as fracturing. The Hydraulic Test Loop was the experimental loop portion of the facility. The building was demolished in 2003. (HSA) | |
| 4873 | No | | Y | EU-12 | Building 4873 first appears and is labeled the Fuel Rod Test Tower and Pad on the 1967 map. There is no record of any activity with fuel rods at this location. Building 4873 is most likely a pad located directly north of Building 4363 and is addressed in that building remediation and release. The Hydraulic Test Facility was used as a preliminary test for piping, pumps and other loop components. This facility combined pressure, temperature and different types of water in its testing. Water was used because it has a similar flow rate to liquid sodium. The tests where designed so that researchers could examine descriptors such as fatigue rates and results such as fracturing. The Hydraulic Test Laboratory was where the engineers established the parameters of the experiment. Building 4873 was demolished in 2003. (HSA) | |
| 4874 | Yes | | Y | EU-12 | Site 4874 was constructed in the late 1950s and used to support the SNAP program, but was not involved in nuclear work. After the building was demolished in the early 1970s, barrels that may have contained radioactive material were stored in the surrounding area. (HSA) | (HSA) Ambient gamma exposure rates |
| 4875 | Yes | | Y | EU-12 | Site 4875 was used to support the SNAP program, but was not involved in nuclear work. However, due to the proximity of Building 4374 (a nuclear facility), radioactive and/or nuclear materials may have been handled there. In addition, after the building was abandoned, barrels that may have contained radioactive material were stored in the surrounding area. It was constructed in the late 1950s and demolished in the middle 1970s. (HSA) | (HSA) Ambient gamma exposure rates |
| 4353 | Yes | | Z | EU-12 | Building 4353 housed the Organics Reactor Development Building, Research and Development (R&D) Laboratory Building, General Storage, and includes Site 4853, Concrete Pad. It was constructed in 1956 as an R&D Laboratory for the Organic Moderate Reactor Program, and the primary usage has been general storage. The steel portion of the structure was removed in the late 1970s, the concrete pad was removed in 2001 during septic tank removal. (HSA) | |

# Appendix B – Historical Site Assessment Summary

| Site | Impacted | Included in | Group | Exposure Unit | Historical Use Impacting COCs | Identified Contaminants |
|---|---|---|---|---|---|---|
| 4553 | No | | Z | EU-12 | Site 4553 served as a parking lot for personnel working in Building 4353 and the surrounding areas. It was constructed prior to 1962 and is no longer in use. (HSA) | |
| 4853 | Yes | 4353 | Z | EU-12 | See 4353 | |
| 4854 | No | | Z | EU-12 | Building 4854 was constructed sometime between 1964 and 1967 and was used to test Radiation Fuel Gauges. It was demolished in the late 1990s. (HSA) | |
| 4314 | No | 4814 | DD | EU-13 | See 4814 | |
| 4317 | No | | DD | EU-13 | Building 4317 was part of a pistol range was a roofed area with open sides that was used to stand under while shooting firearms. There was an earthen berm down range to capture discharged bullets. Building 4317 has been demolished. (HSA) | |
| 4514 | No | 4814 | DD | EU-13 | See 4814 | |
| 4730 | No | | DD | EU-13 | The Impact Test Control Building was constructed in the late 1960s and appears on Industrial Planning Maps from 1967-1972. It housed the controls for the Isotope Impact System Test Device in Building 4820. Demolished in the mid 1970s. (HSA) | |
| 4814 | No | | DD | EU-13 | The Large Leak Injector Device (LLID), Sodium Water Reaction Test Structure includes Building 4314, LLID Test Control Building and Building 4514, Sodium-Water Reaction Test Center. Building 4814 was used in 1975 in tests that analyzed steam and water density at the point at which a pipe ruptured. Building 4314 housed a control room for Building 4814 and Building 4514; the Sodium-Water Reaction Test Center was also associated with the buildings, which were demolished in the late 1970s.<br><br>Use Authorization 83, issue date November 7, 1974, permitted the use of a 25 Ci Cs-137 sealed source, which was checked annually to ensure no leakage occurred, in a DD Electronics Gamma Densitometer. Following each test using the gamma densitometer, radiological surveys were conducted to confirm that contamination had not occurred. (HSA) | |
| 4820 | Yes | | DD | EU-13 | The Isotope System Impact Test Device was constructed in the late 1960s and demolished in the mid 1970s. It was used for impact testing of normal ZrH Fuel. (HSA)<br><br>Use Authorization 5, issued on February 25, 1970, permitted possession of 1 kg of fuel that contains 10% (by weight) of normal U for impact testing of F28 normal ZrH Fuel. This process involved firing a small mass (58.33g) of fuel into a granite target. This was repeated 12 times at varying velocities. The experiment was conducted in an enclosed casing with three openings, two for camera lenses and one for the projectile. Upon impact, each projectile was pulverized. (HSA) | |
| 4318 | No | | DD | EU-13 | Building 4318 was part of a pistol range was a roofed area with open sides that was used to stand under while shooting firearms. There was an earthen berm down range to capture discharged bullets. Building 4318 has been demolished. (HSA) | |
| 4701 | No | | FF | EU-14 | Water tank constructed prior to 1967, used to store water for the site. Water flowed out from the tank only, It is unclear how it was refilled. (HSA) | |
| 4702 | No | | FF | EU-14 | Water tank constructed prior to 1967, used to store water for the site. Water flowed out from the tank only, It is unclear how it was refilled. (HSA) | |
| 4865 | No | 4173 | Y | EU-15 | See 4173 | |
| 4001 | No | | Not Built | | | |
| 4052 | No | | Not Built | | | |
| 4638 | No | | Not Built | | | |
| 4640 | No | | Not Built | | | |
| 4810 | No | | Not Built | | | |

# Appendix C

# Radionuclide Background Sources

# Appendix C
# Radionuclide Background Sources

## C.1 Naturally Occurring Radionuclides

Natural radionuclides in the environment are of two general classes, primordial and cosmogenic. The identification sources and global ranges of these is discussed below. While above-ground nuclear testing represents a man-made, not natural, source of radionuclides, associated radionuclides are present in the environment in the absence of on-site operations. Contribution to "naturally-occuring radionuclide" background from nuclear testing is also discussed below.

### C.1.1 Primordial Radionuclides

Primordial radionuclides are mostly isotopes of heavy elements belonging to three decay series headed by $^{238}U$ (uranium series), $^{235}U$ (actinium series), and $^{232}Th$ (thorium series). The head (or parent) radionuclides of these series have half-lives on the same order as the age of the Earth ($10^9$ years) and are consequently assumed to represent the primordial inventory. The members of these decay series exist in a state of activity equilibrium on a global basis dictated by the rate of decay of the head of the series. However, local concentrations can vary widely due to separations occurring in nature due to different leaching rates from rocks. An example of this is the leaching of $^{226}Ra$ from rocks at a faster rate than the $^{238}U$ parent due to alpha radiation recoil energy of the parent decay breaking the lattice structure of the rock. Radium-226 then has a sufficiently long half-life to exist in soils and waters at higher concentrations than its $^{238}U$ parent. The ratio of $^{226}Ra$ to $^{238}U$ varies at different locations due to the different chemical composition of the rocks and the soil in the area. In addition, a parent's concentrations can vary from one location to another depending on the type of geological formation present. Therefore, it is prudent to determine background concentrations of parent and associated long-lived decay products (or progeny) on a relatively local basis, where "long-lived" is typically defined as a half-life of six months or longer. Short-lived decay products (with half-lives less than six months) are often expressed using "+D" with the longest long-lived parent. (For example, $^{238}U$+D includes: $^{238}U$, $^{234}Th$, $^{234m}Pa$, $^{234}Pa$ all assumed to be present at the same concentration.) Naturally-occurring decay series, including long-lived and short-lived (+D) progeny plus associated half-life, are summaries in Table C-1

As a default, background concentrations of long-live progeny and associated +D products can be assumed in equilibrium with the series parents. However, series concentrations below radon may not be in equilibrium with the parents since radon is a gas and my escape from the soil by emanation. Since radon and progeny may also be in the background air environment of the laboratory detectors, analytical results based on their measurement are normally disregarded and they are assumed to be in equilibrium with the associated radium parent for risk calculation purposes. Therefore, natural background level establishment is not necessary for them.

**Table C-1. Natural Radioactive Decay Series including Progeny and Associated Radiation**

| Uranium Series | | | Thorium Series | | | Actinium Series | | |
|---|---|---|---|---|---|---|---|---|
| **Long-lived [c] Radionuclides** | **Short-lived Progeny [b]** | **Half-life [c]** | **Long-lived [c] Radionuclides** | **Short-lived Progeny [b]** | **Half-life [c]** | **Long-lived [c] Radionuclides** | **Short-lived Progeny [b]** | **Half-life [c]** |
| $^{238}U$ (start) | | $4.47 \times 10^{9}$ yrs | $^{232}Th$ (start) | | $1.4 \times 10^{10}$ yrs | $^{235}U$ (start) | | $7.04 \times 10^{8}$ yrs |
| | $^{234}Th$ | 24.1 days | $^{228}Ra$ | | 5.75 yrs | | $^{231}Th$ | 25.5 hrs |
| | $^{234m}Pa$ | 1.17 min | | $^{228}Ac$ | 6.13 hrs | $^{231}Pa$ | | 32,760 yrs |
| | $^{234}Pa$ | 6.7 hrs | $^{228}Th$ | | 1.91 yrs | $^{227}Ac$ | | 21.77 yrs |
| $^{234}U$ | | 244,500 yrs | | $^{224}Ra$ | 3.66 days | | $^{227}Th$ | 18.72 days |
| $^{230}Th$ | | 77,000 yrs | | $^{220}Rn$ | 55.6 sec | | $^{223}Fr$ | 21.8 min |
| $^{226}Ra$ | | 1,600 yrs | | $^{216}Po$ | 0.15 sec | | $^{223}Ra$ | 11.43 days |
| | $^{222}Rn$ | 3.82 days | | $^{212}Pb$ | 10.64 hrs | | $^{219}Rn$ | 3.96 sec |
| | $^{218}Po$ | 3.05 min | | $^{212}Bi$ | 60.55 min | | $^{215}Po$ | 0.00178 sec |
| | $^{214}Pb$ | 26.8 min | | $^{212}Po$ | $3.07 \times 10^{-7}$ sec | | $^{211}Pb$ | 36.1 min |
| | $^{218}At$ | 2.0 sec | | $^{208}Tl$ | 3.07 min | | $^{215}At$ | 0.0001 sec |
| | $^{214}Bi$ | 19.9 min | $^{208}Pb$ | | (stable) | | $^{211}Bi$ | 2.14 min |
| | $^{214}Po$ | $1.64 \times 10^{-4}$ sec | | | | | $^{211}Po$ | 0.516 sec |
| | $^{210}Tl$ | 1.3 min | | | | | $^{207}Tl$ | 4.77 min |
| $^{210}Pb$ | | 22.3 yrs | | | | $^{207}Pb$ | | (stable) |
| | $^{210}Bi$ | 5.01 days | | | | | | |
| | $^{210}Po$ | 138 days | | | | | | |
| | $^{206}Tl$ | 4.20 min | | | | | | |
| $^{206}Pb$ | | (stable) | | | | | | |

a) Long-lived is defined as exhibiting a radiological half-life of 6 months or greater.
b) Short-lived is defined as exhibiting a radiological half-life less than 6 months.
c) Source = *The Health Physics and Radiological Health Handbook* edited by Bernard Shleien, Scinta Inc, Silver Springs, MD, 1992.

Since $^{235}U$ is naturally uniformly present at 0.7 % by mass of $^{238}U$ concentrations, activity concentrations for $^{235}U$ and its decay chain can also be calculated from the $^{238}U$ activity concentration based on the ratio of their specific activities. For 1 pCi/g of $^{238}U$, there will be ~0.047 pCi/g of $^{235}U$ and its decay chain to radium will also be in equilibrium.

There are two other (non-series) primordial radionuclides that decay directly to stable nuclides. These are $^{40}K$ and $^{87}Rb$. Potassium-40 is so widespread that it contributes about one-third of both the external terrestrial and internal whole-body dose from natural background radiation.[1] Rubidium-87 is only a beta emitter and is important only as an internal radiation source.

Many of the naturally occurring isotopes of uranium, thorium, and protactinium undergo spontaneous fission as an alternative to the principal mode of radioactive decay, and small amount of $^{239}Pu$ are naturally produced by activation. Therefore, some fission and activation products are produced naturally in the earth. However, the concentrations of these are most often much smaller than and indistinguishable from quantities resulting from fallout from nuclear weapons testing and releases from nuclear reactor accidents, which will be discussed later. Reference background levels for primordial radionuclides are shown in Table BB.

### C.1.2 Cosmogenic Radionuclides

Cosmogenic radionuclides are produced by interactions of cosmic nucleons with target atoms in the atmosphere or in the earth. These radionuclides have mostly intermediate or low atomic numbers and are beta- and gamma-ray or x-ray emitters. There are many different radionuclides produced by a variety of spallation and neutron activation reactions. However, there are only four that are produced in large enough quantities or with long enough half-lives to be of dosimetric or risk concern: $^{14}C$, $^{3}H$, $^{22}Na$, and $^{7}Be$. Concentrations of these vary by latitude and by time depending on season and amount of sun spot activity. Nuclear weapons testing also increased the concentrations of these radionuclides. The quantities of $^{3}H$ produced by thermonuclear tests completely overshadow naturally produced $^{3}H$ and will be discussed later. The concentrations of the other three radionuclides in the atmosphere only increased by about a factor of 2 for $^{14}C$ to a factor of 50 for $^{22}Na$ at their highest concentrations. However, the concentrations of these radionuclides in the atmosphere have decreased since 1962 due to decay and exchange with the ocean.[2] Less than 1% of the world inventory of $^{14}C$ is in land surfaces and the biosphere while the numbers for $^{3}H$, $^{22}Na$, and $^{7}Be$ are approximately 35%, 44%, and 20% respectively.[3]
Reference background levels for cosmogenic radionuclides are shown in Table BB.

## C.2 Global Fallout from Nuclear Weapons Tests

Between 1945 and 1980, approximately 450 nuclear weapons were detonated in the atmosphere, mostly in the Northern Hemisphere. The later high yield thermonuclear weapons tests deposited fallout on a global scale. Since 1980, most nuclear weapons tests have been

[1] "Exposure of the Population in the United States and Canada from Natural Background Radiation," NCRP Report No. 94, December 1987, pp. 5.
[2] Ibid., p. 36
[3] Ibid., pp. 38-39

performed underground with smaller yields that have not contributed significantly to global fallout. Since about 1975, the deposition rate of fallout has been less than the decay rate of the material already on the ground for most fallout radioisotopes of concern.[4]

There are three types or sources of radioisotopes produced from nuclear explosions. The majority of radioactivity produced from nuclear explosions is from fission products. These are primarily beta/gamma emitters in the mid atomic weight range with half-lives from seconds to over a hundred years. A second source is activation products produced by neutron activation of the elements of the device itself or of its surroundings. These include isotopes of iron, manganese, cobalt, zinc, carbon ($^{14}C$), and hydrogen ($^{3}H$ or tritium), in addition to transuranic isotopes such as plutonium produced by activation of the $^{238}U$ in the device. The third source is unfissioned uranium, plutonium, or tritium material originally present in the device itself.[5]

It would not be possible to list specific quantities for all of the radionuclides possibly produced by atmospheric nuclear tests. However, based on fission or activation yields and on half-lives, only certain radioisotopes are of primary interest from a background determination standpoint. These include $^{90}Sr$, $^{137}Cs$, and plutonium isotopes as well as the $^{241}Pu$ progeny, $^{241}Am$ and to a lesser extent $^{99}Tc$, $^{129}I$, $^{3}H$, and $^{14}C$.

A relatively uniform pattern of plutonium distribution from fallout characterizes soil deposition. The highest accumulations are located in the northern hemisphere in the latitudinal band of 50 to 40 degrees. Fallout deposition levels in the southern hemisphere are approximately an order of magnitude less. Cesium-137, on the other hand, while deposited fairly uniformly, migrates in the environment with the soil to which it is bound tightly. Both cultivated soil and reservoir sediments serve as a sink or a trap for cesium being washed out of watershed soils. Therefore, soil concentrations vary significantly depending on the degree of erosion or sedimentation. Reference background levels for fallout radionuclides are a shown in Table C-2.

**Table C-2. Radionuclide Background Reference Data**

| Nuclide | mCi/km$^2$ | mCi/km$^2$ | pCi/cm$^2$ | pCi/g | Reference |
|---|---|---|---|---|---|
| | (Calculated from Fallout Estimates) | | | | |
| **U.S. Soil** | | | | | |
| **Cs-137** | 60 | 26.1 | 2.6 | 0.17 | Eisenbud (1987) pp. 331; Richie, J.C., and McHenry, H.R. (1978) pp. 40-44 |
| **Sr-90** | 80 | 32.8 | 3.3 | 0.22 | Eisenbud (1987) pp. 335. |
| **Pu-239** | 1.4 | 1.4 | 0.14 | 0.0092 | Eisenbud (1987) pp. 335. |
| **Pu-239** | -- | 2.2 | 0.22 | 0.0144 | Bennett (1978); Hardy et al. (1973) pp.444-445 |
| **Am-241** | -- | 0.8 | 0.08 | 0.0052 | Bennett (1978) |
| **U.S. Sediment** | | | | | |
| **Cs-137** | -- | -- | -- | 1 | Eisenbud (1987) pp. 119. |
| **Cs-137** | 676 | 397 | 39.7335 | 2.61 | Richie, J.C., and McHenry, H.R. (1978) pp. 40-44 |

[4] Ibid., p. 153
[5] Ibid., p. 154

## Table C-2. Radionuclide Background Reference Data

| | | | | | |
|---|---|---|---|---|---|
| **Continental Soils** | | | | | |
| **K-40** | -- | -- | -- | 10.8 | NCRP Report No. 94 (1987) |
| **Rb-87** | -- | -- | -- | 1.4 | NCRP Report No. 94 (1987) |
| **Th-232** | -- | -- | -- | 1.0 | NCRP Report No. 94 (1987) |
| **U-238** | -- | -- | -- | 1.8 | NCRP Report No. 94 (1987) |


Bennett, B.G. 1978. *Environmental Aspects of Americium*, Department of Energy, Environmental Measurements Laboratory, EML-348, (1978).

Eisenbud, Merril 1987. *Environmental Radioactivity*, Academic Press, pp. 331.

Hardy, E.P., Krey, P.W., and Volchok, H.L. 1973. "Global Inventory and Distribution of Fallout Plutonium," *Nature*, 241. pp.444-445.

NCRP (National Council on Radiation Protection and Measurements) 1987. *Exposure of the Population in the United States and Canada from Natural Background Radiation*, Report No. 94.

Richie, J.C., and McHenry, H.R. 1978. "Fallout Cesium-137 in Cultivated and Noncultivated North Central United States Watersheds," J. *Envrion. Qual.*, 7,1 pp. 40-44.

# Appendix D

# Statistical Evaluation of Radiological Background Distribution

# Appendix D
# Statistical Evaluation of Radiological Background Distribution

Concentrations of primordial radionuclides are dependent on the geological formation the soil is found in. In addition, concentrations of cosmogenic and fallout radionuclides may have been affected by the climate and topography of the area since they affect runoff, sedimentation and movement through soil. Therefore, it is desirable to develop background concentrations from unaffected locations that are in the same geologic formation and similar in climate and topography. Therefore, a background data set will be developed from available from the unaffected areas surrounding the site in the same geological zones. The above mentioned screening levels are estimated using a series of data filters as described

The first screening step is to eliminate from consideration any sample within the SSFL Area IV boundary and buffer zones. The vast majority of the Area IV and buffer areas likely contain SRC concentrations consistent with background (un-impacted) media. However, there is a higher potential for encountering residual contamination within the Area IV boundary, and the null hypothesis for the site (per MARSSIM guidance) is that concentrations are present above health-based concentration limits; thus only offsite data are considered in estimating background concentrations.

Area IV of the SSFL is dominated by the Chatsworth (Kcs) geologic formation, comprising approximately 220 acres of the 290-acre Area IV footprint. The remaining approximately 70 acres, located in the southwestern corner of Area IV, is primarily comprised of the Santa Susana (Tsu) formation. Therefore, the second screening step is to eliminate offsite samples collected from other than soils within the Kcs and Tsu footprints.

Area IV contains multiple natural and man-made drainages that could impact offsite soil/sediment concentrations. The third screening step is, therefore, to eliminate from consideration any sample collected from an Area IV drainage area. Samples collected in the vicinity of these surface water bodies but not within the drainage itself (such as campsites) are retained for consideration pending the result of other filters. Note that samples collected just outside of the Area IV and buffer boundaries and are not associated with drainage are retained by this filter.

Some non-detected results appear to have been altered by assigning 1.0 or 0.5 times the reported minimum detectable activity (MDA). EPA through Risk Assessment Guidance for Superfund (RAGS) suggests assigning the LLD (assumed to mean MDL) for radionuclides when the actual result is not provided (the MDL is approximately equal to one-half the MDA). Using the MDA would be non-conservative for producing background screening levels (i.e., overestimates actual concentrations). By assigning the MDA the average concentration in the example could actually be greater than the maximum measured value. As a consequence the calculated background screening value could result in determining an area is non-impacted when it actually is (Type I error). For this reason one half of the reported MDA was assigned

when the reported value is equal to the MDA (exceptions to this rule are noted later for $^{3}H$, $^{90}Sr$, $^{238}Pu$, and $^{239}Pu$).

The final step was screening samples based on obvious outlier conditions. In a few cases offsite sample results appear to represent substantially different concentrations when compared to the balance of the dataset (e.g., twice the next highest result). Outliers are identified using probability plots and professional judgment. A probability plot of normally distributed results (generally expected in background) would produce a relatively straight line sometimes with a curved tail on both ends. A dramatic deviation from linearity indicates non-normality and suggests the presence of contamination (or at least multiple populations). It is noted, however, that some deviation from linearity can be present even in background due to a number of random variable – professional judgment is used in these cases.

Figure 3-3 of the main text presents the sample locations included in background screening value estimates. The Kcs and Tsu footprints are presented for reference as are SSFL boundaries. Note that due to the scale some locations appear on or very close to surface water bodies. These locations were investigated and actually fall off the drainages, such as on campsites near the feature in question. Also due to the scale, it is difficult to resolve closely clustered samples – sometimes 5 to 10 or more samples appear as a single location on the figure. The intension of the map is to show general locations relative to Area IV and geologic formations and not to provide location-specific details associated with individual samples or sample clusters – other project documents available on-line may serve that function.

### Radiological Constituents – Uncertainties

Eighty-seven $^{239/240}Pu$ samples (assuming all measure concentrations are attributable to $^{239}Pu$) were considered from the offsite dataset, but 70 of these results were assigned concentrations relative to the MDA. Because of this bias on the majority of samples, the background values were calculated using only the 17 un-altered samples. Similarly, 130 $^{238}Pu$ samples were considered from the offsite dataset but 81 of these results were assigned concentrations relative to the MDA. Because of this bias on the majority of samples, the background values were calculated using only the 49 un-altered samples. Thirty-nine of the 59 $^{3}H$ results were assigned relative to the MDA. Because of this bias on the majority of samples, the background values were calculated using only the 28 un-altered samples. Finally, for $^{90}Sr$, many samples were assigned 0.5 times the MDA with high MDA values relative to the detected results. To eliminate the bias, only non-detected $^{90}Sr$ results with MDLs less than or equal to the average detected value (~ 0.046 pCi/g for Kcs) were used.

Half-lives of $^{137}Cs$ and $^{90}Sr$ are about 30 years each, which is non-trivial considering the age of some offsite analytical data. That is, if a sample was collected 10 years ago the present concentration with a 30-year half life is about 80 percent of the original measured value. This would be a concern if comparing data reported from different timeframes. However, the onsite data and offsite data were collected within the same timeframe (i.e., both sets containing relatively new and relatively old data), thus it is appropriate to directly compare all data regardless of collection date. The assumption is that the average date for offsite data is about the same as that for onsite data, introducing uncertainty in the analysis.

Most offsite tritium results for soil are reported with the unit pCi/L (assumed to represent the soil moisture fraction). Because the actual moisture fractions (along with other information allowing accurate conversion to pCi/g units) are not available, only results reported with pCi/g units were considered. It is also noted that the half-life of $^{3}H$ is 12.6 years, thus the age of the data can be relevant if comparing data from samples collected over relatively large spans of time. However, the age of the offsite and onsite data are similar, so as with $^{137}Cs$ and $^{90}Sr$ above, $^{3}H$ results are used without decay corrections.

Figure D-1 presents a series of probability plots for naturally-occurring SRCs and **Figure D-2** presents plots for man-made SRCs. As many as three data series are presented: sample results associated with Kcs, sample results associated with Tsu, and sample results identified as outliers. Potential outliers are identified for five radionuclides (represented as red squares in the figures)samples containing $^{137}Cs$ greater than 0.9 pCi/g, $^{3}H$ greater than 0.5 pCi/g, $^{238}Pu$ greater than 0.06 pCi/g, $^{226}Ra$ greater than 3 pCi/g, and $^{238}U$ greater 2 pCi/g were screened from further consideration. One $^{228}Th$ result above 2 pCi/g and a small cluster of $^{230}Th$ results centered at about 1.5 pCi/g were evaluated as potential outliers, but these values were judged not unexpected for background conditions thus were retained in the background dataset. The single $^{239}Pu$ result of 0.06 pCi/g also appears to be an outlier. However, this is the only Kcs samples and not unexpected for a background dataset. Table 3-2 also shows that the combined (Kcs plus Tsu) UTL95 value is the same as the Tsu value, i.e., this single results does not alter overall results.

Figures D-1 and D-2 illustrate distinct differences in the Kcs and Tsu populations, with Tsu values more tightly clustered and, depending on the SRC, often skewed to one side of the combined dataset, especially for $^{226}Ra$. This suggests background concentrations have statistically different characteristics when comparing Kcs and Tsu formations. However, the respective samples were often collected by different organizations, during different time periods, and using different analytical laboratories. Also, the overall number of samples available for the Tsu formation is relatively small. As a result, one can not conclusively say populations are different considering all available information. Formation-specific populations generally do, however, overlap and the UTL95 calculations in Table 3-2 show similar average and UTL95 results, with two noted exception ($^{226}Ra$ and the aforementioned $^{239}Pu$). Radium-226 results in the Tsu are clearly skewed to the low side of the combined dataset producing a ULT95 of 0.72 pCi/g compared to the Kcs value of 2.6 pCi/g. The combined UTL of 2.4 pCi/g underestimates background in the Kcs and overestimates it in the Tsu. Because the number of samples available for the Tsu formation is small and because Area IV is dominated by the Kcs formation, the combined $^{226}Ra$ UTL95 is deemed appropriate for use across the entire SSFL Area IV.

Finally, some of the plots show deviations from linear at the low of end of the distribution. This is due at least in part to the practice of assigning concentrations relative to the MDA instead of reporting the actual measured value. Without a significant and costly effort the actual values will not be known, though it is assumed the modified results overestimate actual concentrations.

In conclusion, presented results are generally consistent with expected conditions including normal-like distributions, relative concentrations consistent with naturally occurring decay

series, and appropriateness of scale. The combined dataset produces generally conservative screening values for soils within the dominant onsite formation (Ksc) and is still reasonable if applied to the Tsu. A combined dataset also simplifies the data screening and data gap analysis process, thus the combined Kcs/Tsu values presented in Table 3-2 are deemed appropriate for use in SSFL background screening and average background subtraction, if used.

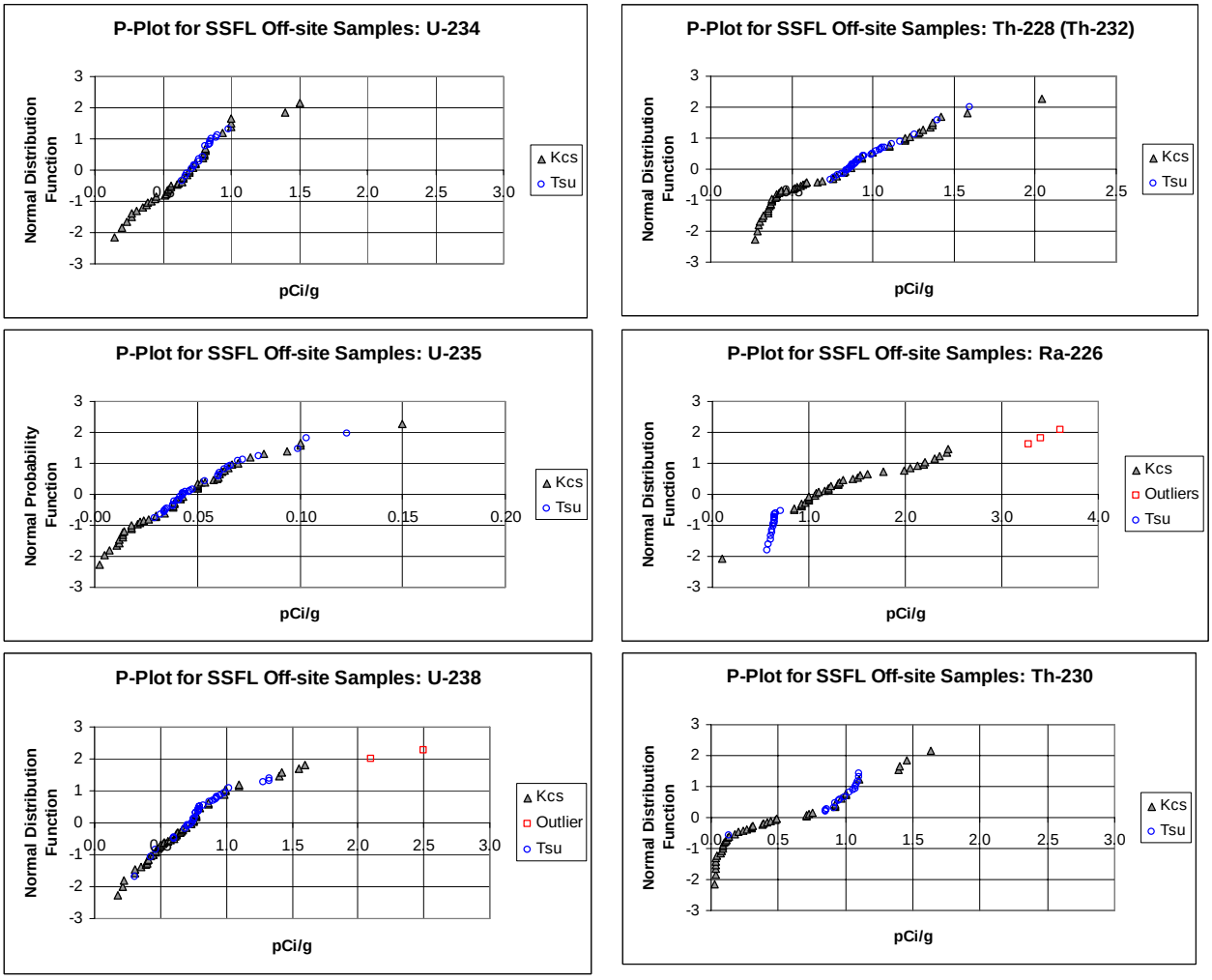



**Figure D-1. Probability Plots for Naturally-Occurring Constituents in Background**

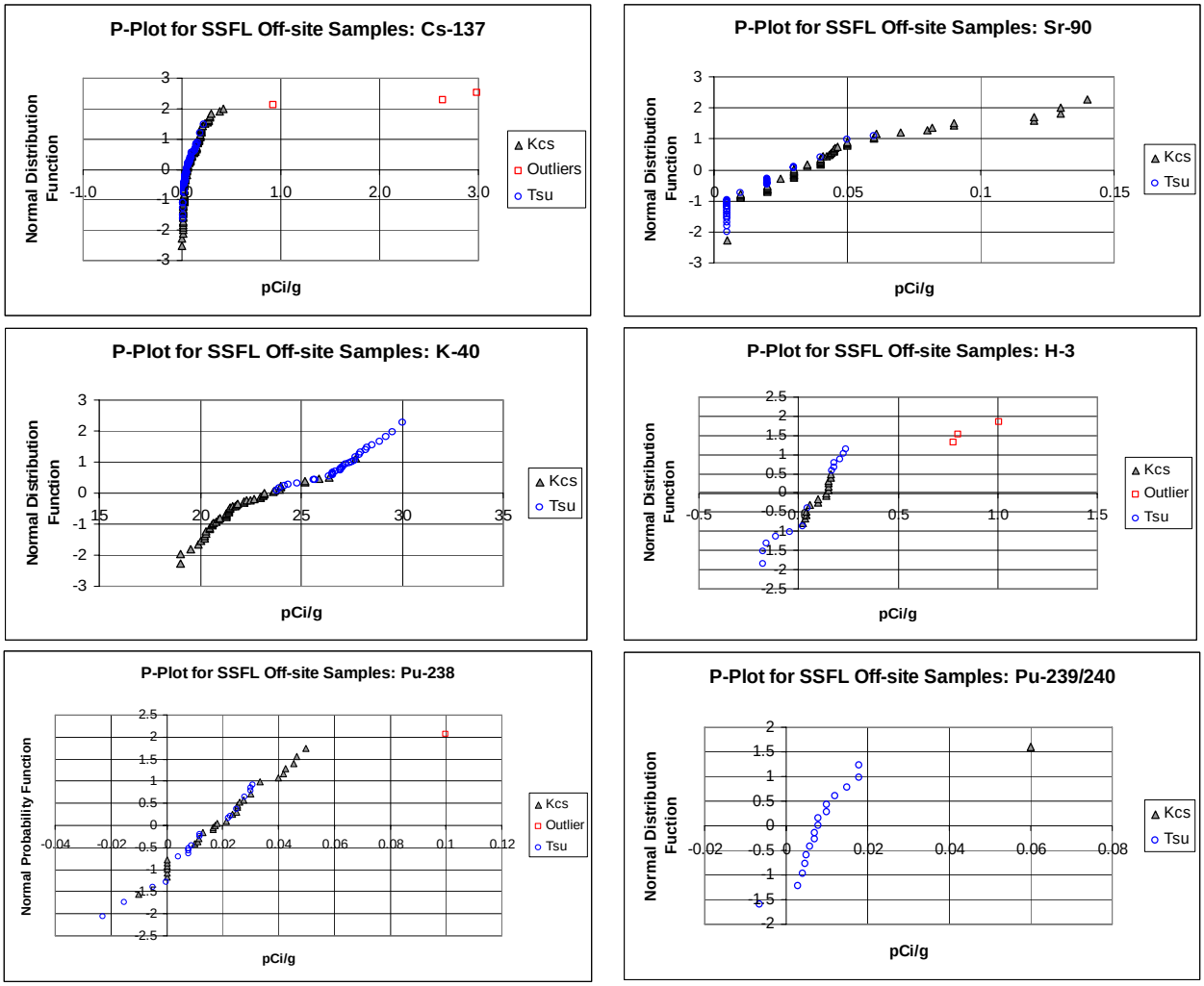



**Figure D-2. Probability Plots for Potential Man-made Constituents in Background**

# Appendix E

# Supporting Information for Ecological Risk: Parameters Required to Calculate Biota Concentration Guides and Data Usability Screening Tables for Radionuclides

# Appendix E
# Supporting Information for Ecological Risk: Parameters Required to Calculate Biota Concentration Guides and Data Usability Screening Tables for Radionuclides

This appendix contains three tables supporting the calculation of biota concentration guides (BCGs) for select radionuclides in accordance with *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota* (DOE 2002). BCGs are used in this report as preliminary remediation goals (PRGs) for radionuclides in media to which ecological receptors could be potentially exposed (Section 3.3.3.1). BCGs are thus analogous to ecological screening levels for chemicals (Section 3.3.3.2). For this report, BCGs are calculated for RPECs for which DOE (2002) does not report a BCG.

Table E-1 shows the derivation of dose coefficients that determine the internal dose to ecological receptors per unit radionuclide in the receptor's tissue. Table E-2 shows the derivation of dose coefficients that determine the external radiological dose to ecological receptors per unit radionuclide in three environmental media: soil, water and sediment. Table E-3 shows the derivation for two media (soil and water) of the "lumped parameter" used to calculate the radionuclide concentration in terrestrial animal tissue per unit radionuclide in the environmental medium and lists the biouptake factors used to calculate the radionuclide concentration in aquatic animal tissue per unit radionuclide in water. Internal and external dose coefficients, lumped parameters and biouptake factors are required to calculate BCGs.

This appendix also includes four tables summarizing (by exposure unit [EU]) the activity (concentration) data for radionuclides in samples from three soil horizons and shallow groundwater. These tables are used to evaluate the quality and usability of historical data for assessing risk to ecological receptors in the SSFL Area IV EIS. The data summaries in these four tables include, for each analyte in each EU, the number of samples and detects; the minimum, maximum, and mean detected concentrations and standard deviation; and the minimum and maximum reported detection limits. Tables E-4, E-5, and E-6 summarize the data for radionuclides in the 0 – 2 foot below ground surface (ft bgs), 2 – 4 ft bgs and 4 – 6 ft bgs soil horizons, respectively. These tables include the derived soil background concentration values (Table 3-2) and the ecological PRGs for radionuclides in soil (Table 3-4). Table E-7 summarizes the data for radionuclides in shallow groundwater and includes the ecological PRGs for radionuclides in water for terrestrial animals (PRG WT, Table 3-4) and aquatic animals (PRG WA, Table 3-5). All four tables include the number of samples for each analyte in each EU that exceed the PRG and ratios of the maximum detected result and the PRG.

## Table E-1. Parameters Required to Calculate Internal Dose Coefficients for Calculated Biota Con

| Radionuclide | Eα | Qα | Eβ | Eγ | Y | $DC_{internal,I}$ (rad/d per pCi/g) |
|---|---|---|---|---|---|---|
| Fe-55 | -- | 20 | 0.004 | 0.002 | 1 | 3.073E-07 |
| Mn-54 | -- | 20 | 0.004 | 0.836 | 1 | 4.302E-05 |
| Na-22 | -- | 20 | 0.194 | 2.193 | 1 | 1.223E-04 |
| Ni-59 | -- | 20 | 0.005 | 0.002 | 1 | 3.585E-07 |
| Ni-63 | -- | 20 | 0.017 | -- | 1 | 8.707E-07 |
| Pu-240 | 5.156 | 20 | 0.011 | 0.002 | 1 | 5.282E-03 |
| Pu-241 | < | 20 | 0.005 | < | 1 | 2.565E-07 |
| Progeny U-237 | -- | 20 | 0.196 | 0.143 | 2.45E-05 | -- |
| Ba-133 | -- | 20 | 0.054 | 0.402 | 1 | 2.336E-05 |

Data from Table A.1, Eckerman and Ryman (1993)

Dose coefficient (DC)

$DC_{internal}$ includes daughters with half-lives less than 100 years, per pages M3-17 and M3-18 in DOE (2002).

$DC_{internal,i}$ (rad/d per pCi/g) = 1dis $s^{-1}$ /Bq ($\Sigma_i\Sigma_j Y_j E_j Q_j$) x (1.6022E-06 erg $MeV^{-1}$) x (8.64E04 s $d^{-1}$) x 0.01 g rad/erg x 0.037 Bq/pCi

where:

$DC_{internal,i}$ = rad/d per pCi/g of wet tissue of radionuclide i

$Y_j$ = yield (abundance) of radiation j per disintegration of nuclide i;

$E_j$ = energy (MeV) of radiation j for nuclide i; and

$Q_j$ is the radiation weighting factor (quality factor, also called WR) for radiation j of nuclide i.

Q = 20 for alpha in the general screening phase; Qβ and Qγ are 1

## Table E-2. Parameters Required to Calculate External Dose Coefficients for Calculated Biota Concentration Guides

| Radionuclide | Ee | Ep | Ep+e | $DC_{ext, soil,i}$ | $DC_{ext,water}$ | $DC_{ext, sediment,i}$ | source |
|---|---|---|---|---|---|---|---|
| Fe-55 | 0.004 | 0.002 | 0.006 | 3.07E-07 | 1.54E-10 | 1.54E-07 | calculated using energies |
| Mn-54 | 0.004 | 0.836 | 0.84 | 4.30E-05 | 2.15E-08 | 2.15E-05 | calculated using energies |
| Na-22 | 0.194 | 2.193 | 2.387 | 1.22E-04 | 6.11E-08 | 6.11E-05 | calculated using energies |
| Ni-59 | -- | -- | -- | 3.40E-07 | 1.70E-10 | 1.70E-07 | DOE 2002, Module 3, tables 2.1-2.3 |
| Ni-63 | -- | -- | -- | 8.80E-07 | 4.40E-10 | 4.40E-07 | DOE 2002, Module 3, tables 2.1-2.3 |
| Pu-240 | -- | -- | -- | 5.00E-07 | 2.50E-10 | 2.50E-07 | DOE 2002, Module 3, tables 2.1-2.3 |
| Pu-241 | -- | -- | -- | 2.70E-07 | 1.30E-10 | 1.30E-07 | DOE 2002, Module 3, tables 2.1-2.3 |
| Ba-133 | 0.054 | 0.402 | 0.456 | 2.33E-05 | 1.17E-08 | 1.17E-05 | calculated using energies |

Energies (E) from Eckerman and Ryman (1993), Table A.1

Calculated using the equations below (pp. M3-7 and M3-8 in DOE 2002):

Dose coefficient (DC)

$DC_{ext,soil}$ (rad/d per pCi/g) = (5.12E-05) *$E_{photons+electrons}$ (MeV/disintegration)

$DC_{ext,water}$ (rad/d per pCi/L) = (2.56E-08) *$E_{photons+electrons}$ (MeV/disintegration)

$DC_{ext,sediment}$ (rad/d per pCi/g) = (2.56E-05) *$E_{photons+electrons}$ (MeV/disintegration)

## Table E-3. Parameters Required to Calculate Lumped Parameters for Calculated Biota Concentration Guides

| Radionuclide | $f_1$ | **Biv** (kg dry soil/ kg wet plant) | Biv reference | PT/IT | $k_{rad}$ | $LP(soil)_{i,terrestrial\ animal}$ | $LP(water)_{i,terrestrial\ animal}$ | Biv,aa,i | Biv,aa, reference |
|---|---|---|---|---|---|---|---|---|---|
| Fe-55 | 1.00E-01 | 8.89E-04 | Baes et al 1984, converted to wet weight | 3.01E+02 | 7.03E-04 | 4.88E+00 | 3.244645092 | 4066 | EPA 1999, aquatic invertebrate, mean of 14 inorganics |
| Mn-54 | 1.00E-01 | 5.56E-02 | Baes et al 1984, converted to wet weight | 3.01E+02 | 2.22E-03 | 3.84E+00 | 2.509992495 | 4066 | EPA 1999, aquatic invertebrate, mean of 14 inorganics |
| Na-22 | 1.00E+00 | 1.67E-02 | Baes et al 1984, converted to wet weight | 3.01E+02 | 7.30E-04 | 4.88E+01 | 32.29381783 | 2300 | BDAC website, value for Na-24, crayfish |
| Ni-59 | 5.00E-02 | 7.11E-03 | EPA (1999), App Table C-2, converted to wet wei | 9.10E-01 | 2.53E-08 | 9.41E-02 | 1.844138552 | 78 | EPA 1999, fish |
| Ni-63 | 5.00E-02 | 7.11E-03 | EPA (1999), App Table C-2, converted to wet wei | 9.10E-01 | 1.98E-05 | 9.38E-02 | 1.837368476 | 78 | EPA 1999, fish |
| Pu-240 | 1.00E-03 | 1.00E-02 | DOE 2002, value for Pu-239 | 5.70E+03 | 2.91E-07 | 1.02E+00 | 0.036880949 | 1000 | DOE 2002, table 4.1, value for Pu-239 |
| Pu-241 | 1.00E-03 | 1.00E-02 | DOE 2002, value for Pu-239 | 5.70E+03 | 1.32E-04 | 9.98E-01 | 0.035991545 | 1000 | DOE 2002, table 4.1, value for Pu-239 |
| Ba-133 | 1.00E-01 | 3.33E-02 | Baes et al 1984, converted to wet weight | 3.01E+02 | 1.77E-04 | 5.42E+00 | 3.569436023 | 633 | EPA 1999, fish |

Values for $f_1$ are from Eckerman et al (1988)
Biv = water to plant bioaccumulation factor; for terrestrial plant, soil BCG it is used in place of Lumped Parameter (LP)
Biv dry/wet conversion = 4.5, per Table 4.2 (pg M3-49) of DOE (2002)
PT/IT from Zach (1985); values not found in Zach are averages of all PT/IT values found in Zach (1985); mean = 300.8
Biv,aa = aquatic animal accumulation factor, used in place of LP for aquatic animal water BCG
Biv values reported by EPA as the average of 14 inorganics with data available: antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc (see value/note for aluminum).
When more than one Biv,aa was available (fish, crustacean, invertebrate, etc), the largest value was used for conservative reasons.
Equations from DOE (2002), pg M3-40:

$$LP(soil)_{i,terrestrial\ animal} = \frac{\text{Canimal soil}}{\text{Csoil}} \quad \frac{= f1[(Biv + f)(10\text{-}3\ a/dc\ 70M0.75) + PT/IT\ X\ 0.481M0.76](1\text{-}e^{-}(krad + kbio)(365.25)*1.02M0.3)}{(krad+kbio)M}$$

$$LP(water)_{i,terrestrial\ animal} = \frac{\text{Canimal water}}{\text{Cwater}} \quad \frac{= f1\ 0.099M0.90(1\text{-}e^{-}(krad + kbio)(365.25)*1.02M0.3)}{(krad+kbio)M}$$

Mean parameters used per DOE 2002, Table 3.1 (pg M3-41):
a, ratio of active to maintenance metabolic rate (see equation 13) = 2
d, fraction of energy ingested that is assimilated (see equation 13) = 0.65
c, caloric value of food intake (see equation 13) = 5
f, fraction of diet that is soil (see equation 15) = 0.1
M, body mass in kilograms = 1 kg
X Dust loading (equation 16) = 0.001
kbio assumed unimportant (not included in calculations).
krad = ln(2)/t1/2, where t1/2 is radioactive half-life in days (standard decay equation, see wikipedia, http://en.wikipedia.org/wiki/Half-life).
Radioactive half-lives from Eckerman and Ryman (1993), Table A.1. Half-lives given in years multiplied by 365 to get $t_{1/2}$ in days.

| Radionuclide | $t_{1/2}$ (d) | $k_{rad}$ |
|---|---|---|
| Fe-55 | 985.5 | 7.033E-04 |
| Mn-54 | 312.5 | 2.218E-03 |
| Na-22 | 949.73 | 7.298E-04 |
| Ni-59 | 27375000 | 2.532E-08 |
| Ni-63 | 35040 | 1.978E-05 |
| Pu-240 | 2386005 | 2.905E-07 |
| Pu-241 | 5256 | 1.319E-04 |
| Ba-133 | 3920.1 | 1.768E-04 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Exposure Unit 1** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 8 | 1 | 0.067 | 0.067 | 0.0246875 | 0.00088388 | | 0.025 | 0.025 | | 3.35E-07 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 76 | 39 | 0.06 | 2.702 | 0.314167895 | 0.55752574 | | 0.0025 | 0.03 | | 1.35E-01 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 26 | 3 | 0.32 | 0.45 | 0.09125 | 0.0576899 | | 0.015 | 0.1775 | | 2.25E-02 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 20 | 1 | 0.063 | 0.063 | 0.0254875 | 0.00452368 | | 0.01675 | 0.035 | | 9.00E-05 | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 28 | 28 | 17 | 25.5 | 20.74285714 | 2.15791885 | | | | | 2.14E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 30 | 30 | 0.5 | 1.4 | 0.832333333 | 0.19143169 | | | | | 2.80E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | 20 | 1 | 0.05 | 0.05 | 0.0199125 | 0.0026978 | | 0.01425 | 0.0275 | | 4.42E-03 | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 28 | 2 | 0.004 | 0.007 | 0.007294643 | 0.00346347 | | 0.00075 | 0.01175 | | 1.33E-06 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 8 | 8 | 0.45 | 1.1 | 0.8425 | 0.18820581 | | | | | 2.20E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | 20 | 2 | 1.2 | 1.2 | 0.61125 | 0.15862796 | | 0.45 | 0.825 | | 6.32E-06 | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 8 | 8 | 0.42 | 1.8 | 0.8325 | 0.48150805 | | | | | 1.80E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 8 | 8 | 0.51 | 1.5 | 0.9 | 0.36866555 | | | | | 2.83E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | 20 | 20 | 0.85 | 1.53 | 1.224 | 0.15802731 | 20 | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 22 | 1 | 0.12 | 0.12 | 0.035988636 | 0.00399887 | | 0.029 | 0.0425 | | 7.89E-05 | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 28 | 3 | 0.004 | 0.021 | 0.005392857 | 0.00302492 | | 0.00075 | 0.01525 | | 3.50E-06 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 30 | 28 | 0.015 | 0.057 | 0.028825 | 0.01699064 | | 0.013 | 0.022 | | 1.90E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | 20 | 5 | 0.14 | 0.37 | 0.0835 | 0.10988152 | | 0.0225 | 0.09 | | 3.70E-04 | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 28 | 28 | 0.54 | 1.6 | 1.144642857 | 0.28324158 | | | | | 8.00E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 30 | 30 | 0.49 | 1.4 | 0.840666667 | 0.20772882 | | | | | 7.00E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 20 | | | | 0.046 | 0.00598243 | | 0.0375 | 0.0575 | | | 0 |
| **Exposure Unit 2** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 6 | | | | 0.023333333 | 0.00129099 | | 0.0225 | 0.025 | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 17 | 16 | 0.03 | 0.45 | 0.175 | 0.16498106 | | 0.005 | 0.005 | | 2.25E-02 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 15 | 6 | 0.053 | 0.099 | 0.0378 | 0.02998083 | | 0.015 | 0.025 | | 4.95E-03 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 16 | 16 | 11.53 | 22 | 19.970625 | 2.41836162 | | | | | 1.85E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 15 | 15 | 0.4 | 1.1 | 0.698666667 | 0.24277758 | | | | | 2.20E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 15 | 1 | 0.006 | 0.006 | 0.0027 | 0.0017454 | | 0.001 | 0.005 | | 1.14E-06 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 15 | 15 | 0.42 | 0.97 | 0.737333333 | 0.20648302 | | | | | 1.94E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 15 | 15 | 0.41 | 1 | 0.67 | 0.2018486 | | | | | 1.00E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 15 | 15 | 0.52 | 1.1 | 0.767333333 | 0.22400468 | | | | | 2.08E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 2 | | | | 0.040875 | 0.00159099 | | 0.03975 | 0.042 | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 15 | 5 | 0.005 | 0.012 | 0.00415 | 0.00296377 | | 0.0015 | 0.005 | | 2.00E-06 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 15 | 15 | 0.022 | 0.053 | 0.036866667 | 0.01205859 | | | | | 1.77E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 15 | 15 | 0.57 | 1 | 0.770666667 | 0.14577216 | | | | | 5.00E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 15 | 15 | 0.42 | 1.1 | 0.703333333 | 0.24182835 | | | | | 5.50E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |
| **Exposure Unit 3** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 2 | | | | 0.0225 | 0.00353553 | | 0.02 | 0.025 | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 116 | 68 | 0.018 | 3.09 | 0.288135991 | 0.5197518 | | 0.005 | 0.0345 | | 1.55E-01 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 15 | 6 | 0.053 | 4.82 | 0.493 | 1.24734332 | | 0.0175 | 0.3075 | | 2.41E-01 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 6 | 6 | 0.03 | 2.6 | 0.638666667 | 0.98541071 | | | | | 3.71E-03 | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 31 | 31 | 15 | 25.9 | 22.02516129 | 2.30287193 | | | | | 2.18E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 29 | 29 | 0.6 | 2.1 | 0.935655172 | 0.29854807 | | | | | 4.20E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 13 | 1 | 0.006 | 0.006 | 0.004226923 | 0.00668445 | | 0.00075 | 0.019225 | | 1.14E-06 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 89 | 89 | 0.51 | 2.78 | 1.116539326 | 0.40027107 | | | | | 5.56E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | 2 | 2 | 5.87 | 5.87 | 1.5275 | 0 | | | | | 3.09E-05 | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 33 | 33 | 0.52 | 2.57 | 1.03230303 | 0.44895549 | | | | | 2.58E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 41 | 41 | 0.56 | 2.5 | 1.241731707 | 0.32280482 | | | | | 4.72E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 12 | 2 | 0.43 | 25.7 | 2.207166667 | 7.39920556 | | 0.0075 | 0.0505 | | 1.69E-02 | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 17 | 12 | 0.001 | 0.023 | 0.00835 | 0.00741954 | | 0.00075 | 0.019225 | | 3.83E-06 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 28 | 28 | 0.031 | 0.1 | 0.044910714 | 0.01608185 | | | | | 3.33E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 102 | 102 | 0.51 | 2.73 | 1.360578431 | 0.39090353 | | | | | 1.37E-03 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 29 | 27 | 0.61 | 2 | 14.36634483 | 50.3102352 | | 196 | 196 | | 1.00E-03 | 1.3 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 86954-36-1 | Am-241 | pCi/g | 4000 | 6 | 1 | 0.006 | 0.006 | 0.027083333 | 0.02523572 | | 0.0125 | 0.0595 | | 1.50E-06 | 0 |
| **Exposure Unit 4** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 55 | 11 | 0.3 | 1.4 | 0.386772727 | 0.52838584 | | 0.0225 | 1.525 | | 7.00E-06 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 379 | 267 | 0.01 | 6.99 | 0.441045119 | 0.86738624 | | 0.0025 | 0.055 | | 3.50E-01 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 159 | 54 | 0.042 | 1.3 | 0.294147799 | 0.43054938 | | 0.02 | 2.7 | | 6.50E-02 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 262 | 6 | 0.023 | 0.1 | 0.022326145 | 0.01666891 | | 0.004 | 0.055 | | 1.43E-04 | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 201 | 201 | 14.97 | 33.1 | 20.26870647 | 2.71677406 | | | | | 2.78E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 151 | 147 | 0.565 | 1.3 | 0.914529801 | 0.34097411 | | 2.7 | 2.7 | | 2.60E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | 48 | 3 | 0.033 | 0.066 | 0.01896875 | 0.00806071 | | 0.0125 | 0.0375 | | 5.84E-03 | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 162 | 37 | 0.000337 | 0.0614 | 0.016044231 | 0.00864024 | | 0.001 | 0.0325 | | 1.17E-05 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | 6 | | | | 1.2475 | 2.1765E-08 | | 1.2475 | 1.2475 | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 145 | 141 | 0.205 | 1.63 | 0.801706897 | 0.27159072 | | 0.085 | 0.22 | | 3.26E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | 131 | 67 | 1.13 | 6.56 | 1.997328244 | 1.57626778 | | 0.525 | 3.25 | | 3.45E-05 | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | 1 | 1 | 1.39 | 1.39 | 1.39 | | | | | | 1.00E-03 | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 104 | 104 | 0.57 | 1.77 | 1.028384615 | 0.2681687 | | | | | 1.77E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 104 | 104 | 0.59 | 13.7 | 1.575230769 | 2.44487553 | | | | | 2.58E-02 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | 41 | 41 | 0.94 | 1.4 | 1.135853659 | 0.12326751 | 41 | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | 1 | 1 | 0.06 | 0.06 | 0.06 | | | | | | 3.00E-06 | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | 6 | | | | 0.3425 | 0 | | 0.3425 | 0.3425 | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 68 | 2 | 0.066 | 0.09 | 0.039290441 | 0.01810045 | | 0.02225 | 0.12 | | 5.92E-05 | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 158 | 38 | 0.00074 | 0.613 | 0.023260316 | 0.07243122 | | 0.00075 | 0.022 | | 1.02E-04 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 296 | 247 | 0.004 | 0.68 | 0.059560135 | 0.06495891 | | 0.011325 | 0.21 | | 2.27E-04 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | 47 | 17 | 0.06 | 0.31 | 0.100414894 | 0.1017691 | | 0.015 | 0.2045 | | 3.10E-04 | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 173 | 173 | 0.64 | 1.94 | 1.061190751 | 0.20484961 | | | | | 9.70E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 295 | 288 | 0.09 | 3.42 | 0.878133898 | 0.40236056 | | 0.2525 | 0.5875 | | 1.71E-03 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 155 | 14 | 0.047 | 0.133 | 0.042040323 | 0.02150318 | | 0.009325 | 0.12675 | | 3.33E-05 | 0 |
| **Exposure Unit 5** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 2 | 1 | 0.057 | 0.057 | 0.025 | 0 | | 0.025 | 0.025 | | 2.85E-07 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 6 | 6 | 0.03 | 0.53 | 0.158333333 | 0.18744777 | | | | | 2.65E-02 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 6 | 5 | 0.028 | 0.059 | 0.01625 | 0.00720243 | | 0.0175 | 0.0175 | | 2.95E-03 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 1 | 1 | 0.04 | 0.04 | 0.04 | | | | | | 5.71E-05 | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 8 | 8 | 19 | 23.6 | 20.85 | 1.81344187 | | | | | 1.98E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 6 | 6 | 0.62 | 1.3 | 0.951666667 | 0.28999425 | | | | | 2.60E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 6 | | | | 0.00175 | 0.00082158 | | 0.001 | 0.0025 | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 7 | 7 | 0.78 | 1.4 | 1.015714286 | 0.26968235 | | | | | 2.80E-02 | 2.5 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 6 | 6 | 0.58 | 0.96 | 0.706666667 | 0.14569374 | | | | | 9.62E-05 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 6 | 6 | 0.39 | 1.2 | 0.766666667 | 0.34191617 | | | | | 2.26E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | 2 | 2 | 0.04 | 0.11 | 0.075 | 0.04949747 | | | | | 5.50E-06 | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 6 | 2 | 0.004 | 0.013 | 0.003416667 | 0.00470018 | | 0.00125 | 0.00175 | | 2.17E-06 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 6 | 6 | 0.027 | 0.082 | 0.0515 | 0.02440287 | | | | | 2.73E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 6 | 6 | 0.42 | 1.1 | 0.763333333 | 0.30942958 | | | | | 5.50E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 6 | 6 | 0.62 | 1.4 | 0.986666667 | 0.33524121 | | | | | 7.00E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |
| **Exposure Unit 6** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 19 | 1 | 1 | 1 | 0.422368421 | 0.00788254 | | 0.4 | 0.425 | | 5.00E-06 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 370 | 214 | 0.0095 | 5.84 | 0.307240676 | 0.68320573 | | 0.00275 | 0.045 | | 2.92E-01 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 328 | 136 | 0.039 | 28.1 | 0.316040396 | 1.57690197 | 1 | 0.015 | 0.21 | | 1.41E+00 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 342 | 4 | 0.048 | 0.07 | 0.024300292 | 0.00881161 | | 0.00245 | 0.045 | | 1.00E-04 | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 356 | 356 | 13.72 | 28.2 | 21.19674157 | 2.22145151 | | | | | 2.37E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 328 | 328 | 0.292 | 9.6 | 0.954021341 | 0.60173035 | | | | | 1.92E-03 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | 202 | 3 | 0.012 | 0.068 | 0.02742203 | 0.01134345 | | 0.00325 | 0.045 | | 4.15E-03 | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | 343 | 18 | 0.0057 | 0.11 | 0.018978936 | 0.00565247 | | 0.00235 | 0.0375 | | 9.73E-03 | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 328 | 15 | 0.02 | 0.077 | 0.012898628 | 0.00472135 | | 0.00075 | 0.04 | | 1.46E-05 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | 19 | | | | 1.055263158 | 0.29751038 | | 0.775 | 2.15 | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 173 | 164 | 0.31 | 7.1 | 1.433641618 | 1.30137228 | | 0.4 | 2 | | 1.42E-01 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | 320 | 17 | 1.1 | 4.9 | 0.88515625 | 0.32645619 | | 0.35 | 2.475 | | 2.58E-05 | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 192 | 192 | 0.041 | 1.64 | 0.841598958 | 0.3278275 | | | | | 1.64E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 192 | 174 | 0.42 | 2.53 | 1.104114583 | 0.39471285 | | 0.1475 | 0.225 | | 4.77E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | 282 | 281 | 0.54 | 2.09 | 1.162083333 | 0.22910807 | 281 | 0.0875 | 0.0875 | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | 19 | 1 | 720 | 720 | 409.3421053 | 114.939121 | | 207.5 | 550 | | 2.69E-03 | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | 19 | 1 | 6 | 6 | 1.736842105 | 0.32780503 | | 1.275 | 2.325 | | 1.08E-04 | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 360 | 18 | 0.024 | 2.84 | 0.152898819 | 0.22369196 | | 0.0065 | 0.325 | | 1.87E-03 | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 324 | 27 | 0.002 | 0.116 | 0.010722222 | 0.00854912 | | 0.001 | 0.0275 | | 1.93E-05 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 328 | 257 | 0.012 | 0.73 | 0.045631098 | 0.05460028 | | 0.0075 | 0.02375 | | 2.43E-04 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | 148 | 148 | 0.54 | 2.09 | 1.189459459 | 0.26710538 | | | | | 5.23E-02 | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | 338 | 60 | 0.028 | 0.63 | 0.134585799 | 0.096692 | | 0.00775 | 0.325 | | 6.30E-04 | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 478 | 478 | 0.063 | 2.36 | 1.120979079 | 0.31278198 | | | | | 1.18E-03 | 1.6 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7440-61-1 | U-238 | pCi/g | 2000 | 335 | 335 | 0.242 | 8.6 | 0.877689552 | 0.54632731 | | | | | 4.30E-03 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 320 | 24 | 0.023 | 0.86 | 0.029875781 | 0.04879101 | | 0.00725 | 0.0525 | | 2.15E-04 | 0 |
| **Exposure Unit 7** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 8 | | | | 0.02375 | 0.00133631 | | 0.0225 | 0.025 | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 65 | 53 | 0.01 | 2.93 | 0.434276923 | 0.61273501 | | 0.00375 | 0.023425 | | 1.47E-01 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 41 | 13 | 0.034 | 3.08 | 0.190256098 | 0.51044677 | | 0.01 | 0.235 | | 1.54E-01 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 2 | 2 | 0.04 | 0.04 | 0.04 | 0 | | | | | 5.71E-05 | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 35 | 35 | 16 | 24.27 | 19.47828571 | 1.95075926 | | | | | 2.04E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 41 | 41 | 0.54 | 1.71 | 0.953170732 | 0.33085071 | | | | | 3.42E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | 1 | 1 | 0.04 | 0.04 | 0.04 | | | | | | 3.54E-03 | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 42 | 4 | 0.005 | 0.16 | 0.023119048 | 0.02179549 | | 0.001 | 0.0625 | | 3.04E-05 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 35 | 35 | 0.55 | 2.16 | 0.9934 | 0.39634842 | | | | | 4.32E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 41 | 41 | 0.59 | 2.7 | 1.103170732 | 0.52109231 | | | | | 2.71E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 52 | 52 | 0.67 | 2.69 | 1.289788462 | 0.45149031 | | | | | 5.08E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 4 | 1 | 0.0875 | 0.0875 | 0.0530625 | 0.02332236 | | 0.036 | 0.04575 | | 5.76E-05 | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 42 | 11 | 0.003 | 0.15 | 0.02139881 | 0.02849685 | | 0.001 | 0.0525 | | 2.50E-05 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 50 | 39 | 0.022 | 0.25 | 0.06276 | 0.05085589 | | 0.016 | 0.15 | | 8.33E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | 11 | 11 | 1.01 | 2.87 | 1.56 | 0.56181848 | | | | | 7.18E-02 | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 52 | 52 | 0.57 | 2.87 | 1.140961538 | 0.42212469 | | | | | 1.44E-03 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 50 | 50 | 0.55 | 3.56 | 1.1162 | 0.60974364 | | | | | 1.78E-03 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 22 | 3 | 0.053 | 0.1 | 0.077534091 | 0.07439607 | | 0.02275 | 0.28 | | 2.50E-05 | 0 |
| **Exposure Unit 8** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 157 | 48 | -3.55 | 11.8 | 1.305517709 | 2.21946212 | | 0.0575 | 1.75 | | 5.90E-05 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 180 | 55 | -0.03 | 0.436 | 0.043559891 | 0.07118462 | | 0.005 | 0.05335 | | 2.18E-02 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 156 | 67 | -0.37991826 | 1.2505437 | 0.099306992 | 0.147265 | | 0.0075 | 0.16975 | | 6.25E-02 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 156 | 41 | -0.0336 | 0.09558 | 0.040649336 | 0.04709661 | | 0.0195 | 0.53 | | 1.37E-04 | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 217 | 207 | 0.257 | 39.34 | 21.19626179 | 7.44327675 | | 0.1844 | 0.23775 | | 3.31E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 155 | 155 | 0.285 | 1.518 | 0.763022581 | 0.24796537 | | | | | 3.04E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | 2 | | | | 0.0375 | 0 | | 0.0375 | 0.0375 | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 155 | 63 | -0.000758 | 0.115 | 0.02068629 | 0.01266916 | | 0.001 | 0.064175 | | 2.18E-05 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | 146 | 77 | -10.8 | 48.5 | 3.388744838 | 6.63292709 | | 0.7725 | 2.75 | | 4.66E-04 | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | 63 | 20 | -0.01 | 0.401 | 0.057509804 | 0.09771502 | | 0.01725 | 0.058 | | 6.01E-04 | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13982-63-3 | Ra-226 | pCi/g | 50 | 9 | 9 | 0.68 | 0.85 | 0.758888889 | 0.05230785 | | | | | 1.70E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | 146 | 56 | -5.40548892 | 8.61 | 0.626748663 | 1.29733965 | | 0.245 | 1.700774305 | | 4.53E-05 | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | 51 | 10 | -0.00180708 | 0.0178 | 0.003297081 | 0.00396011 | | 0.000445 | 0.0157065 | | 9.62E-04 | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 155 | 155 | 0.406 | 2.39 | 1.112916129 | 0.36622665 | | | | | 2.39E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 155 | 155 | 0.704 | 1.865 | 1.21676 | 0.24632892 | | | | | 3.52E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | 2 | 2 | 1.13 | 1.13 | 1.13 | 0 | 2 | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | 31 | 31 | -5.04 | 58.1 | 37.704 | 21.1630827 | | | | | 2.17E-04 | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | 146 | 40 | -0.445 | 30 | 2.308474359 | 3.64815168 | | 0.3075 | 7.5 | | 5.42E-04 | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 150 | 68 | -0.35 | 0.844 | 0.252876168 | 0.24476927 | | 0.02025 | 0.3175 | | 5.55E-04 | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 155 | 43 | -0.0148 | 0.101 | 0.012717616 | 0.00939972 | | 0.000755 | 0.02925 | | 1.68E-05 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 157 | 113 | 0.012 | 0.3399 | 0.044606529 | 0.04951981 | | 0.0045 | 0.03575 | | 1.13E-04 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | 150 | 42 | -0.494 | 0.166 | 0.167187385 | 0.06317521 | | 0.072375 | 0.25 | | 1.66E-04 | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 157 | 157 | 0.51 | 1.842 | 1.188511465 | 0.26585203 | | | | | 9.21E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 157 | 157 | 0.25 | 1.355 | 0.752740764 | 0.21990063 | | | | | 6.78E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 146 | 63 | -0.0107 | 0.118 | 0.019760522 | 0.01219462 | | 0.00625 | 0.0375 | | 2.95E-05 | 0 |
| **Exposure Unit 9** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 11 | 1 | 0.055 | 0.055 | 0.024772727 | 0.00075378 | | 0.0225 | 0.025 | | 2.75E-07 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 541 | 304 | 0.012 | 5.864 | 0.164843033 | 0.46988861 | | 0.0025 | 0.042425 | | 2.93E-01 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 337 | 94 | 0.035 | 1.05 | 0.212780415 | 0.10380143 | | 0.02 | 0.215 | | 5.25E-02 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 93 | | | | 0.033736559 | 0.01075053 | | 0.0225 | 0.05 | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 44 | 44 | 12.22 | 26.23 | 17.22931818 | 2.61698424 | | | | | 2.20E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 54 | 53 | 0.29 | 1.3 | 0.652467593 | 0.18917007 | | 0.01325 | 0.01325 | | 2.60E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | 15 | | | | 0.0375 | 7.271E-10 | | 0.0375 | 0.0375 | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 179 | 58 | -0.000231 | 0.11 | 0.015903238 | 0.01721423 | | 0.001 | 0.125 | | 2.09E-05 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 249 | 225 | 0.51 | 1.2 | 0.764859438 | 0.26989708 | | 0.1 | 0.1 | | 2.40E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 53 | 53 | 0.48 | 2.09 | 1.145660377 | 0.38613225 | | | | | 2.09E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 55 | 55 | 0.72 | 2.86 | 1.567272727 | 0.52351891 | | | | | 5.40E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | 2 | 2 | 0.06 | 0.06 | 0.06 | 0 | | | | | 3.00E-06 | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 101 | | | | 0.044049505 | 0.02016116 | | 0.025 | 0.075 | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 185 | 70 | -0.000122 | 0.613 | 0.033223082 | 0.08427333 | | 0.001 | 0.09 | | 1.02E-04 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 254 | 35 | 0.034 | 0.2 | 0.079562008 | 0.04047454 | | 0.016 | 0.15 | | 6.67E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7440-29-1 | Th-232 | pCi/g | 2000 | 360 | 276 | 0.63 | 2.76 | 1.091111111 | 0.58742144 | | 0.075 | 0.225 | | 1.38E-03 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 602 | 441 | 0.285 | 5.07 | 0.842569204 | 0.54118569 | | 0.0075 | 0.5 | | 2.54E-03 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 185 | 16 | 0.029 | 0.15 | 0.039539189 | 0.02785917 | | 0.02 | 0.2325 | | 3.75E-05 | 0 |
| **Exposure Unit 10** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 7 | 1 | 0.055 | 0.055 | 0.498571429 | 0.79698763 | | 0.0225 | 1.665 | | 2.75E-07 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 80 | 22 | 0.0262 | 0.438 | 0.055823125 | 0.08226833 | | 0.006 | 0.0485 | | 2.19E-02 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 12 | 7 | 0.036 | 0.511 | 0.044958333 | 0.04958107 | | 0.0125 | 0.025 | | 2.56E-02 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 3 | | | | 0.030166667 | 0.00447446 | | 0.025 | 0.03275 | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 14 | 14 | 16.25 | 25.2 | 19.695 | 2.67845176 | | | | | 2.12E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 12 | 12 | 0.52 | 1.2 | 0.826 | 0.22472124 | | | | | 2.40E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 12 | | | | 0.006375 | 0.01140051 | | 0.001 | 0.03075 | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | 3 | 1 | 5.9 | 5.9 | 1.32 | 0.41569219 | | 1.08 | 1.08 | | 5.67E-05 | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | 1 | | | | 0.025 | | | 0.025 | 0.025 | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 9 | 9 | 0.6 | 0.96 | 0.762222222 | 0.13414337 | | | | | 1.92E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | 3 | | | | 0.756666667 | 0.39548493 | | 0.3 | 0.985 | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | 1 | 1 | 0.00285 | 0.00285 | 0.00285 | | | | | | 1.54E-04 | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 12 | 12 | 0.5 | 2.39 | 1.086166667 | 0.64324035 | | | | | 2.39E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 12 | 12 | 0.62 | 1.59 | 1.141666667 | 0.35728352 | | | | | 3.00E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | 3 | | | | 2.395 | 3.55503428 | | 0.3425 | 6.5 | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 7 | 3 | 0.0875 | 0.332 | 0.151428571 | 0.13683846 | | 0.0335 | 0.2025 | | 2.18E-04 | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 12 | 7 | 0.003 | 0.024 | 0.009808333 | 0.00867546 | | 0.00125 | 0.01755 | | 4.00E-06 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 12 | 12 | 0.018 | 0.076 | 0.0384 | 0.01690616 | | | | | 2.53E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | 3 | | | | 0.175333333 | 0.01544412 | | 0.1575 | 0.18425 | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 12 | 12 | 0.56 | 1.58 | 1.116666667 | 0.34618265 | | | | | 7.90E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 12 | 12 | 0.5 | 1.1 | 0.798416667 | 0.20565923 | | | | | 5.50E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 3 | | | | 0.019416667 | 0.01443376 | | 0.00275 | 0.02775 | | | 0 |
| **Exposure Unit 11** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 24 | 9 | 0.055 | 0.11 | 0.0284375 | 0.01738022 | | 0.0225 | 0.025 | | 5.50E-07 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 184 | 22 | 0.04 | 1.2 | 0.071287772 | 0.16732346 | | 0.005 | 0.0375 | | 6.00E-02 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 36 | 18 | 0.028 | 1.9 | 0.098416667 | 0.31235418 | | 0.01 | 0.08 | | 9.50E-02 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 145 | | | | 0.037327586 | 0.00104811 | | 0.03 | 0.0375 | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 193 | 193 | 10.01 | 26.5 | 15.7111399 | 2.61700603 | | | | | 2.23E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 36 | 36 | 0.36 | 1.53 | 0.8075 | 0.24699769 | | | | | 3.06E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | 4 | | | | 0.035 | 0.0057735 | | 0.03 | 0.04 | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | 141 | | | | 0.037117021 | 0.00225566 | | 0.023 | 0.0375 | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 65 | 22 | 0.000016 | 0.0552 | 0.007814587 | 0.011906 | | 0.00075 | 0.01525 | | 1.05E-05 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13981-52-7 | Po-210 | pCi/g | | 1 | 1 | 1.35 | 1.35 | 1.35 | | 1 | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 36 | 36 | 0.57 | 4 | 1.049916667 | 0.84411287 | | | | | 8.00E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | 4 | | | | 0.75 | 0.02886751 | | 0.725 | 0.775 | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | 1 | 1 | 1.31 | 1.31 | 1.31 | | | | | | 9.42E-04 | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 36 | 36 | 0.37 | 1.45 | 0.896666667 | 0.22146267 | | | | | 1.45E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 21 | 21 | 0.49 | 1.6 | 1.143809524 | 0.29237777 | | | | | 3.02E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | 2 | 2 | 1.33 | 1.33 | 1.33 | 0 | 2 | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 4 | | | | 0.24875 | 0.0591784 | | 0.1975 | 0.3 | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 65 | 36 | 0.000504 | 0.613 | 0.041740781 | 0.1249164 | | 0.00075 | 0.01225 | | 1.02E-04 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 70 | 39 | 0.019 | 0.131 | 0.065881429 | 0.02739481 | | 0.0575 | 0.115 | | 4.37E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | 3 | 3 | 0.809 | 1.33 | 1.156333333 | 0.30079949 | | | | | 3.33E-02 | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | 4 | | | | 0.2225 | 0.03175426 | | 0.195 | 0.25 | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 191 | 191 | 0.49 | 1.5 | 0.910837696 | 0.21279674 | | | | | 7.50E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 223 | 210 | 0.285 | 5.07 | 0.766098655 | 0.62619181 | | 0.12 | 0.2525 | | 2.54E-03 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 38 | | | | 0.049355263 | 0.04673963 | | 0.0075 | 0.225 | | | 0 |
| **Exposure Unit 12** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 14 | 1 | 0.053 | 0.053 | 0.024642857 | 0.00090784 | | 0.0225 | 0.025 | | 2.65E-07 | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 64 | 13 | 0.03 | 0.17 | 0.032641406 | 0.03169691 | | 0.0025 | 0.03 | | 8.50E-03 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 58 | 18 | 0.048 | 0.48 | 0.094284483 | 0.05626263 | | 0.015 | 0.25 | | 2.40E-02 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | 40 | 2 | 0.062 | 0.095 | 0.02519375 | 0.00371349 | | 0.01675 | 0.0325 | | 1.36E-04 | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 61 | 61 | 17 | 24 | 20.56065574 | 1.76901844 | | | | | 2.02E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 65 | 65 | 0.56 | 1.15 | 0.789046154 | 0.12961149 | | | | | 2.30E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | 40 | 2 | 0.048 | 0.052 | 0.0198 | 0.00266338 | | 0.0145 | 0.025 | | 4.60E-03 | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 63 | 7 | 0.024 | 0.08 | 0.010869048 | 0.01425664 | | 0.00075 | 0.0215 | | 1.52E-05 | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | 1 | 1 | 0.773 | 0.773 | 0.773 | | 1 | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 21 | 21 | 0.59 | 0.93 | 0.774714286 | 0.10051723 | | | | | 1.86E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | 40 | 3 | 2.4 | 4.4 | 1.014375 | 0.8002381 | | 0.475 | 1.25 | | 2.32E-05 | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | 1 | 1 | 0.818 | 0.818 | 0.818 | | | | | | 5.88E-04 | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 21 | 21 | 0.45 | 1.2 | 0.843809524 | 0.22835228 | | | | | 1.20E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 21 | 21 | 0.53 | 1.72 | 1.043333333 | 0.32485894 | | | | | 3.25E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | 40 | 40 | 0.98 | 1.69 | 1.31375 | 0.14680682 | 40 | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | 40 | 3 | 0.089 | 0.09 | 0.0368125 | 0.00490249 | | 0.03 | 0.0475 | | 5.92E-05 | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 64 | 15 | 0.003 | 0.19 | 0.012871094 | 0.03142098 | | 0.00075 | 0.0175 | | 3.17E-05 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 65 | 55 | 0.021 | 0.086 | 0.033179231 | 0.01974508 | | 0.008 | 0.01925 | | 2.87E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | 1 | 1 | 1.32 | 1.32 | 1.32 | | | | | | 3.30E-02 | 1.6 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15585-10-1 | Eu-154 | pCi/g | 1000 | 38 | 12 | 0.11 | 0.4 | 0.086513158 | 0.10484309 | | 0.02 | 0.0325 | | 4.00E-04 | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 61 | 61 | 0.4 | 1.69 | 1.202786885 | 0.26290766 | | | | | 8.45E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 65 | 65 | 0.55 | 1.06 | 0.807553846 | 0.1111539 | | | | | 5.30E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | 40 | 1 | 0.12 | 0.12 | 0.045875 | 0.00600614 | | 0.035 | 0.0575 | | 3.00E-05 | 0 |
| **Exposure Unit 13** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | 7 | | | | 0.025 | 4.0646E-10 | | 0.025 | 0.025 | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 8 | 4 | 0.06 | 0.17 | 0.0671875 | 0.06496479 | | 0.015 | 0.02 | | 8.50E-03 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 8 | 5 | 0.053 | 0.22 | 0.06975 | 0.07261149 | | 0.0175 | 0.025 | | 1.10E-02 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 8 | 8 | 15 | 20 | 18 | 1.77281052 | | | | | 1.68E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 8 | 8 | 0.6 | 0.74 | 0.67125 | 0.04673252 | | | | | 1.48E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 8 | | | | 0.0025 | 0.00114174 | | 0.001 | 0.005 | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 8 | 8 | 0.55 | 1 | 0.805 | 0.13533028 | | | | | 2.00E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 8 | 8 | 0.64 | 1 | 0.79625 | 0.12339686 | | | | | 1.00E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 1 | 1 | 0.89 | 0.89 | 0.89 | | | | | | 1.68E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 8 | 2 | 0.005 | 0.008 | 0.00321875 | 0.00223382 | | 0.001 | 0.0025 | | 1.33E-06 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 8 | 8 | 0.03 | 0.054 | 0.041625 | 0.00957583 | | | | | 1.80E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 8 | 8 | 0.95 | 1.6 | 1.21875 | 0.19988836 | | | | | 8.00E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 8 | 8 | 0.66 | 0.78 | 0.72625 | 0.03814914 | | | | | 3.90E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |
| **Exposure Unit 14** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | | | | | | | | | | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 4 | 4 | 0.04 | 0.29 | 0.1725 | 0.13622897 | | | | | 1.45E-02 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 4 | 4 | 0.031 | 0.11 | 0.0715 | 0.04682236 | | | | | 5.50E-03 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 4 | 4 | 9.3 | 17 | 12.075 | 3.37971892 | | | | | 1.43E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 4 | 4 | 0.46 | 0.69 | 0.6075 | 0.10111874 | | | | | 1.38E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 4 | | | | 0.0015625 | 0.000375 | | 0.001 | 0.00175 | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 4 | 4 | 0.4 | 0.7 | 0.545 | 0.12261049 | | | | | 1.40E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 4 | 4 | 0.5 | 0.61 | 0.5775 | 0.05188127 | | | | | 6.11E-05 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 4 | 4 | 0.8 | 1 | 0.9 | 0.08164966 | | | | | 1.89E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 4 | 3 | 0.003 | 0.012 | 0.00675 | 0.00607591 | | 0.002 | 0.002 | | 2.00E-06 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 4 | 4 | 0.024 | 0.032 | 0.02625 | 0.00386221 | | | | | 1.07E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 4 | 4 | 0.77 | 1 | 0.9 | 0.11803954 | | | | | 5.00E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 4 | 4 | 0.51 | 0.79 | 0.655 | 0.11445523 | | | | | 3.95E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |
| **Exposure Unit 15** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | | | | | | | | | | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 6 | 6 | 0.03 | 0.38 | 0.15 | 0.12066483 | | | | | 1.90E-02 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 6 | 6 | 0.047 | 0.12 | 0.071166667 | 0.04642593 | | | | | 6.00E-03 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 6 | 6 | 14 | 19 | 16.66666667 | 1.96638416 | | | | | 1.60E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 6 | 6 | 0.63 | 1.1 | 0.801666667 | 0.17702166 | | | | | 2.20E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 6 | | | | 0.001166667 | 0.00040825 | | 0.00075 | 0.00175 | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 6 | 6 | 0.57 | 1.4 | 0.805 | 0.29991666 | | | | | 2.80E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 6 | 6 | 0.59 | 1.3 | 0.821666667 | 0.26656456 | | | | | 1.30E-04 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 6 | 6 | 0.66 | 2.1 | 1.226666667 | 0.47693466 | | | | | 3.96E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 6 | 6 | 0.004 | 0.029 | 0.007916667 | 0.01056488 | | | | | 4.83E-06 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 6 | 6 | 0.035 | 0.069 | 0.0445 | 0.01261348 | | | | | 2.30E-05 | 0.09 |

**Table E-4**
**Data Usability Results for Radionuclides in Surface Soil (0 - 2 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 6 | 6 | 0.71 | 1.9 | 1.06 | 0.4304881 | | | | | 9.50E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 6 | 6 | 0.68 | 1.2 | 0.846666667 | 0.18790068 | | | | | 6.00E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |
| **Exposure Unit 16** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | | | | | | | | | | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 2 | 2 | 0.09 | 0.09 | 0.09 | 0 | | | | | 4.50E-03 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | 2 | 2 | 0.053 | 0.08 | 0.02375 | 0.00176777 | | | | | 4.00E-03 | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 2 | 2 | 15 | 16 | 15.5 | 0.70710678 | | | | | 1.34E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | 2 | 2 | 0.66 | 1.3 | 0.98 | 0.45254834 | | | | | 2.60E-04 | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | 2 | | | | 0.0015 | 0.00035355 | | 0.00125 | 0.00175 | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 2 | 2 | 0.7 | 1.6 | 1.15 | 0.6363961 | | | | | 3.20E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | 2 | 2 | 0.69 | 0.81 | 0.75 | 0.08485281 | | | | | 8.12E-05 | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | 2 | 2 | 0.97 | 1.1 | 1.035 | 0.09192388 | | | | | 2.08E-03 | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | 2 | 1 | 0.004 | 0.004 | 0.002625 | 0.00194454 | | 0.00125 | 0.00125 | | 6.67E-07 | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 2 | 2 | 0.041 | 0.072 | 0.0565 | 0.02192031 | | | | | 2.40E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | 2 | 2 | 0.74 | 1 | 0.87 | 0.18384776 | | | | | 5.00E-04 | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | 2 | 2 | 0.72 | 1.3 | 1.01 | 0.41012193 | | | | | 6.50E-04 | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |

CAS = Chemical Abstract Service
pCi/g = picocurie per gram
PRG = preliminary remediation goal

**Table E-5**
**Data Usability Results for Radionuclides in Soil (2 - 4 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Exposure Unit 4** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | | | | | | | | | | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 3 | 1 | 0.05 | 0.05 | 0.02 | 0.02598076 | | 0.005 | 0.005 | | 2.50E-03 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | | | | | | | | | | | | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 3 | 3 | 17.99 | 19.59 | 18.6133333 | 0.85652398 | | | | | 1.65E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | | | | | | | | | | | | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | | | | | | | | | | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 3 | 3 | 1.48 | 1.63 | 1.57333333 | 0.08144528 | | | | | 3.26E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | | | | | | | | | | | | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | | | | | | | | | | | | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | | | | | | | | | | | | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 3 | 3 | 0.09 | 0.1 | 0.09666667 | 0.0057735 | | | | | 3.33E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | | | | | | | | | | | | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | | | | | | | | | | | | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |
| **Exposure Unit 7** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | | | | | | | | | | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 3 | | | | 0.17 | 0.28578838 | | 0.005 | 0.5 | | | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | | | | | | | | | | | | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 3 | 3 | 15.78 | 18.26 | 16.9766667 | 1.24226943 | | | | | 1.53E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | | | | | | | | | | | | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | | | | | | | | | | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 3 | 3 | 1.53 | 1.86 | 1.65666667 | 0.17785762 | | | | | 3.72E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |

**Table E-5**
**Data Usability Results for Radionuclides in Soil (2 - 4 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | | | | | | | | | | | | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | | | | | | | | | | | | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | | | | | | | | | | | | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 3 | 3 | 0.09 | 0.11 | 0.1 | 0.01 | | | | | 3.67E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | | | | | | | | | | | | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | | | | | | | | | | | | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |

CAS = Chemical Abstract Service
pCi/g = picocurie per gram
PRG = preliminary remediation goal

**Table E-6**
**Data Usability Results for Radionuclides in Soil (4 - 6 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Exposure Unit 4** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | | | | | | | | | | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 3 | 1 | 0.01 | 0.01 | 0.006666667 | 0.002886751 | | 0.005 | 0.005 | | 5.00E-04 | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | | | | | | | | | | | | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 3 | 3 | 17.21 | 19.02 | 17.95 | 0.949052159 | | | | | 1.60E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | | | | | | | | | | | | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | | | | | | | | | | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 3 | 3 | 0.19 | 1.86 | 1.173333333 | 0.873632264 | | | | | 3.72E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | | | | | | | | | | | | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | | | | | | | | | | | | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | | | | | | | | | | | | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 3 | 3 | 0.09 | 0.11 | 0.1 | 0.01 | | | | | 3.67E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | | | | | | | | | | | | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | | | | | | | | | | | | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |
| **Exposure Unit 7** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/g | 200000 | | | | | | | | | | | | 0.35 |
| 10045-97-3 | Cs-137 | pCi/g | 20 | 5 | | | | 0.005 | 7.36275E-11 | | 0.005 | 0.005 | | | 0.24 |
| 10098-97-2 | Sr-90 | pCi/g | 20 | | | | | | | | | | | | 0.1 |
| 10198-40-0 | Co-60 | pCi/g | 700 | | | | | | | | | | | | 0 |
| 13966-00-2 | K-40 | pCi/g | 119 | 5 | 5 | 15.57 | 18.37 | 16.816 | 1.190915614 | | | | | 1.54E-01 | 30 |
| 13966-29-5 | U-234 | pCi/g | 5000 | | | | | | | | | | | | 1.2 |
| 13966-32-0 | Na-22 | pCi/g | 16.4 | | | | | | | | | | | | 0 |
| 13967-70-9 | Cs-134 | pCi/g | 11.3 | | | | | | | | | | | | 0 |
| 13981-16-3 | Pu-238 | pCi/g | 5270 | | | | | | | | | | | | 0.08 |
| 13981-37-8 | Ni-63 | pCi/g | 104000 | | | | | | | | | | | | 0 |
| 13981-41-4 | Ba-133 | pCi/g | 667 | | | | | | | | | | | | 0 |
| 13981-52-7 | Po-210 | pCi/g | | | | | | | | | | | | | 2.5 |
| 13982-63-3 | Ra-226 | pCi/g | 50 | 5 | 5 | 1.43 | 1.89 | 1.604 | 0.17980545 | | | | | 3.78E-02 | 2.5 |
| 14119-32-5 | Pu-241 | pCi/g | 190000 | | | | | | | | | | | | 0 |

**Table E-6**
**Data Usability Results for Radionuclides in Soil (4 - 6 ft)**

| CAS Number | Analyte | Units | PRG | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG | Minimum Detection Limit | Maximum Detection Limit | Minimum Detection Limit > PRG | Maximum Result/ PRG | Background Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14119-33-6 | Pu-240 | pCi/g | 18.5 | | | | | | | | | | | | 0 |
| 14255-04-0 | Pb-210 | pCi/g | 1390 | | | | | | | | | | | | 2.5 |
| 14269-63-7 | Th-230 | pCi/g | 9980 | | | | | | | | | | | | 1.6 |
| 14274-82-9 | Th-228 | pCi/g | 530 | | | | | | | | | | | | 1.6 |
| 14331-83-0 | Ac-228 | pCi/g | | | | | | | | | | | | | 1.6 |
| 14336-70-0 | Ni-59 | pCi/g | 268000 | | | | | | | | | | | | 0 |
| 14391-16-3 | Eu-155 | pCi/g | 20000 | | | | | | | | | | | | 0 |
| 14681-59-5 | Fe-55 | pCi/g | 55300 | | | | | | | | | | | | 0 |
| 14683-23-9 | Eu-152 | pCi/g | 1520 | | | | | | | | | | | | 0 |
| 15117-48-3 | Pu-239 | pCi/g | 6000 | | | | | | | | | | | | 0.023 |
| 15117-96-1 | U-235 | pCi/g | 3000 | 5 | 5 | 0.09 | 0.11 | 0.098 | 0.0083666 | | | | | 3.67E-05 | 0.09 |
| 15262-20-1 | Ra-228 | pCi/g | 40 | | | | | | | | | | | | 1.6 |
| 15585-10-1 | Eu-154 | pCi/g | 1000 | | | | | | | | | | | | 0 |
| 7440-29-1 | Th-232 | pCi/g | 2000 | | | | | | | | | | | | 1.6 |
| 7440-61-1 | U-238 | pCi/g | 2000 | | | | | | | | | | | | 1.3 |
| 86954-36-1 | Am-241 | pCi/g | 4000 | | | | | | | | | | | | 0 |

CAS = Chemical Abstract Service
pCi/g = picocurie per gram
PRG = preliminary remediation goal

**Table E-7**
**Data Usability Results for Radionuclides in Shallow Groundwater**

| CAS Number | Analyte | Units | PRG WT | PRG WA | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG WT | Samples Exceeding PRG WA | Minimum Detection Limit > PRG | Maximum Result/ PRG WT | Maximum Result/ PRG WA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Exposure Unit 4** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/L | 2E+08 | 4.99E+09 | 42 | 42 | -393 | 1099 | 171.89048 | 364.220342 | | | | 5.495E-06 | 2.2024E-07 |
| 10045-97-3 | Cs-137 | pCi/L | 600000 | 1050 | 2 | 2 | 1.64 | 1.64 | 1.64 | 0 | | | | 2.7333E-06 | 0.0015619 |
| 10198-40-0 | Co-60 | pCi/L | 1000000 | 3760 | 2 | 2 | 1.66 | 1.66 | 1.66 | 0 | | | | 0.00000166 | 0.00044149 |
| 13966-00-2 | K-40 | pCi/L | 1930000 | 2900 | 2 | 2 | 34.7 | 34.7 | 34.7 | 0 | | | | 1.7979E-05 | 0.01196552 |
| 13966-02-4 | Be-7 | pCi/L | | | | | | | | | | | | | |
| 13966-29-5 | U-234 | pCi/L | 400000 | 202 | | | | | | | | | | | |
| 13966-31-9 | Mn-54 | pCi/L | | | | | | | | | | | | | |
| 13966-32-0 | Na-22 | pCi/L | 25.3 | 3.56 | | | | | | | | | | | |
| 13967-48-1 | Ruthenium-106, Dissolved | pCi/L | | | | | | | | | | | | | |
| 13967-70-9 | Cs-134 | pCi/L | 326000 | 518 | 2 | 2 | 1.88 | 1.88 | 1.88 | 0 | | | | 5.7669E-06 | 0.00362934 |
| 13968-55-3 | U-233/234 | pCi/L | 400000 | 200 | 2 | 2 | 1.98 | 1.98 | 1.98 | 0 | | | | 0.00000495 | 0.0099 |
| 13981-50-5 | Co-57 | pCi/L | | | 2 | 2 | 1.31 | 1.31 | 1.31 | 0 | 2 | 2 | | | |
| 13982-63-3 | Ra-226 | pCi/L | 8000 | 10.2 | 2 | 2 | 25.5 | 25.5 | 25.5 | 0 | | 2 | | 0.0031875 | 2.5 |
| 13982-70-2 | Uranium-236, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14234-35-6 | Sb-125 | pCi/L | 6970000 | 367000 | | | | | | | | | | | |
| 14255-04-0 | Pb-210 | pCi/L | 292000 | 601 | 2 | 2 | 366 | 366 | 366 | 0 | | | | 0.00125342 | 0.60898502 |
| 14269-63-7 | Th-230 | pCi/L | 452000 | 2570 | | | | | | | | | | | |
| 14274-82-9 | Th-228 | pCi/L | 63300 | 374 | | | | | | | | | | | |
| 14331-83-0 | Ac-228 | pCi/L | | | 2 | 2 | 7.2 | 7.2 | 7.2 | 0 | 2 | 2 | | | |
| 14391-16-3 | Eu-155 | pCi/L | 30000000 | 264000 | | | | | | | | | | | |
| 14391-76-5 | Silver-110m, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14683-23-9 | Eu-152 | pCi/L | 2550000 | 25500 | | | | | | | | | | | |
| 14733-03-0 | Bi-214 | pCi/L | | | 2 | 2 | 3.1 | 3.1 | 3.1 | 0 | 2 | 2 | | | |
| 14913-49-6 | Bi-212 | pCi/L | | | 2 | 2 | 12.2 | 12.2 | 12.2 | 0 | 2 | 2 | | | |
| 14913-50-9 | Thallium-208 | pCi/L | | | | | | | | | | | | | |
| 15065-10-8 | Th-234 | pCi/L | | | 2 | 2 | 51 | 51 | 51 | 0 | 2 | 2 | | | |
| 15067-28-4 | Pb-214 | pCi/L | | | 2 | 2 | 3.23 | 3.23 | 3.23 | 0 | 2 | 2 | | | |
| 15092-94-1 | Pb-212 | pCi/L | | | 2 | 2 | 2.46 | 2.46 | 2.46 | 0 | 2 | 2 | | | |
| 15117-96-1 | U-235 | pCi/L | 400000 | 217 | 4 | 4 | 0.09 | 9.81 | 4.95 | 5.61184462 | | | | 2.4525E-05 | 0.04520737 |
| 15262-20-1 | Ra-228 | pCi/L | 7000 | 8.49 | | | | | | | | | | | |
| 15585-10-1 | Eu-154 | pCi/L | 2000000 | 21600 | | | | | | | | | | | |
| 7440-29-1 | Th-232 | pCi/L | 50000 | 304 | | | | | | | | | | | |
| 7440-61-1 | U-238 | pCi/L | 400000 | 223 | 2 | 2 | 2.02 | 2.02 | 2.02 | 0 | | | | 0.00000505 | 0.0090583 |
| 86954-36-1 | Am-241 | pCi/L | 200000 | 438 | | | | | | | | | | | |
| UKN093 | Gross alpha, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN094 | Gross alpha, Dissolved | pCi/L | | | 2 | 2 | 2.18 | 2.18 | 2.18 | 0 | 2 | 2 | | | |
| UKN095 | Gross alpha, Total | pCi/L | | | | | | | | | | | | | |
| UKN097 | Gross beta, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN098 | Gross beta, Dissolved | pCi/L | | | 2 | 2 | 8.98 | 8.98 | 8.98 | 0 | 2 | 2 | | | |
| UKN099 | Gross beta, Total | pCi/L | | | | | | | | | | | | | |
| **Exposure Unit 5** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/L | 2E+08 | 4.99E+09 | | | | | | | | | | | |
| 10045-97-3 | Cs-137 | pCi/L | 600000 | 1050 | 1 | 1 | 1.25 | 1.25 | 1.25 | | | | | 2.0833E-06 | 0.00119048 |
| 10198-40-0 | Co-60 | pCi/L | 1000000 | 3760 | 1 | 1 | 1.42 | 1.42 | 1.42 | | | | | 0.00000142 | 0.00037766 |
| 13966-00-2 | K-40 | pCi/L | 1930000 | 2900 | 1 | 1 | 13.1 | 13.1 | 13.1 | | | | | 6.7876E-06 | 0.00451724 |
| 13966-02-4 | Be-7 | pCi/L | | | | | | | | | | | | | |
| 13966-29-5 | U-234 | pCi/L | 400000 | 202 | | | | | | | | | | | |

**Table E-7**
**Data Usability Results for Radionuclides in Shallow Groundwater**

| CAS Number | Analyte | Units | PRG WT | PRG WA | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG WT | Samples Exceeding PRG WA | Minimum Detection Limit > PRG | Maximum Result/ PRG WT | Maximum Result/ PRG WA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13966-31-9 | Mn-54 | pCi/L | | | 1 | 1 | 1.23 | 1.23 | 1.23 | | 1 | 1 | | | |
| 13966-32-0 | Na-22 | pCi/L | 25.3 | 3.56 | 1 | 1 | 1.4 | 1.4 | 1.4 | | | | | 0.05533597 | 0.39325843 |
| 13967-48-1 | Ruthenium-106, Dissolved | pCi/L | | | | | | | | | | | | | |
| 13967-70-9 | Cs-134 | pCi/L | 326000 | 518 | 1 | 1 | 1.56 | 1.56 | 1.56 | | | | | 4.7853E-06 | 0.00301158 |
| 13968-55-3 | U-233/234 | pCi/L | 400000 | 200 | | | | | | | | | | | |
| 13981-50-5 | Co-57 | pCi/L | | | 1 | 1 | 0.528 | 0.528 | 0.528 | | 1 | 1 | | | |
| 13982-63-3 | Ra-226 | pCi/L | 8000 | 10.2 | | | | | | | | | | | |
| 13982-70-2 | Uranium-236, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14234-35-6 | Sb-125 | pCi/L | 6970000 | 367000 | | | | | | | | | | | |
| 14255-04-0 | Pb-210 | pCi/L | 292000 | 601 | | | | | | | | | | | |
| 14269-63-7 | Th-230 | pCi/L | 452000 | 2570 | | | | | | | | | | | |
| 14274-82-9 | Th-228 | pCi/L | 63300 | 374 | | | | | | | | | | | |
| 14331-83-0 | Ac-228 | pCi/L | | | | | | | | | | | | | |
| 14391-16-3 | Eu-155 | pCi/L | 30000000 | 264000 | | | | | | | | | | | |
| 14391-76-5 | Silver-110m, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14683-23-9 | Eu-152 | pCi/L | 2550000 | 25500 | 1 | 1 | 3.21 | 3.21 | 3.21 | | | | | 1.2588E-06 | 0.00012588 |
| 14733-03-0 | Bi-214 | pCi/L | | | | | | | | | | | | | |
| 14913-49-6 | Bi-212 | pCi/L | | | | | | | | | | | | | |
| 14913-50-9 | Thallium-208 | pCi/L | | | | | | | | | | | | | |
| 15065-10-8 | Th-234 | pCi/L | | | | | | | | | | | | | |
| 15067-28-4 | Pb-214 | pCi/L | | | | | | | | | | | | | |
| 15092-94-1 | Pb-212 | pCi/L | | | | | | | | | | | | | |
| 15117-96-1 | U-235 | pCi/L | 400000 | 217 | | | | | | | | | | | |
| 15262-20-1 | Ra-228 | pCi/L | 7000 | 8.49 | | | | | | | | | | | |
| 15585-10-1 | Eu-154 | pCi/L | 2000000 | 21600 | 1 | 1 | 4.12 | 4.12 | 4.12 | | | | | 0.00000206 | 0.00019074 |
| 7440-29-1 | Th-232 | pCi/L | 50000 | 304 | | | | | | | | | | | |
| 7440-61-1 | U-238 | pCi/L | 400000 | 223 | | | | | | | | | | | |
| 86954-36-1 | Am-241 | pCi/L | 200000 | 438 | | | | | | | | | | | |
| UKN093 | Gross alpha, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN094 | Gross alpha, Dissolved | pCi/L | | | 1 | 1 | 3.84 | 3.84 | 3.84 | | 1 | 1 | | | |
| UKN095 | Gross alpha, Total | pCi/L | | | | | | | | | | | | | |
| UKN097 | Gross beta, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN098 | Gross beta, Dissolved | pCi/L | | | 1 | 1 | 5.53 | 5.53 | 5.53 | | 1 | 1 | | | |
| UKN099 | Gross beta, Total | pCi/L | | | | | | | | | | | | | |
| **Exposure Unit 6** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/L | 2E+08 | 4.99E+09 | 45 | 45 | -393 | 500 | 79.492667 | 237.842221 | | | | 0.0000025 | 1.002E-07 |
| 10045-97-3 | Cs-137 | pCi/L | 600000 | 1050 | 19 | 17 | -3.02 | 14.5 | 2.6405882 | 4.74152142 | | | | 2.4167E-05 | 0.01380952 |
| 10198-40-0 | Co-60 | pCi/L | 1000000 | 3760 | 11 | 11 | -1.4 | 15.2 | 4.5245455 | 5.69649079 | | | | 0.0000152 | 0.00404255 |
| 13966-00-2 | K-40 | pCi/L | 1930000 | 2900 | 7 | 7 | -15 | 215 | 57 | 74.762446 | | | | 0.0001114 | 0.07413793 |
| 13966-02-4 | Be-7 | pCi/L | | | 1 | 1 | 26.5 | 26.5 | 26.5 | | 1 | 1 | | | |
| 13966-29-5 | U-234 | pCi/L | 400000 | 202 | | | | | | | | | | | |
| 13966-31-9 | Mn-54 | pCi/L | | | 4 | 4 | 0.812 | 2.16 | 1.453 | 0.6410689 | 4 | 4 | | | |
| 13966-32-0 | Na-22 | pCi/L | 25.3 | 3.56 | 3 | 3 | 0.821 | 1.51 | 1.1536667 | 0.34510916 | | | | 0.05968379 | 0.4241573 |
| 13967-48-1 | Ruthenium-106, Dissolved | pCi/L | | | 1 | 1 | 16 | 16 | 16 | | 1 | 1 | | | |
| 13967-70-9 | Cs-134 | pCi/L | 326000 | 518 | 10 | 10 | -2.5 | 20.7 | 6.669 | 7.61919134 | | | | 6.3497E-05 | 0.03996139 |
| 13968-55-3 | U-233/234 | pCi/L | 400000 | 200 | 1 | 1 | 4.59 | 4.59 | 4.59 | | | | | 1.1475E-05 | 0.02295 |
| 13981-50-5 | Co-57 | pCi/L | | | 10 | 10 | -1.5 | 9.5 | 2.7682 | 3.78618324 | 10 | 10 | | | |
| 13982-63-3 | Ra-226 | pCi/L | 8000 | 10.2 | 10 | 10 | -0.06 | 184 | 35.36836 | 63.439895 | | 3 | | 0.023 | 18.0392157 |

**Table E-7**
**Data Usability Results for Radionuclides in Shallow Groundwater**

| CAS Number | Analyte | Units | PRG WT | PRG WA | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG WT | Samples Exceeding PRG WA | Minimum Detection Limit > PRG | Maximum Result/ PRG WT | Maximum Result/ PRG WA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13982-70-2 | Uranium-236, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14234-35-6 | Sb-125 | pCi/L | 6970000 | 367000 | 1 | 1 | 6.28 | 6.28 | 6.28 | | | | | 9.01E-07 | 1.7112E-05 |
| 14255-04-0 | Pb-210 | pCi/L | 292000 | 601 | 3 | 3 | 73.448 | 2810 | 1094.1493 | 1494.85908 | | 1 | | 0.00962329 | 4.67554077 |
| 14269-63-7 | Th-230 | pCi/L | 452000 | 2570 | 2 | 2 | 0.0058 | 0.147 | 0.0764 | 0.09984348 | | | | 3.2522E-07 | 5.7198E-05 |
| 14274-82-9 | Th-228 | pCi/L | 63300 | 374 | 2 | 2 | 0.0222 | 0.586 | 0.3041 | 0.3986668 | | | | 9.2575E-06 | 0.00156684 |
| 14331-83-0 | Ac-228 | pCi/L | | | 4 | 3 | 14.3 | 56 | 32.633333 | 21.3007825 | 3 | 3 | | | |
| 14391-16-3 | Eu-155 | pCi/L | 30000000 | 264000 | 1 | 1 | 6.91 | 6.91 | 6.91 | | | | | 2.3033E-07 | 2.6174E-05 |
| 14391-76-5 | Silver-110m, Dissolved | pCi/L | | | 1 | 1 | 3.58 | 3.58 | 3.58 | | 1 | 1 | | | |
| 14683-23-9 | Eu-152 | pCi/L | 2550000 | 25500 | 4 | 4 | 2.26 | 6.04 | 4.0275 | 1.73476944 | | | | 2.3686E-06 | 0.00023686 |
| 14733-03-0 | Bi-214 | pCi/L | | | 4 | 4 | 15.4 | 103 | 44.30125 | 40.0175546 | 4 | 4 | | | |
| 14913-49-6 | Bi-212 | pCi/L | | | 3 | 3 | 41.1 | 93.8 | 62.9 | 27.5032725 | 3 | 3 | | | |
| 14913-50-9 | Thallium-208 | pCi/L | | | 4 | 4 | -0.5 | 12.6 | 5.4979 | 5.60357758 | 4 | 4 | | | |
| 15065-10-8 | Th-234 | pCi/L | | | 4 | 4 | -2 | 384 | 160.425 | 167.219584 | 4 | 4 | | | |
| 15067-28-4 | Pb-214 | pCi/L | | | 4 | 4 | 12.9 | 120 | 50.054 | 48.4054397 | 4 | 4 | | | |
| 15092-94-1 | Pb-212 | pCi/L | | | 4 | 4 | -0.4 | 24.2 | 10.275 | 10.2590074 | 4 | 4 | | | |
| 15117-96-1 | U-235 | pCi/L | 400000 | 217 | 5 | 5 | 0.153 | 77.7 | 24.1046 | 32.5863453 | | | | 0.00019425 | 0.35806452 |
| 15262-20-1 | Ra-228 | pCi/L | 7000 | 8.49 | 7 | 7 | -0.059 | 1.03 | 0.5195714 | 0.3598763 | | | | 0.00014714 | 0.1213192 |
| 15585-10-1 | Eu-154 | pCi/L | 2000000 | 21600 | 4 | 4 | 2.39 | 4.42 | 3.385 | 0.82987951 | | | | 0.00000221 | 0.00020463 |
| 7440-29-1 | Th-232 | pCi/L | 50000 | 304 | 2 | 2 | 0.00193 | 0.662 | 0.331965 | 0.46673997 | | | | 0.00001324 | 0.00217763 |
| 7440-61-1 | U-238 | pCi/L | 400000 | 223 | 1 | 1 | 4.24 | 4.24 | 4.24 | | | | | 0.0000106 | 0.01901345 |
| 86954-36-1 | Am-241 | pCi/L | 200000 | 438 | 1 | 1 | 10.4 | 10.4 | 10.4 | | | | | 0.000052 | 0.02374429 |
| UKN093 | Gross alpha, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN094 | Gross alpha, Dissolved | pCi/L | | | 33 | 33 | 0.3 | 25.7 | 6.1057273 | 4.40315466 | 33 | 33 | | | |
| UKN095 | Gross alpha, Total | pCi/L | | | 2 | 2 | 7.38 | 42.3 | 24.84 | 24.6921688 | 2 | 2 | | | |
| UKN097 | Gross beta, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN098 | Gross beta, Dissolved | pCi/L | | | 33 | 33 | -5 | 33.7 | 6.7581212 | 5.86016245 | 33 | 33 | | | |
| UKN099 | Gross beta, Total | pCi/L | | | 2 | 2 | 7.03 | 49.5 | 28.265 | 30.030825 | 2 | 2 | | | |
| **Exposure Unit 7** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/L | 2E+08 | 4.99E+09 | 54 | 50 | -120 | 500 | 79.029 | 158.387692 | | | | 0.0000025 | 1.002E-07 |
| 10045-97-3 | Cs-137 | pCi/L | 600000 | 1050 | 29 | 27 | -5.61 | 14.8 | 3.3795185 | 5.7038933 | | | | 2.4667E-05 | 0.01409524 |
| 10198-40-0 | Co-60 | pCi/L | 1000000 | 3760 | 18 | 18 | 0.839 | 16.7 | 5.7136111 | 6.16991745 | | | | 0.0000167 | 0.00444149 |
| 13966-00-2 | K-40 | pCi/L | 1930000 | 2900 | 18 | 18 | 5 | 418 | 121.78333 | 152.073207 | | | | 0.00021658 | 0.14413793 |
| 13966-02-4 | Be-7 | pCi/L | | | | | | | | | | | | | |
| 13966-29-5 | U-234 | pCi/L | 400000 | 202 | | | | | | | | | | | |
| 13966-31-9 | Mn-54 | pCi/L | | | 7 | 7 | 0.802 | 1.48 | 1.1382857 | 0.27725242 | 7 | 7 | | | |
| 13966-32-0 | Na-22 | pCi/L | 25.3 | 3.56 | 7 | 7 | 0.844 | 1.64 | 1.2278571 | 0.29915572 | | | | 0.06482213 | 0.46067416 |
| 13967-48-1 | Ruthenium-106, Dissolved | pCi/L | | | | | | | | | | | | | |
| 13967-70-9 | Cs-134 | pCi/L | 326000 | 518 | 18 | 18 | 0.941 | 19.6 | 6.5056111 | 7.12798674 | | | | 6.0123E-05 | 0.03783784 |
| 13968-55-3 | U-233/234 | pCi/L | 400000 | 200 | 1 | 1 | 20 | 20 | 20 | | | | | 0.00005 | 0.1 |
| 13981-50-5 | Co-57 | pCi/L | | | 18 | 18 | 0.552 | 9.08 | 3.3827778 | 3.51697618 | 18 | 18 | | | |
| 13982-63-3 | Ra-226 | pCi/L | 8000 | 10.2 | 23 | 23 | -0.165 | 206 | 47.646826 | 79.3266977 | | 10 | | 0.02575 | 20.1960784 |
| 13982-70-2 | Uranium-236, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14234-35-6 | Sb-125 | pCi/L | 6970000 | 367000 | | | | | | | | | | | |
| 14255-04-0 | Pb-210 | pCi/L | 292000 | 601 | 11 | 11 | 5 | 2940 | 677.45455 | 789.21624 | | 3 | | 0.01006849 | 4.89184692 |
| 14269-63-7 | Th-230 | pCi/L | 452000 | 2570 | | | | | | | | | | | |
| 14274-82-9 | Th-228 | pCi/L | 63300 | 374 | | | | | | | | | | | |
| 14331-83-0 | Ac-228 | pCi/L | | | 11 | 11 | 5 | 67.2 | 36.767273 | 28.7777373 | 11 | 11 | | | |
| 14391-16-3 | Eu-155 | pCi/L | 30000000 | 264000 | | | | | | | | | | | |

**Table E-7**
**Data Usability Results for Radionuclides in Shallow Groundwater**

| CAS Number | Analyte | Units | PRG WT | PRG WA | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG WT | Samples Exceeding PRG WA | Minimum Detection Limit > PRG | Maximum Result/ PRG WT | Maximum Result/ PRG WA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14391-76-5 | Silver-110m, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14683-23-9 | Eu-152 | pCi/L | 2550000 | 25500 | 7 | 7 | 2.13 | 4.05 | 2.9785714 | 0.61121269 | | | | 1.5882E-06 | 0.00015882 |
| 14733-03-0 | Bi-214 | pCi/L | | | 11 | 11 | 2.49 | 165 | 29.614545 | 46.7458769 | 11 | 11 | | | |
| 14913-49-6 | Bi-212 | pCi/L | | | 11 | 11 | 3 | 112 | 60.410909 | 48.7927586 | 11 | 11 | | | |
| 14913-50-9 | Thallium-208 | pCi/L | | | 6 | 6 | 13 | 16.4 | 14.666667 | 1.1147496 | 6 | 6 | | | |
| 15065-10-8 | Th-234 | pCi/L | | | 11 | 11 | 5 | 384 | 175.56364 | 138.738245 | 11 | 11 | | | |
| 15067-28-4 | Pb-214 | pCi/L | | | 11 | 11 | 2.36 | 162 | 28.523636 | 45.8253411 | 11 | 11 | | | |
| 15092-94-1 | Pb-212 | pCi/L | | | 11 | 11 | 1.78 | 26.2 | 12.710909 | 10.0667388 | 11 | 11 | | | |
| 15117-96-1 | U-235 | pCi/L | 400000 | 217 | 12 | 12 | 0.9 | 75.8 | 38.43 | 33.4435128 | | | | 0.0001895 | 0.34930876 |
| 15262-20-1 | Ra-228 | pCi/L | 7000 | 8.49 | 12 | 12 | -0.104 | 0.682 | 0.2010833 | 0.20861424 | | | | 9.7429E-05 | 0.0803298 |
| 15585-10-1 | Eu-154 | pCi/L | 2000000 | 21600 | 7 | 7 | 2.44 | 4.81 | 3.6071429 | 0.90759231 | | | | 2.405E-06 | 0.00022269 |
| 7440-29-1 | Th-232 | pCi/L | 50000 | 304 | | | | | | | | | | | |
| 7440-61-1 | U-238 | pCi/L | 400000 | 223 | 1 | 1 | 17.9 | 17.9 | 17.9 | | | | | 0.00004475 | 0.08026906 |
| 86954-36-1 | Am-241 | pCi/L | 200000 | 438 | | | | | | | | | | | |
| UKN093 | Gross alpha, Decanted | pCi/L | | | 1 | 1 | 6.9 | 6.9 | 6.9 | | 1 | 1 | | | |
| UKN094 | Gross alpha, Dissolved | pCi/L | | | 51 | 50 | -2.14 | 27.9 | 5.7888 | 6.43058744 | 50 | 50 | | | |
| UKN095 | Gross alpha, Total | pCi/L | | | | | | | | | | | | | |
| UKN097 | Gross beta, Decanted | pCi/L | | | 1 | 1 | 6.7 | 6.7 | 6.7 | | 1 | 1 | | | |
| UKN098 | Gross beta, Dissolved | pCi/L | | | 51 | 51 | -8.84 | 28 | 5.3851176 | 6.23069965 | 51 | 51 | | | |
| UKN099 | Gross beta, Total | pCi/L | | | | | | | | | | | | | |
| **Exposure Unit 8** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/L | 2E+08 | 4.99E+09 | 3 | 3 | -61 | -46.2 | -51.6 | 8.17067929 | | | | -2.31E-07 | -9.259E-09 |
| 10045-97-3 | Cs-137 | pCi/L | 600000 | 1050 | 1 | 1 | 0.335 | 0.335 | 0.335 | | | | | 5.5833E-07 | 0.00031905 |
| 10198-40-0 | Co-60 | pCi/L | 1000000 | 3760 | | | | | | | | | | | |
| 13966-00-2 | K-40 | pCi/L | 1930000 | 2900 | | | | | | | | | | | |
| 13966-02-4 | Be-7 | pCi/L | | | | | | | | | | | | | |
| 13966-29-5 | U-234 | pCi/L | 400000 | 202 | | | | | | | | | | | |
| 13966-31-9 | Mn-54 | pCi/L | | | | | | | | | | | | | |
| 13966-32-0 | Na-22 | pCi/L | 25.3 | 3.56 | | | | | | | | | | | |
| 13967-48-1 | Ruthenium-106, Dissolved | pCi/L | | | | | | | | | | | | | |
| 13967-70-9 | Cs-134 | pCi/L | 326000 | 518 | | | | | | | | | | | |
| 13968-55-3 | U-233/234 | pCi/L | 400000 | 200 | | | | | | | | | | | |
| 13981-50-5 | Co-57 | pCi/L | | | | | | | | | | | | | |
| 13982-63-3 | Ra-226 | pCi/L | 8000 | 10.2 | | | | | | | | | | | |
| 13982-70-2 | Uranium-236, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14234-35-6 | Sb-125 | pCi/L | 6970000 | 367000 | | | | | | | | | | | |
| 14255-04-0 | Pb-210 | pCi/L | 292000 | 601 | | | | | | | | | | | |
| 14269-63-7 | Th-230 | pCi/L | 452000 | 2570 | | | | | | | | | | | |
| 14274-82-9 | Th-228 | pCi/L | 63300 | 374 | | | | | | | | | | | |
| 14331-83-0 | Ac-228 | pCi/L | | | | | | | | | | | | | |
| 14391-16-3 | Eu-155 | pCi/L | 30000000 | 264000 | | | | | | | | | | | |
| 14391-76-5 | Silver-110m, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14683-23-9 | Eu-152 | pCi/L | 2550000 | 25500 | | | | | | | | | | | |
| 14733-03-0 | Bi-214 | pCi/L | | | | | | | | | | | | | |
| 14913-49-6 | Bi-212 | pCi/L | | | | | | | | | | | | | |
| 14913-50-9 | Thallium-208 | pCi/L | | | | | | | | | | | | | |
| 15065-10-8 | Th-234 | pCi/L | | | | | | | | | | | | | |
| 15067-28-4 | Pb-214 | pCi/L | | | | | | | | | | | | | |

**Table E-7**
**Data Usability Results for Radionuclides in Shallow Groundwater**

| CAS Number | Analyte | Units | PRG WT | PRG WA | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG WT | Samples Exceeding PRG WA | Minimum Detection Limit > PRG | Maximum Result/ PRG WT | Maximum Result/ PRG WA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15092-94-1 | Pb-212 | pCi/L | | | | | | | | | | | | | |
| 15117-96-1 | U-235 | pCi/L | 400000 | 217 | | | | | | | | | | | |
| 15262-20-1 | Ra-228 | pCi/L | 7000 | 8.49 | | | | | | | | | | | |
| 15585-10-1 | Eu-154 | pCi/L | 2000000 | 21600 | | | | | | | | | | | |
| 7440-29-1 | Th-232 | pCi/L | 50000 | 304 | | | | | | | | | | | |
| 7440-61-1 | U-238 | pCi/L | 400000 | 223 | | | | | | | | | | | |
| 86954-36-1 | Am-241 | pCi/L | 200000 | 438 | | | | | | | | | | | |
| UKN093 | Gross alpha, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN094 | Gross alpha, Dissolved | pCi/L | | | 4 | 4 | -0.3 | 2 | 0.646 | 1.10715732 | 4 | 4 | | | |
| UKN095 | Gross alpha, Total | pCi/L | | | | | | | | | | | | | |
| UKN097 | Gross beta, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN098 | Gross beta, Dissolved | pCi/L | | | 4 | 4 | 1.03 | 4 | 2.6825 | 1.41039888 | 4 | 4 | | | |
| UKN099 | Gross beta, Total | pCi/L | | | | | | | | | | | | | |
| **Exposure Unit 9** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/L | 2E+08 | 4.99E+09 | 24 | 24 | -133 | 434 | 128.51667 | 203.764488 | | | | 0.00000217 | 8.6974E-08 |
| 10045-97-3 | Cs-137 | pCi/L | 600000 | 1050 | | | | | | | | | | | |
| 10198-40-0 | Co-60 | pCi/L | 1000000 | 3760 | | | | | | | | | | | |
| 13966-00-2 | K-40 | pCi/L | 1930000 | 2900 | | | | | | | | | | | |
| 13966-02-4 | Be-7 | pCi/L | | | | | | | | | | | | | |
| 13966-29-5 | U-234 | pCi/L | 400000 | 202 | | | | | | | | | | | |
| 13966-31-9 | Mn-54 | pCi/L | | | | | | | | | | | | | |
| 13966-32-0 | Na-22 | pCi/L | 25.3 | 3.56 | | | | | | | | | | | |
| 13967-48-1 | Ruthenium-106, Dissolved | pCi/L | | | | | | | | | | | | | |
| 13967-70-9 | Cs-134 | pCi/L | 326000 | 518 | | | | | | | | | | | |
| 13968-55-3 | U-233/234 | pCi/L | 400000 | 200 | 4 | 4 | 5.17 | 5.17 | 5.17 | 0 | | | | 1.2925E-05 | 0.02585 |
| 13981-50-5 | Co-57 | pCi/L | | | | | | | | | | | | | |
| 13982-63-3 | Ra-226 | pCi/L | 8000 | 10.2 | | | | | | | | | | | |
| 13982-70-2 | Uranium-236, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14234-35-6 | Sb-125 | pCi/L | 6970000 | 367000 | | | | | | | | | | | |
| 14255-04-0 | Pb-210 | pCi/L | 292000 | 601 | | | | | | | | | | | |
| 14269-63-7 | Th-230 | pCi/L | 452000 | 2570 | | | | | | | | | | | |
| 14274-82-9 | Th-228 | pCi/L | 63300 | 374 | | | | | | | | | | | |
| 14331-83-0 | Ac-228 | pCi/L | | | | | | | | | | | | | |
| 14391-16-3 | Eu-155 | pCi/L | 30000000 | 264000 | | | | | | | | | | | |
| 14391-76-5 | Silver-110m, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14683-23-9 | Eu-152 | pCi/L | 2550000 | 25500 | | | | | | | | | | | |
| 14733-03-0 | Bi-214 | pCi/L | | | | | | | | | | | | | |
| 14913-49-6 | Bi-212 | pCi/L | | | | | | | | | | | | | |
| 14913-50-9 | Thallium-208 | pCi/L | | | | | | | | | | | | | |
| 15065-10-8 | Th-234 | pCi/L | | | | | | | | | | | | | |
| 15067-28-4 | Pb-214 | pCi/L | | | | | | | | | | | | | |
| 15092-94-1 | Pb-212 | pCi/L | | | | | | | | | | | | | |
| 15117-96-1 | U-235 | pCi/L | 400000 | 217 | 4 | 4 | 0.6 | 0.6 | 0.6 | 0 | | | | 0.0000015 | 0.00276498 |
| 15262-20-1 | Ra-228 | pCi/L | 7000 | 8.49 | | | | | | | | | | | |
| 15585-10-1 | Eu-154 | pCi/L | 2000000 | 21600 | | | | | | | | | | | |
| 7440-29-1 | Th-232 | pCi/L | 50000 | 304 | | | | | | | | | | | |
| 7440-61-1 | U-238 | pCi/L | 400000 | 223 | 4 | 4 | 5.67 | 5.67 | 5.67 | 0 | | | | 1.4175E-05 | 0.02542601 |
| 86954-36-1 | Am-241 | pCi/L | 200000 | 438 | | | | | | | | | | | |

**Table E-7**
**Data Usability Results for Radionuclides in Shallow Groundwater**

| CAS Number | Analyte | Units | PRG WT | PRG WA | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG WT | Samples Exceeding PRG WA | Minimum Detection Limit > PRG | Maximum Result/ PRG WT | Maximum Result/ PRG WA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UKN093 | Gross alpha, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN094 | Gross alpha, Dissolved | pCi/L | | | | | | | | | | | | | |
| UKN095 | Gross alpha, Total | pCi/L | | | | | | | | | | | | | |
| UKN097 | Gross beta, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN098 | Gross beta, Dissolved | pCi/L | | | | | | | | | | | | | |
| UKN099 | Gross beta, Total | pCi/L | | | | | | | | | | | | | |
| **Exposure Unit 10** | | | | | | | | | | | | | | | |
| 10028-17-8 | Tritium (H-3) | pCi/L | 2E+08 | 4.99E+09 | 14 | 14 | -60 | 500 | 126.30143 | 204.191007 | | | | 0.0000025 | 1.002E-07 |
| 10045-97-3 | Cs-137 | pCi/L | 600000 | 1050 | 1 | | | | | | | | | | |
| 10198-40-0 | Co-60 | pCi/L | 1000000 | 3760 | | | | | | | | | | | |
| 13966-00-2 | K-40 | pCi/L | 1930000 | 2900 | | | | | | | | | | | |
| 13966-02-4 | Be-7 | pCi/L | | | | | | | | | | | | | |
| 13966-29-5 | U-234 | pCi/L | 400000 | 202 | | | | | | | | | | | |
| 13966-31-9 | Mn-54 | pCi/L | | | | | | | | | | | | | |
| 13966-32-0 | Na-22 | pCi/L | 25.3 | 3.56 | | | | | | | | | | | |
| 13967-48-1 | Ruthenium-106, Dissolved | pCi/L | | | | | | | | | | | | | |
| 13967-70-9 | Cs-134 | pCi/L | 326000 | 518 | | | | | | | | | | | |
| 13968-55-3 | U-233/234 | pCi/L | 400000 | 200 | | | | | | | | | | | |
| 13981-50-5 | Co-57 | pCi/L | | | | | | | | | | | | | |
| 13982-63-3 | Ra-226 | pCi/L | 8000 | 10.2 | 1 | 1 | 0.227 | 0.227 | 0.227 | | | | | 2.8375E-05 | 0.0222549 |
| 13982-70-2 | Uranium-236, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14234-35-6 | Sb-125 | pCi/L | 6970000 | 367000 | | | | | | | | | | | |
| 14255-04-0 | Pb-210 | pCi/L | 292000 | 601 | | | | | | | | | | | |
| 14269-63-7 | Th-230 | pCi/L | 452000 | 2570 | | | | | | | | | | | |
| 14274-82-9 | Th-228 | pCi/L | 63300 | 374 | | | | | | | | | | | |
| 14331-83-0 | Ac-228 | pCi/L | | | | | | | | | | | | | |
| 14391-16-3 | Eu-155 | pCi/L | 30000000 | 264000 | | | | | | | | | | | |
| 14391-76-5 | Silver-110m, Dissolved | pCi/L | | | | | | | | | | | | | |
| 14683-23-9 | Eu-152 | pCi/L | 2550000 | 25500 | | | | | | | | | | | |
| 14733-03-0 | Bi-214 | pCi/L | | | | | | | | | | | | | |
| 14913-49-6 | Bi-212 | pCi/L | | | | | | | | | | | | | |
| 14913-50-9 | Thallium-208 | pCi/L | | | | | | | | | | | | | |
| 15065-10-8 | Th-234 | pCi/L | | | | | | | | | | | | | |
| 15067-28-4 | Pb-214 | pCi/L | | | | | | | | | | | | | |
| 15092-94-1 | Pb-212 | pCi/L | | | | | | | | | | | | | |
| 15117-96-1 | U-235 | pCi/L | 400000 | 217 | | | | | | | | | | | |
| 15262-20-1 | Ra-228 | pCi/L | 7000 | 8.49 | 1 | 1 | 0.167 | 0.167 | 0.167 | | | | | 2.3857E-05 | 0.0196702 |
| 15585-10-1 | Eu-154 | pCi/L | 2000000 | 21600 | | | | | | | | | | | |
| 7440-29-1 | Th-232 | pCi/L | 50000 | 304 | | | | | | | | | | | |
| 7440-61-1 | U-238 | pCi/L | 400000 | 223 | | | | | | | | | | | |
| 86954-36-1 | Am-241 | pCi/L | 200000 | 438 | | | | | | | | | | | |
| UKN093 | Gross alpha, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN094 | Gross alpha, Dissolved | pCi/L | | | 5 | 5 | 3 | 11.6 | 6.668 | 4.04550615 | 5 | 5 | | | |
| UKN095 | Gross alpha, Total | pCi/L | | | | | | | | | | | | | |
| UKN097 | Gross beta, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN098 | Gross beta, Dissolved | pCi/L | | | 5 | 5 | 1.4 | 8.93 | 3.846 | 2.92217043 | 5 | 5 | | | |
| UKN099 | Gross beta, Total | pCi/L | | | | | | | | | | | | | |
| **Exposure Unit 11** | | | | | | | | | | | | | | | |

**Table E-7**
**Data Usability Results for Radionuclides in Shallow Groundwater**

| CAS Number | Analyte | Units | PRG WT | PRG WA | Samples | Detects | Minimum Result | Maximum Result | Average Result | Standard Deviation | Samples Exceeding PRG WT | Samples Exceeding PRG WA | Minimum Detection Limit > PRG | Maximum Result/ PRG WT | Maximum Result/ PRG WA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10028-17-8 | Tritium (H-3) | pCi/L | 2E+08 | 4.99E+09 | 114 | 114 | -200 | 1099 | 114.4964 | 224.967071 | | | | 5.495E-06 | 2.2024E-07 |
| 10045-97-3 | Cs-137 | pCi/L | 600000 | 1050 | 51 | 46 | -6.3 | 31.3 | 3.6335217 | 7.44900431 | | | | 5.2167E-05 | 0.02980952 |
| 10198-40-0 | Co-60 | pCi/L | 1000000 | 3760 | 44 | 43 | -2.3 | 32.6 | 4.8198372 | 7.68772028 | | | | 0.0000326 | 0.00867021 |
| 13966-00-2 | K-40 | pCi/L | 1930000 | 2900 | 25 | 25 | -21.8 | 444 | 86.636 | 125.316905 | | | | 0.00023005 | 0.15310345 |
| 13966-02-4 | Be-7 | pCi/L | | | 1 | 1 | 16.5 | 16.5 | 16.5 | | 1 | 1 | | | |
| 13966-29-5 | U-234 | pCi/L | 400000 | 202 | 1 | 1 | 12.7 | 12.7 | 12.7 | | | | | 0.00003175 | 0.06287129 |
| 13966-31-9 | Mn-54 | pCi/L | | | 10 | 10 | -0.031 | 2.28 | 1.1367 | 0.57014833 | 10 | 10 | | | |
| 13966-32-0 | Na-22 | pCi/L | 25.3 | 3.56 | 9 | 9 | 0.14 | 2.18 | 1.2327778 | 0.53913769 | | | | 0.08616601 | 0.61235955 |
| 13967-48-1 | Ruthenium-106, Dissolved | pCi/L | | | 1 | 1 | 7.91 | 7.91 | 7.91 | | 1 | 1 | | | |
| 13967-70-9 | Cs-134 | pCi/L | 326000 | 518 | 42 | 42 | -5.3 | 32.3 | 5.1119048 | 8.38868089 | | | | 9.908E-05 | 0.06235521 |
| 13968-55-3 | U-233/234 | pCi/L | 400000 | 200 | 42 | 42 | 1.8 | 36.6 | 12.52381 | 7.02001631 | | | | 0.0000915 | 0.183 |
| 13981-50-5 | Co-57 | pCi/L | | | 43 | 42 | -5.8 | 16.5 | 2.8939524 | 4.21597335 | 42 | 42 | | | |
| 13982-63-3 | Ra-226 | pCi/L | 8000 | 10.2 | 23 | 23 | -110 | 316 | 57.608826 | 102.846906 | | 11 | | 0.0395 | 30.9803922 |
| 13982-70-2 | Uranium-236, Dissolved | pCi/L | | | 1 | 1 | 2.1 | 2.1 | 2.1 | | 1 | 1 | | | |
| 14234-35-6 | Sb-125 | pCi/L | 6970000 | 367000 | 1 | 1 | 2.35 | 2.35 | 2.35 | | | | | 3.3716E-07 | 6.4033E-06 |
| 14255-04-0 | Pb-210 | pCi/L | 292000 | 601 | 13 | 13 | 5 | 2380 | 503.47692 | 669.638078 | | 3 | | 0.00815068 | 3.96006656 |
| 14269-63-7 | Th-230 | pCi/L | 452000 | 2570 | 30 | 27 | -0.038 | 1.28 | 0.1353885 | 0.27540858 | | | | 2.8319E-06 | 0.00049805 |
| 14274-82-9 | Th-228 | pCi/L | 63300 | 374 | 30 | 28 | -0.07 | 0.6 | 0.0527857 | 0.14449615 | | | | 9.4787E-06 | 0.00160428 |
| 14331-83-0 | Ac-228 | pCi/L | | | 15 | 15 | -19 | 112 | 25.002667 | 33.3671991 | 15 | 15 | | | |
| 14391-16-3 | Eu-155 | pCi/L | 30000000 | 264000 | 1 | 1 | 3.2 | 3.2 | 3.2 | | | | | 1.0667E-07 | 1.2121E-05 |
| 14391-76-5 | Silver-110m, Dissolved | pCi/L | | | 1 | 1 | 1.9 | 1.9 | 1.9 | | 1 | 1 | | | |
| 14683-23-9 | Eu-152 | pCi/L | 2550000 | 25500 | 10 | 10 | -2.26 | 5.97 | 2.964 | 2.21071733 | | | | 2.3412E-06 | 0.00023412 |
| 14733-03-0 | Bi-214 | pCi/L | | | 15 | 15 | 3 | 51.5 | 15.832 | 14.6895168 | 15 | 15 | | | |
| 14913-49-6 | Bi-212 | pCi/L | | | 13 | 13 | 2.1 | 183 | 54.938462 | 55.0443993 | 13 | 13 | | | |
| 14913-50-9 | Thallium-208 | pCi/L | | | 11 | 10 | -2.6 | 26.5 | 9.142 | 8.24447802 | 10 | 10 | | | |
| 15065-10-8 | Th-234 | pCi/L | | | 16 | 16 | 5 | 486 | 134.4375 | 141.940574 | 16 | 16 | | | |
| 15067-28-4 | Pb-214 | pCi/L | | | 16 | 16 | -50 | 46.4 | 11.38375 | 21.2752322 | 16 | 16 | | | |
| 15092-94-1 | Pb-212 | pCi/L | | | 17 | 17 | -6.2 | 35.8 | 10.056471 | 11.5219681 | 17 | 17 | | | |
| 15117-96-1 | U-235 | pCi/L | 400000 | 217 | 59 | 59 | -4 | 132 | 9.029661 | 22.6946581 | | | | 0.00033 | 0.60829493 |
| 15262-20-1 | Ra-228 | pCi/L | 7000 | 8.49 | 9 | 9 | 0.054 | 1 | 0.4596667 | 0.33981061 | | | | 0.00014286 | 0.11778563 |
| 15585-10-1 | Eu-154 | pCi/L | 2000000 | 21600 | 10 | 10 | 1 | 6.31 | 3.689 | 1.34076636 | | | | 3.155E-06 | 0.00029213 |
| 7440-29-1 | Th-232 | pCi/L | 50000 | 304 | 30 | 22 | -0.011 | 0.6 | 0.0487045 | 0.13085039 | | | | 0.000012 | 0.00197368 |
| 7440-61-1 | U-238 | pCi/L | 400000 | 223 | 42 | 42 | 3.6 | 41.9 | 12.221429 | 6.93973099 | | | | 0.00010475 | 0.18789238 |
| 86954-36-1 | Am-241 | pCi/L | 200000 | 438 | 1 | 1 | 16.2 | 16.2 | 16.2 | | | | | 0.000081 | 0.0369863 |
| UKN093 | Gross alpha, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN094 | Gross alpha, Dissolved | pCi/L | | | 59 | 59 | -0.194 | 78 | 22.532983 | 15.1864738 | 59 | 59 | | | |
| UKN095 | Gross alpha, Total | pCi/L | | | 2 | 2 | 20 | 27.6 | 23.8 | 5.37401154 | 2 | 2 | | | |
| UKN097 | Gross beta, Decanted | pCi/L | | | | | | | | | | | | | |
| UKN098 | Gross beta, Dissolved | pCi/L | | | 58 | 58 | -6.78 | 50 | 12.471034 | 9.27767622 | 58 | 58 | | | |
| UKN099 | Gross beta, Total | pCi/L | | | 2 | 2 | 11 | 33 | 22 | 15.5563492 | 2 | 2 | | | |

CAS = Chemical Abstract Service
WT = Water, terrestrial; WA = Water, aquatic
PRG = preliminary remediation goal
pCi /L = picocurie per liter

# Appendix F

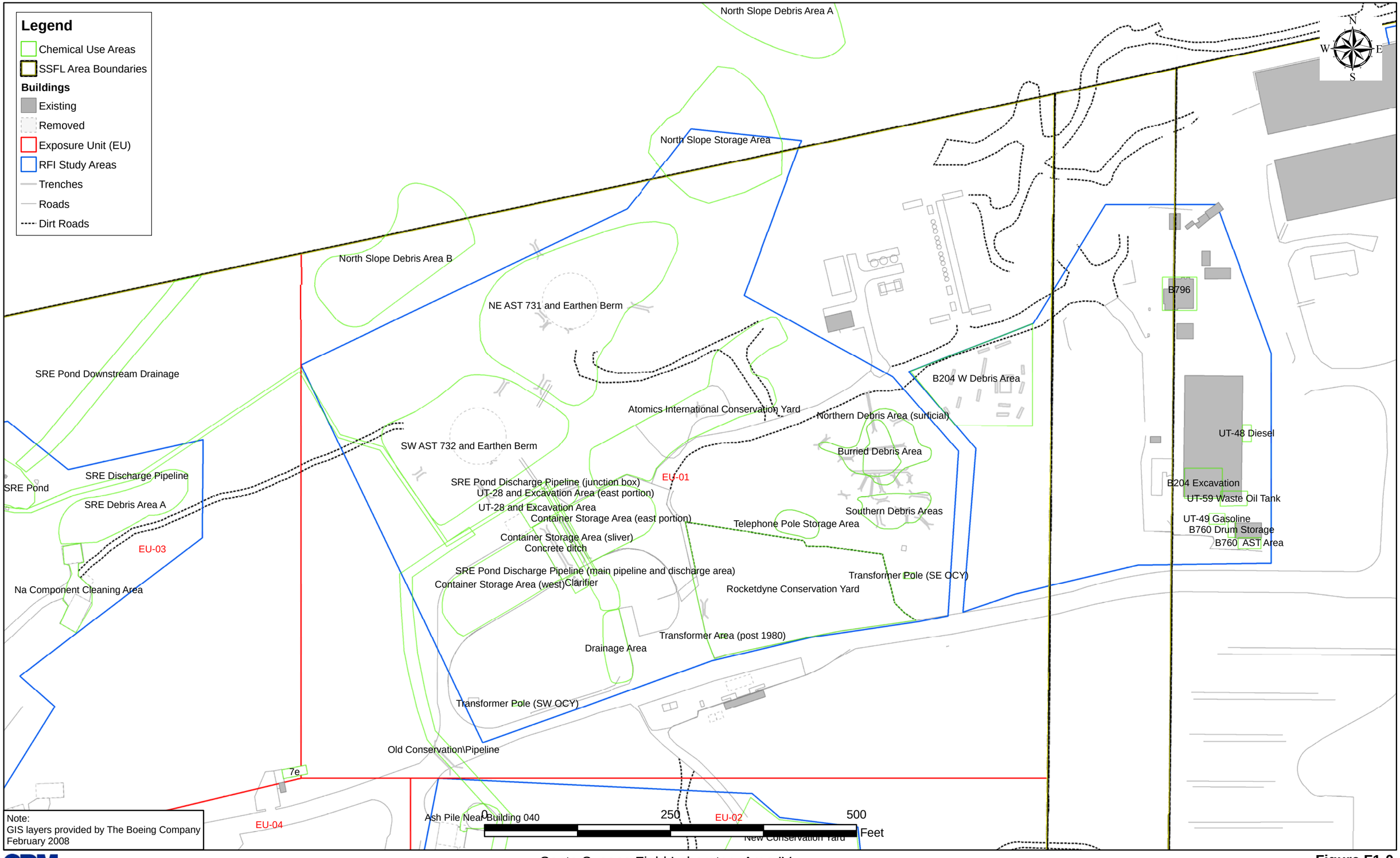
# Chemical and Radionuclide Contaminants of Interest Distribution Maps

# Appendix F
# Chemical and Radionuclide Contaminants of Interest Distribution Maps

Appendix F contains a series of maps indicating locations where samples have been collected for analysis of chemical and radiological chemicals of interest (COIs). In the case of chemicals, the color of the "sample dot" indicates if the concentrations of COIs exceed the Derived Concentration Guideline Level (DCGL). These maps are used as the basis for evaluating where additional data are needed for characterizing Chemical Use Areas that have not previously been characterized, delineating areas where chemicals have already been found at concentrations above DCGLs, or determining where samples should be collected in undeveloped areas within each Exposure Unit (EU) in order to fully characterize Area IV. For the radionuclide COIs, the sample dots are color coded to indicate the percentage of the DCGL that was exceeded by the sample result. These maps are used to delineate and classify the Survey Units (SUs) within each EU.

The maps are organized by EU and the first map within each "EU package of maps" indicates the Chemical Use Areas within the EU. All COIs within a chemical group are shown on two maps: one for the 0 to 2-foot depth and another for the 2 to 10-foot depth. The chemical groups include Volatile Organic Compounds (VOCs), Semi-volatile Organic Compound (SVOCs), Polychlorinated Biphenyls (PCBs), inorganic compounds (metals and cyanide) and Dioxin. A map showing the distribution of the radionuclide COIs follows the chemical distribution maps.

It is important to note that these maps represent data for particular chemicals that are included in the Database at a particular point in time and they only represent data present in the data base, subject to the review and corrections discussed in Section 3.1.3. Data for samples collected from soil that has been removed from the site (through a removal action) prior to the start of the Data Gap Analysis, are not included in the Database, and these sample locations are not shown. Only data for COIs within each chemical class are shown. Similarly, the color of the sample dot is relative to the specific screening criteria used in this EIS Data Gaps Analysis.

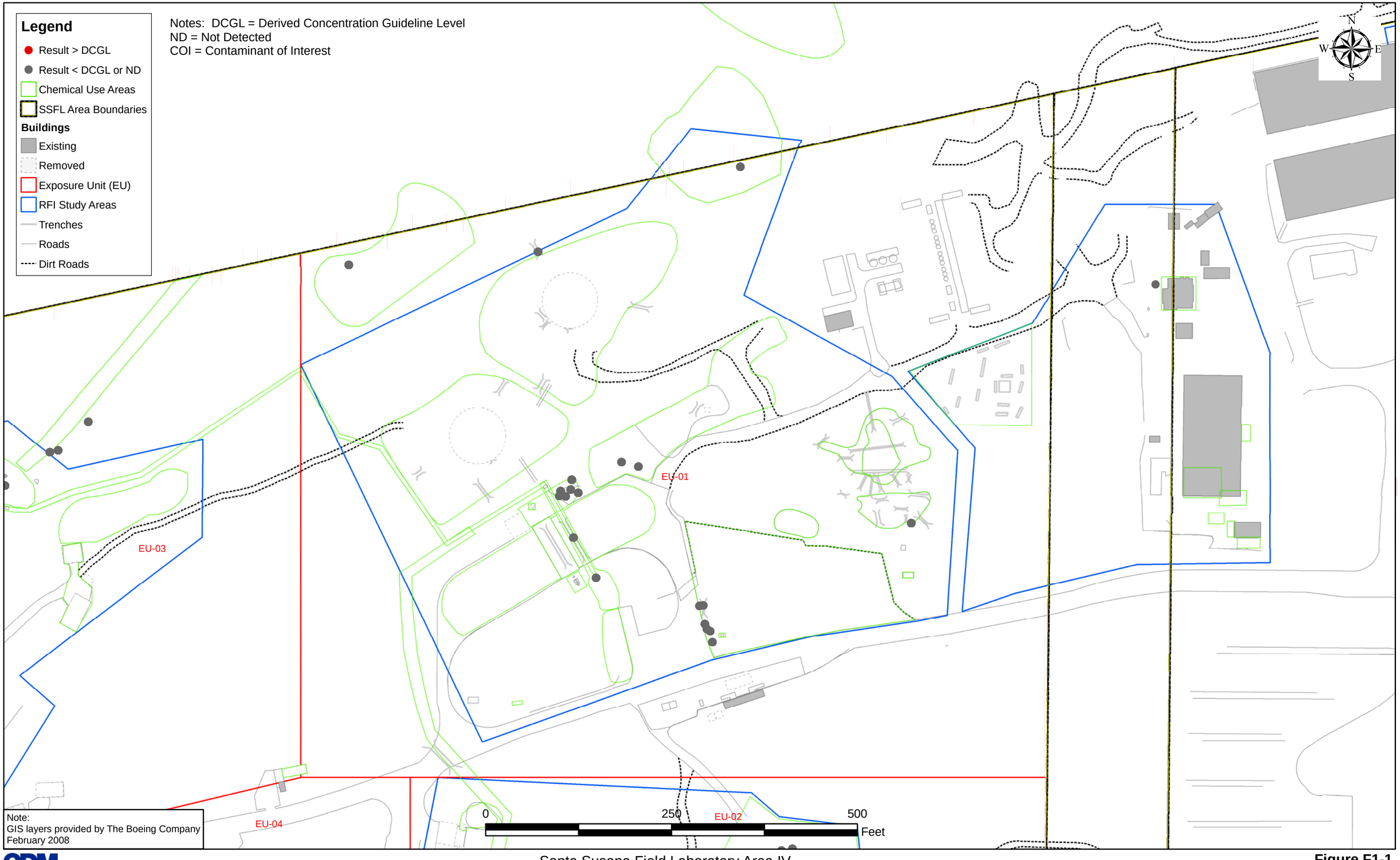



Note:
GIS layers provided by The Boeing Company
February 2008

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Santa Susana Field Laboratory Area IV
Ventura County, California

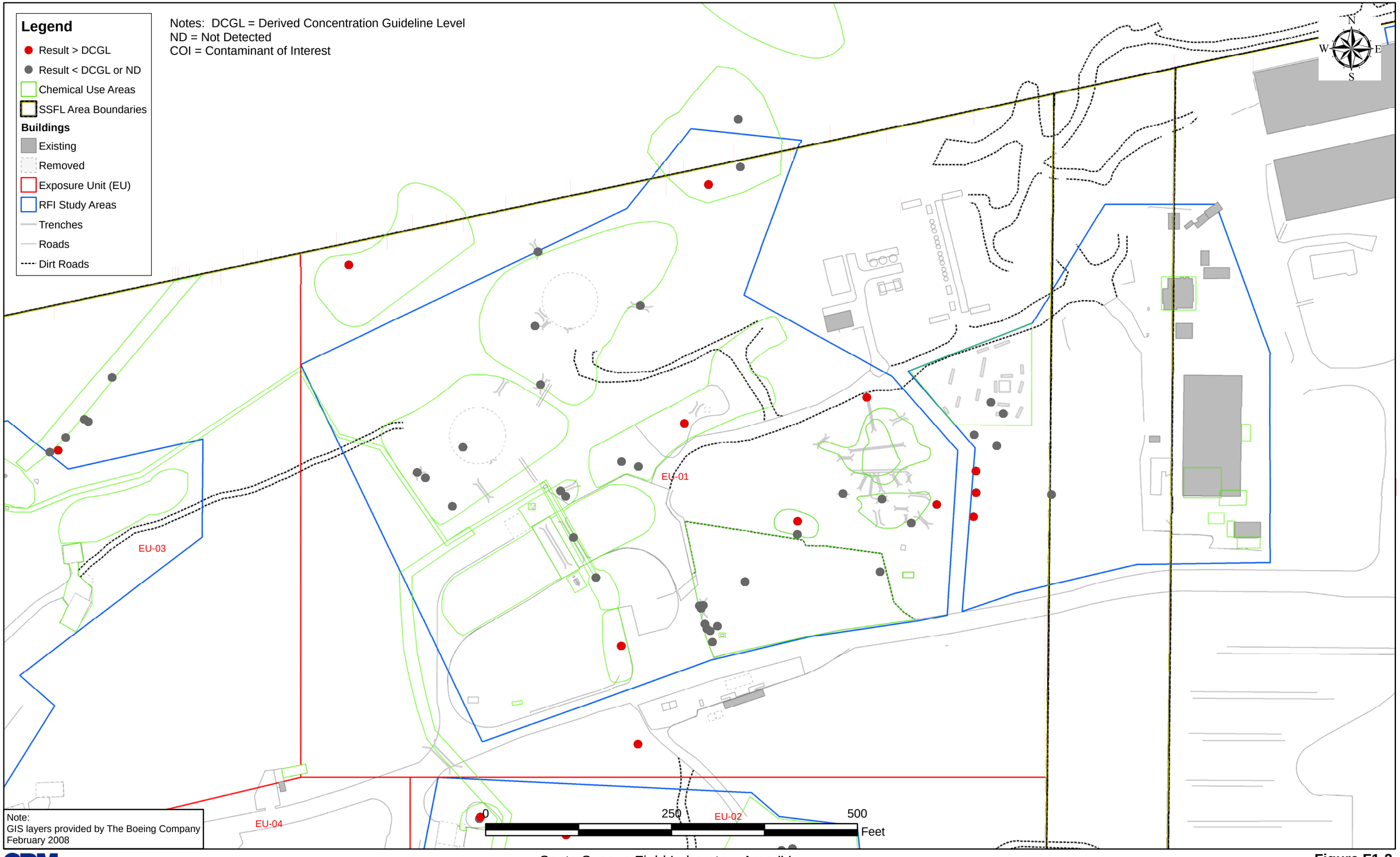
**Figure F1-0**
**EU-01 Chemical Use Areas**




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Santa Susana Field Laboratory Area IV
Ventura County, California

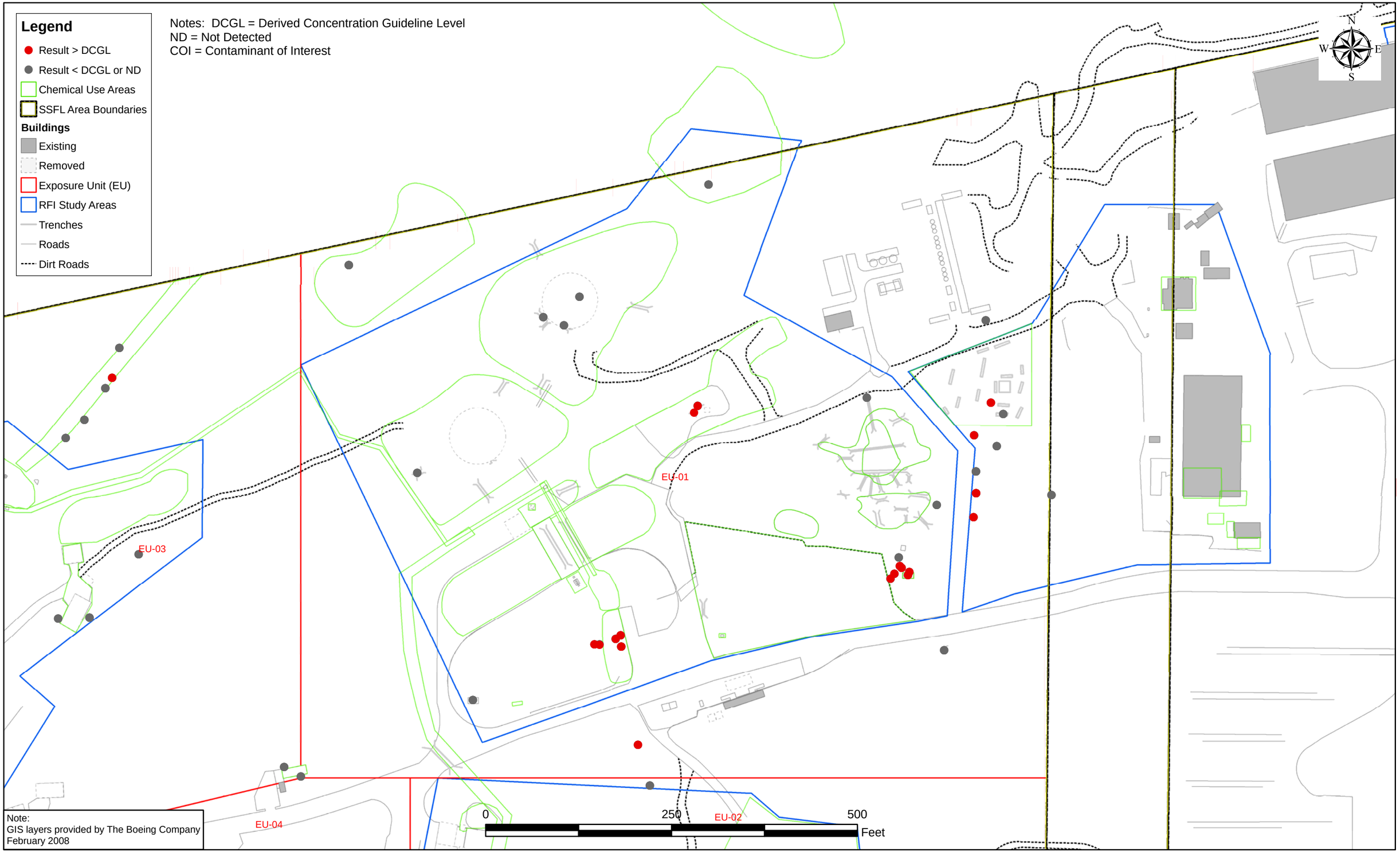
**Figure F1-1**
**VOC COIs in Soils - EU-01**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

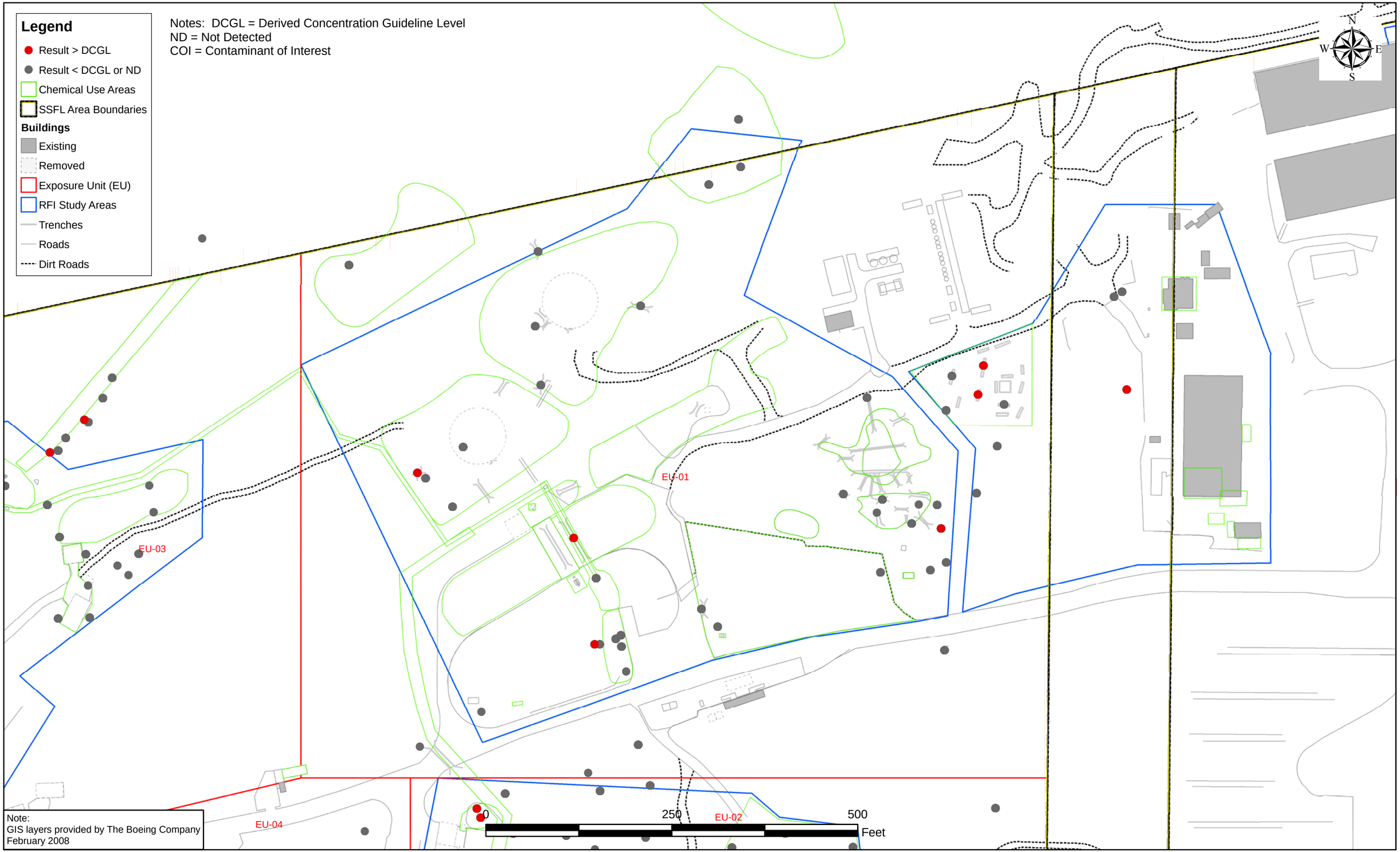
**Figure F1-2**
**SVOC COIs in Soils - EU-01**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

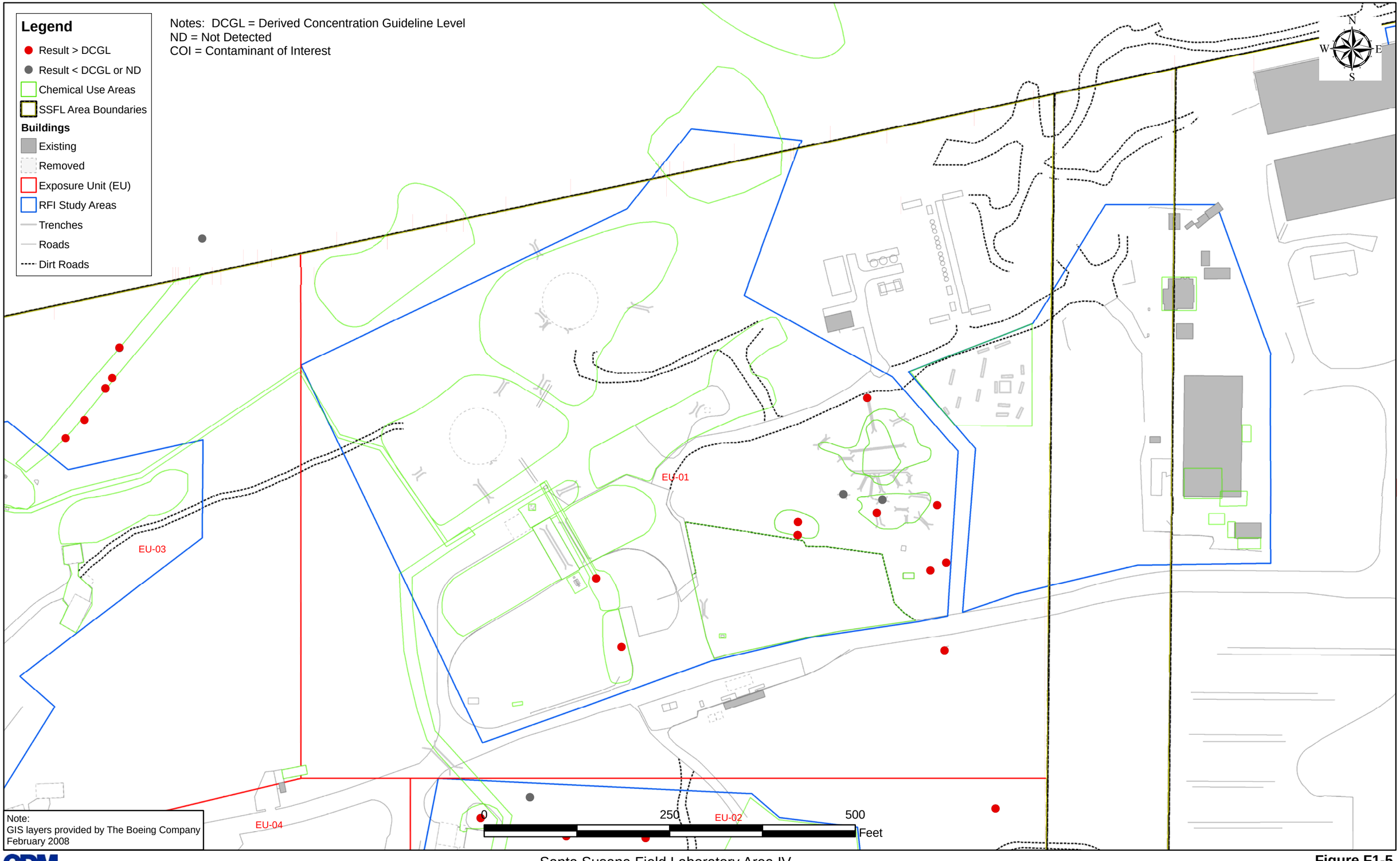
**Figure F1-3**
**PCB COIs in Soils - EU-01**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

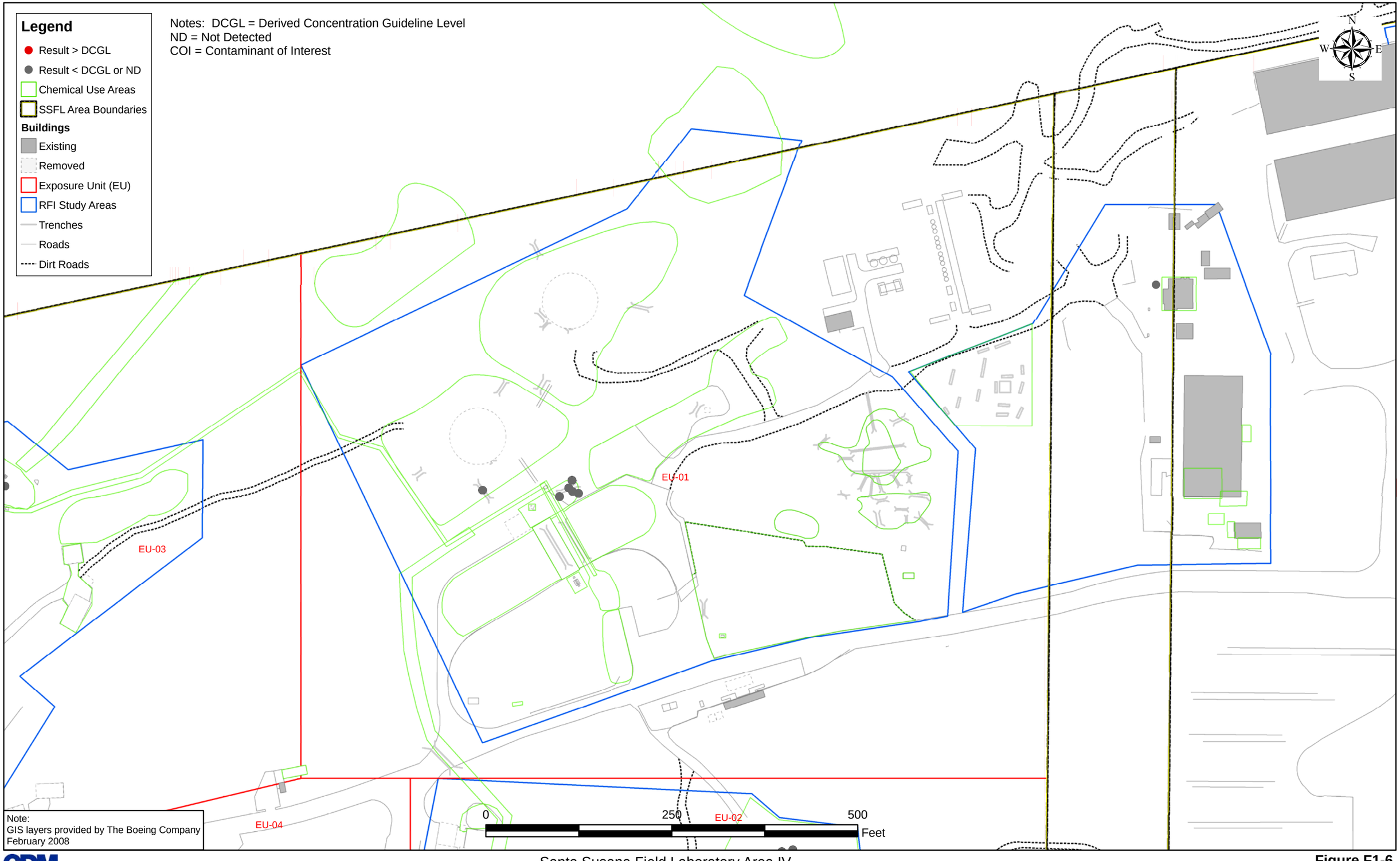
**Figure F1-4**
**Inorganic COIs in Soils - EU-01**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

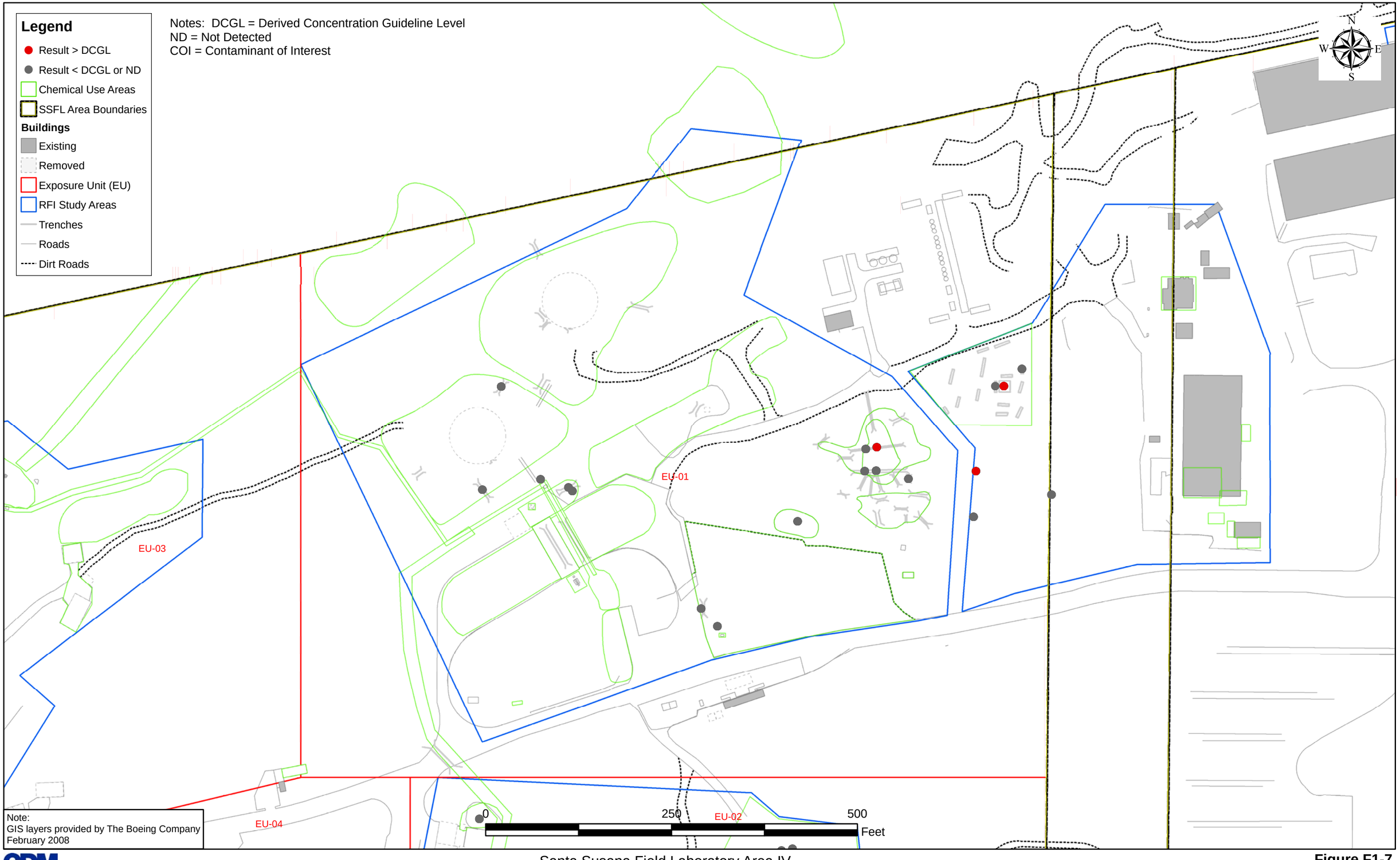
**Figure F1-5**
**Dioxin COIs in Soils - EU-01**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

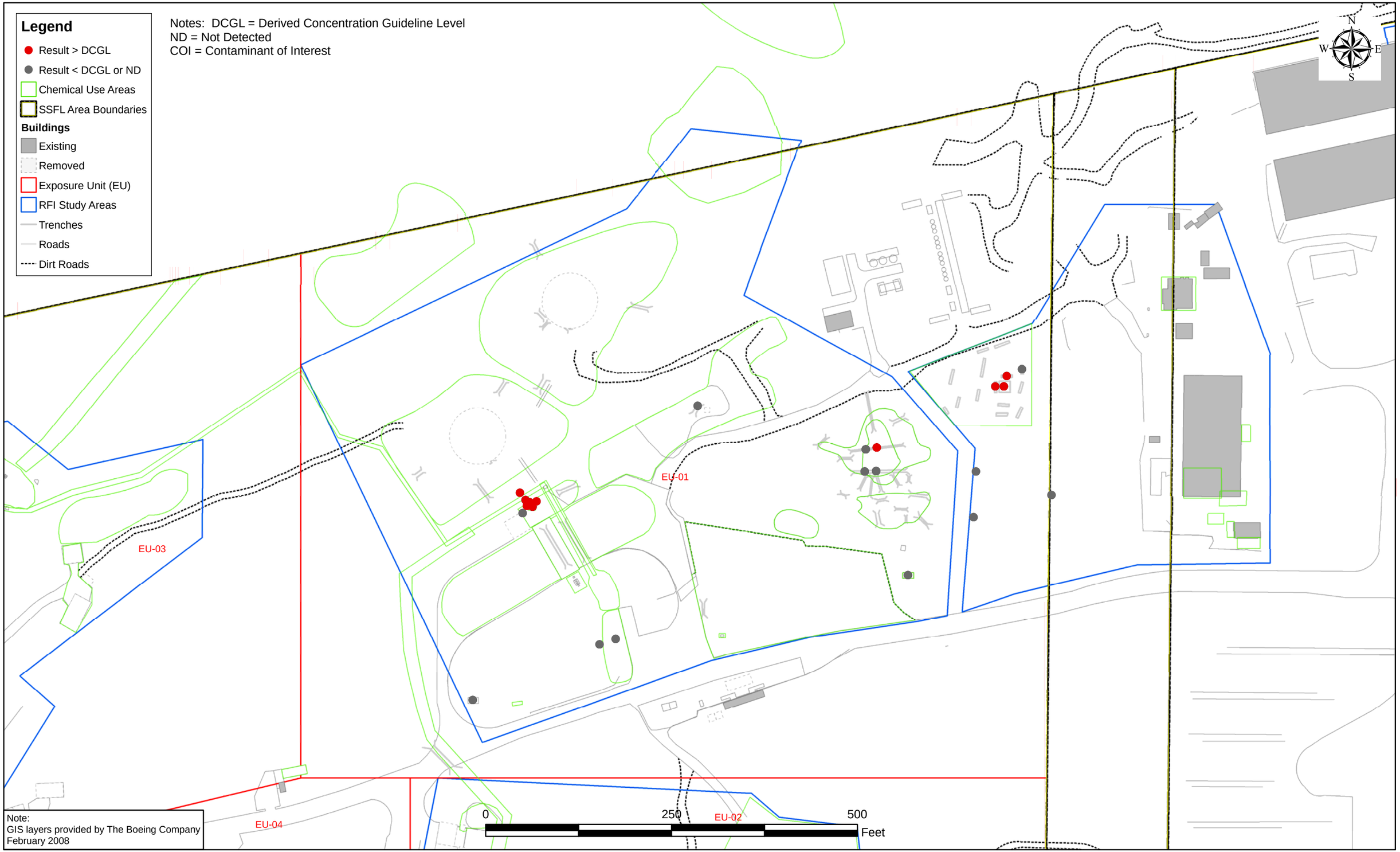
**Figure F1-6**
**VOC COIs in Soils - EU-01**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

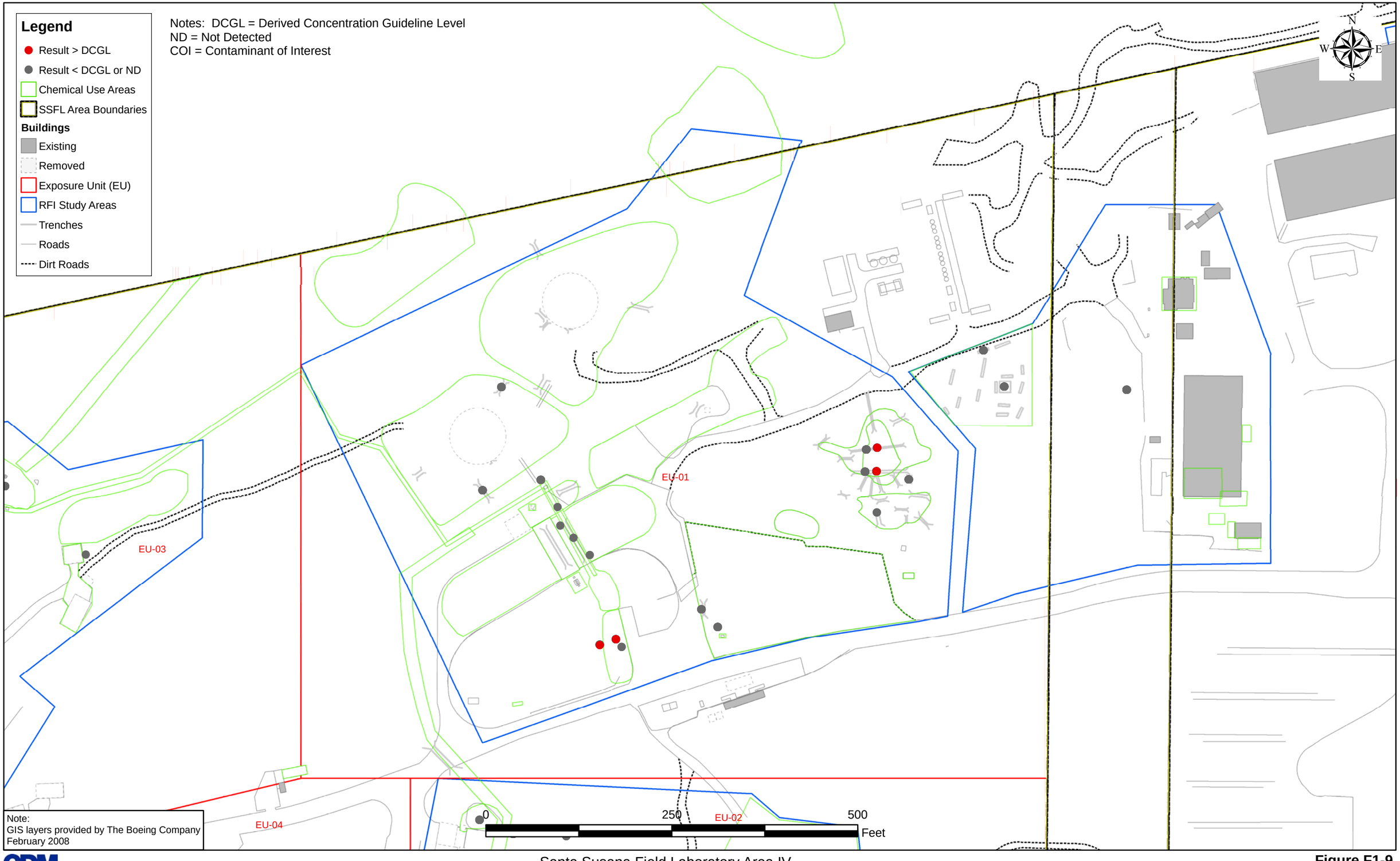
**Figure F1-7**
**SVOC COIs in Soils - EU-01**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

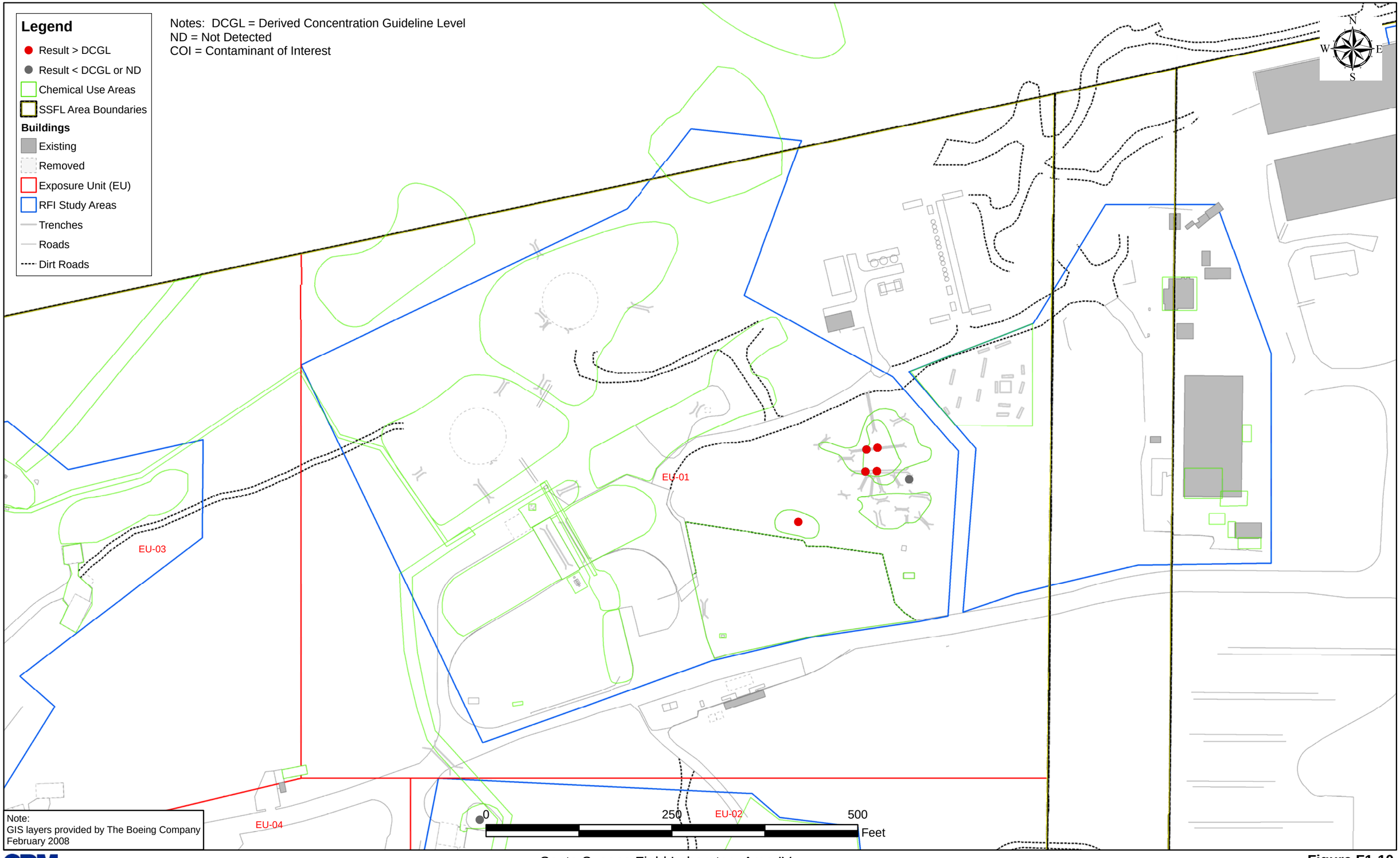
**Figure F1-8**
**PCB COIs in Soils - EU-01**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

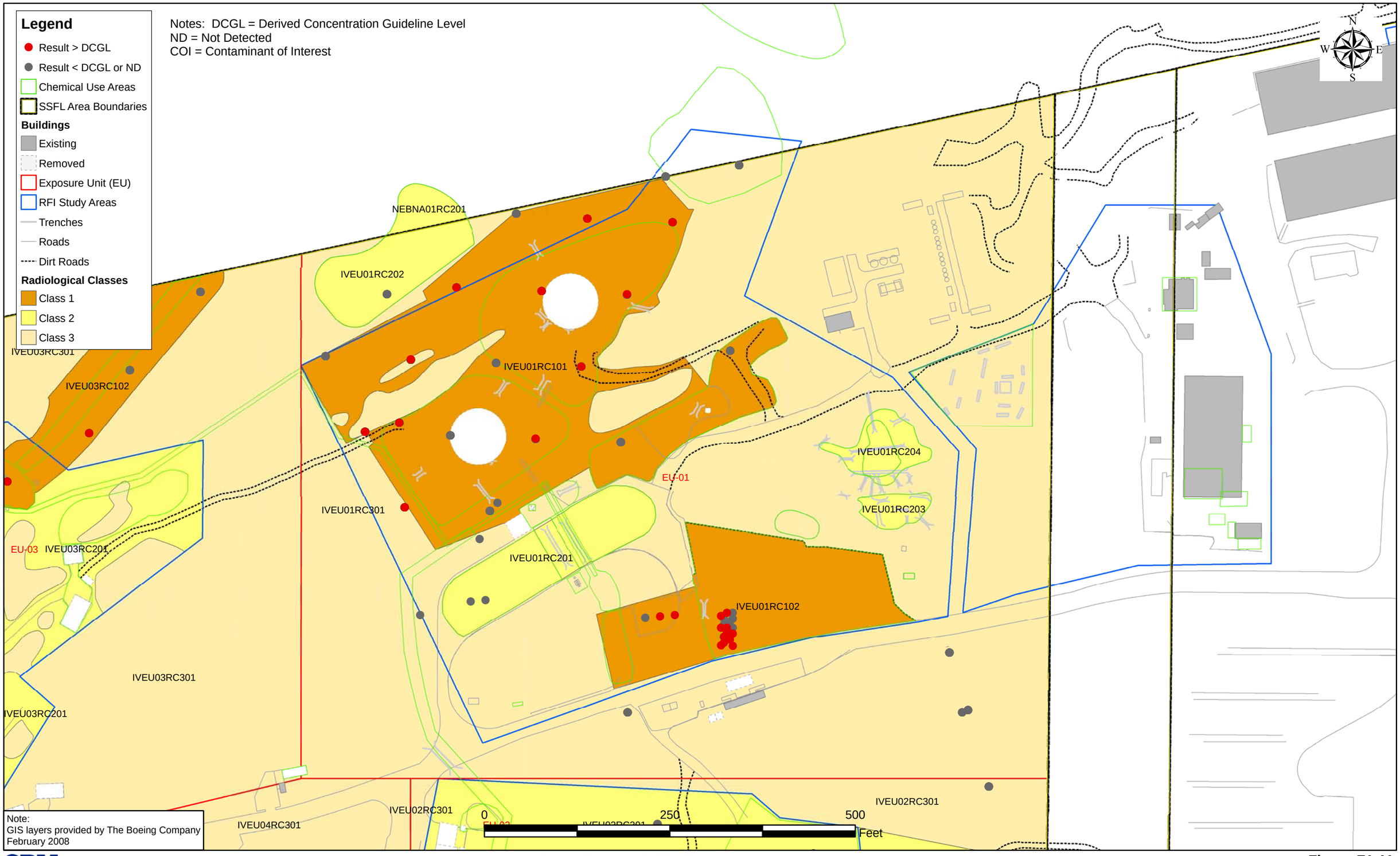
**Figure F1-9**
**Inorganic COIs in Soils - EU-01**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

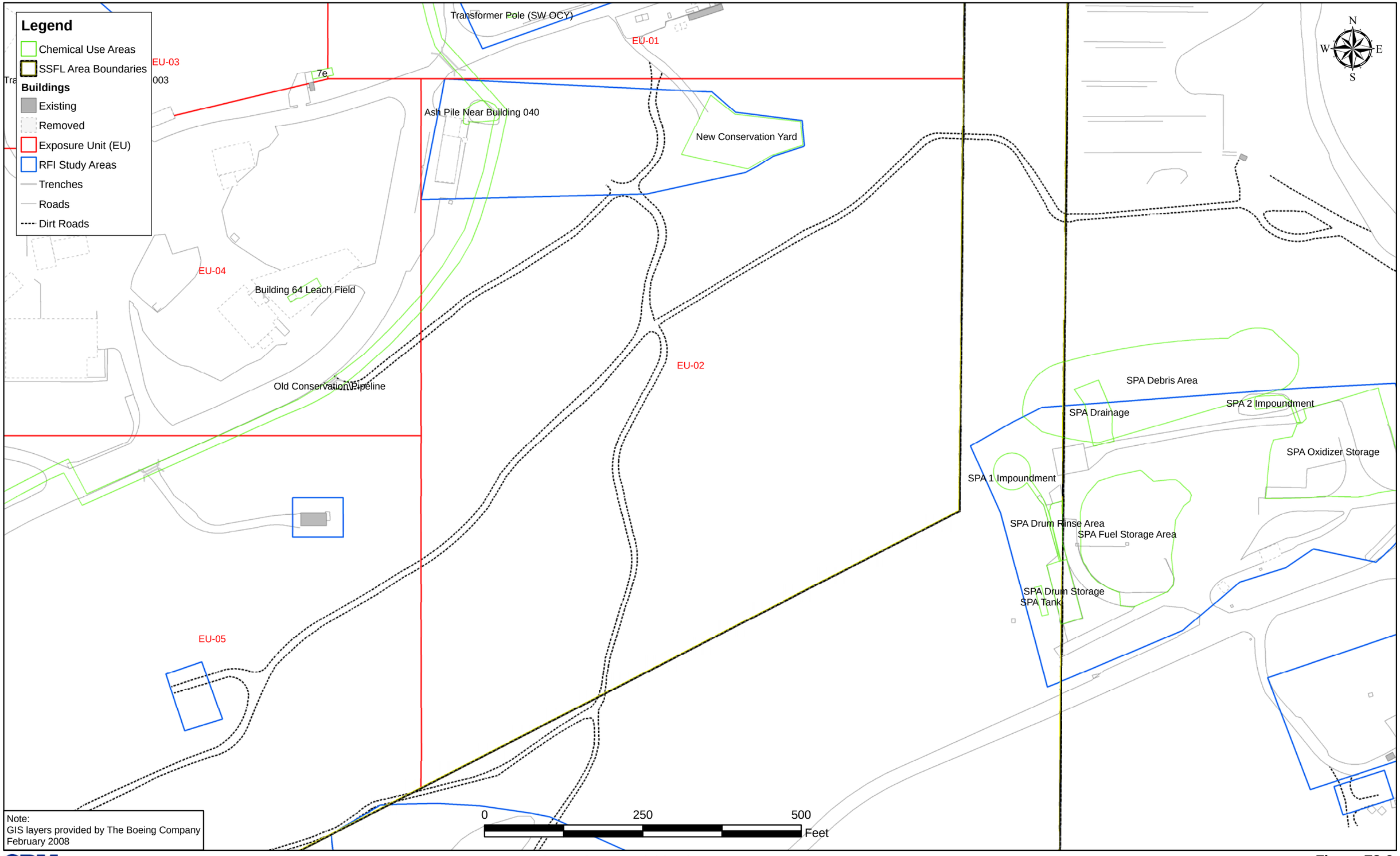
**Figure F1-10**
**Dioxin COIs in Soils - EU-01**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

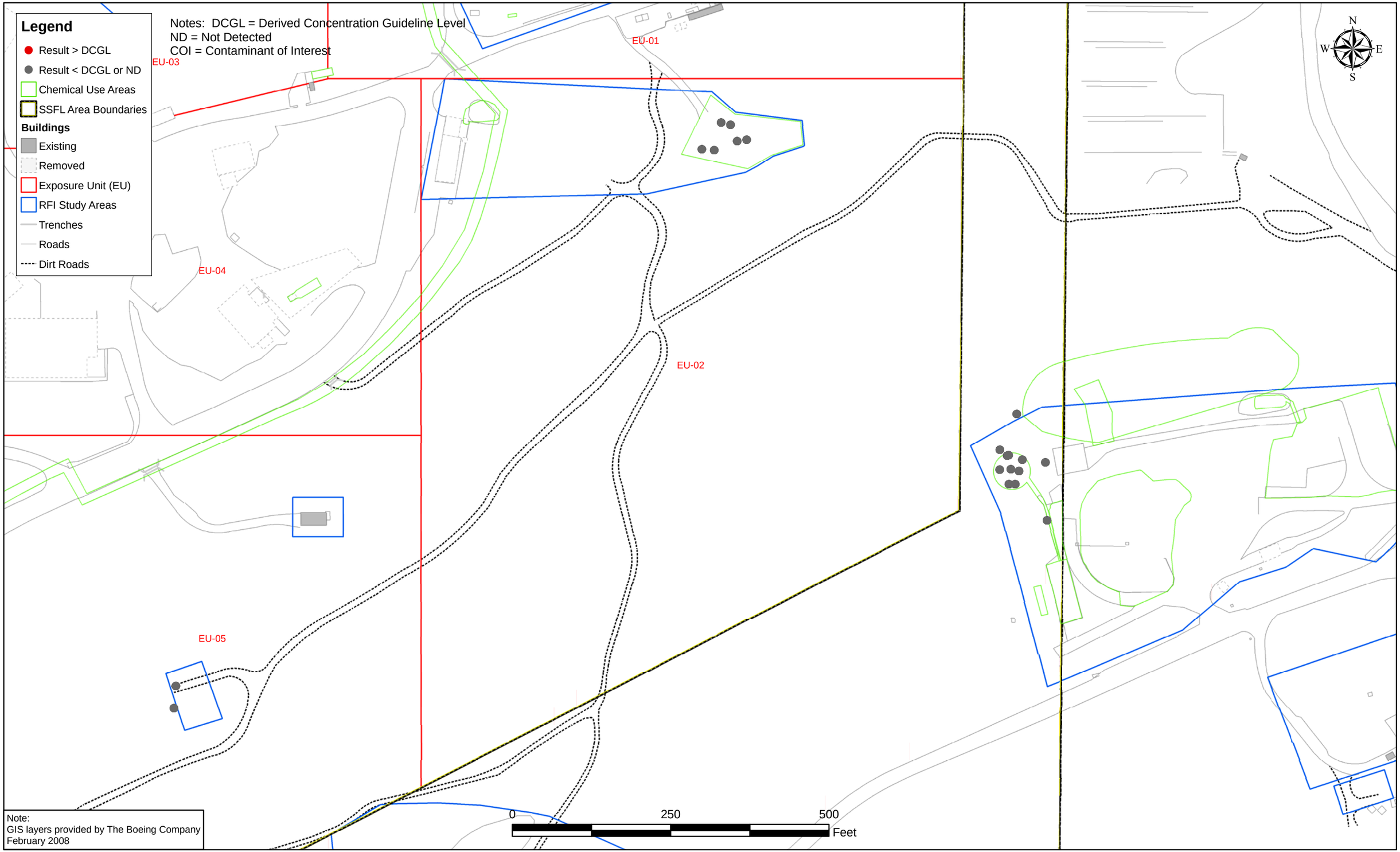
**Figure F1-11**
**Radiological COIs in Soils - EU-01**
**(0-6 in bgs)**




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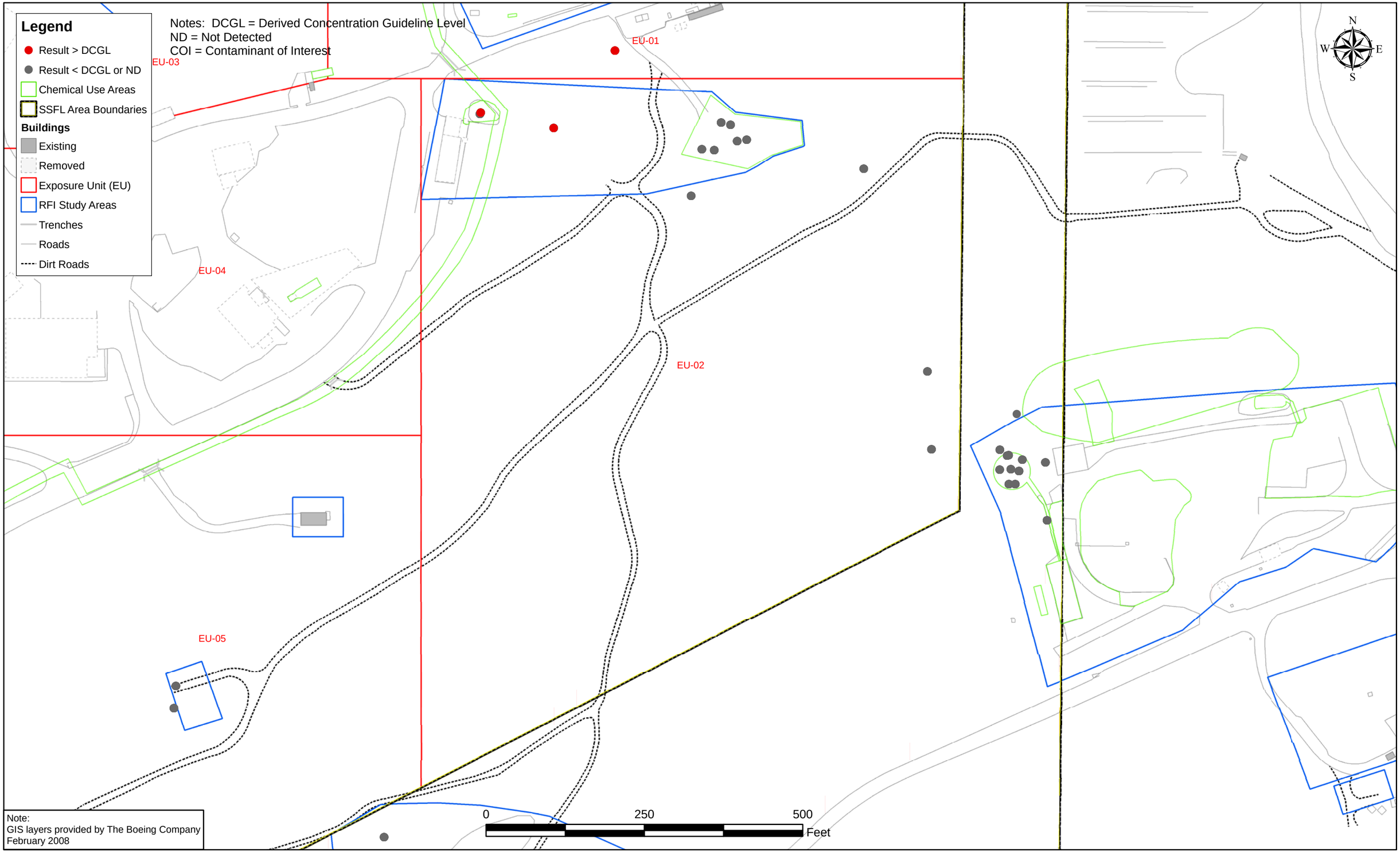
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F2-0**
**EU-02 Chemical Use Areas**



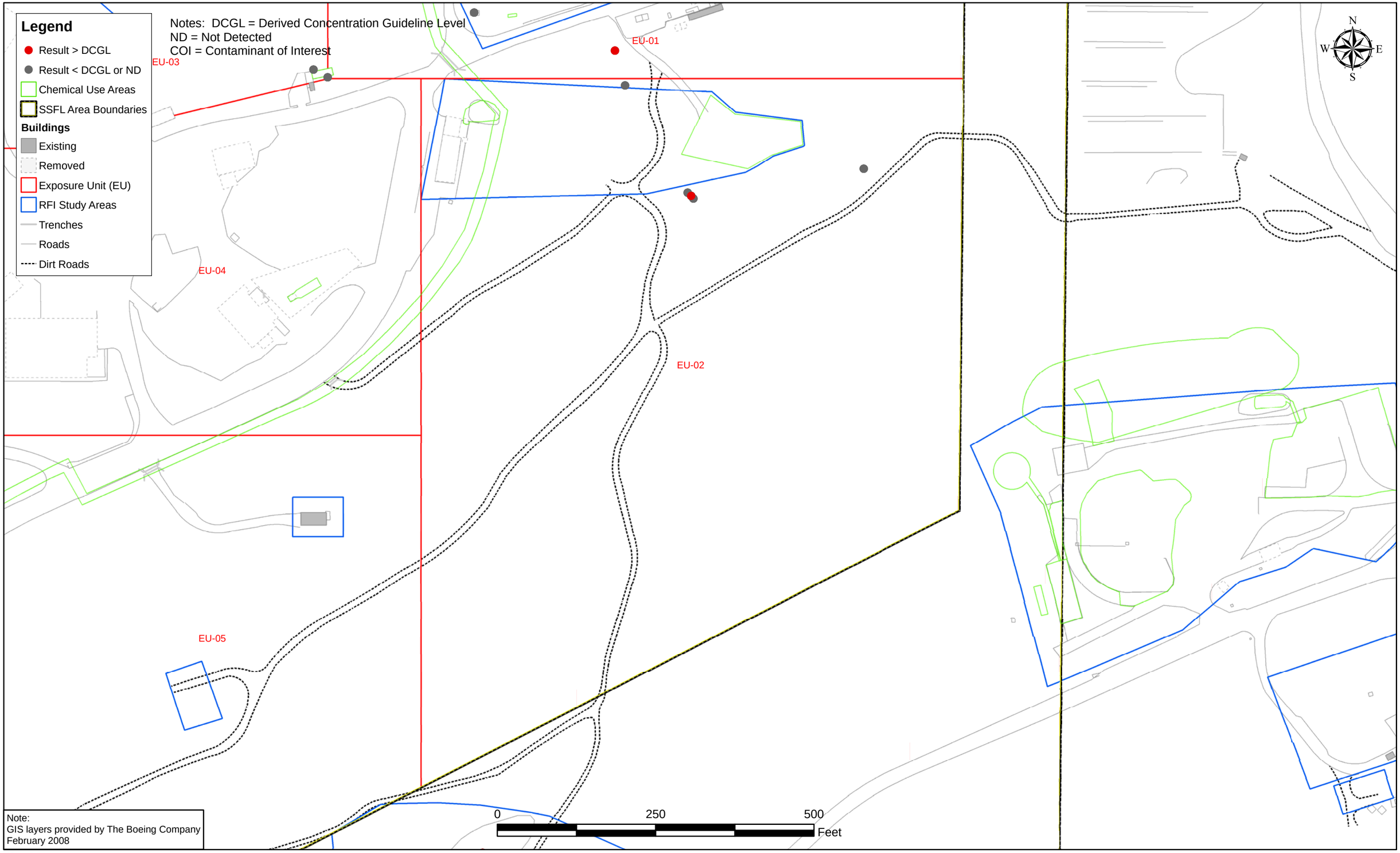

Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F2-1**
**VOC COIs in Soils - EU-02**
**(0-2 ft bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

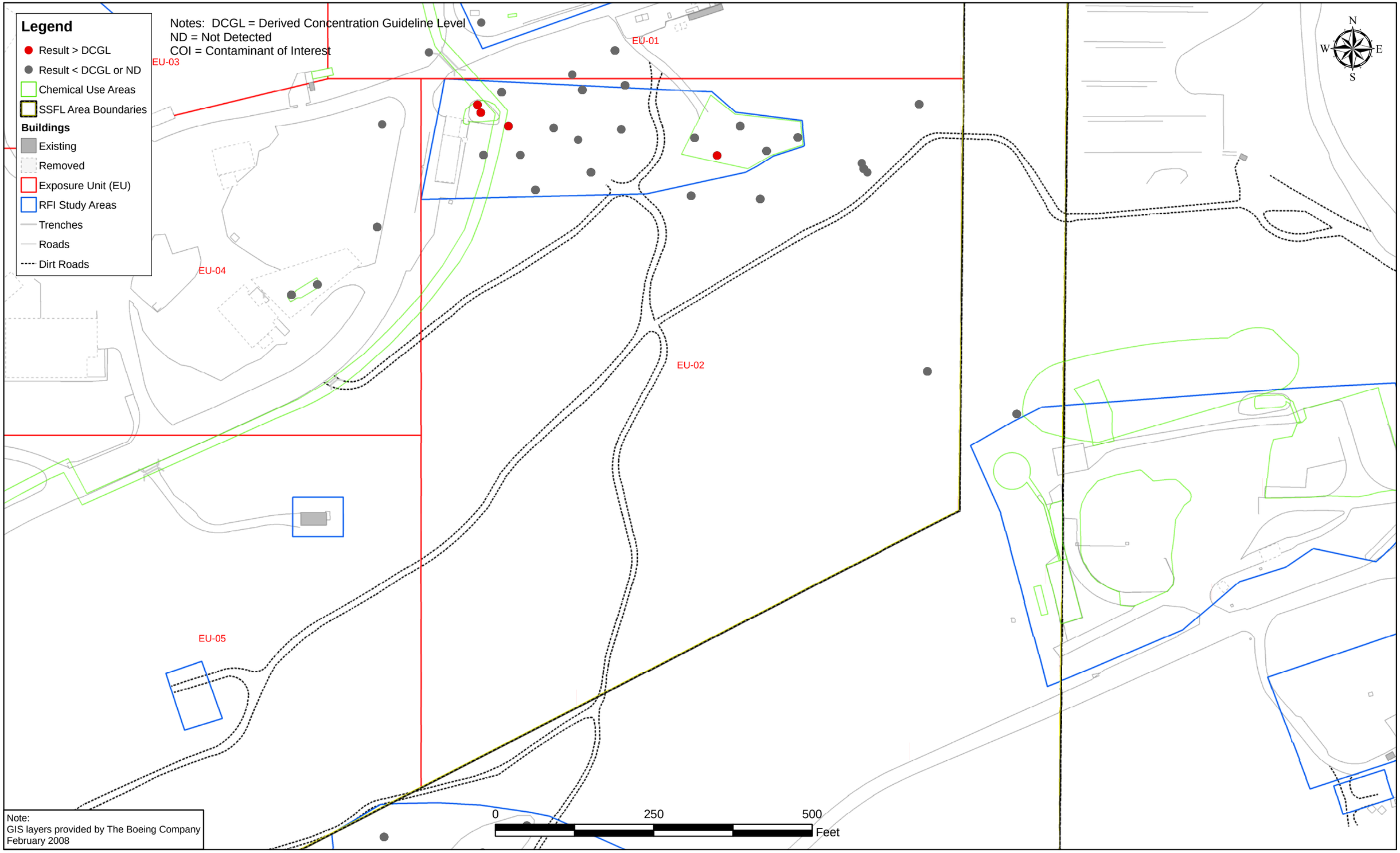
**Figure F2-2**
**SVOC COIs in Soils - EU-02**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

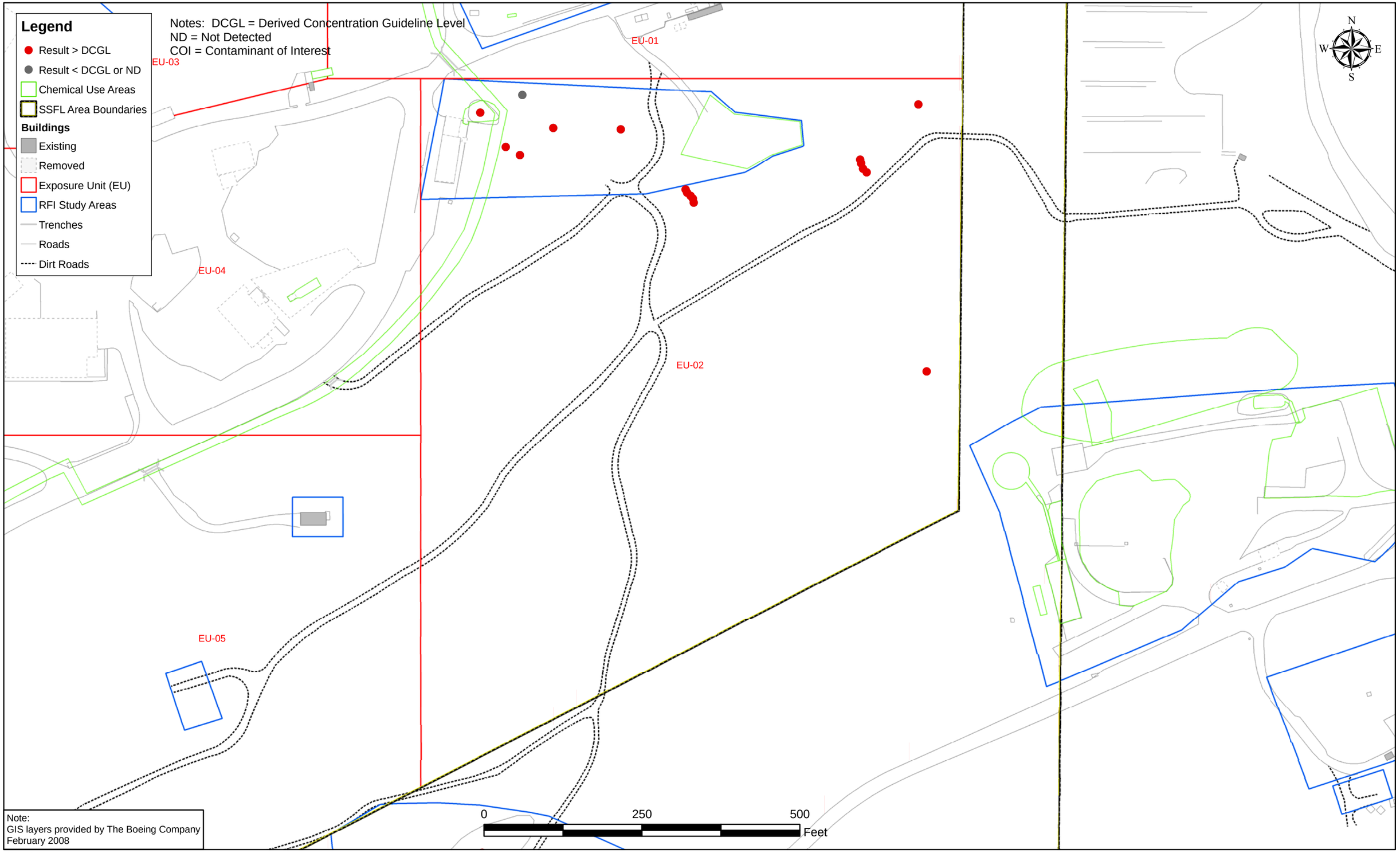
**Figure F2-3**
**PCB COIs in Soils - EU-02**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

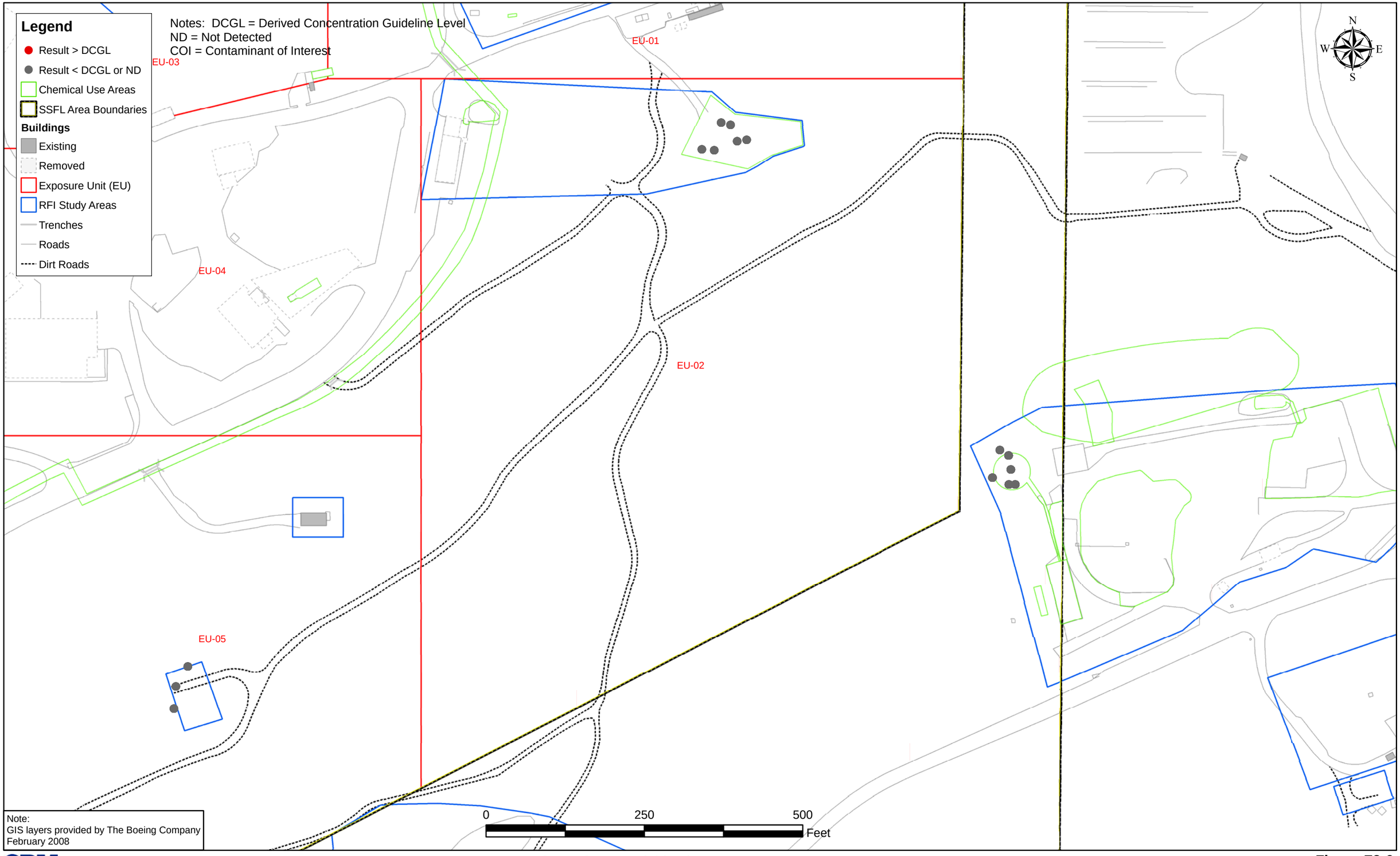
**Figure F2-4**
**Inorganic COIs in Soils - EU-02**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

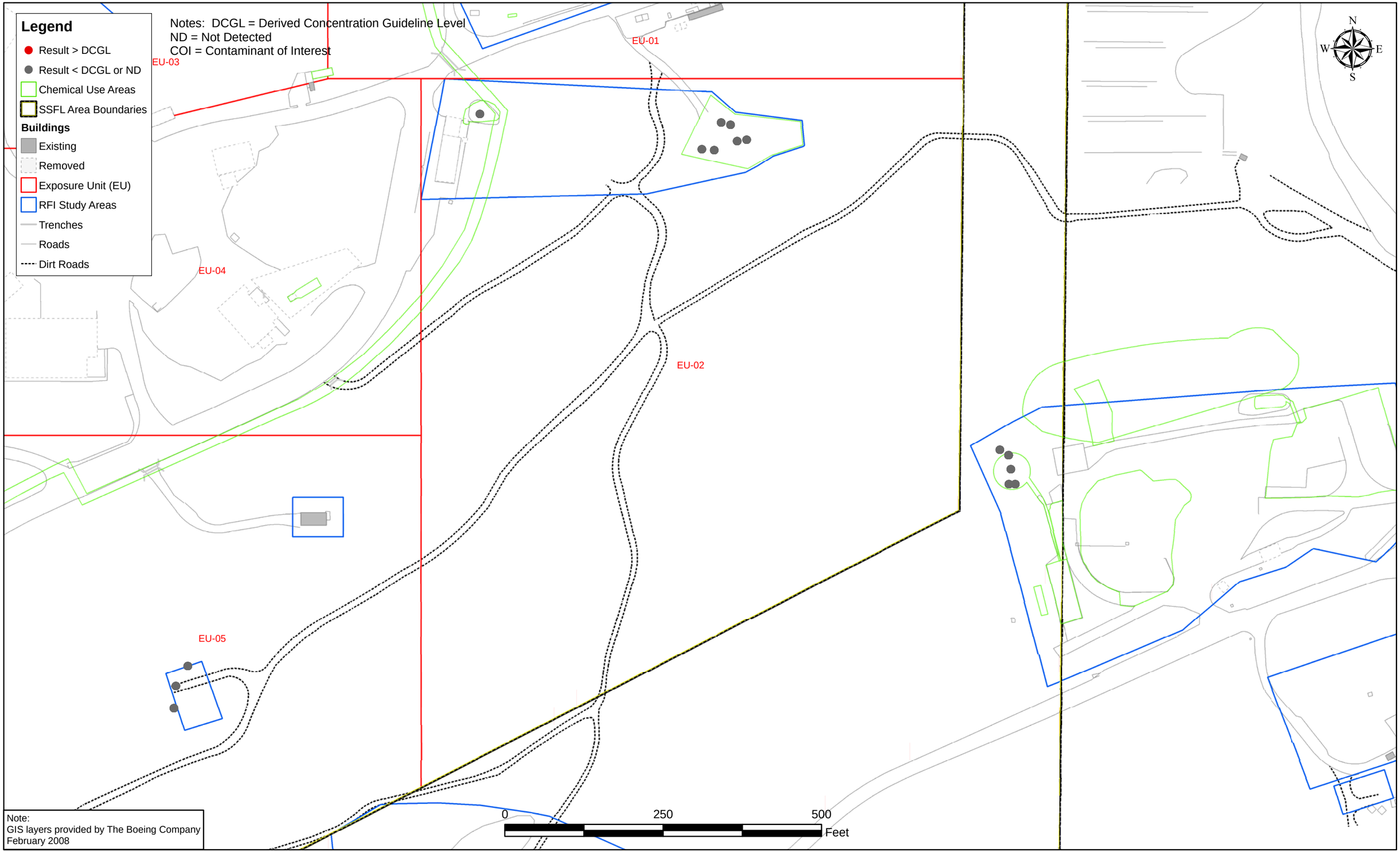
**Figure F2-5**
**Dioxin COIs in Soils - EU-02**
**(0-2 ft bgs)**




CDM

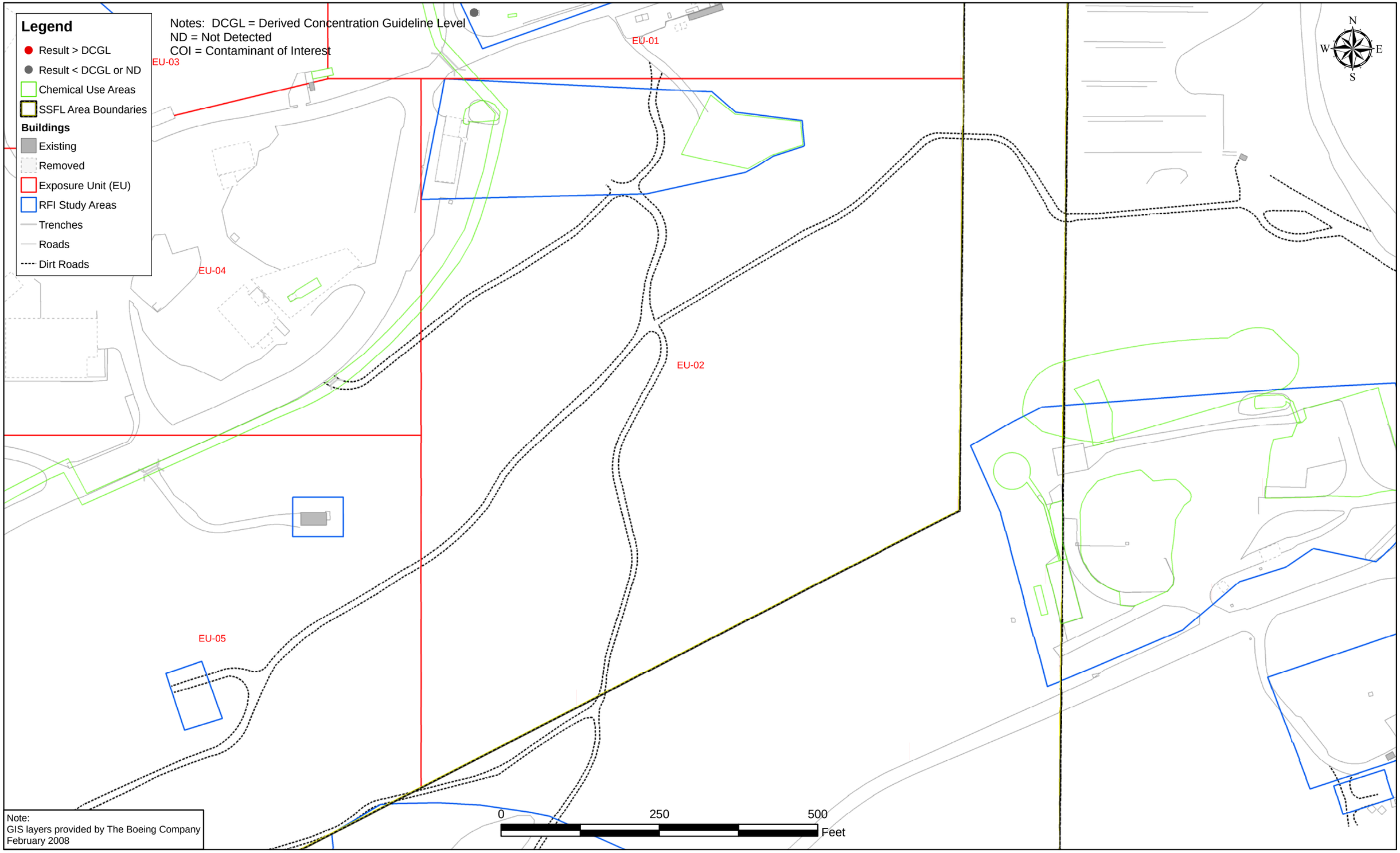
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F2-6**
**VOC COIs in Soils - EU-02**
**(2-10 ft bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

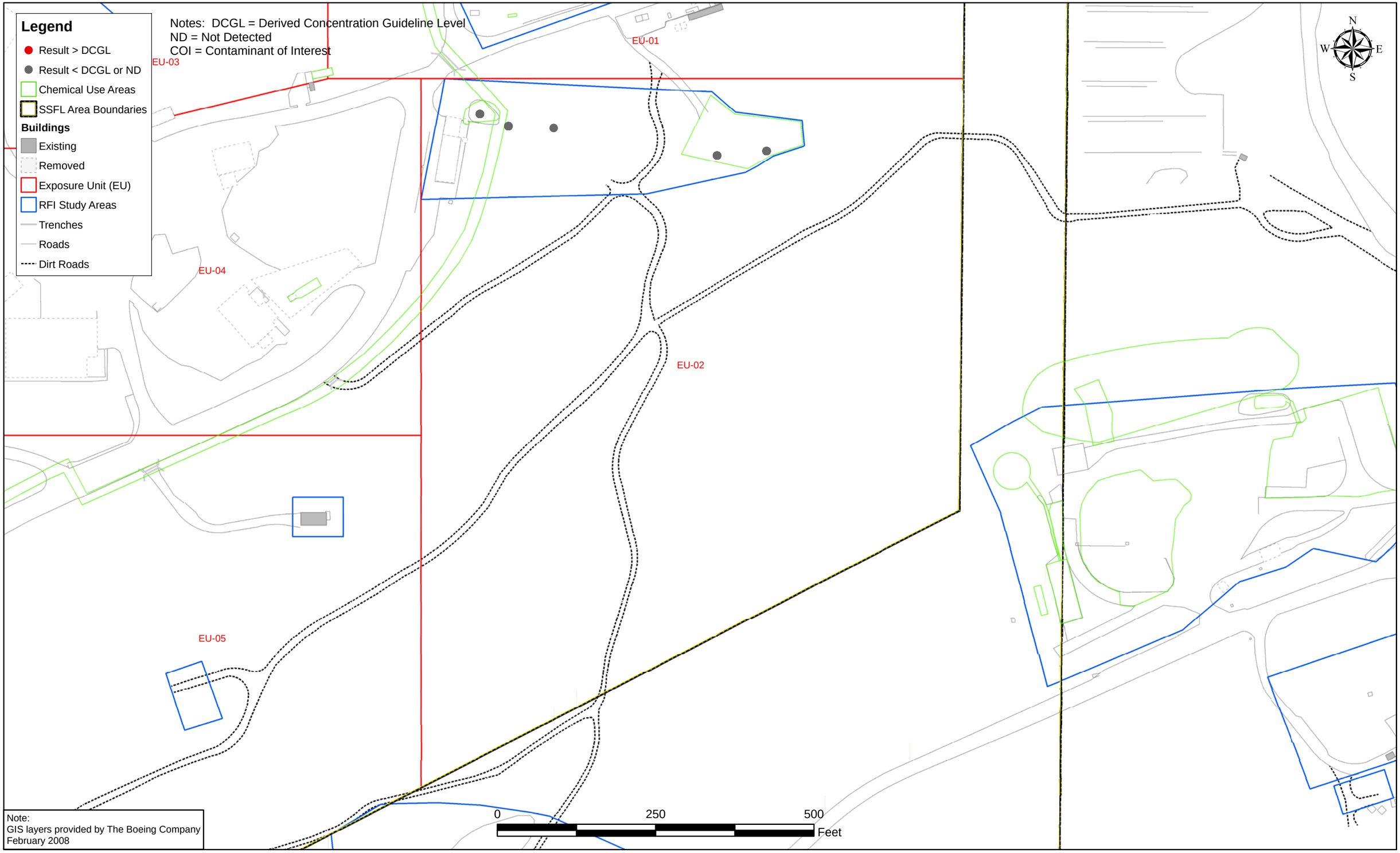
**Figure F2-7**
**SVOC COIs in Soils - EU-02**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

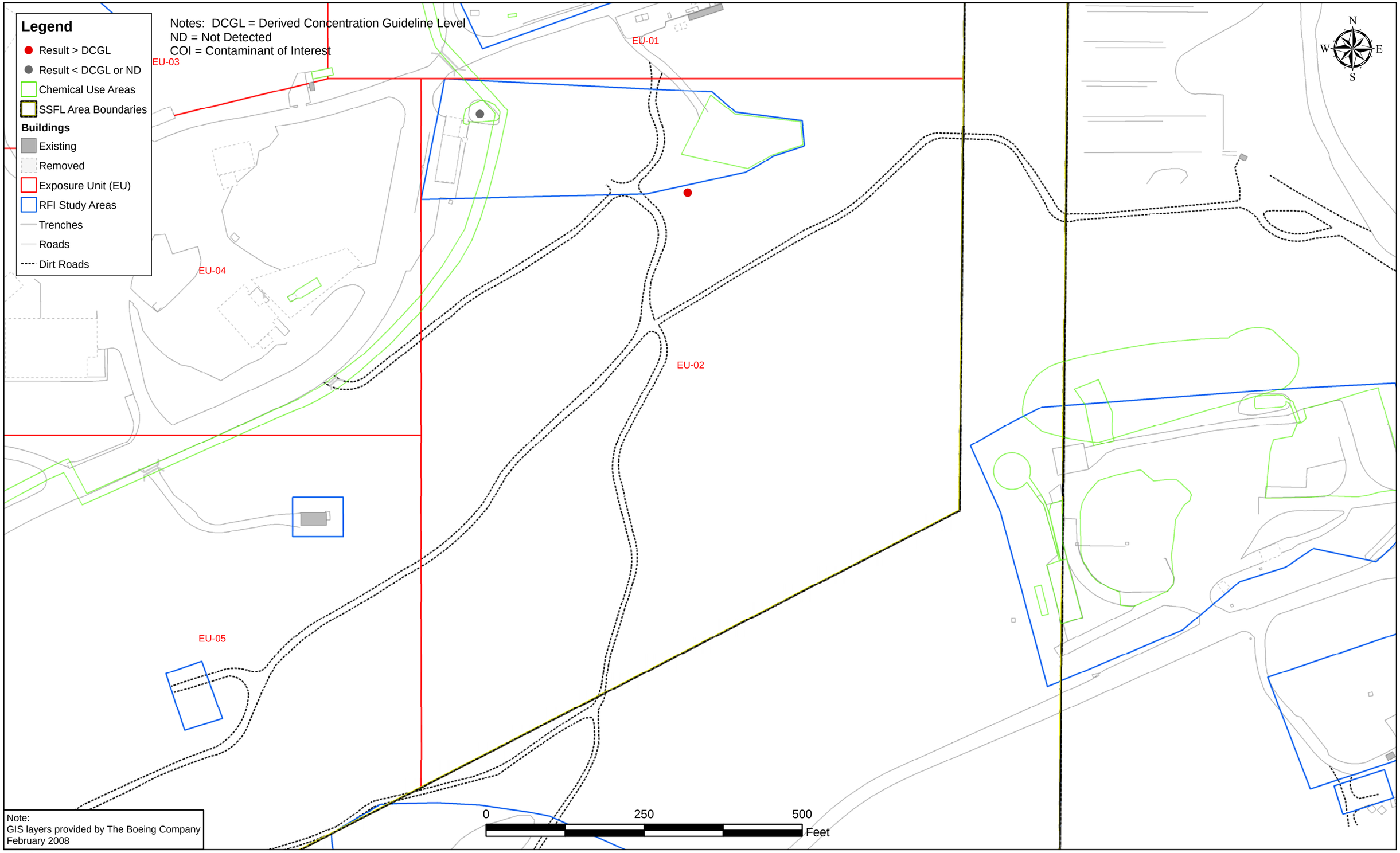
**Figure F2-8**
**PCB COIs in Soils - EU-02**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

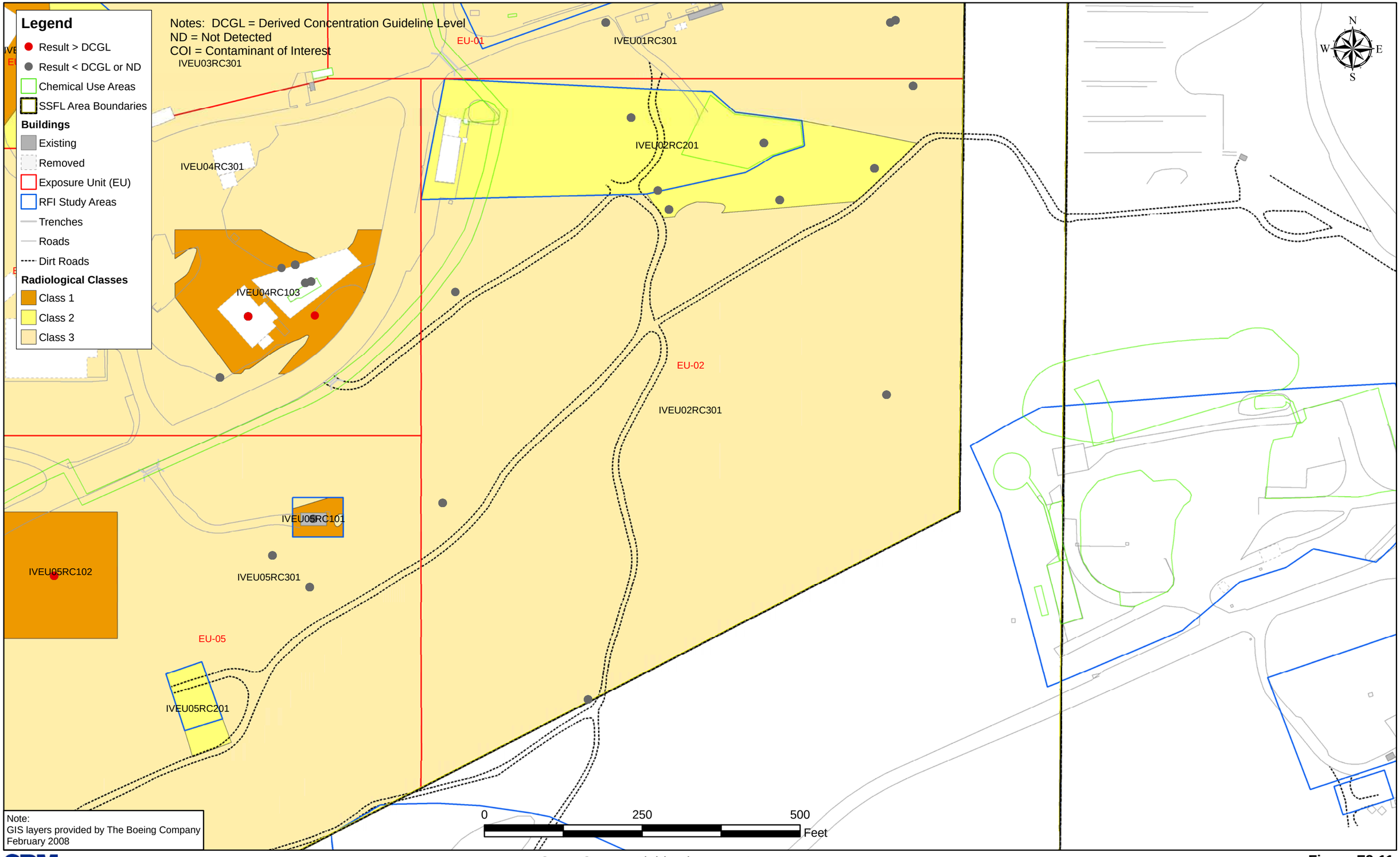
**Figure F2-9**
**Inorganic COIs in Soils - EU-02**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

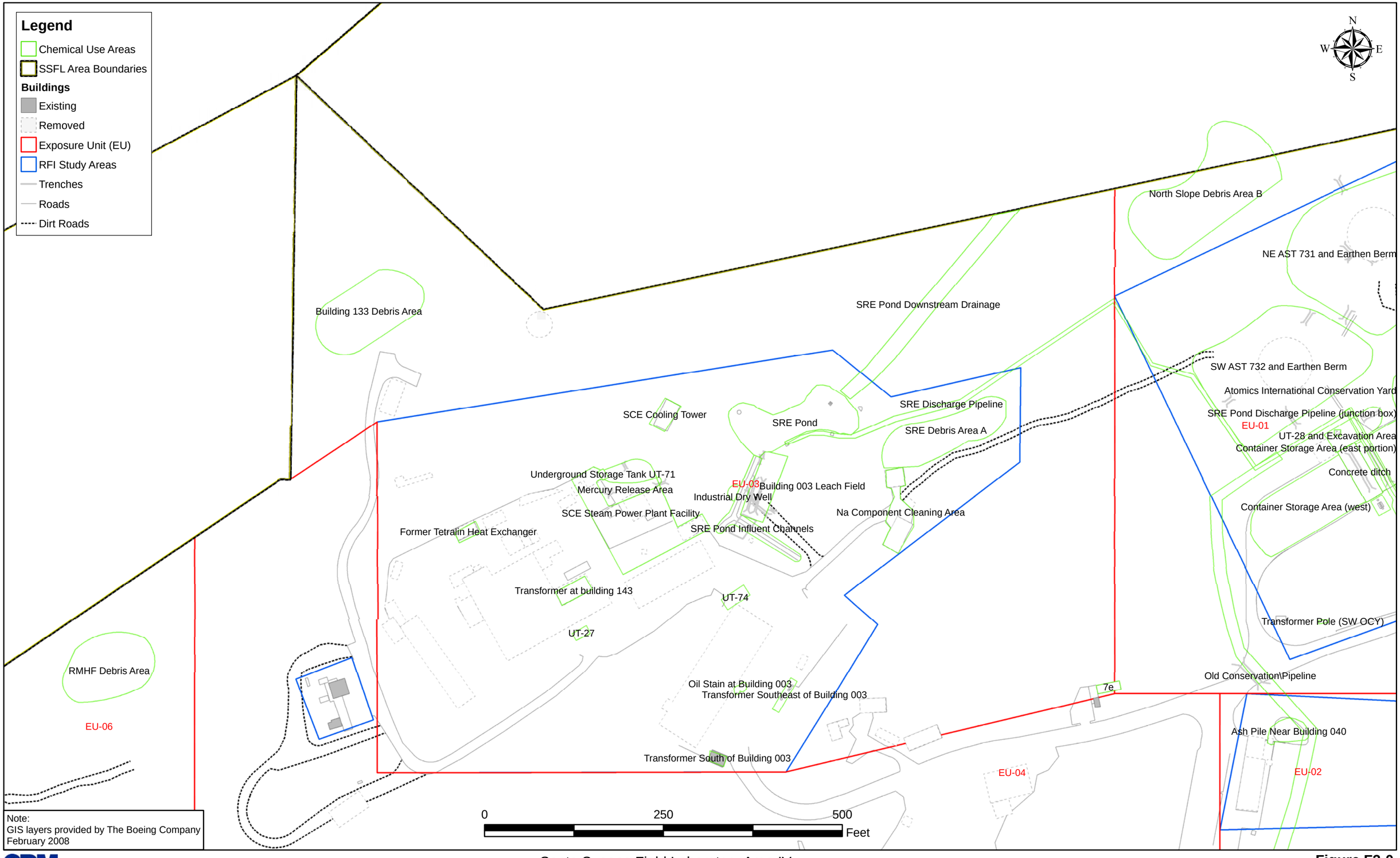
**Figure F2-10**
**Dioxin COIs in Soils - EU-02**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

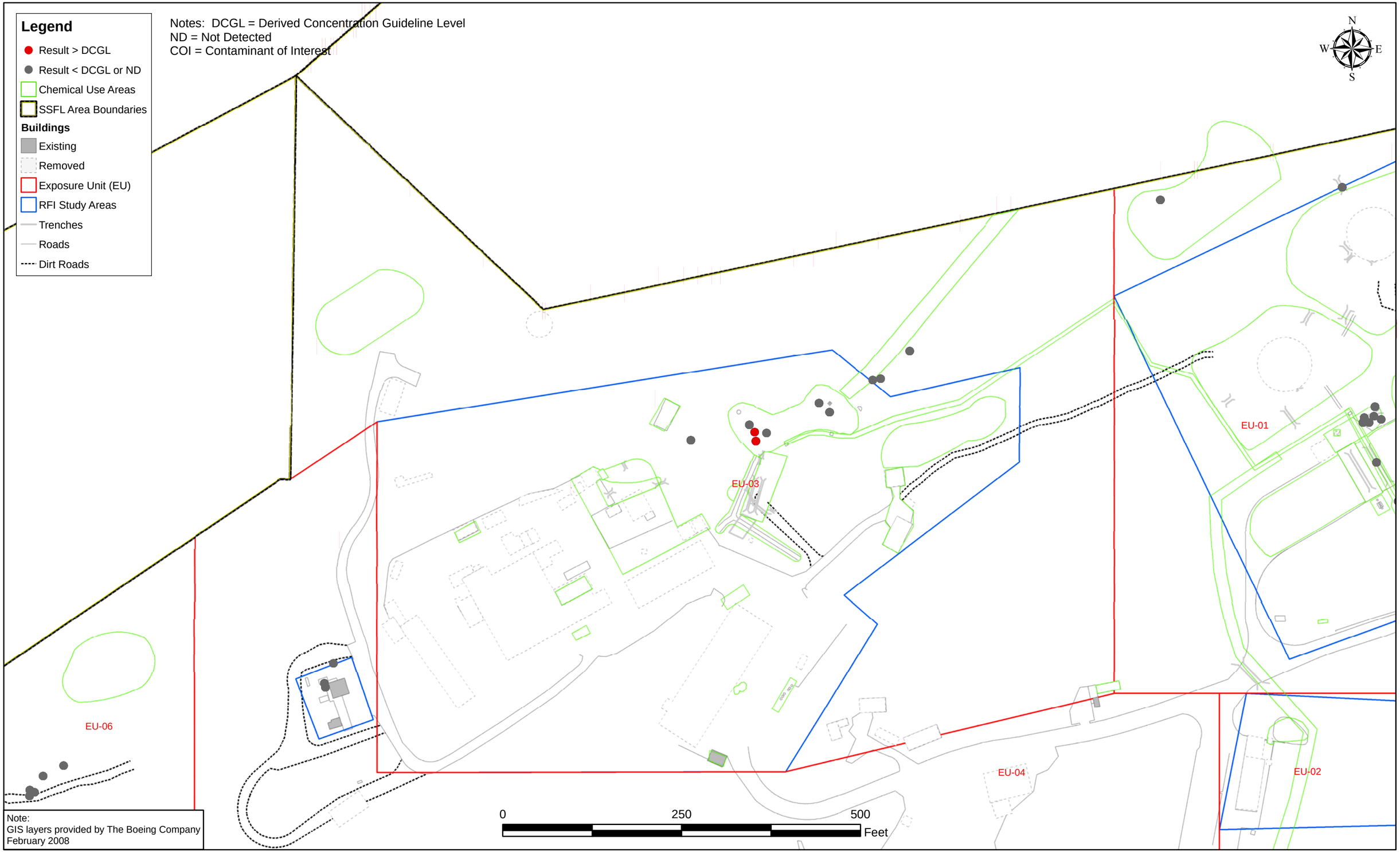
**Figure F2-11**
**Radiological COIs in Soils - EU-02**
**(0-6 in bgs)**




CDM

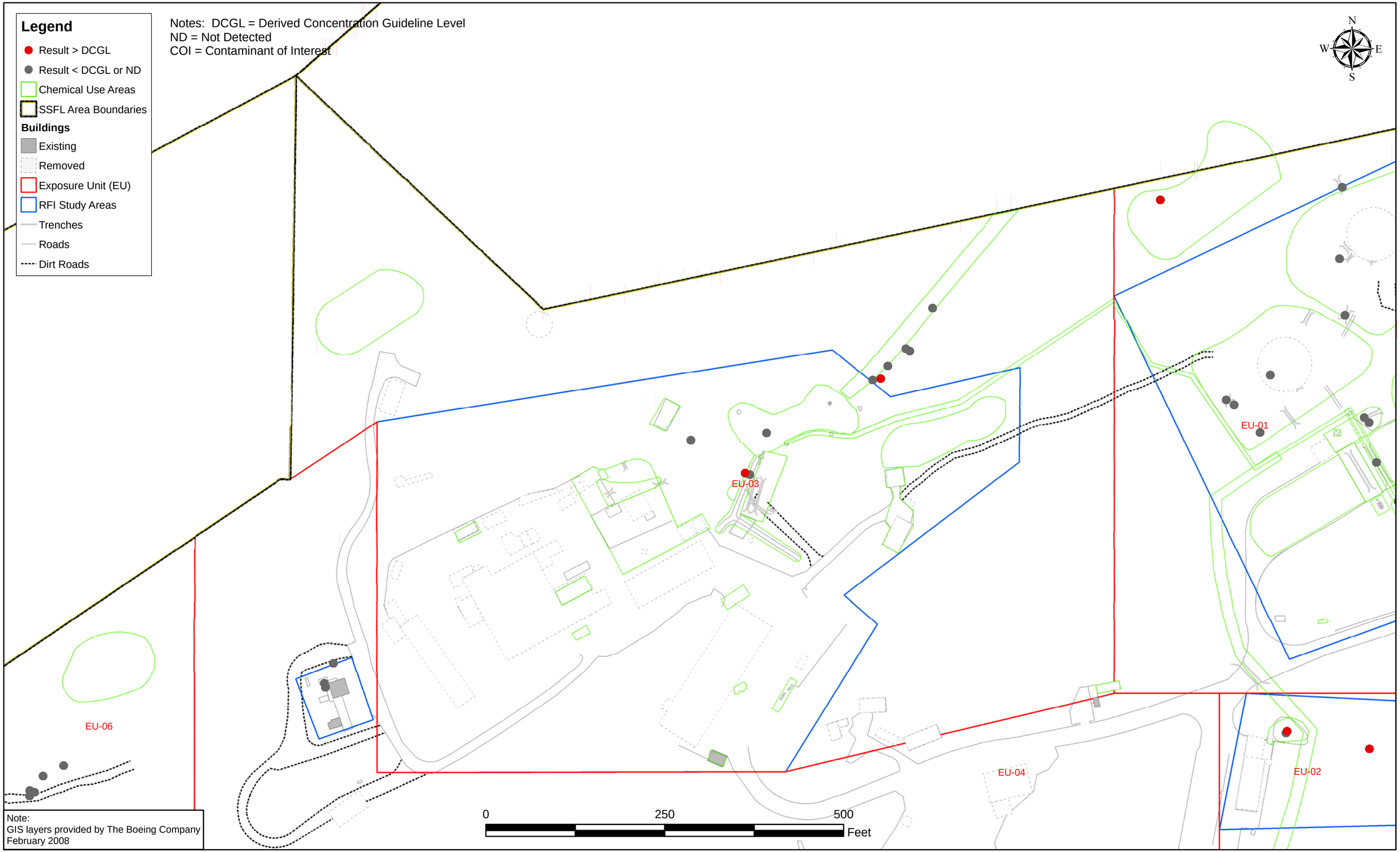
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F3-0**
**EU-03 Chemical Use Areas**




Santa Susana Field Laboratory Area IV
Ventura County, California

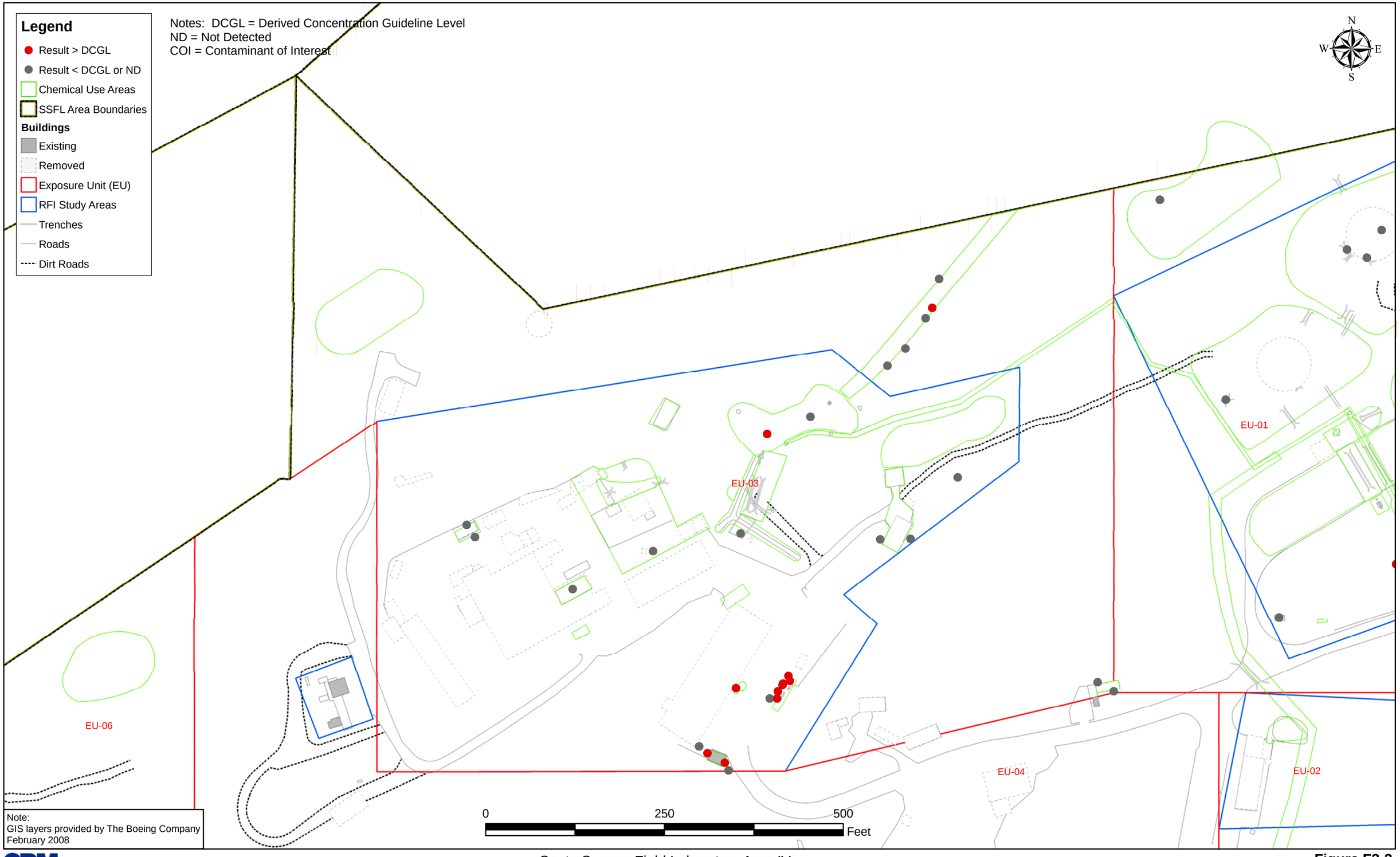
**Figure F3-1**
**VOC COIs in Soils - EU-03**
**(0-2 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

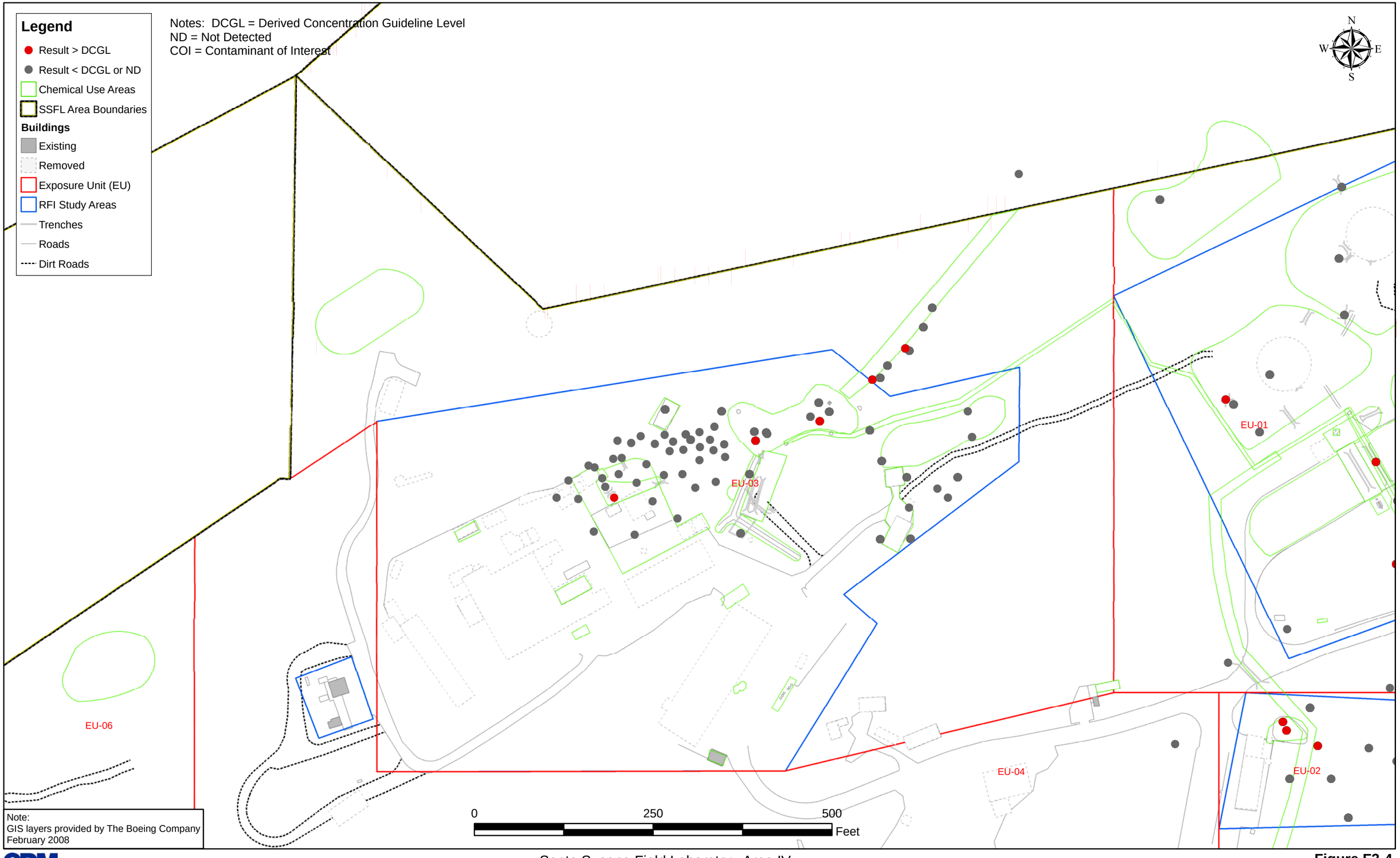
**Figure F3-2**
**SVOC COIs in Soils - EU-03**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

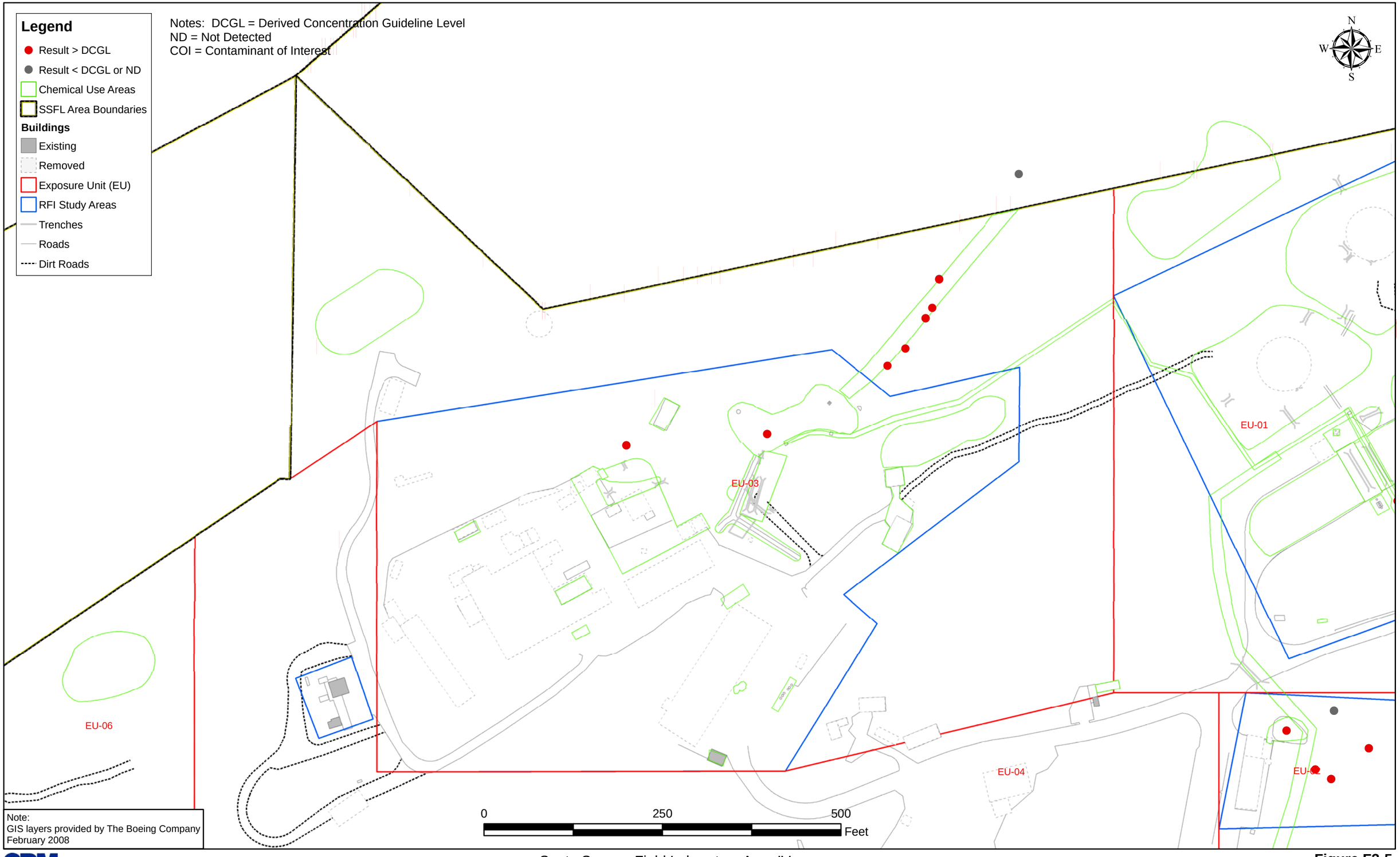
**Figure F3-3**
**PCB COIs in Soils - EU-03**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

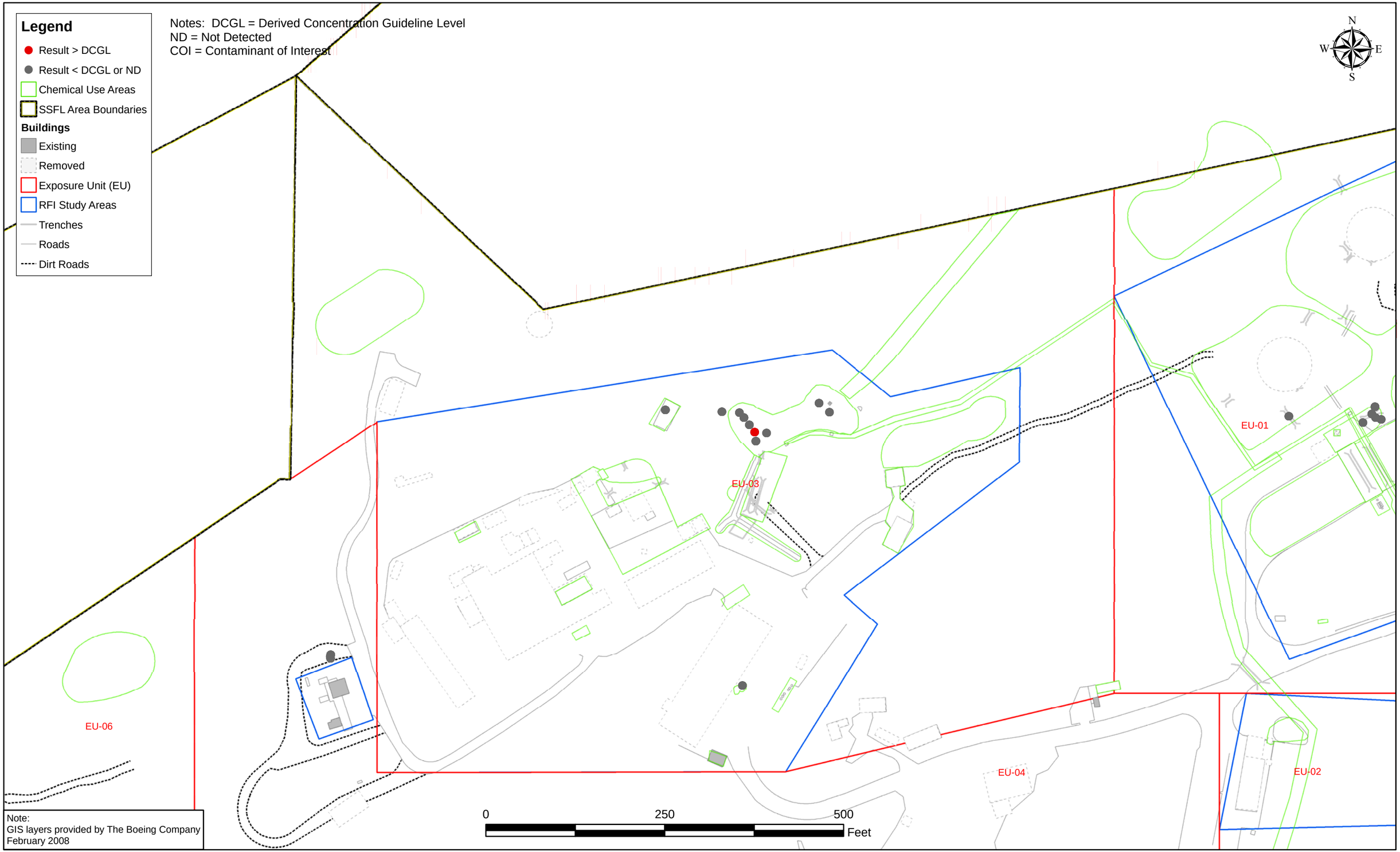
**Figure F3-4**
**Inorganic COIs in Soils - EU-03**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

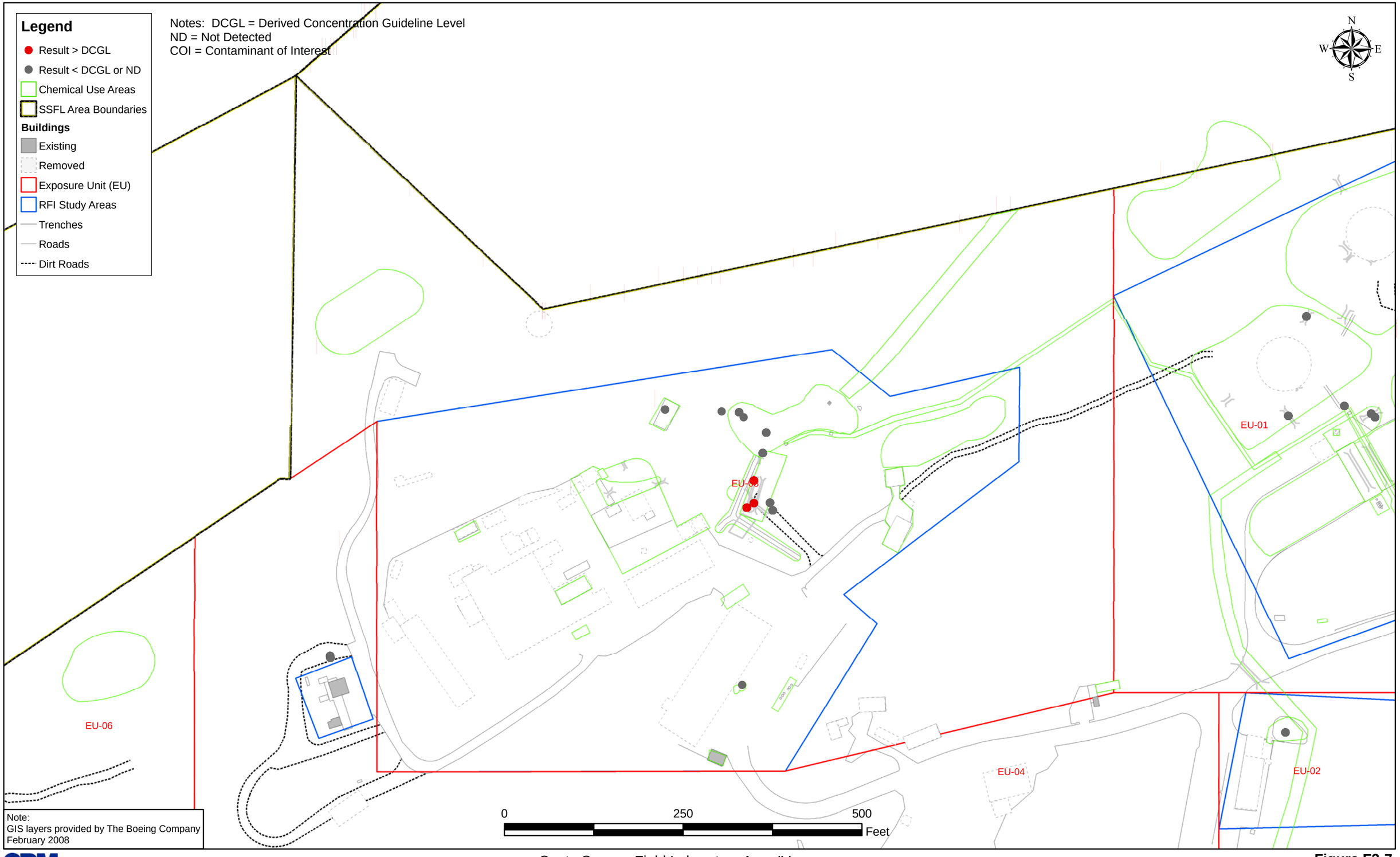
**Figure F3-5**
**Dioxin COIs in Soils - EU-03**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

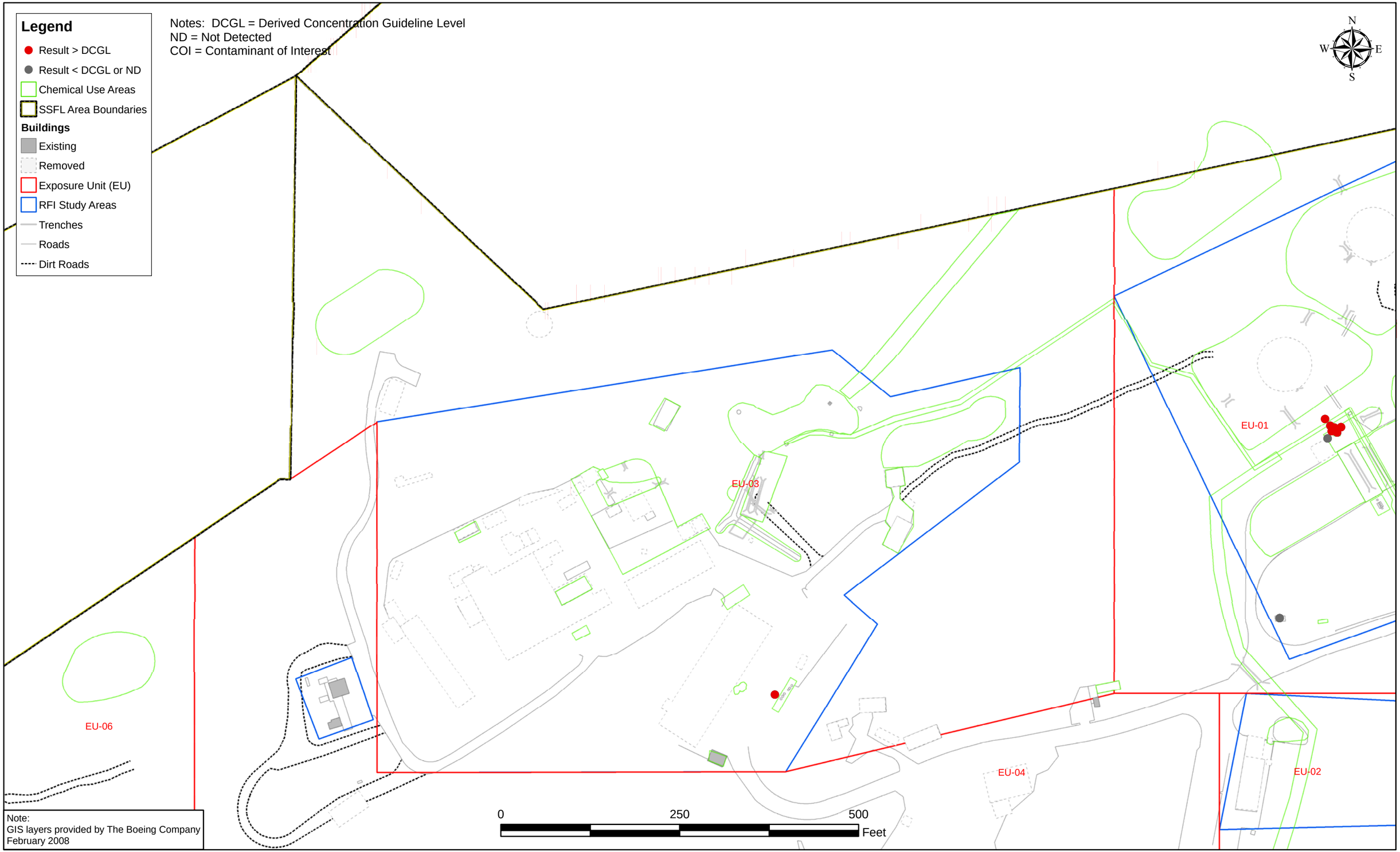
**Figure F3-6**
**VOC COIs in Soils - EU-03**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

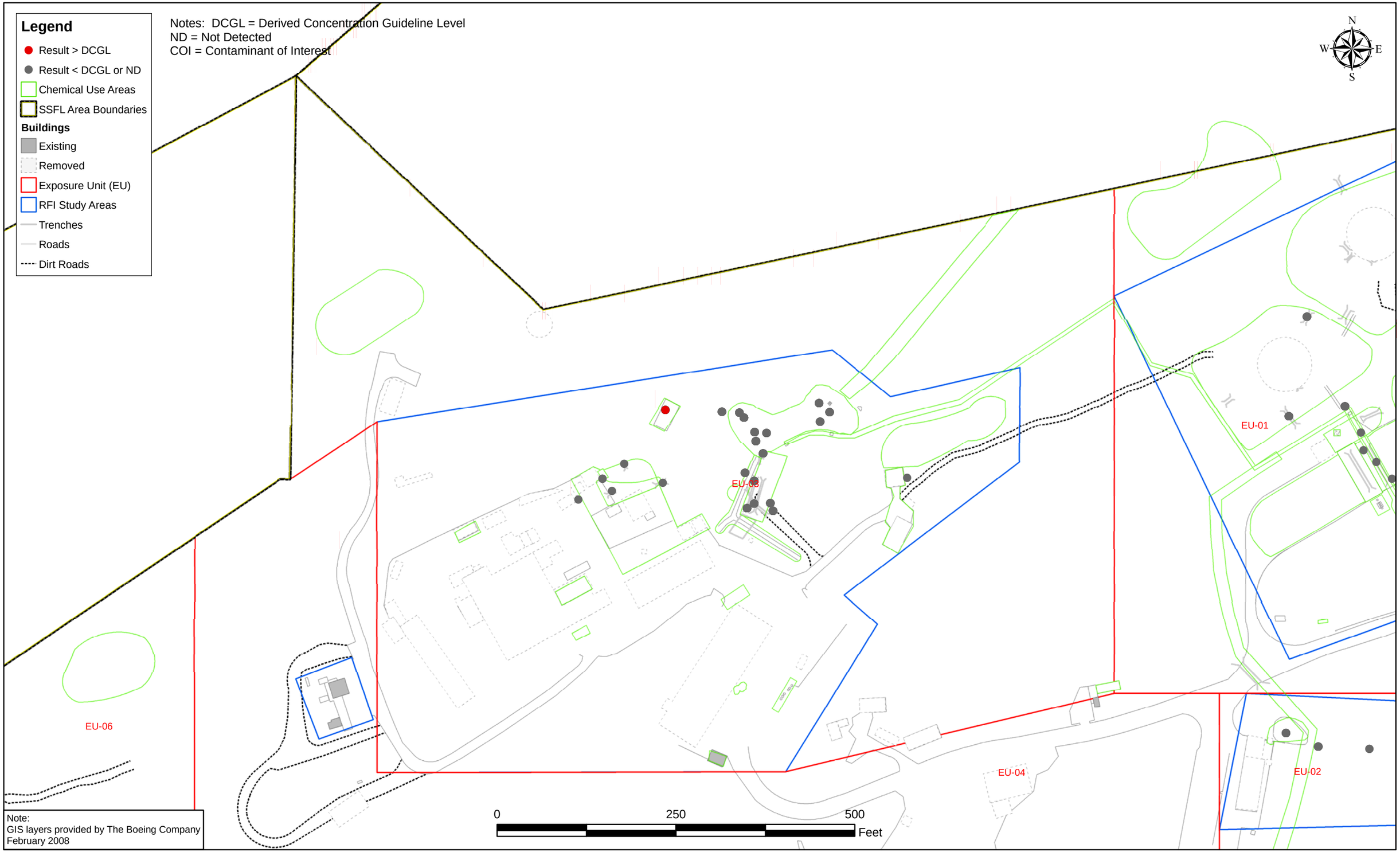
**Figure F3-7**
**SVOC COIs in Soils - EU-03**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

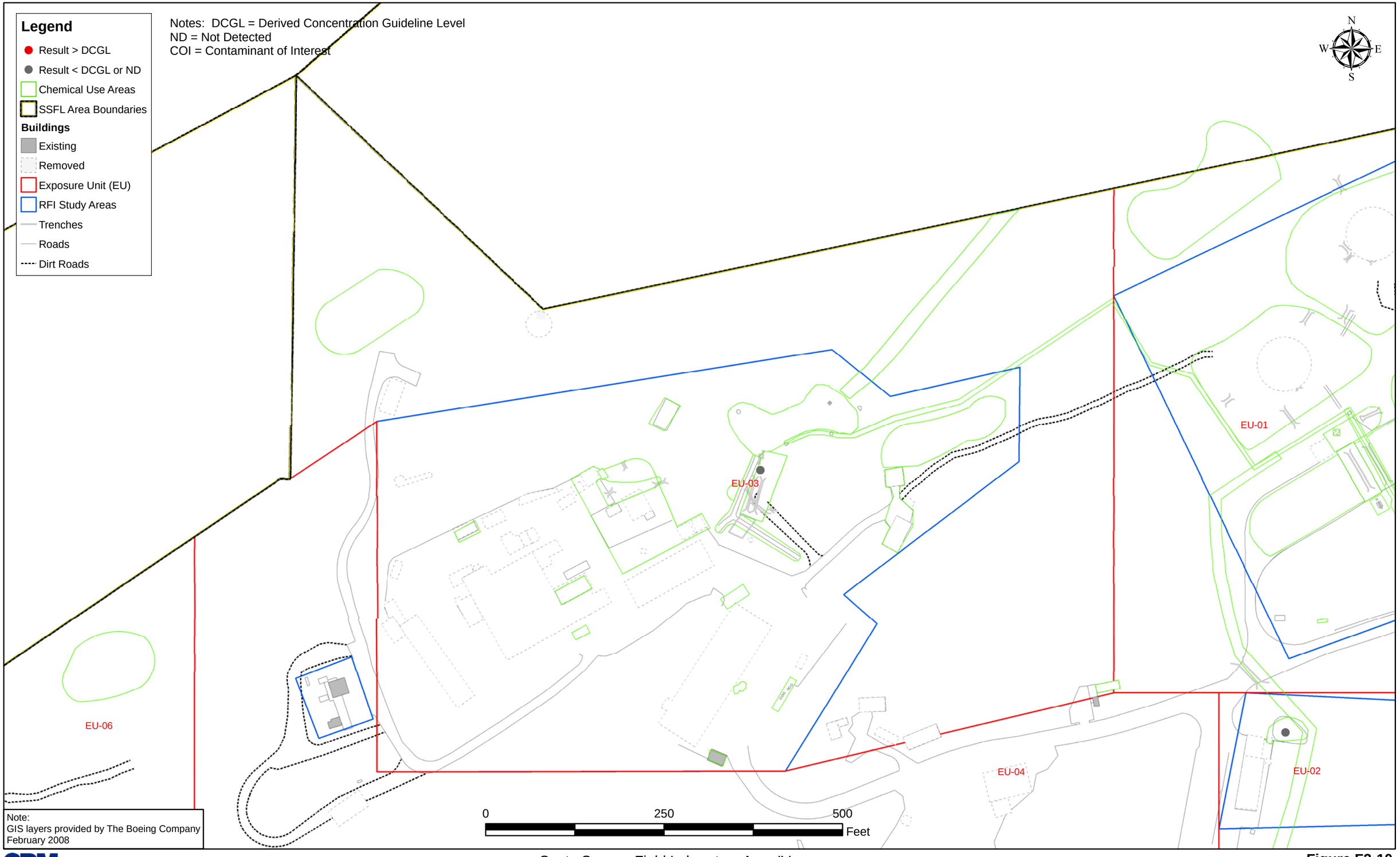
**Figure F3-8**
**PCB COIs in Soils - EU-03**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F3-9**
**Inorganic COIs in Soils - EU-03**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

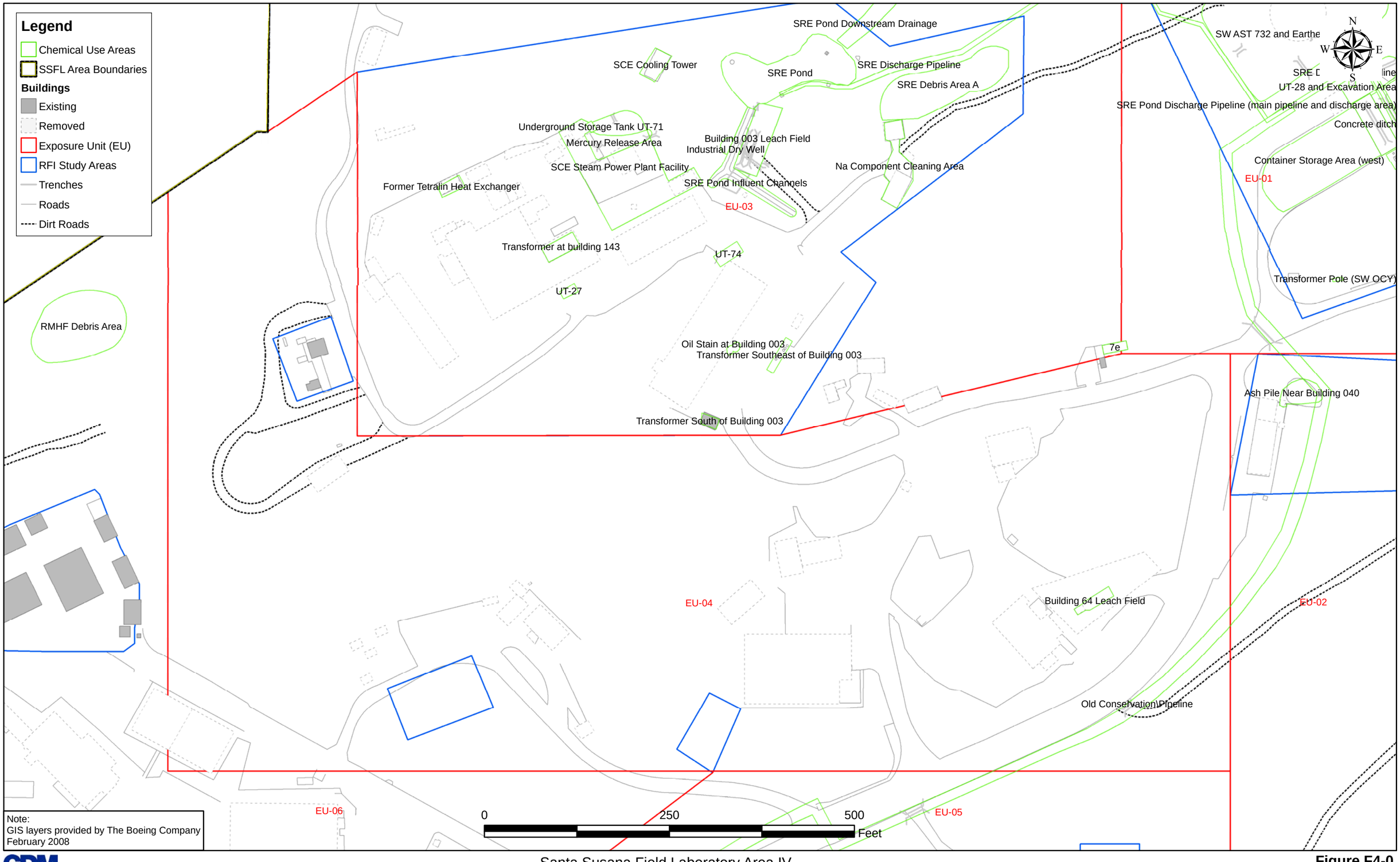
**Figure F3-10**
**Dioxin COIs in Soils - EU-03**
**(2-10 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

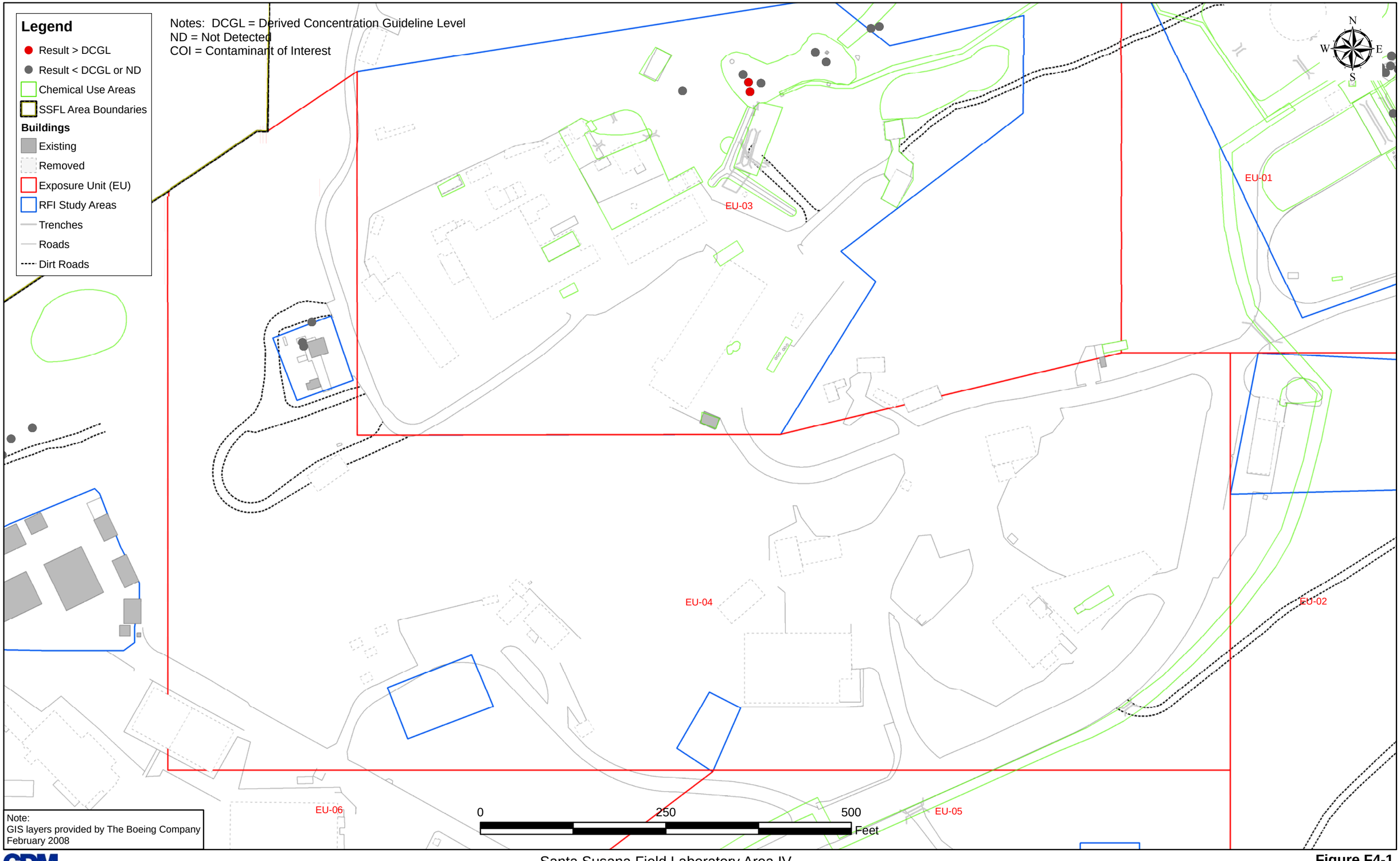
**Figure F3-11**
**Radiological COIs in Soils - EU-03**
**(0-6 in bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

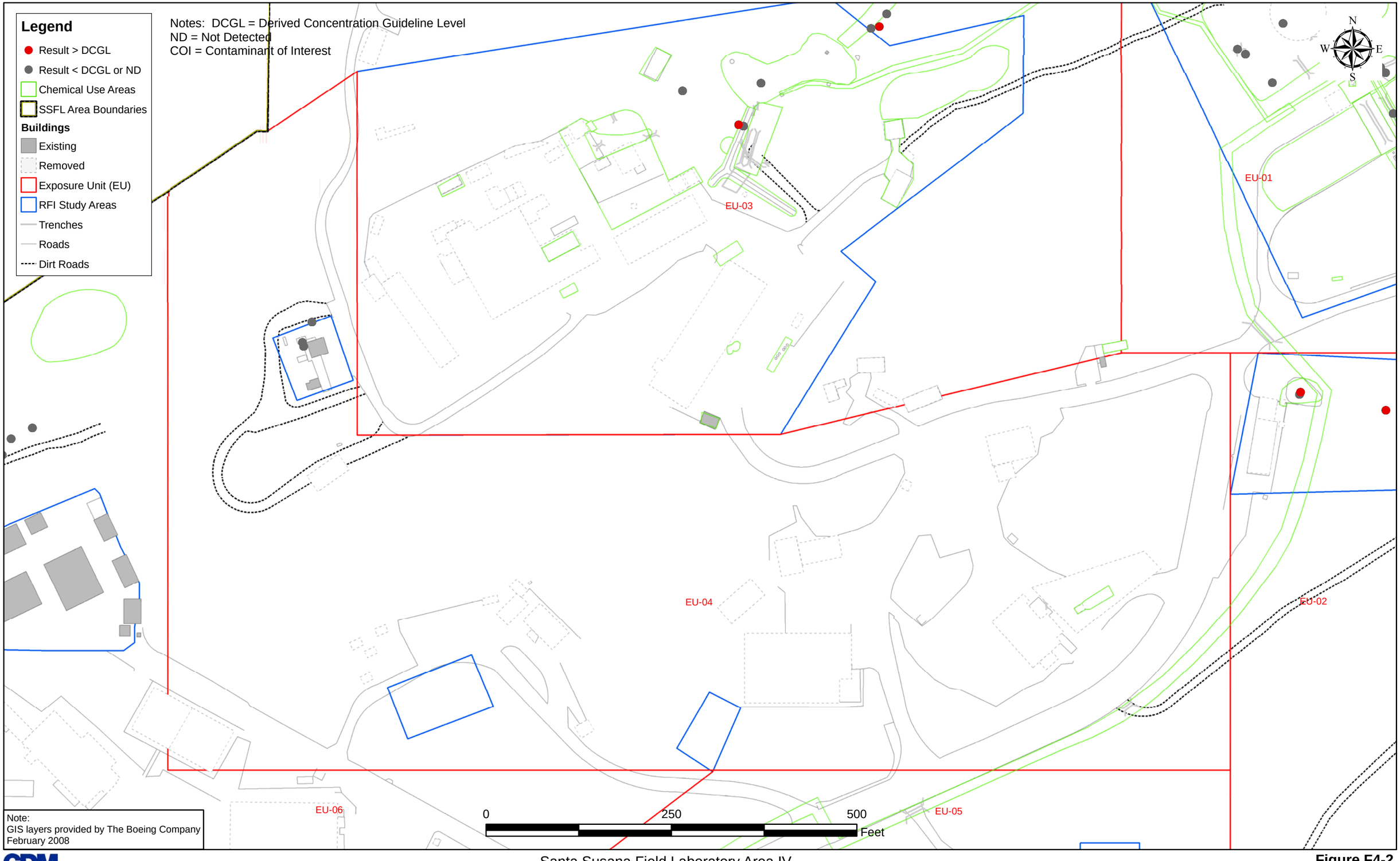
**Figure F4-0**
**EU-04 Chemical Use Areas**




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Santa Susana Field Laboratory Area IV
Ventura County, California

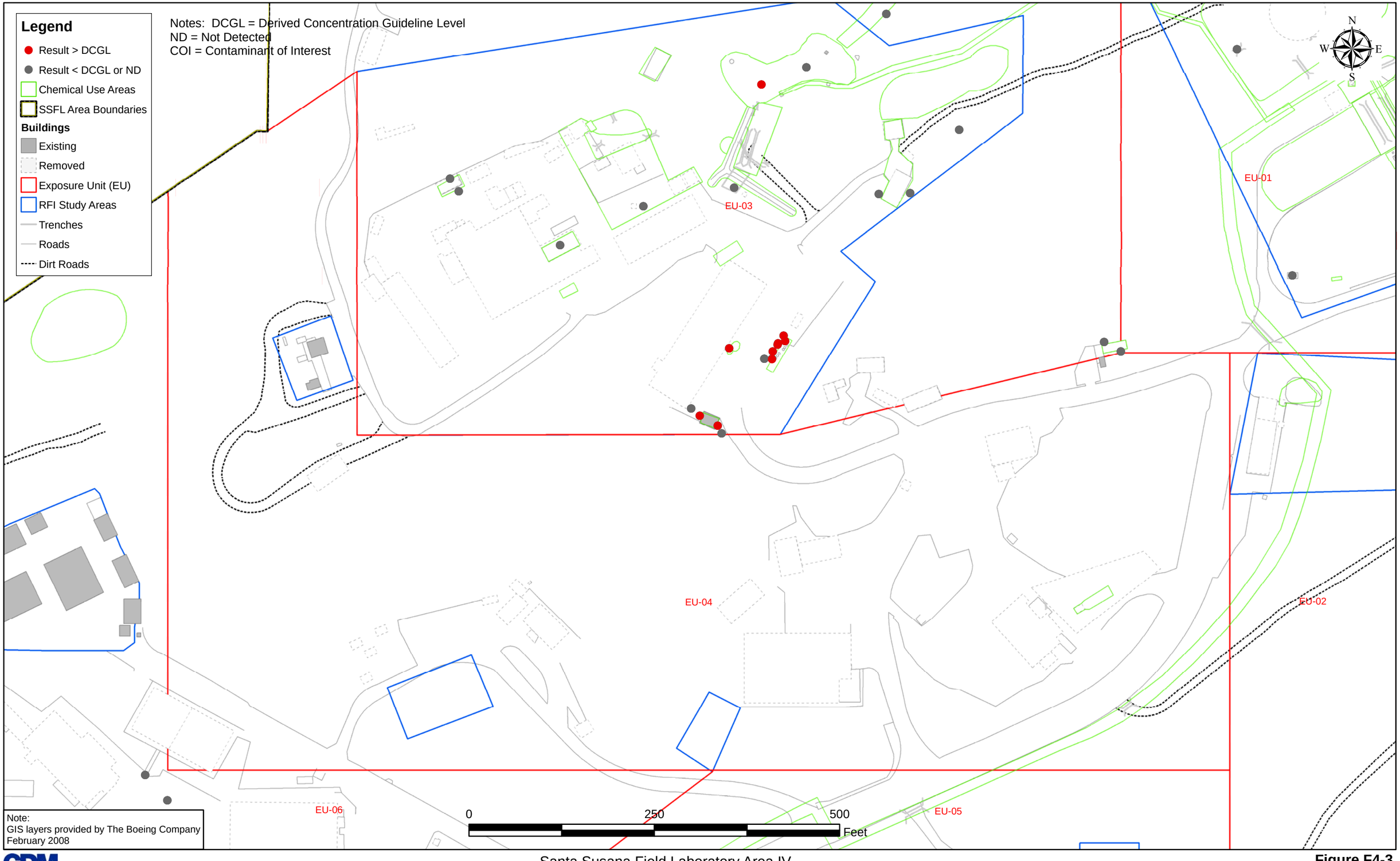
**Figure F4-1**
**VOC COIs in Soils - EU-04**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

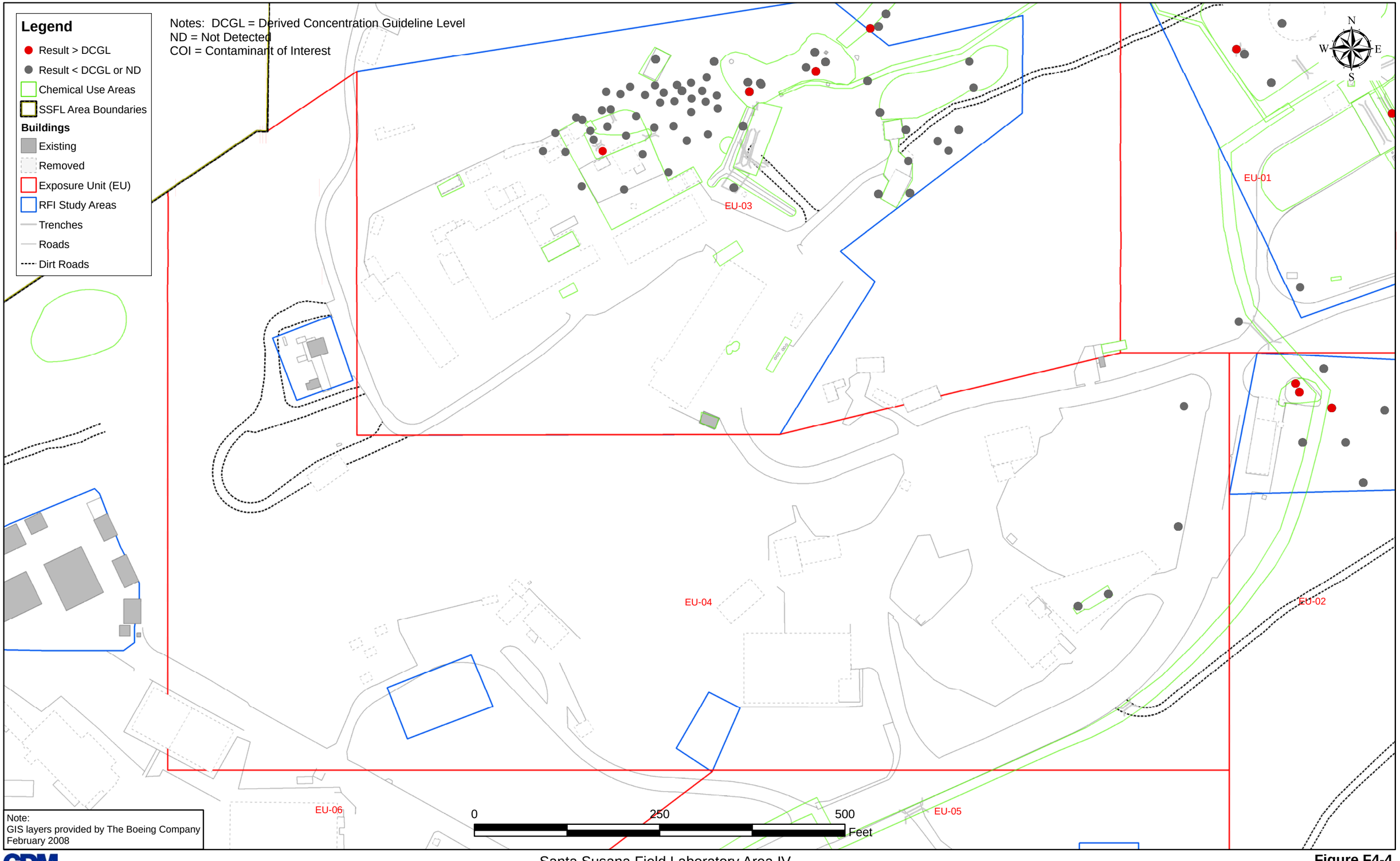
**Figure F4-2**
**SVOC COIs in Soils - EU-04**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

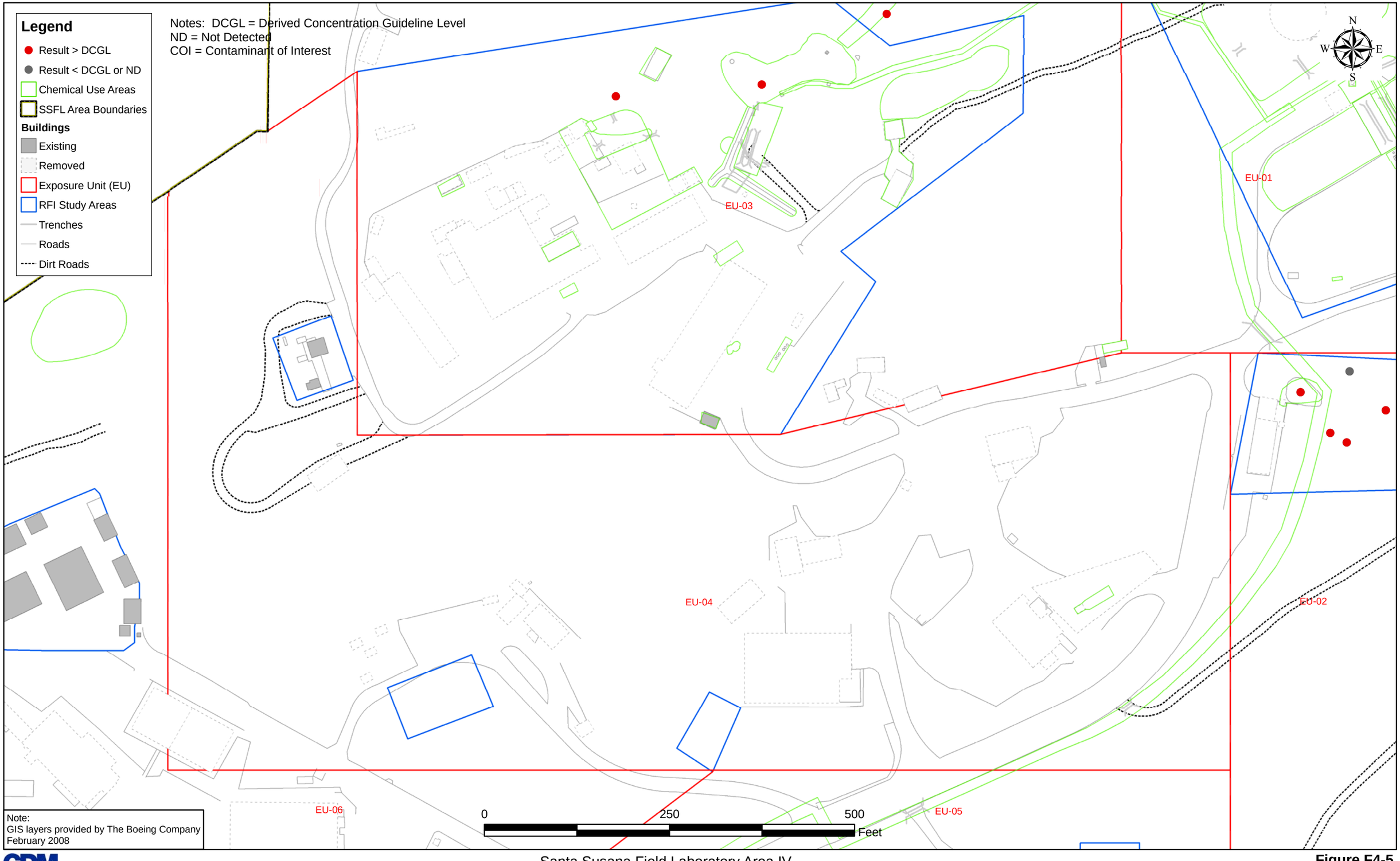
**Figure F4-3**
**PCB COIs in Soils - EU-04**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

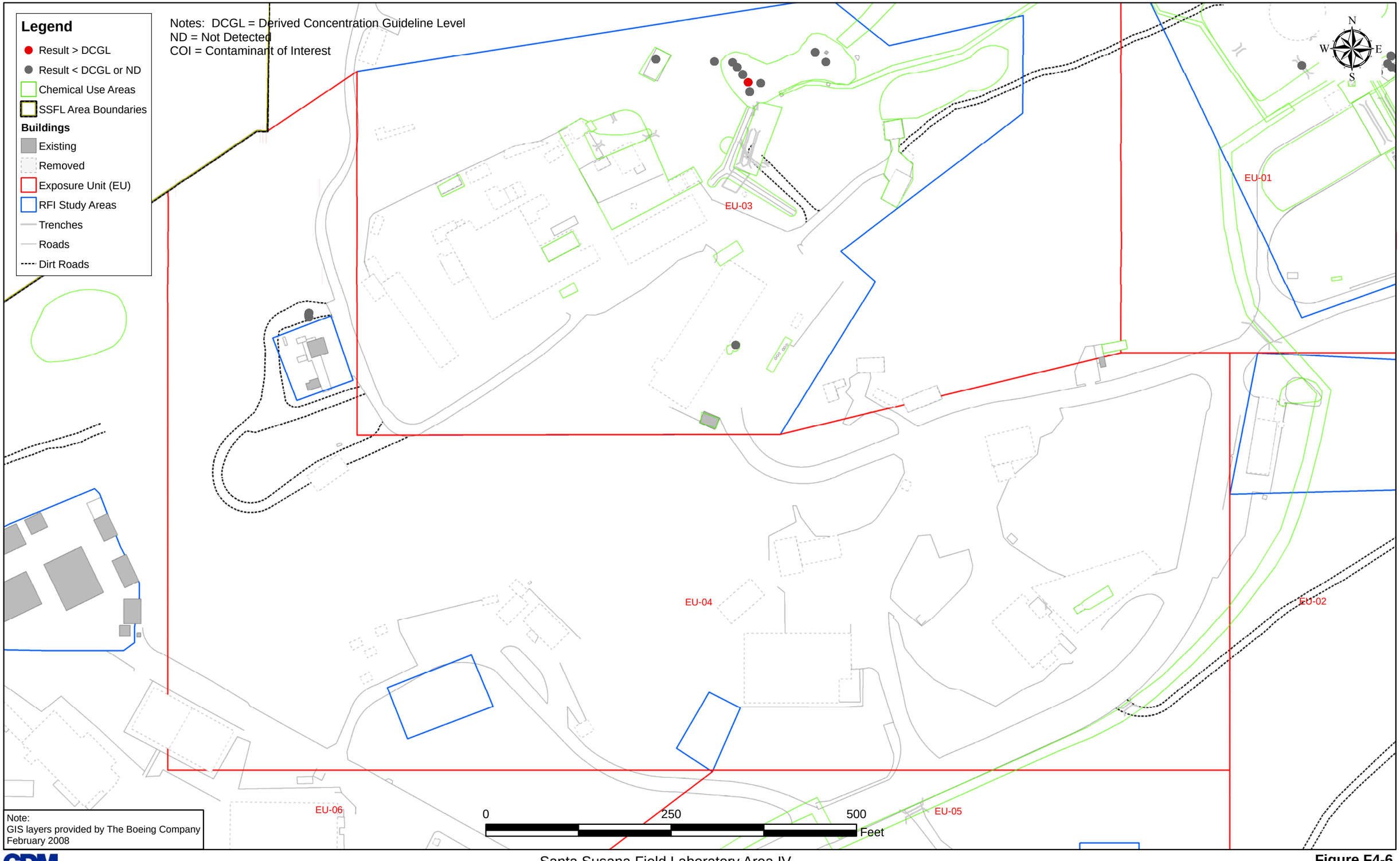
**Figure F4-4**
**Inorganic COIs in Soils - EU-04**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

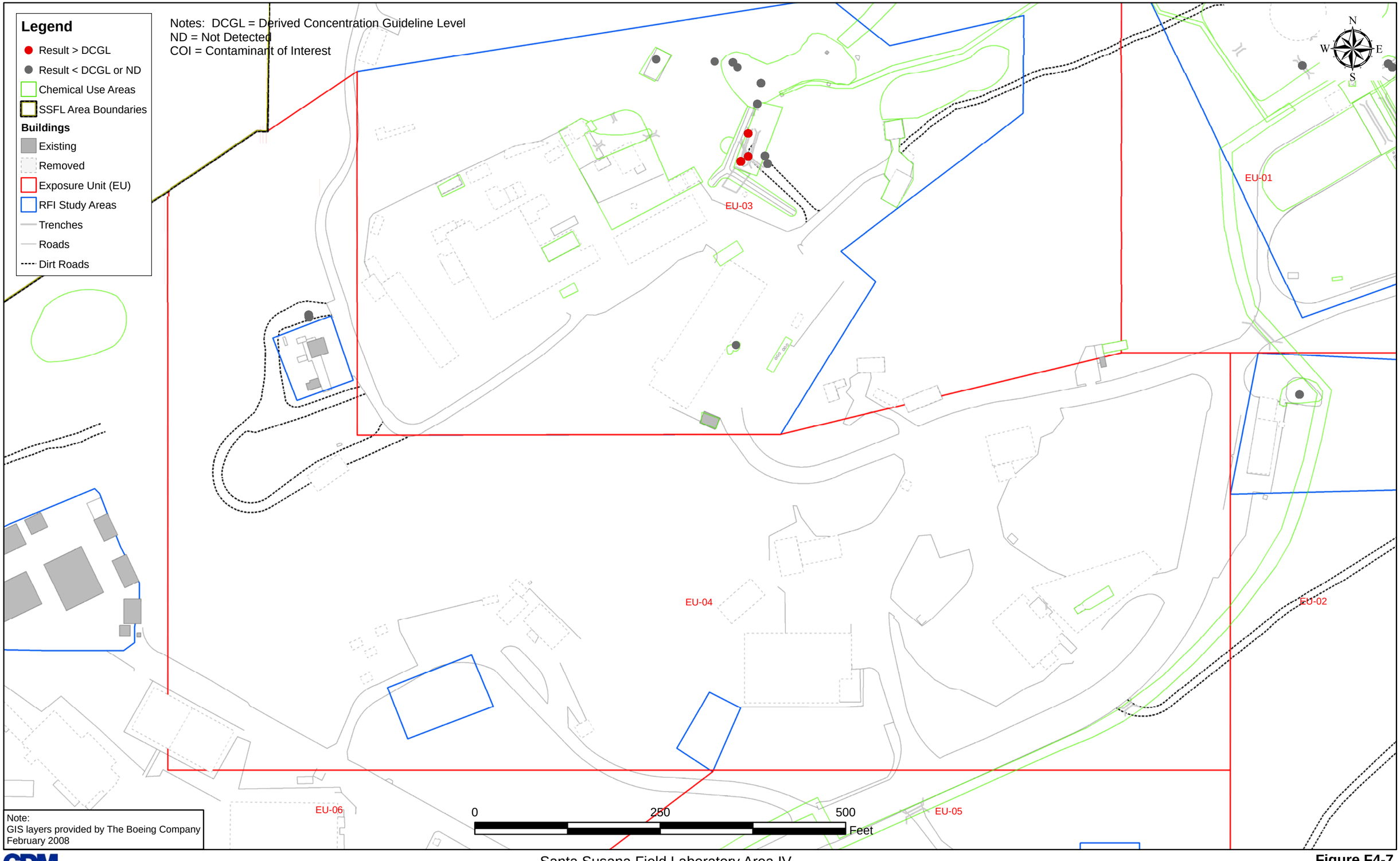
**Figure F4-5**
**Dioxin COIs in Soils - EU-04**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

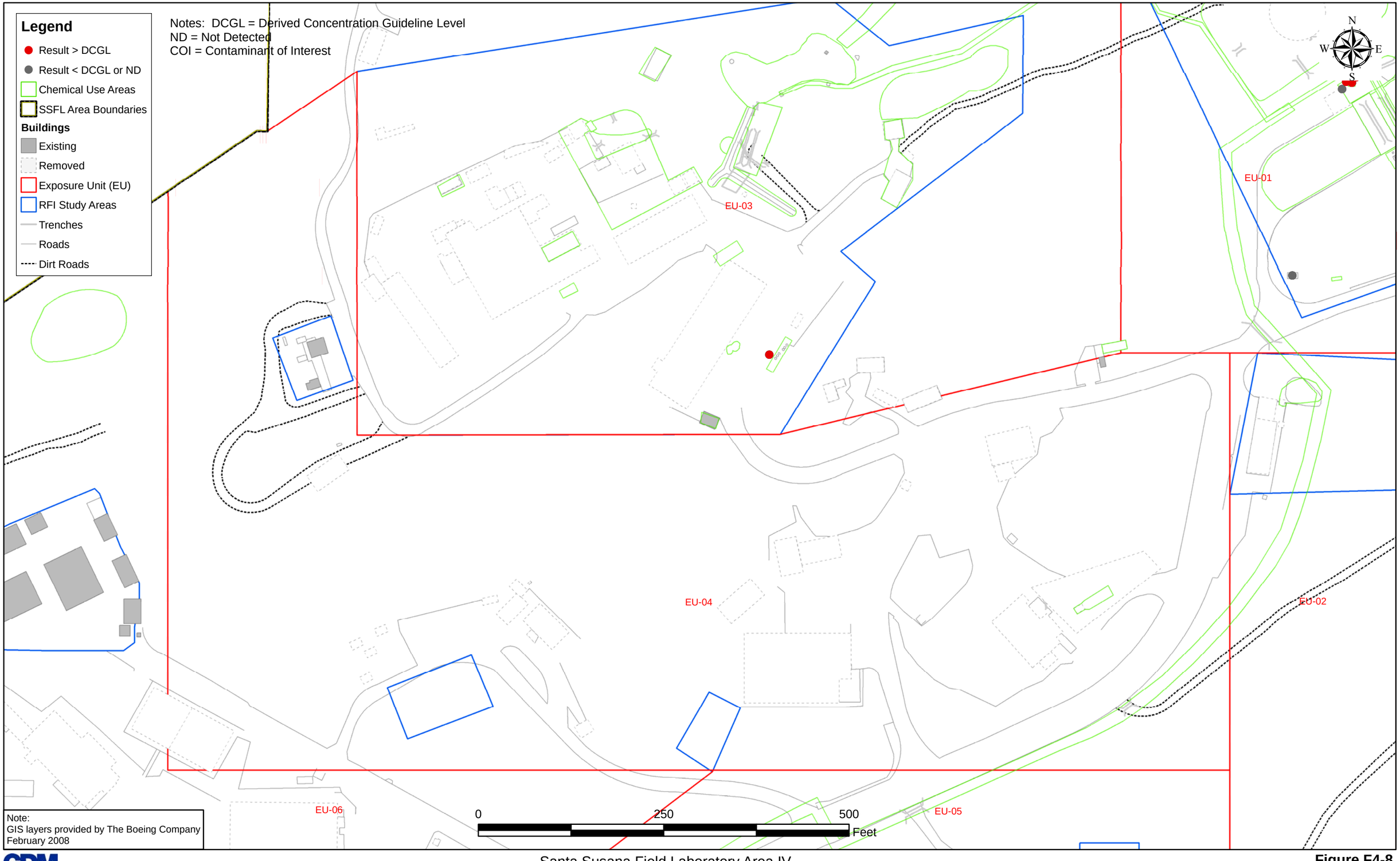
**Figure F4-6**
**VOC COIs in Soils - EU-04**
**(2-10 ft bgs)**




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Ventura County, California

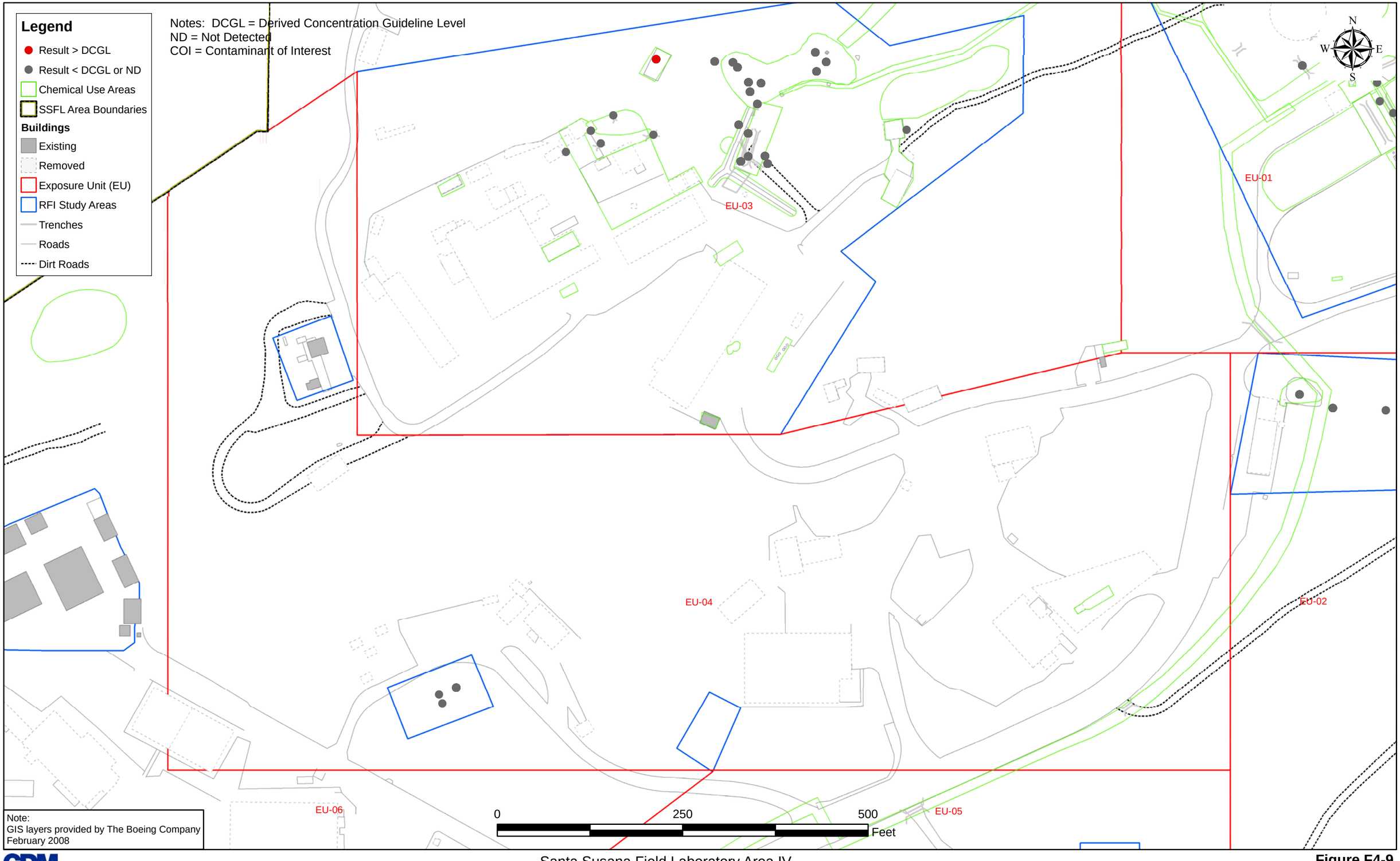
**Figure F4-7**
**SVOC COIs in Soils - EU-04**
**(2-10 ft bgs)**




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Ventura County, California

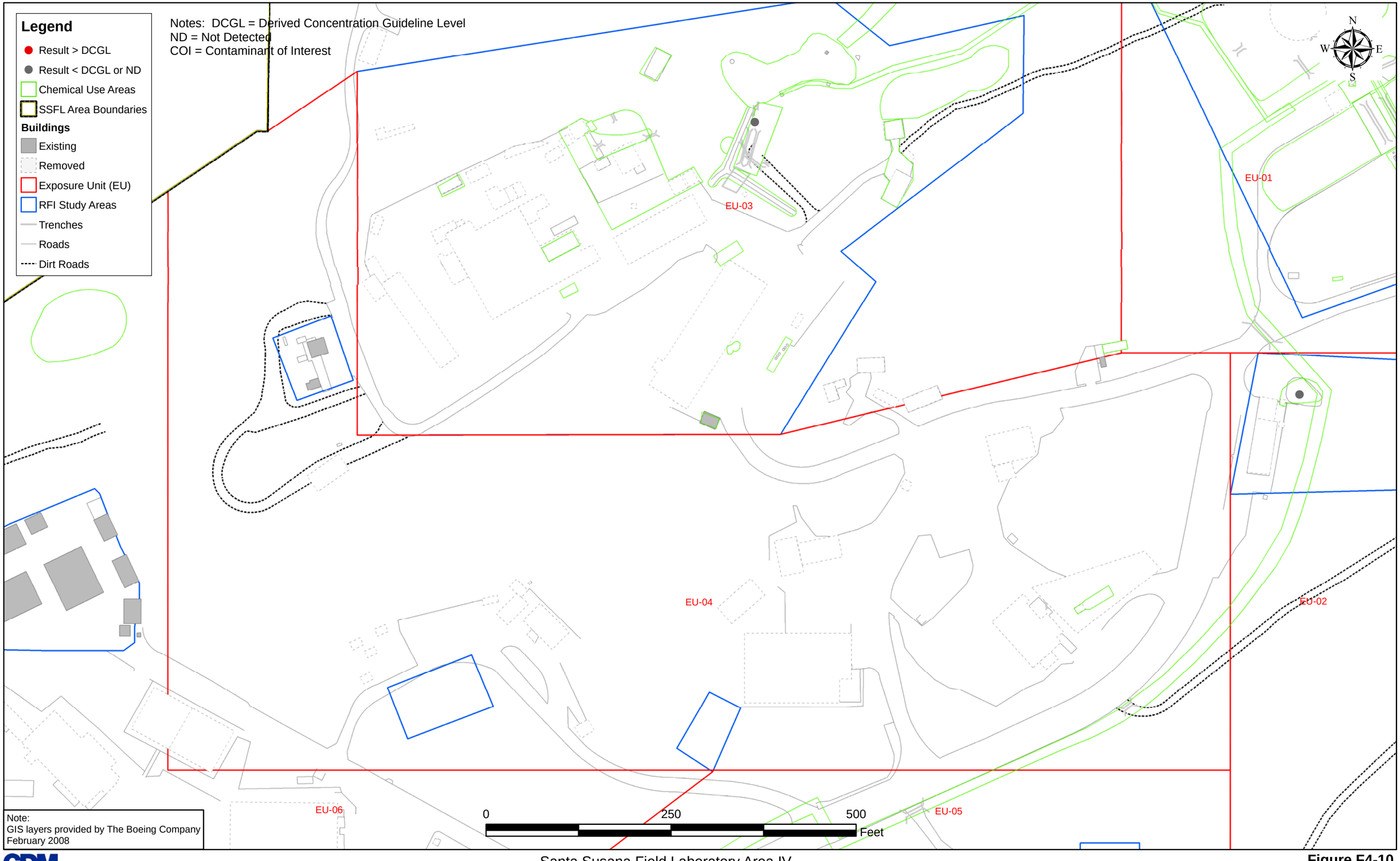
**Figure F4-8**
**PCB COIs in Soils - EU-04**
**(2-10 ft bgs)**




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Ventura County, California

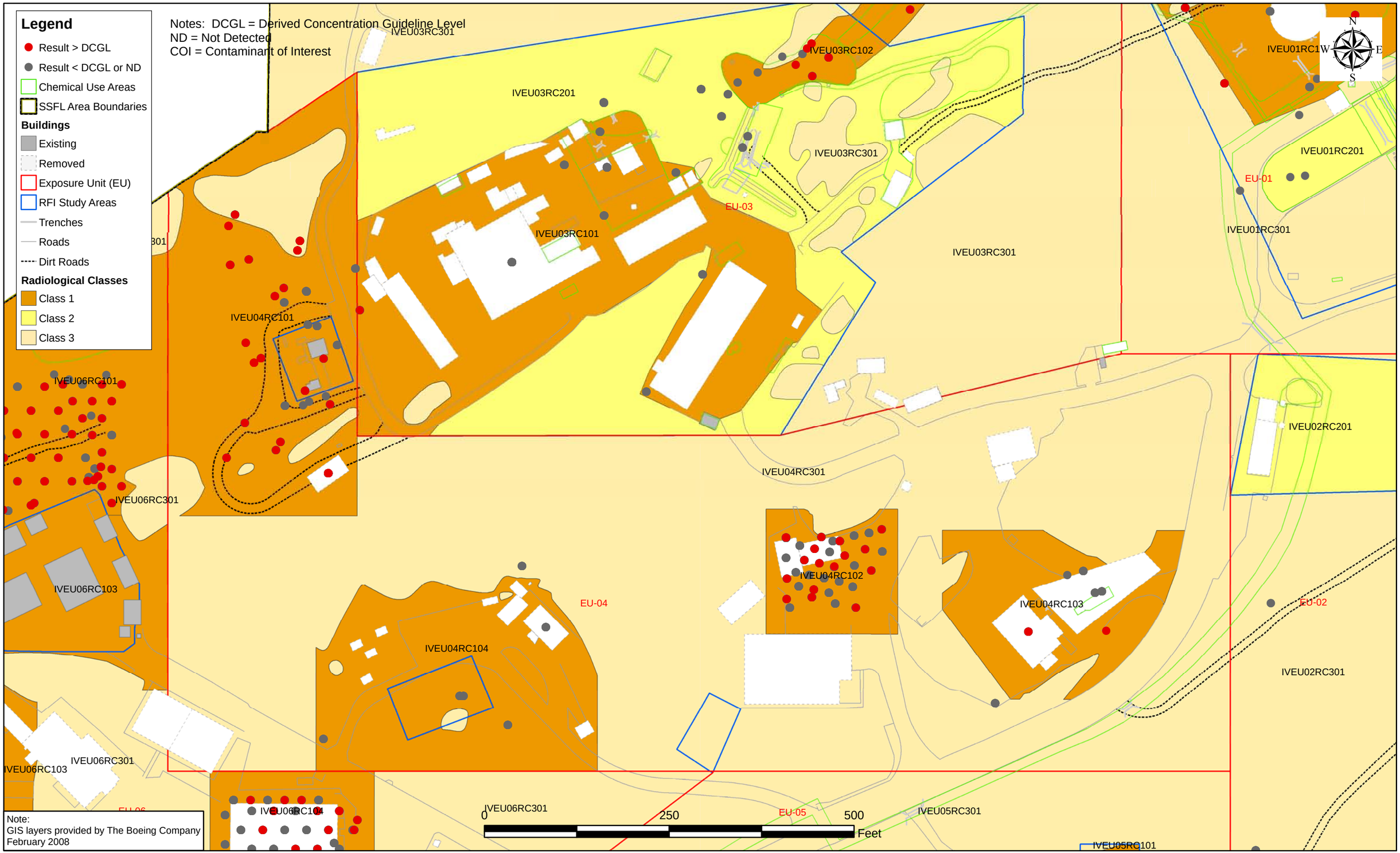
**Figure F4-9**
**Inorganic COIs in Soils - EU-04**
**(2-10 ft bgs)**




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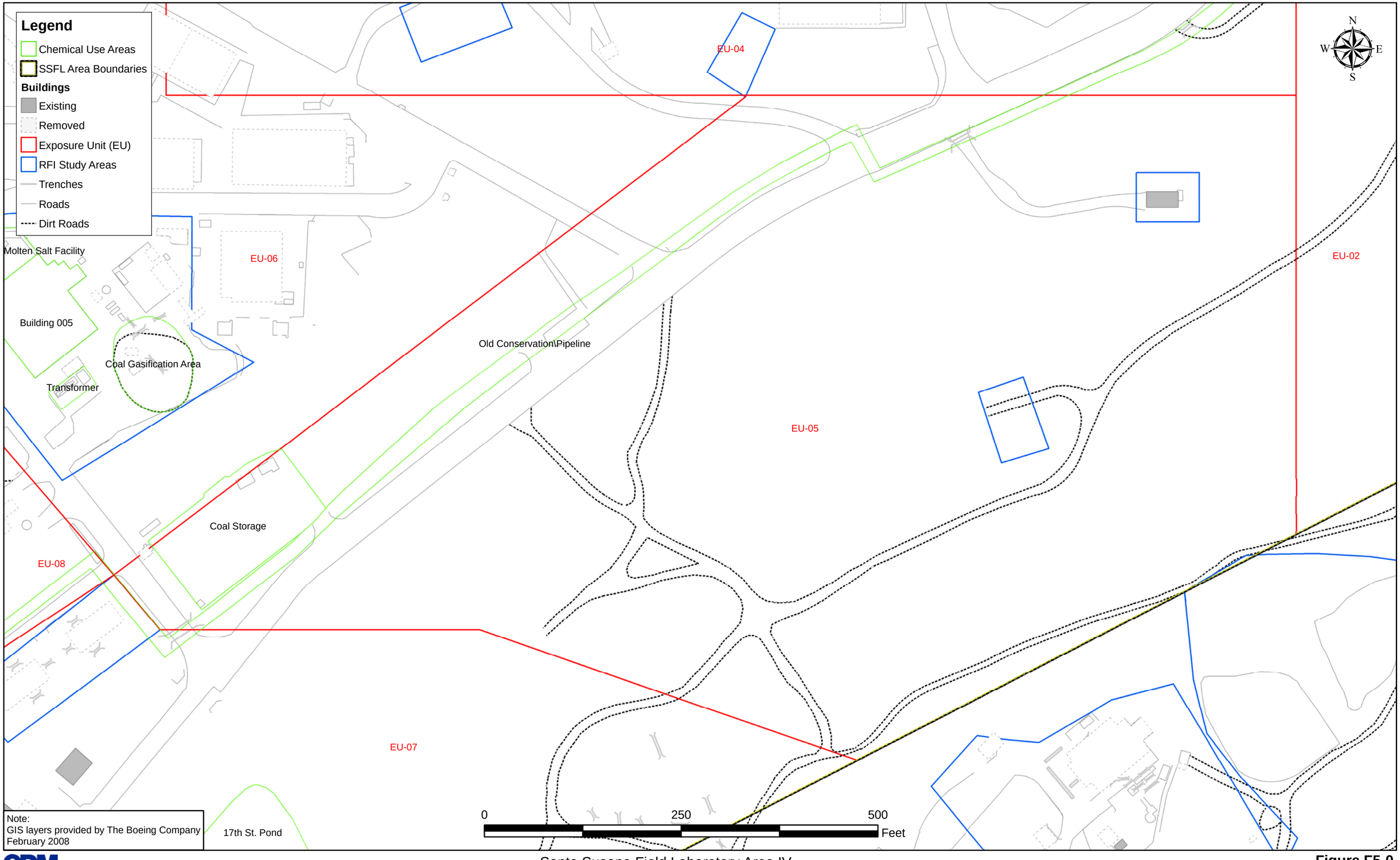
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F4-10**
**Dioxin COIs in Soils - EU-04**
**(2-10 ft bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

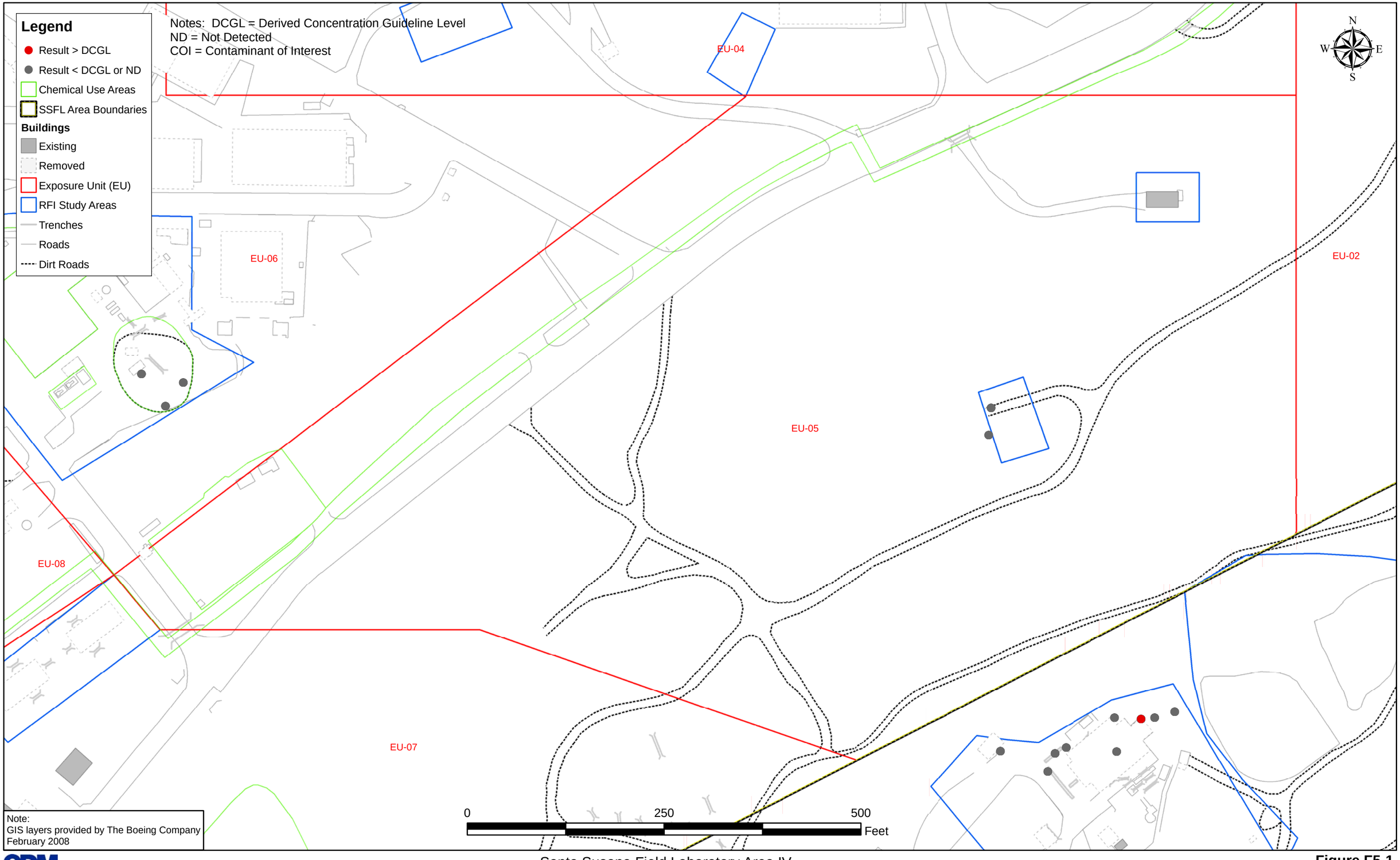
**Figure F4-11**
**Radiological COIs in Soils - EU-04**
**(0-6 in bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

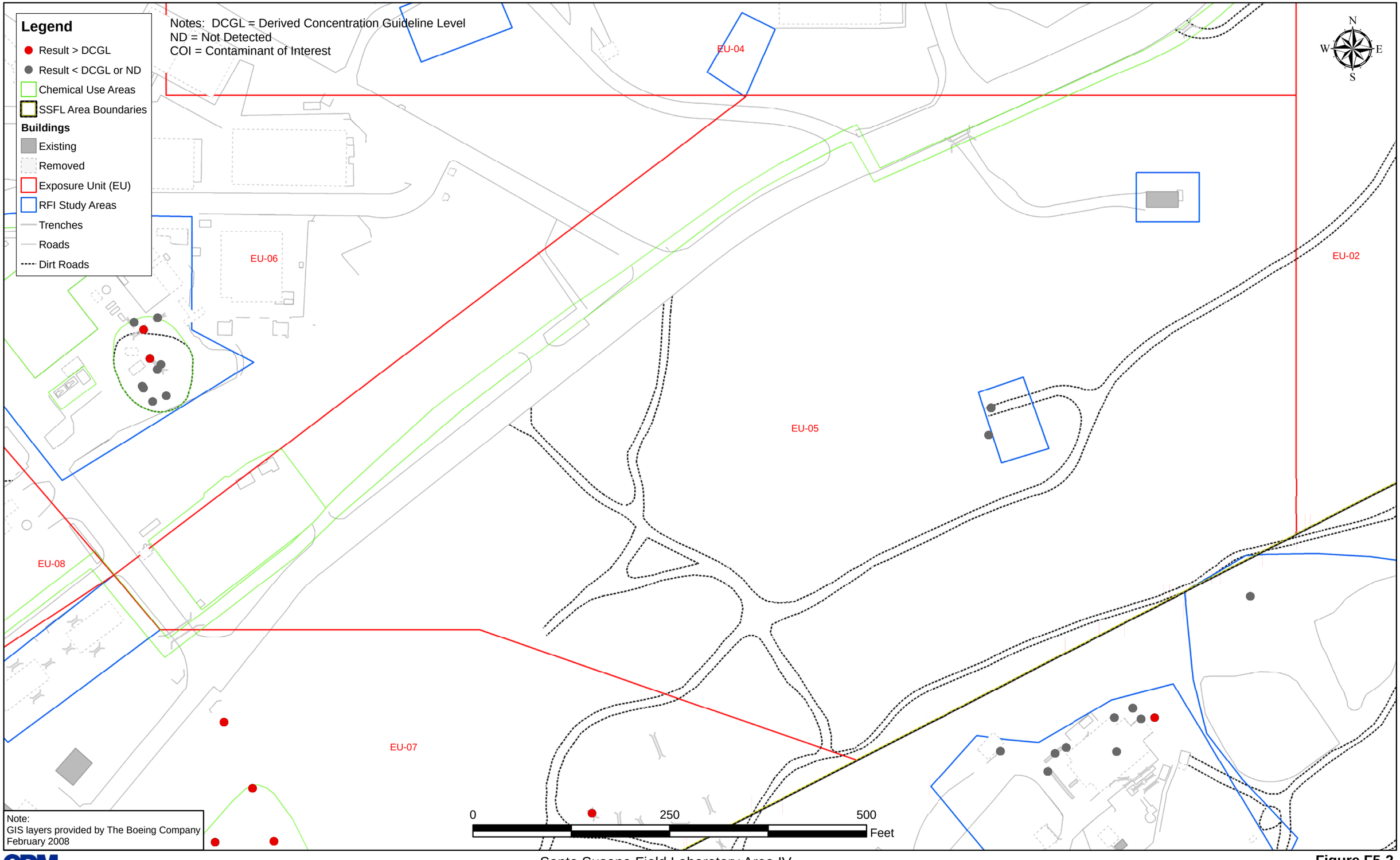
**Figure F5-0**
**EU-05 Chemical Use Areas**




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Ventura County, California

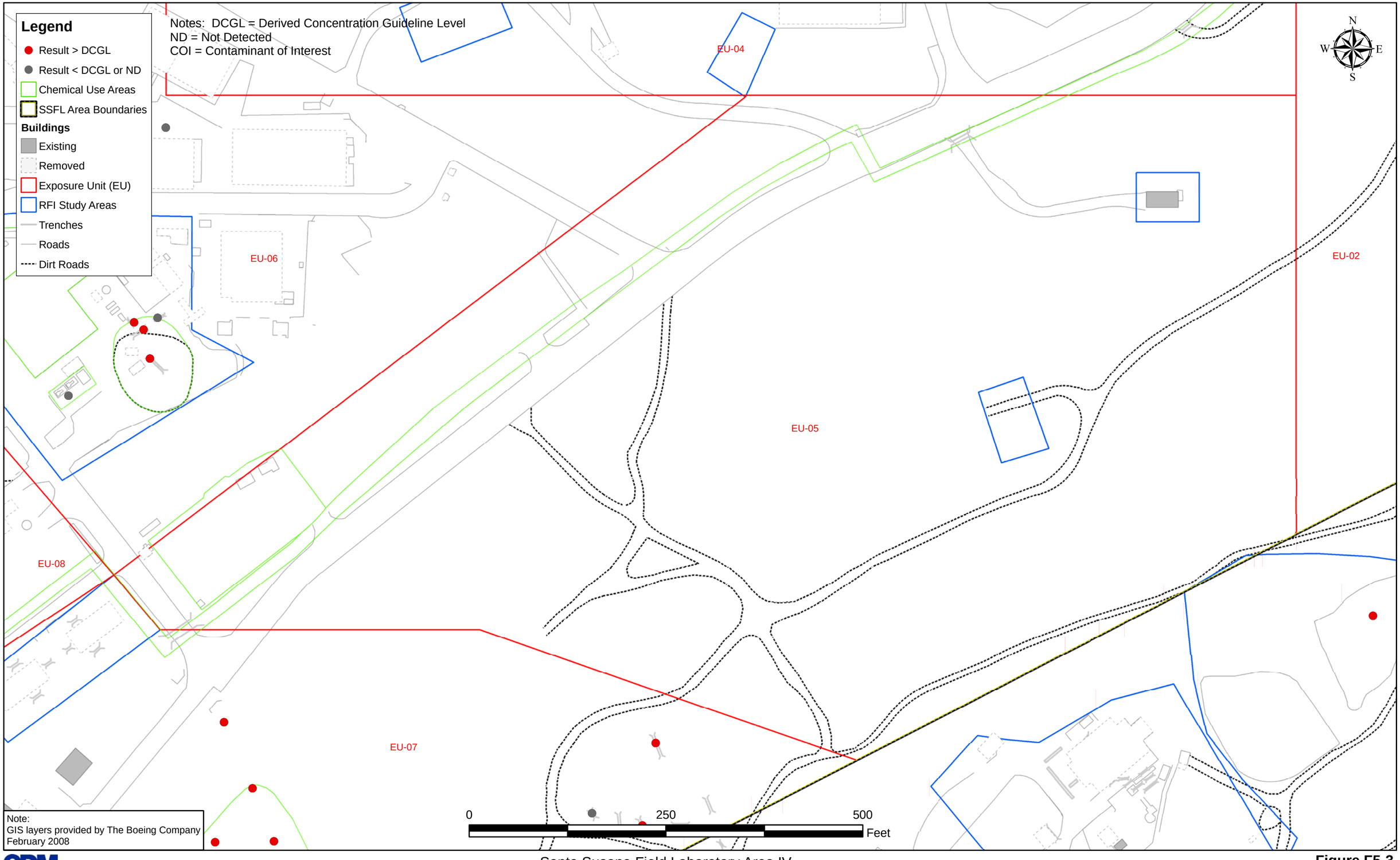
**Figure F5-1**
**VOC COIs in Soils - EU-05**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

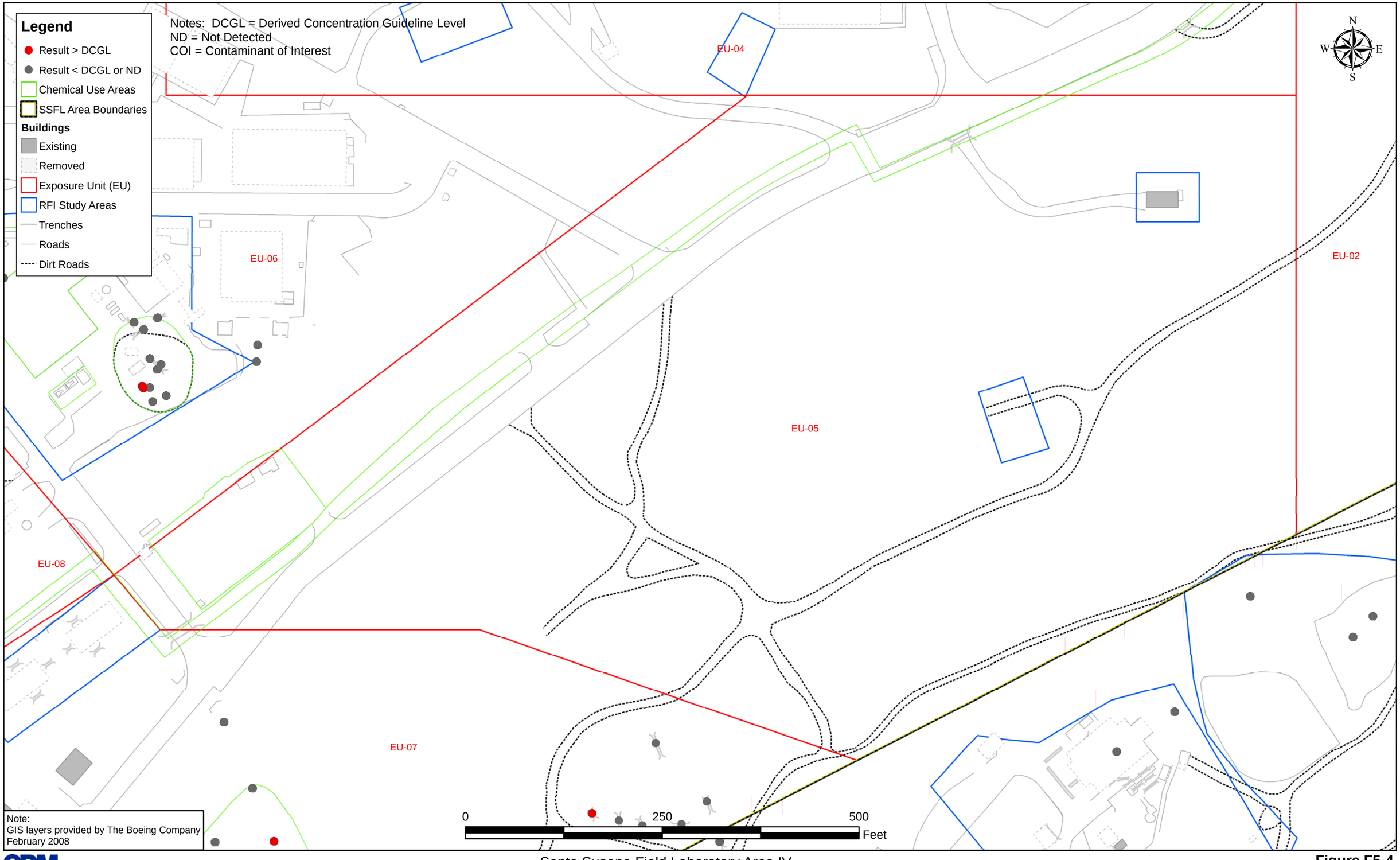
**Figure F5-2**
**SVOC COIs in Soils - EU-05**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
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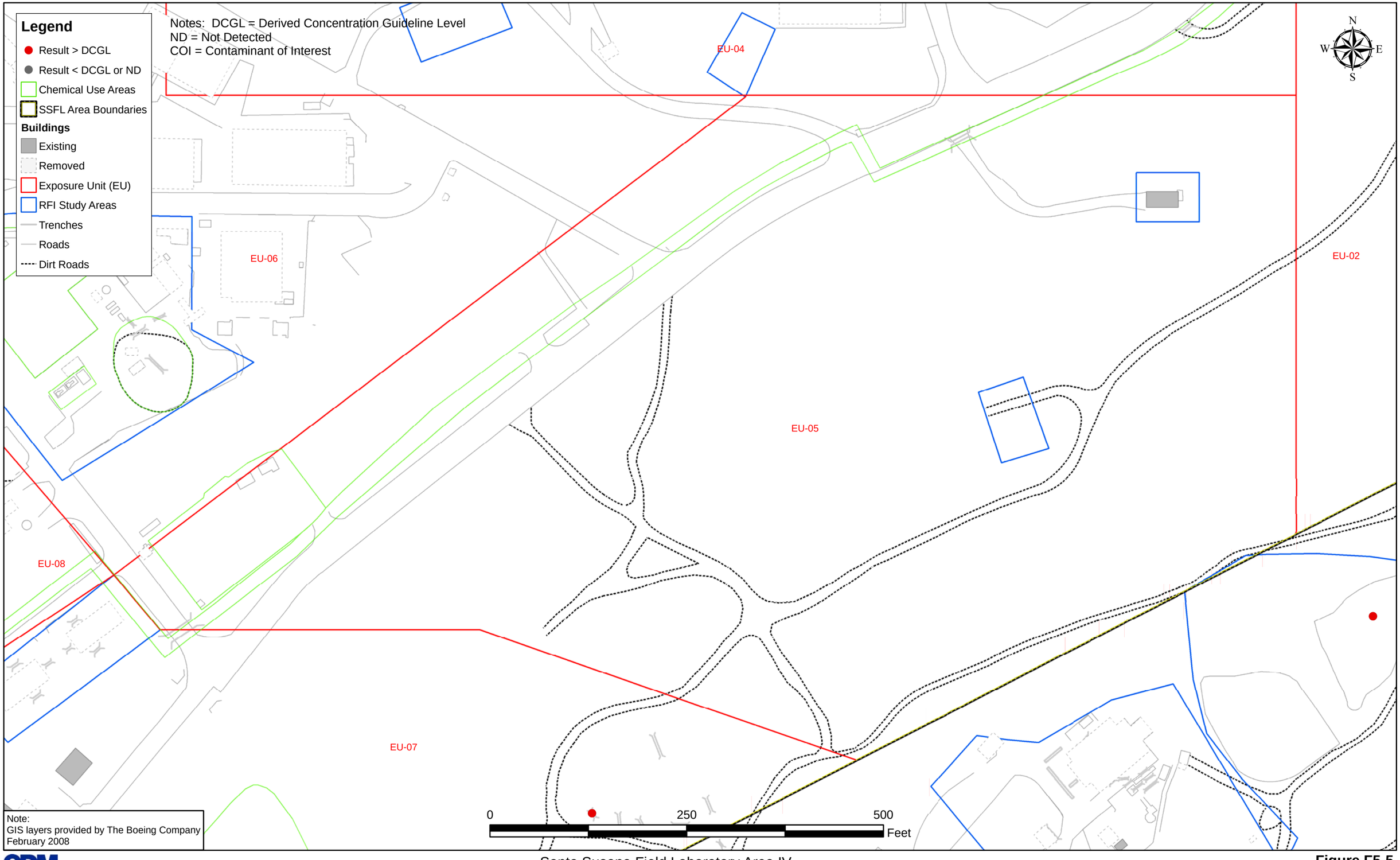
**Figure F5-3**
**PCB COIs in Soils - EU-05**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

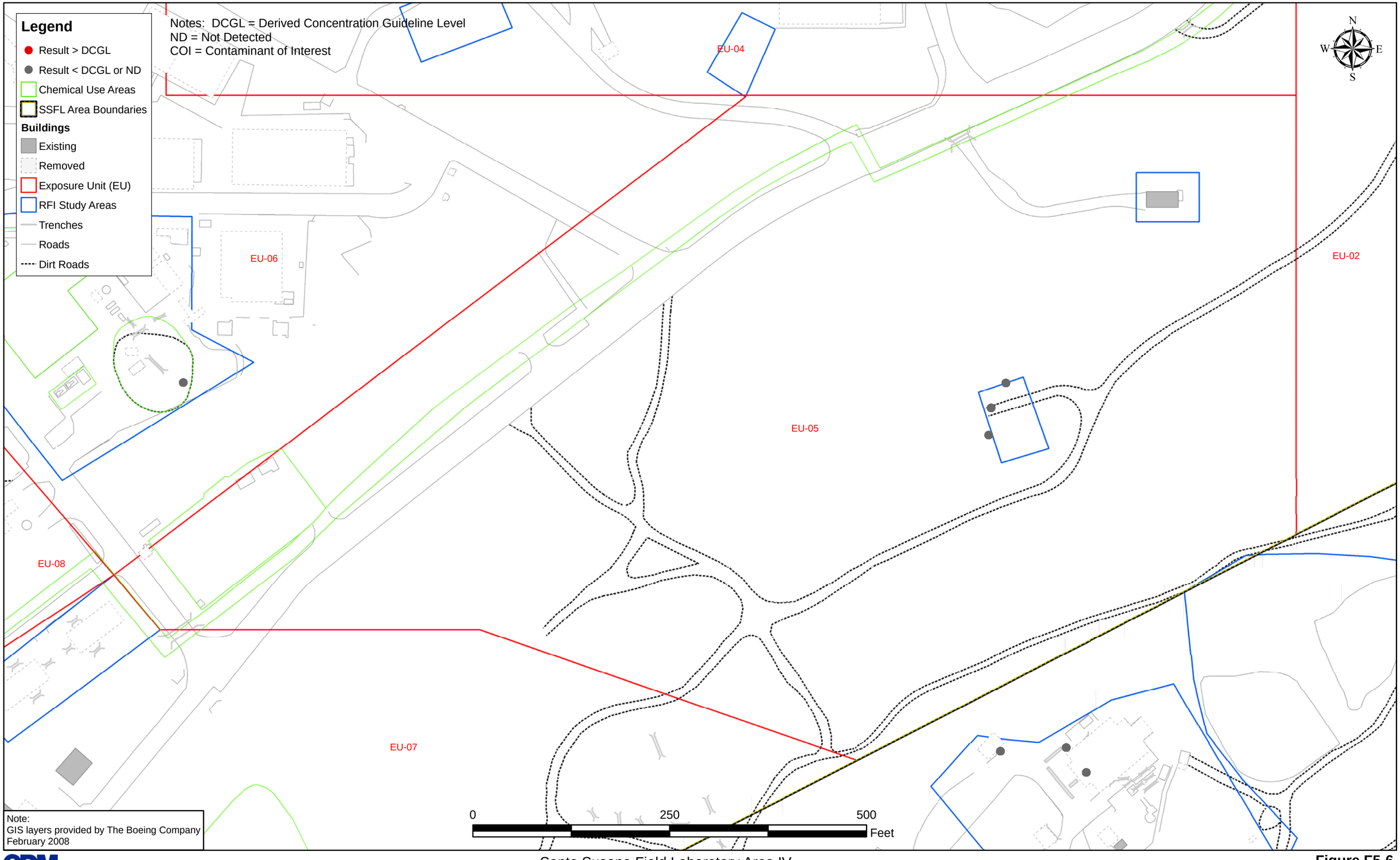
**Figure F5-4**
**Inorganic COIs in Soils - EU-05**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

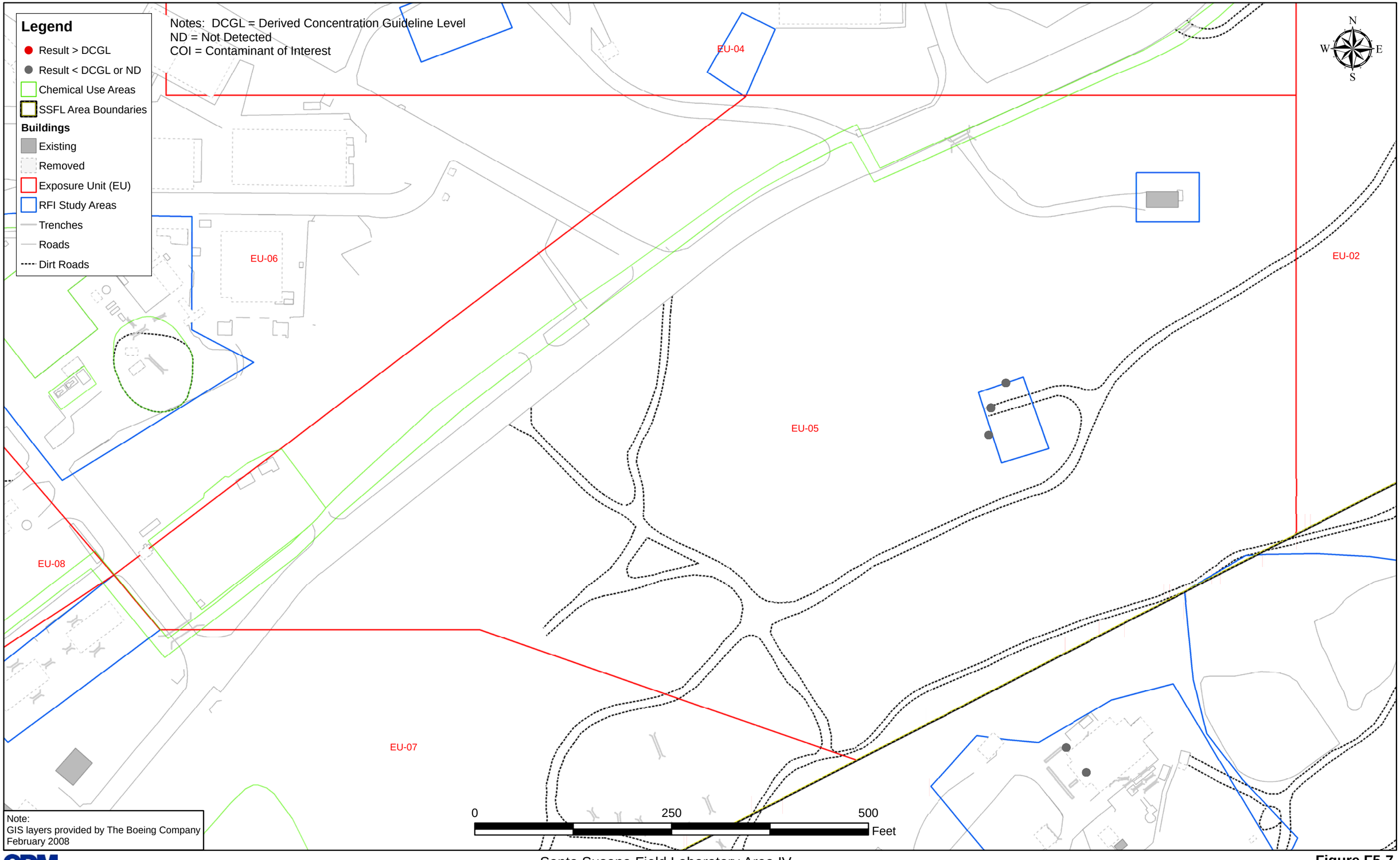
**Figure F5-5**
**Dioxin COIs in Soils - EU-05**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

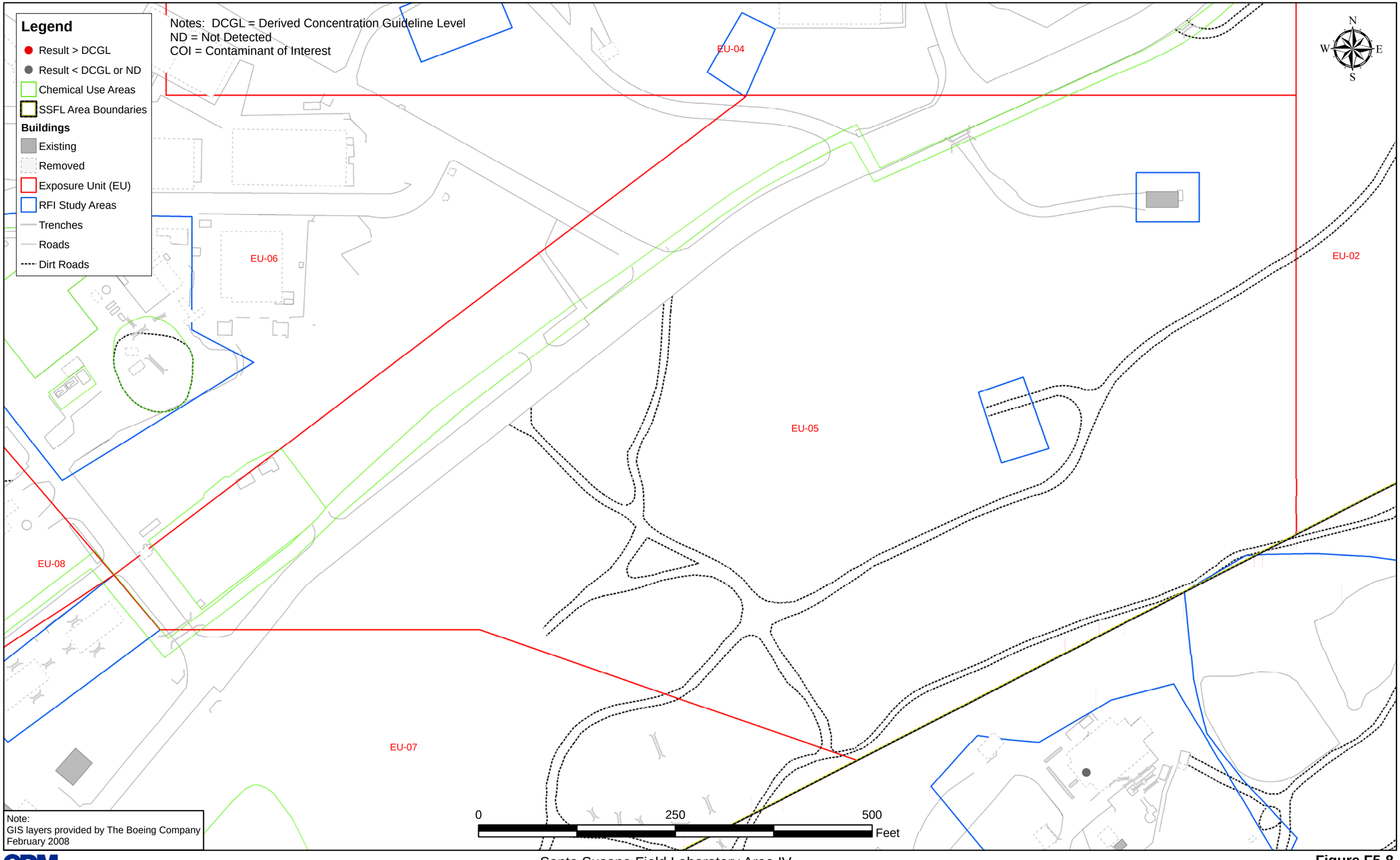
**Figure F5-6**
**VOC COIs in Soils - EU-05**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

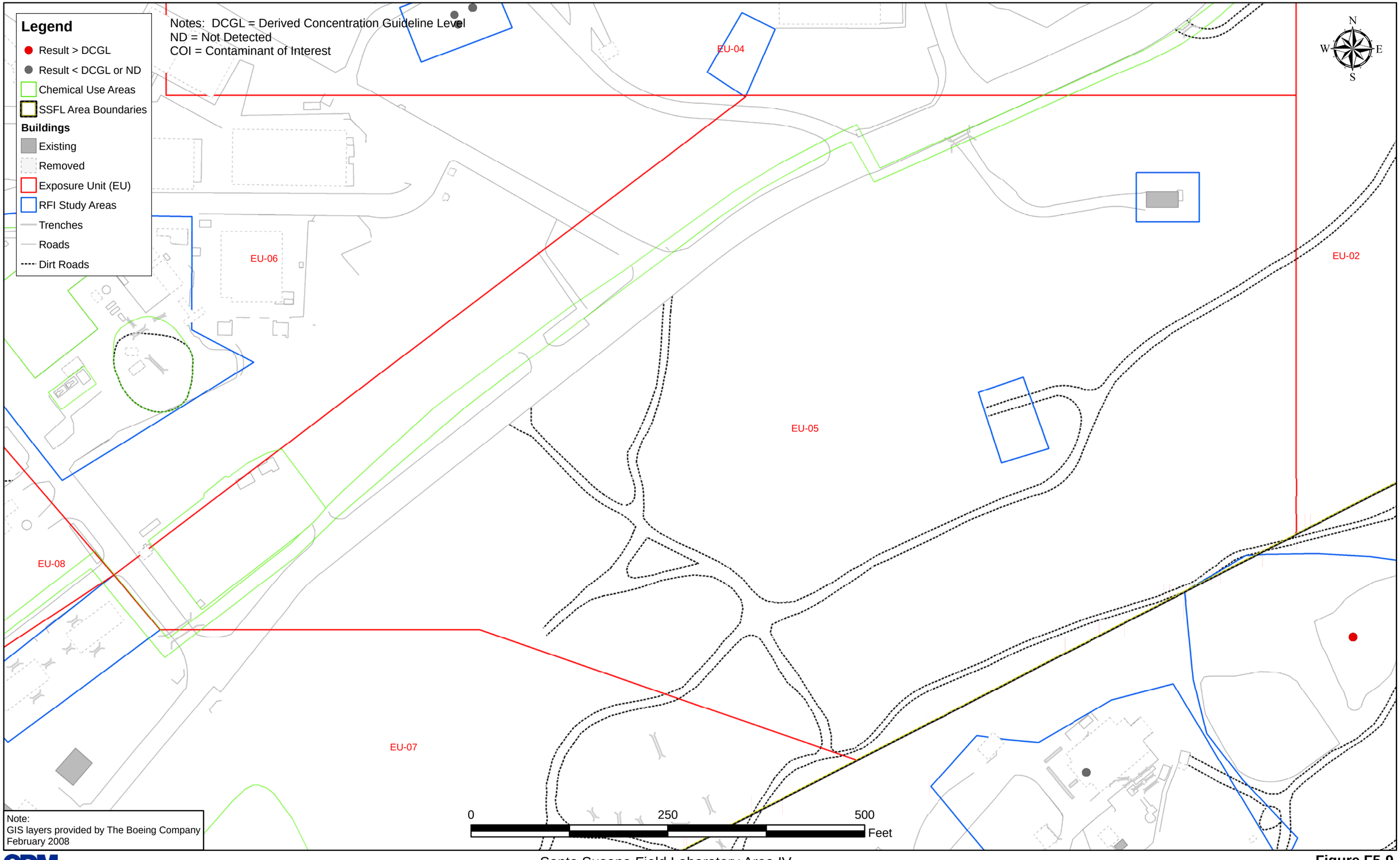
**Figure F5-7**
**SVOC COIs in Soils - EU-05**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

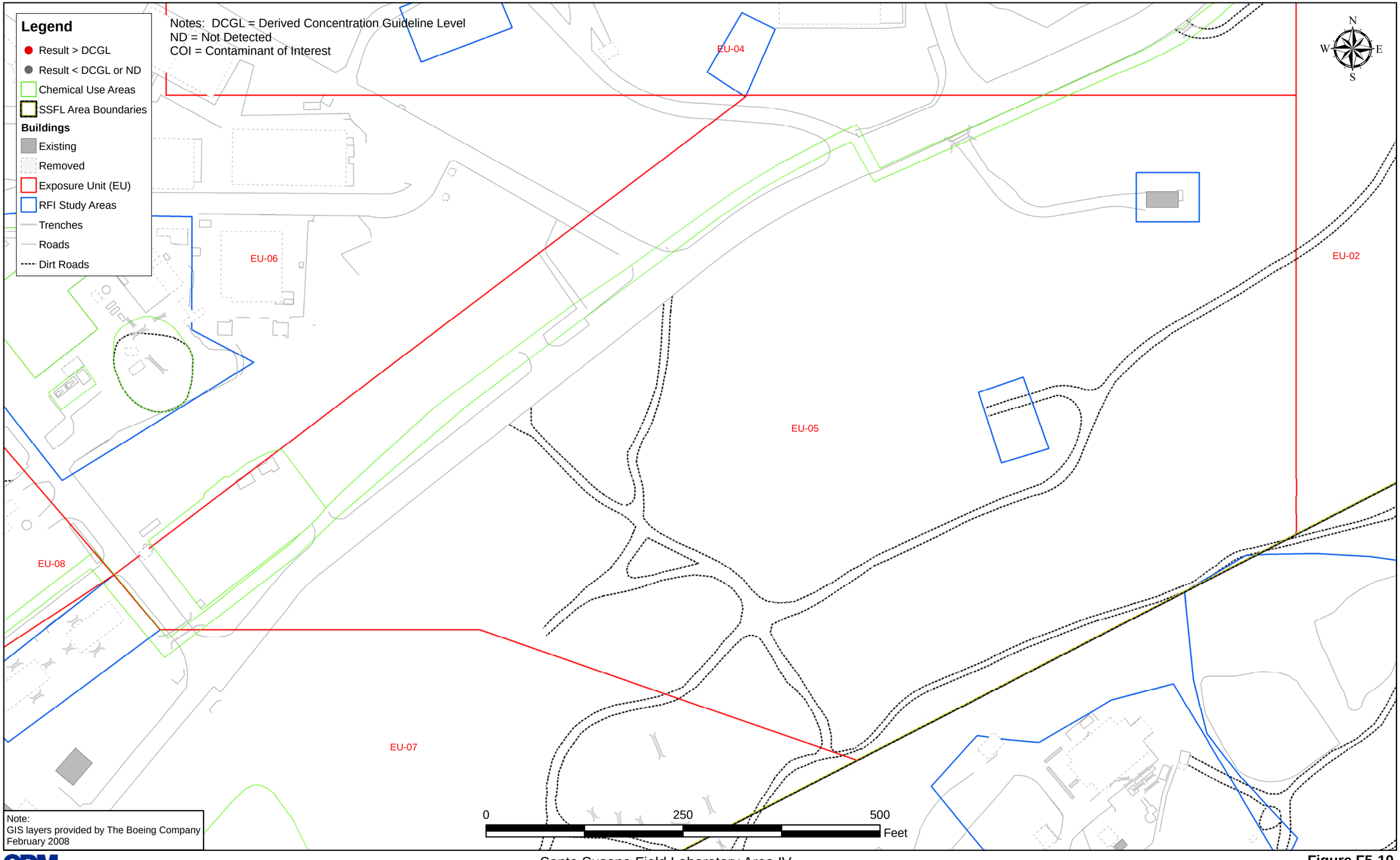
**Figure F5-8**
**PCB COIs in Soils - EU-05**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

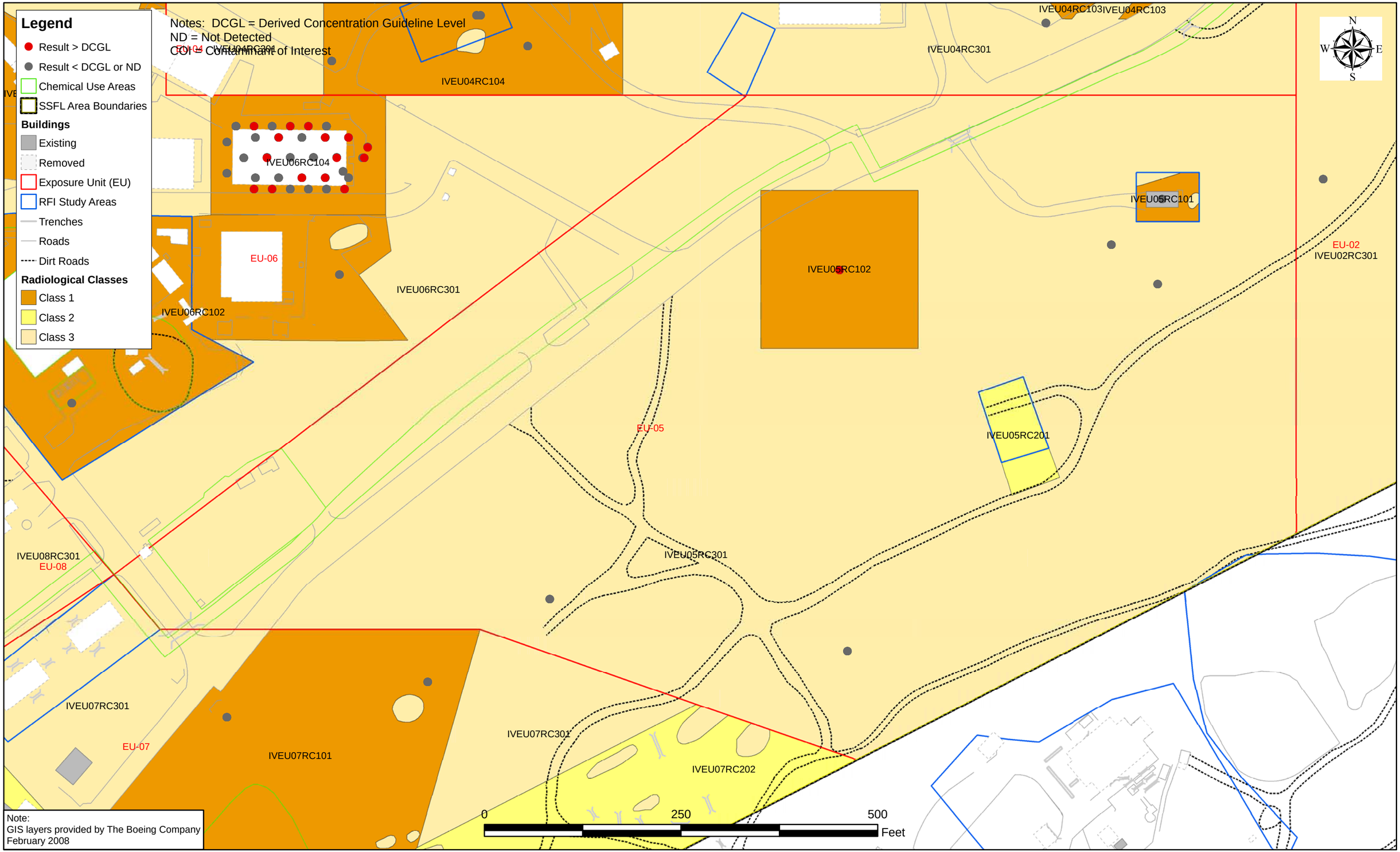
**Figure F5-9**
**Inorganic COIs in Soils - EU-05**
**(2-10 ft bgs)**




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Ventura County, California

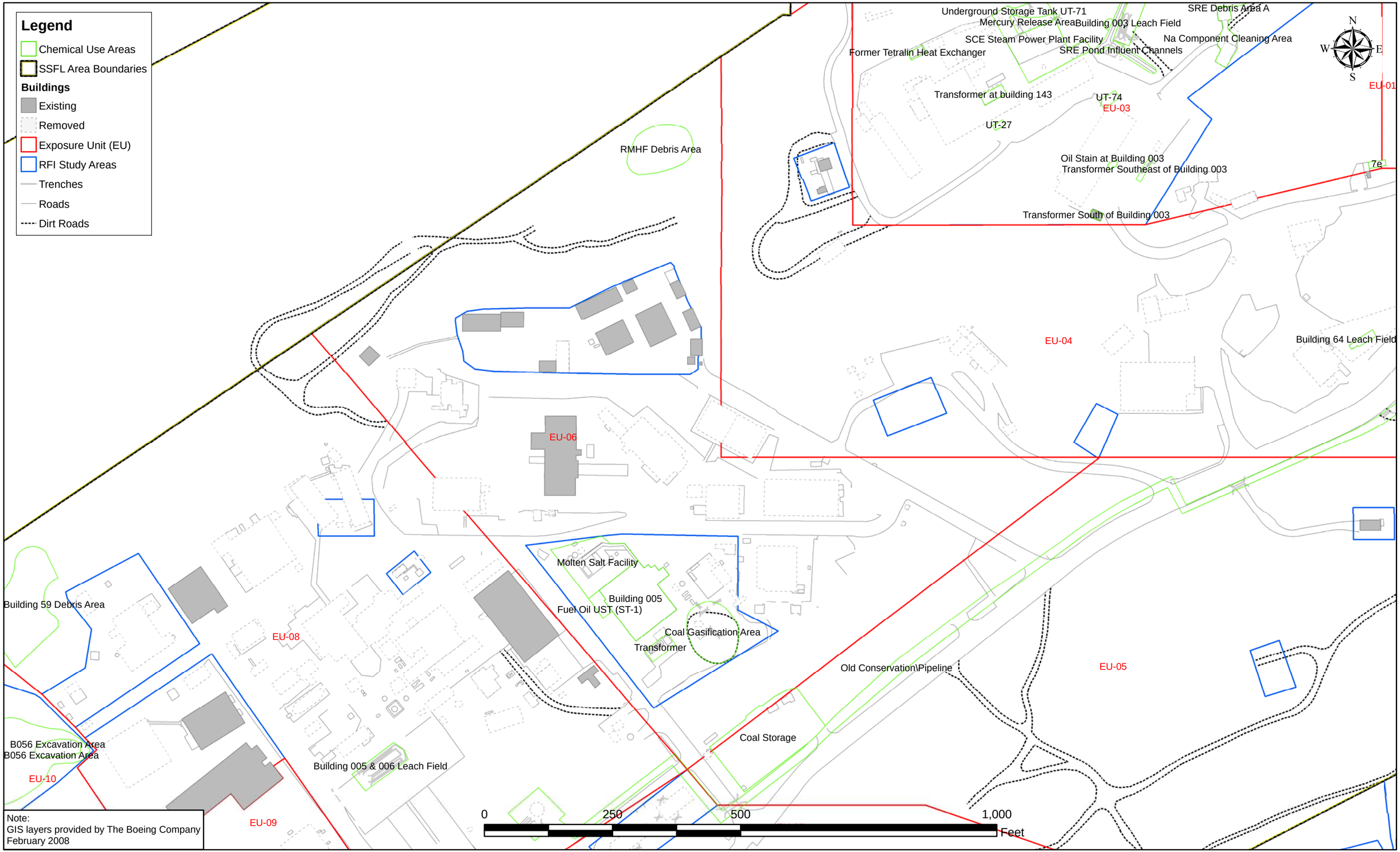
**Figure F5-10**
**Dioxin COIs in Soils - EU-05**
**(2-10 ft bgs)**




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Ventura County, California

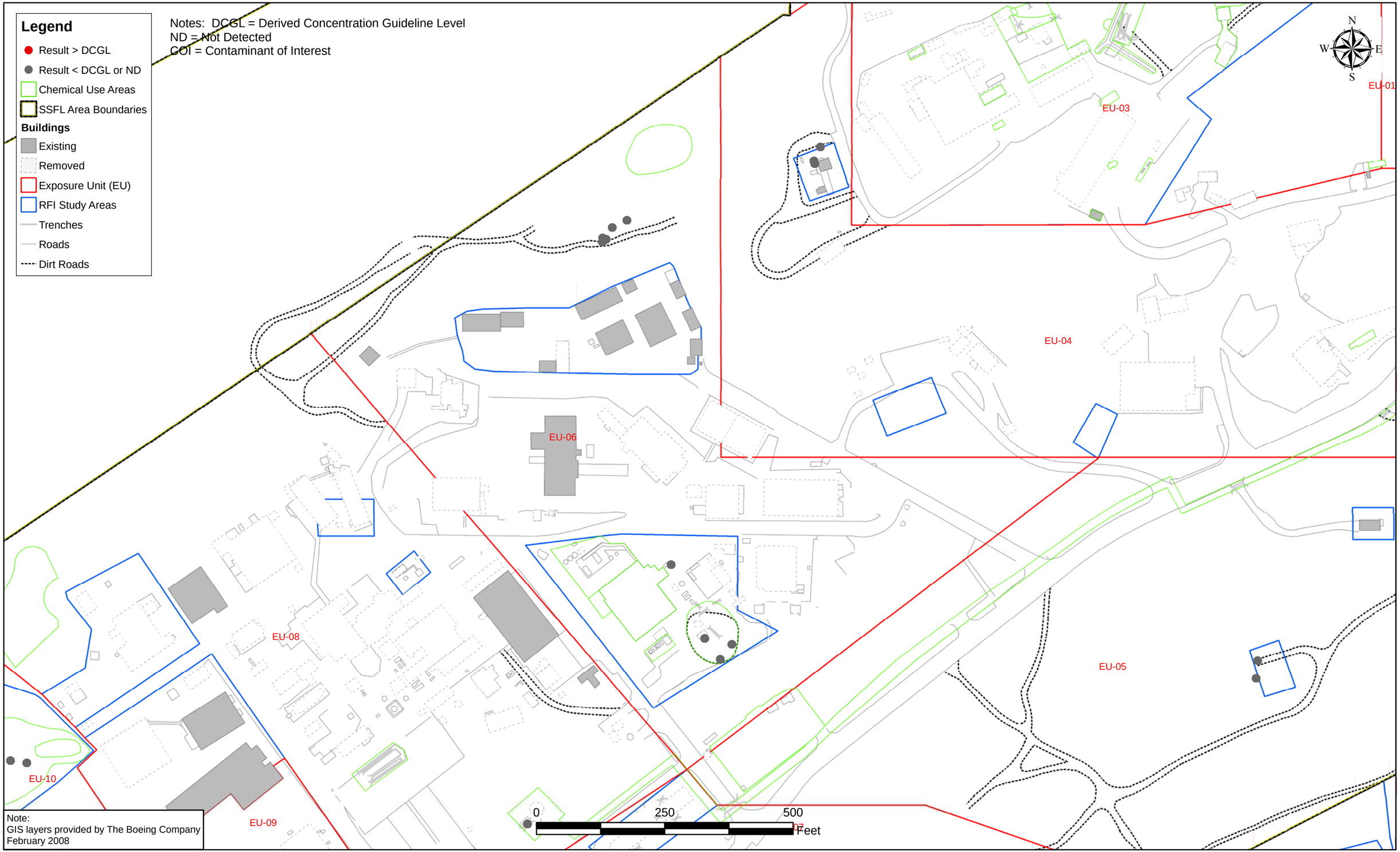
**Figure F5-11**
**Radiological COIs in Soils - EU-05**
**(0-6 in bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

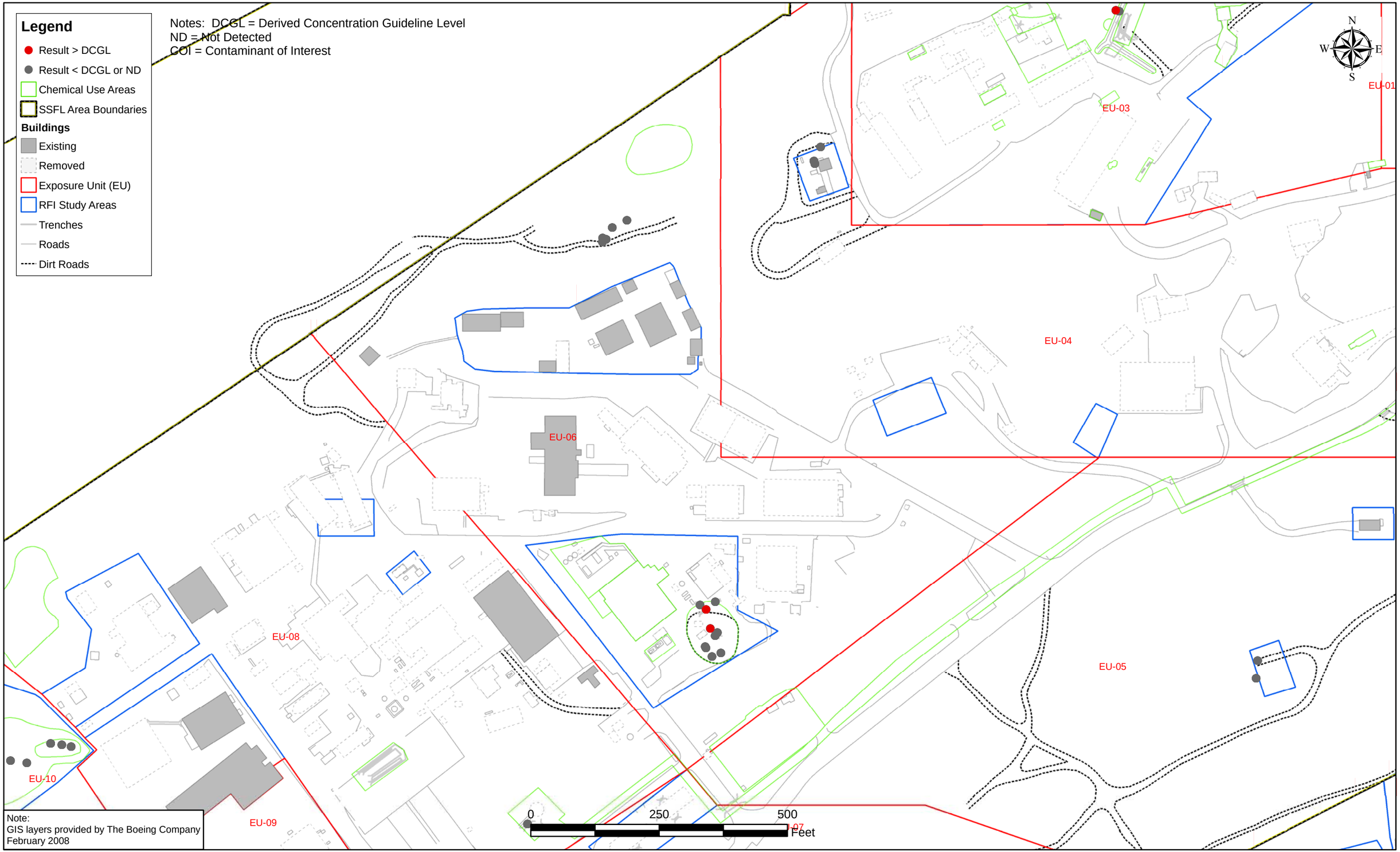
**Figure F6-0**
**EU-06 Chemical Use Areas**




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Ventura County, California

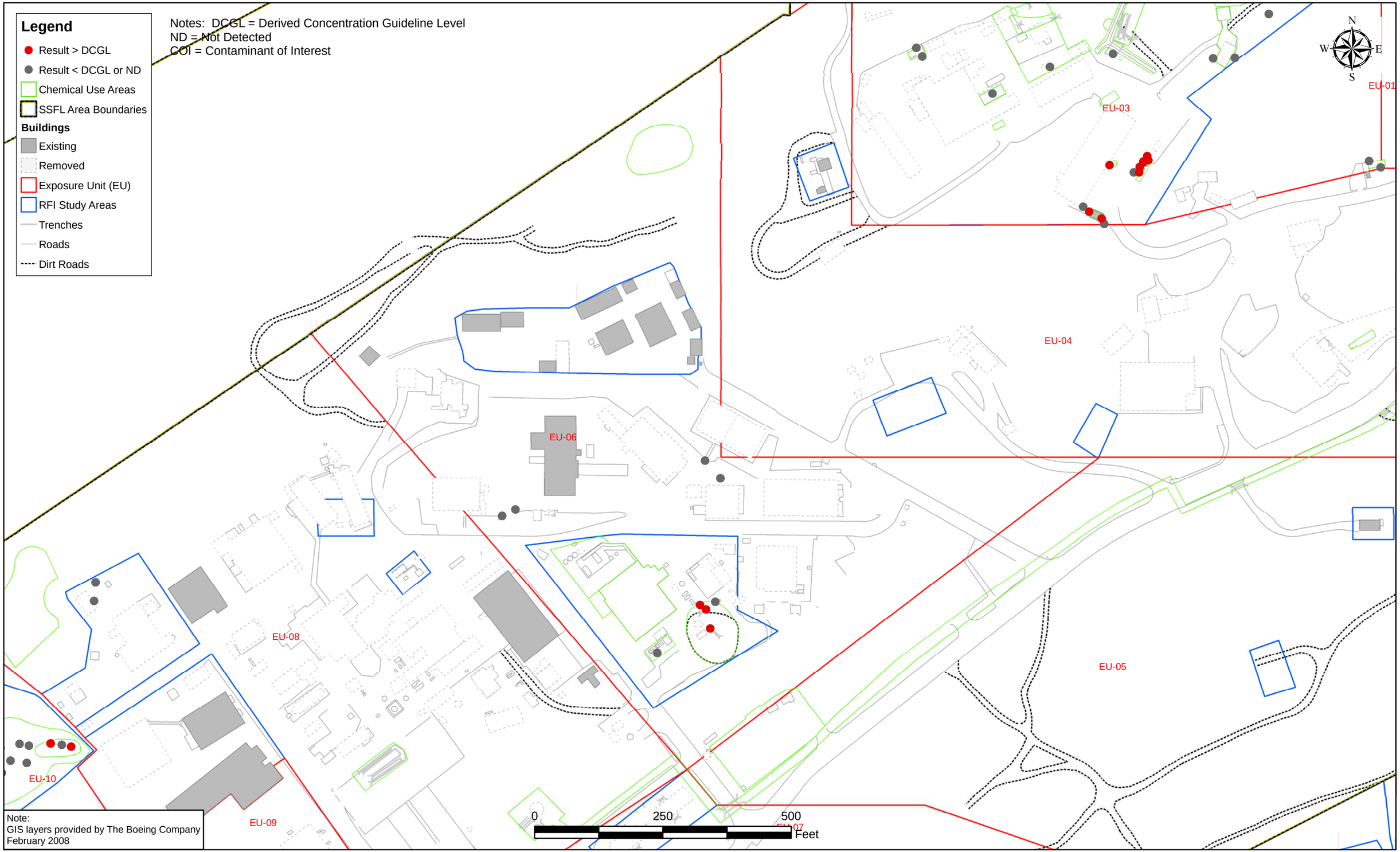
**Figure F6-1**
**VOC COIs in Soils - EU-06**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

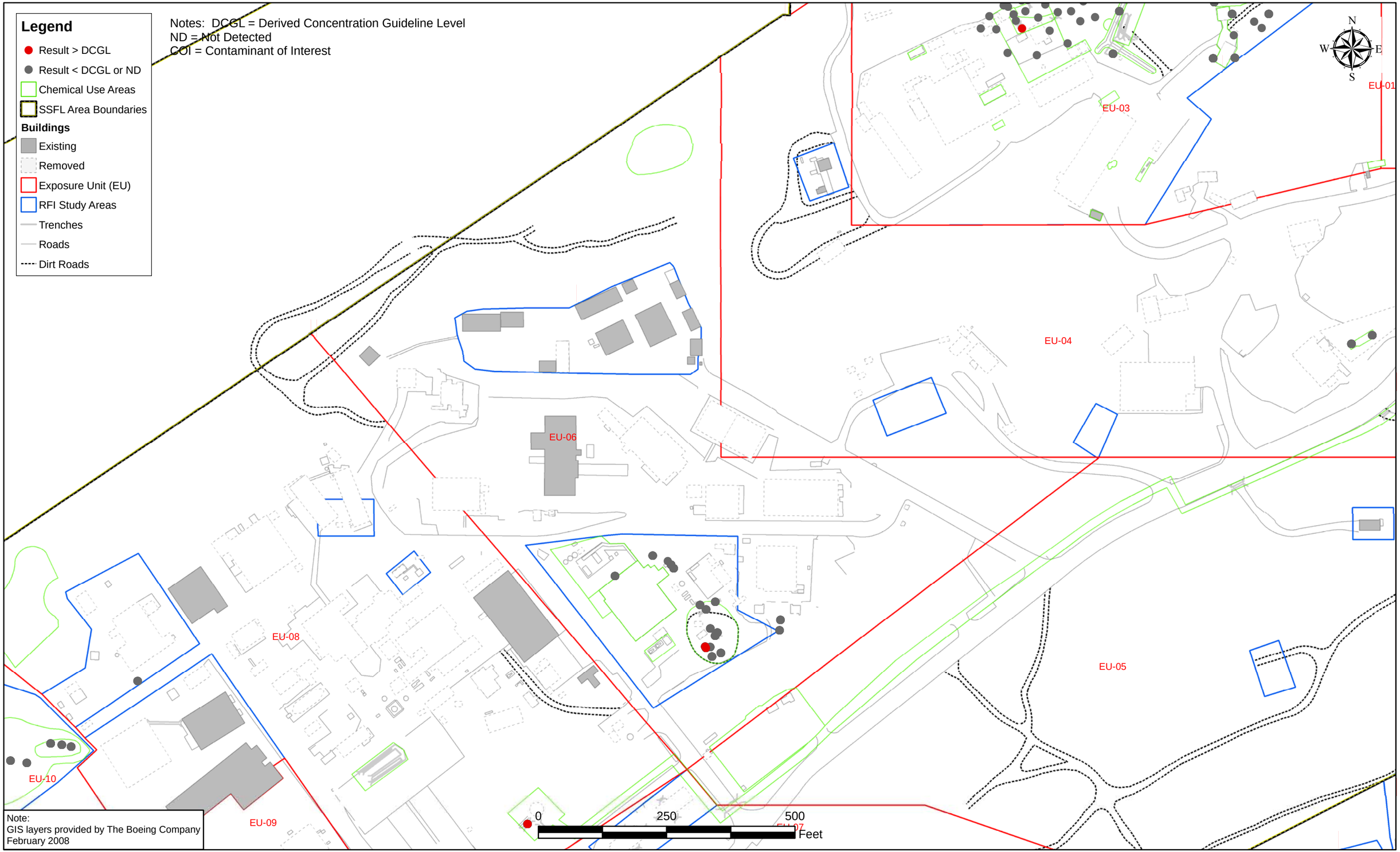
**Figure F6-2**
**SVOC COIs in Soils - EU-06**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

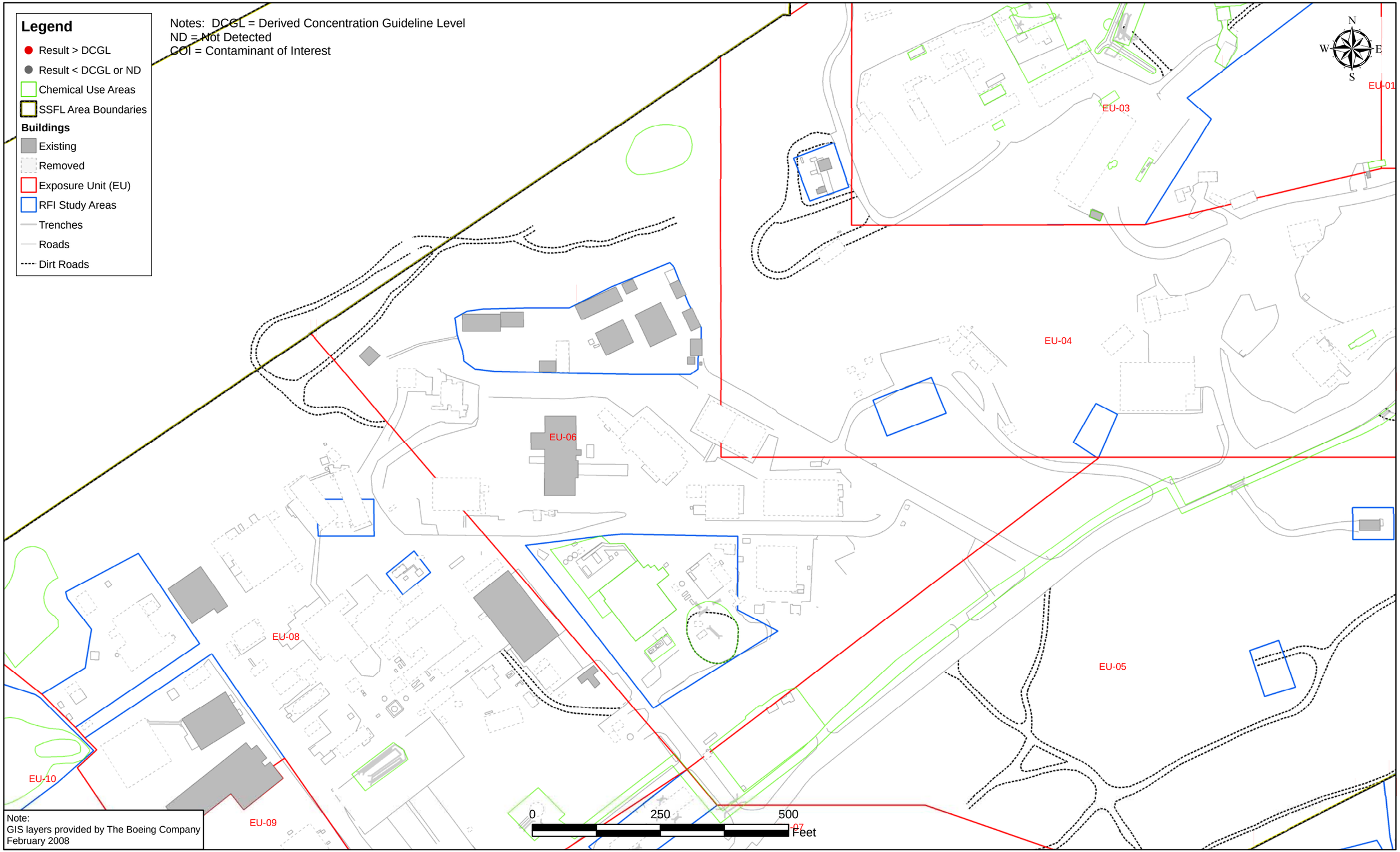
**Figure F6-3**
**PCB COIs in Soils - EU-06**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

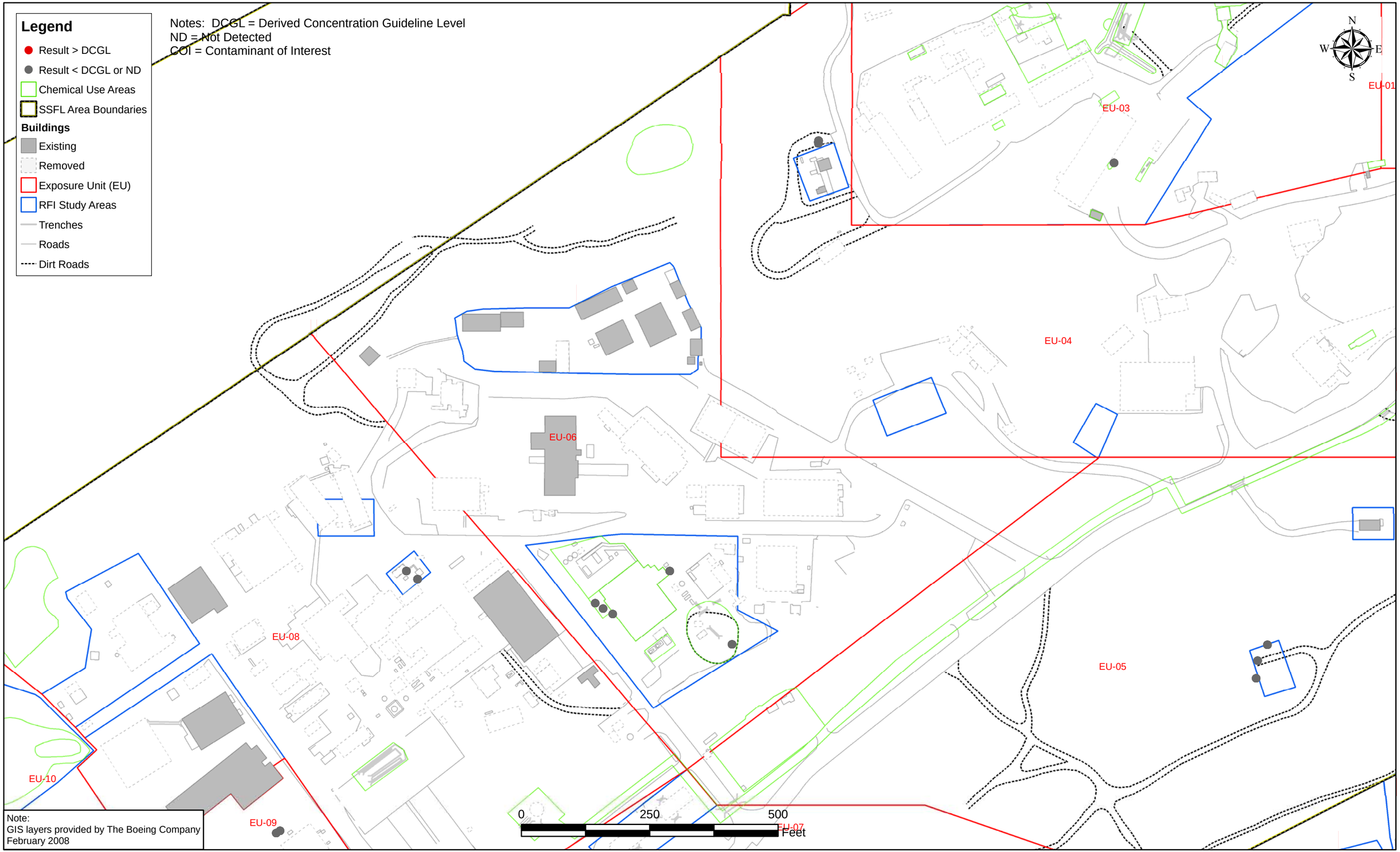
**Figure F6-4**
**Inorganic COIs in Soils - EU-06**
**(0-2 ft bgs)**




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Ventura County, California

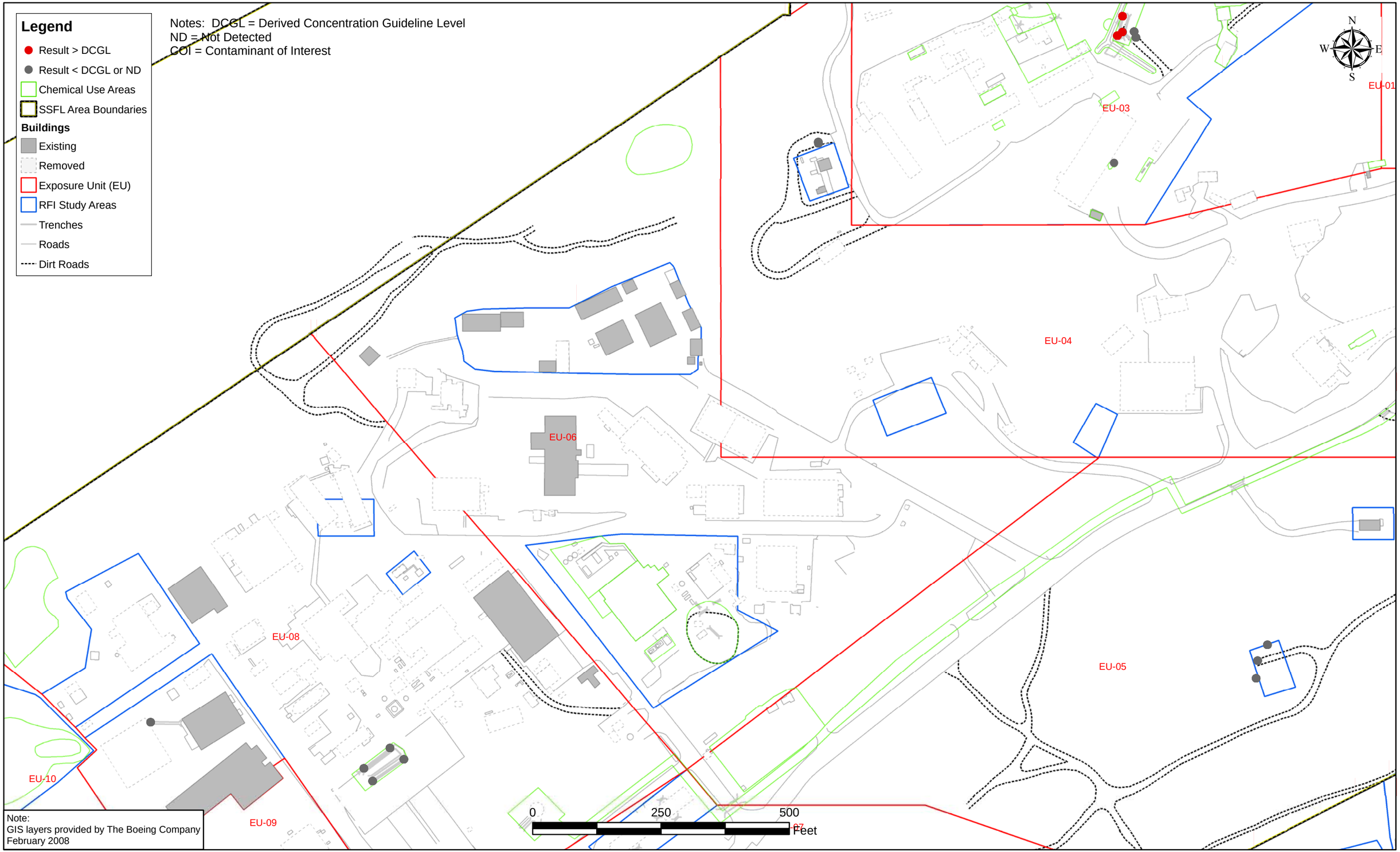
**Figure F6-5**
**Dioxin COIs in Soils - EU-06**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

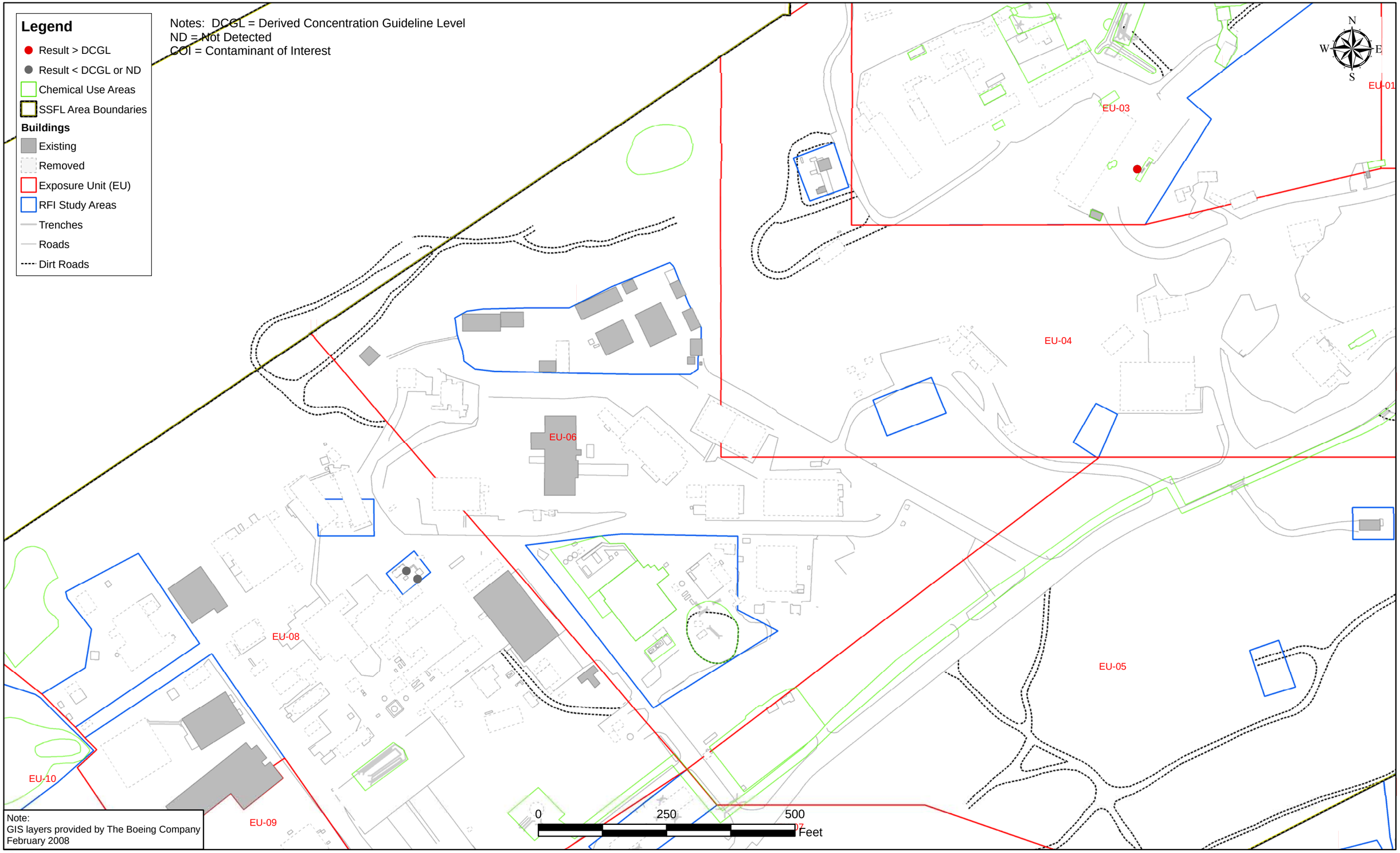
**Figure F6-6**
**VOC COIs in Soils - EU-06**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

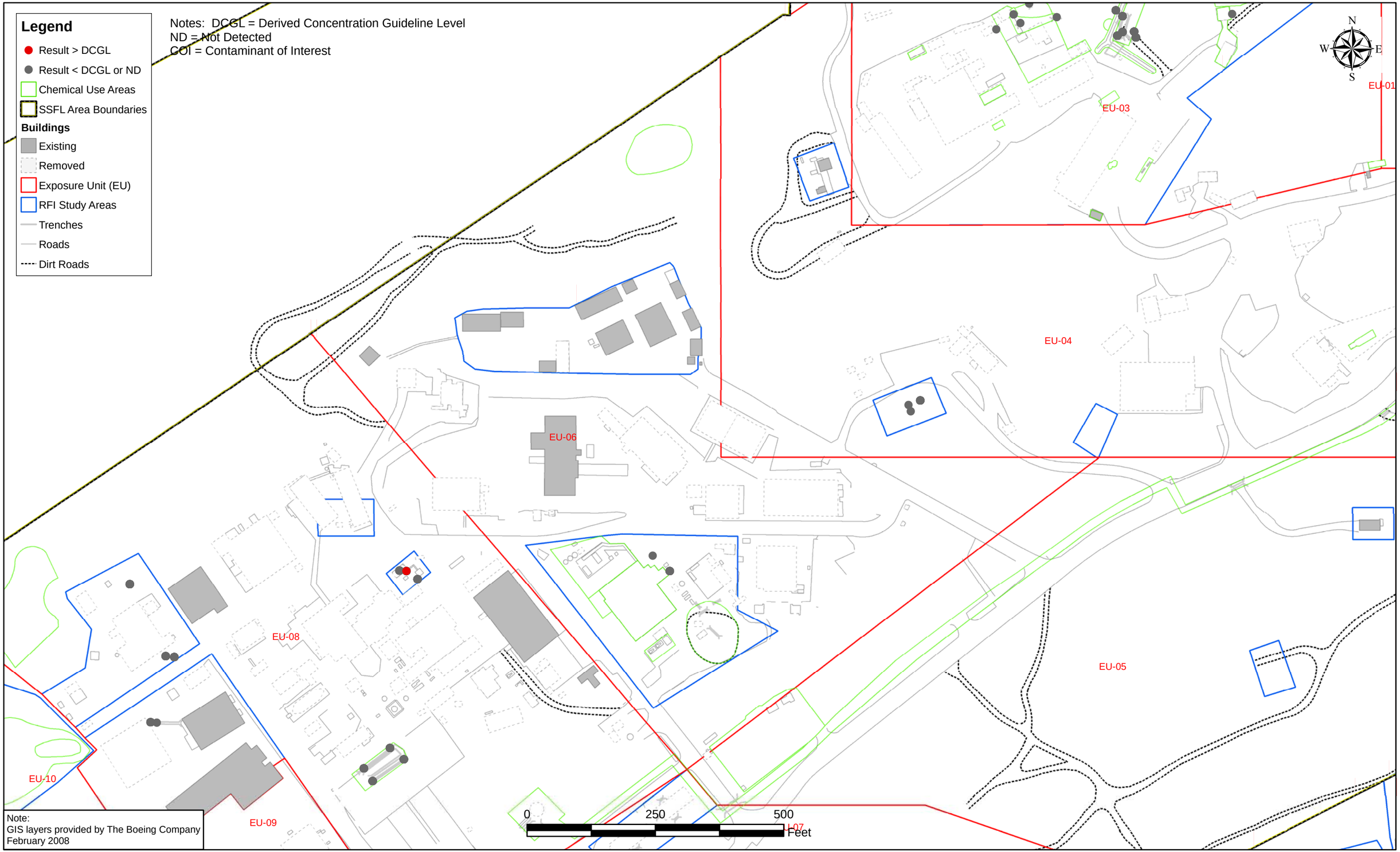
**Figure F6-7**
**SVOC COIs in Soils - EU-06**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

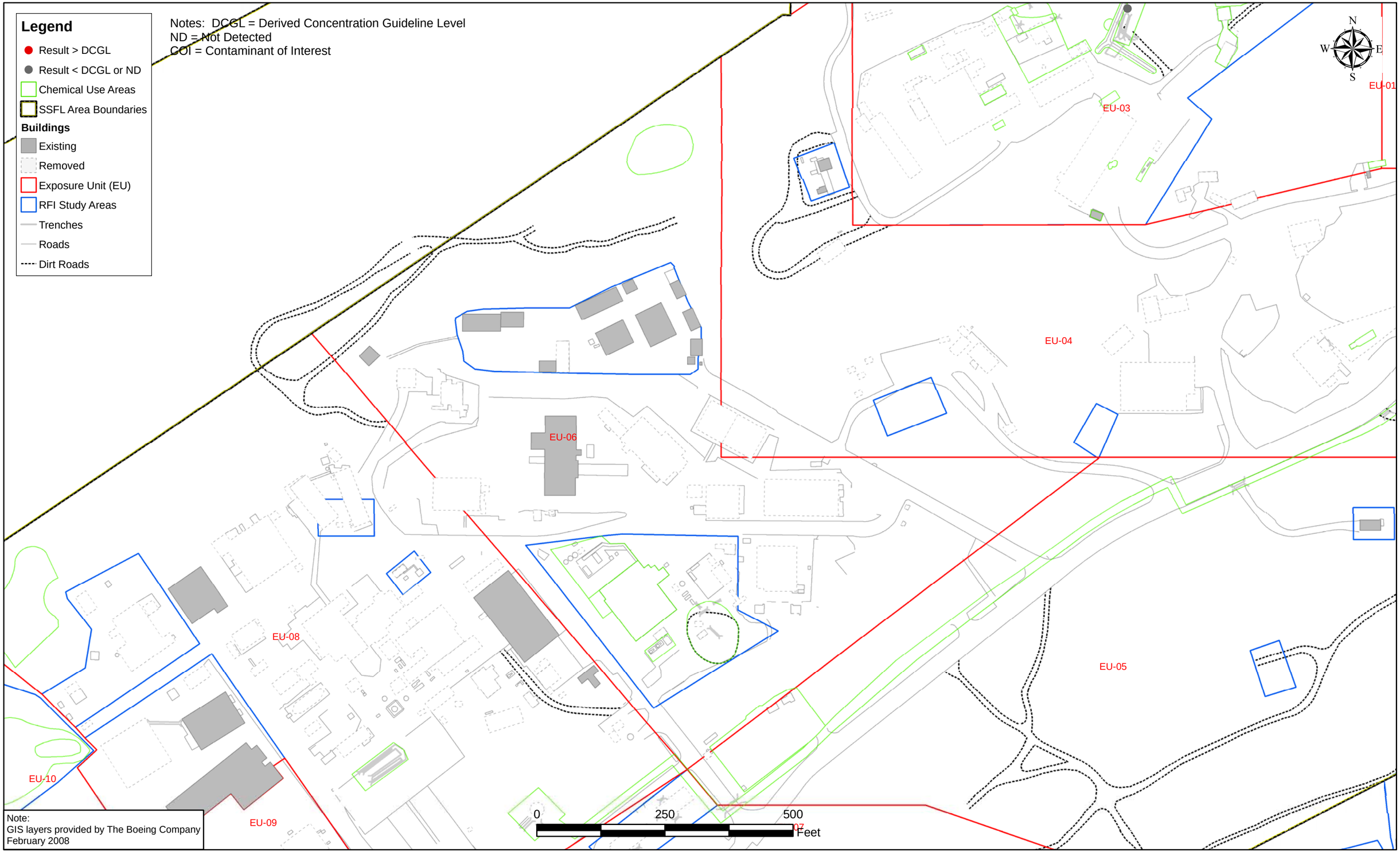
**Figure F6-8**
**PCB COIs in Soils - EU-06**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

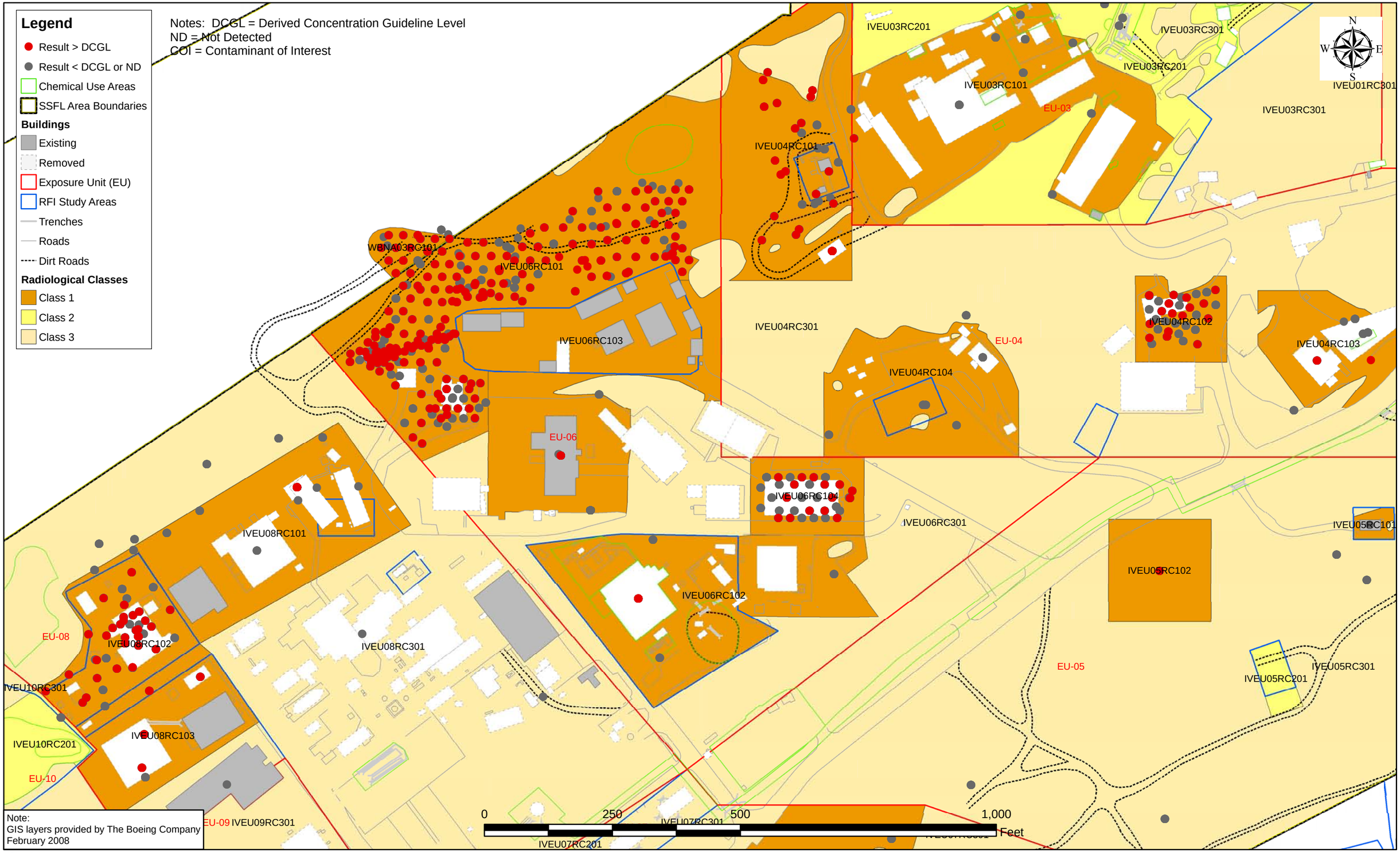
**Figure F6-9**
**Inorganic COIs in Soils - EU-06**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

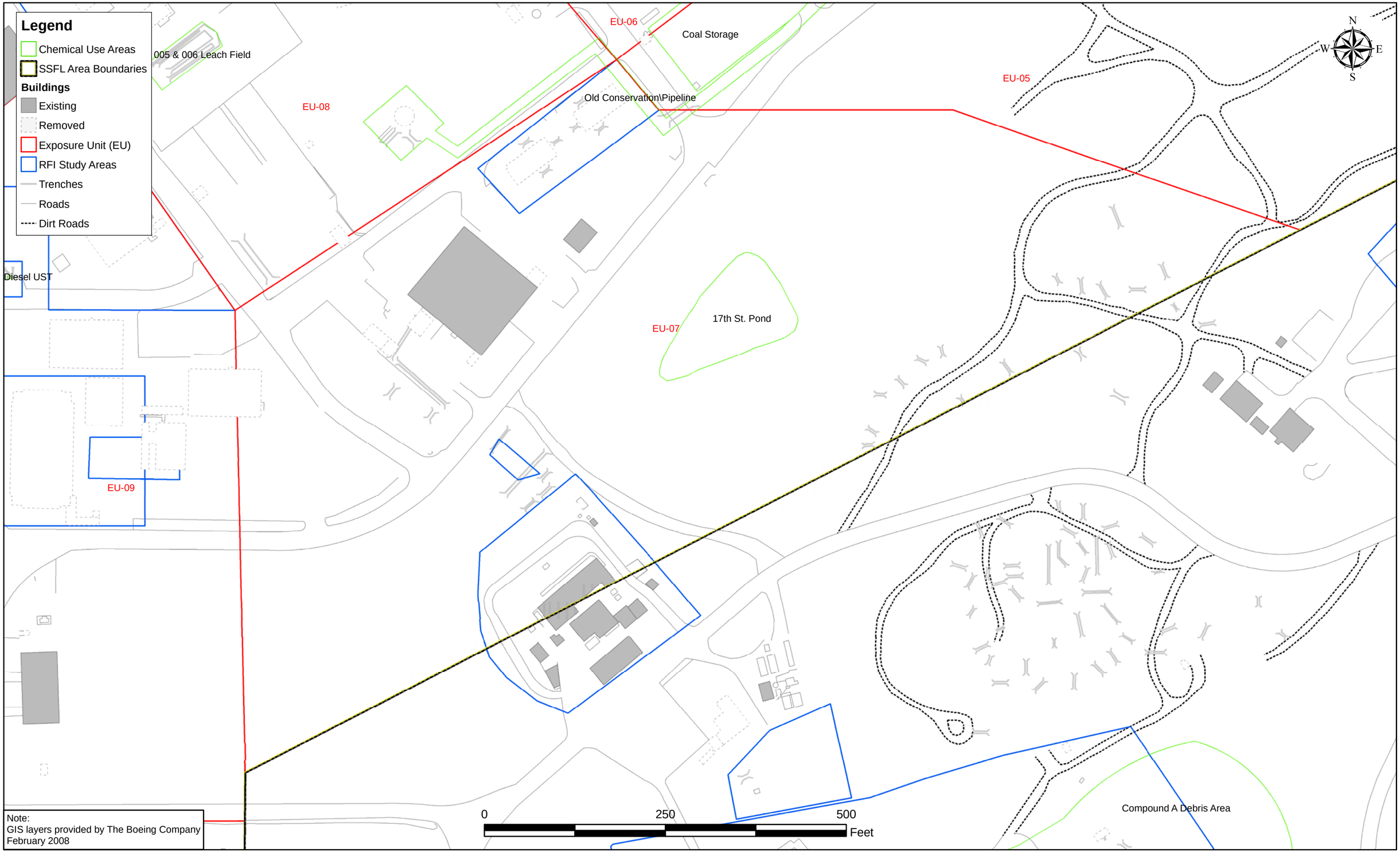
**Figure F6-10**
**Dioxin COIs in Soils - EU-06**
**(2-10 ft bgs)**




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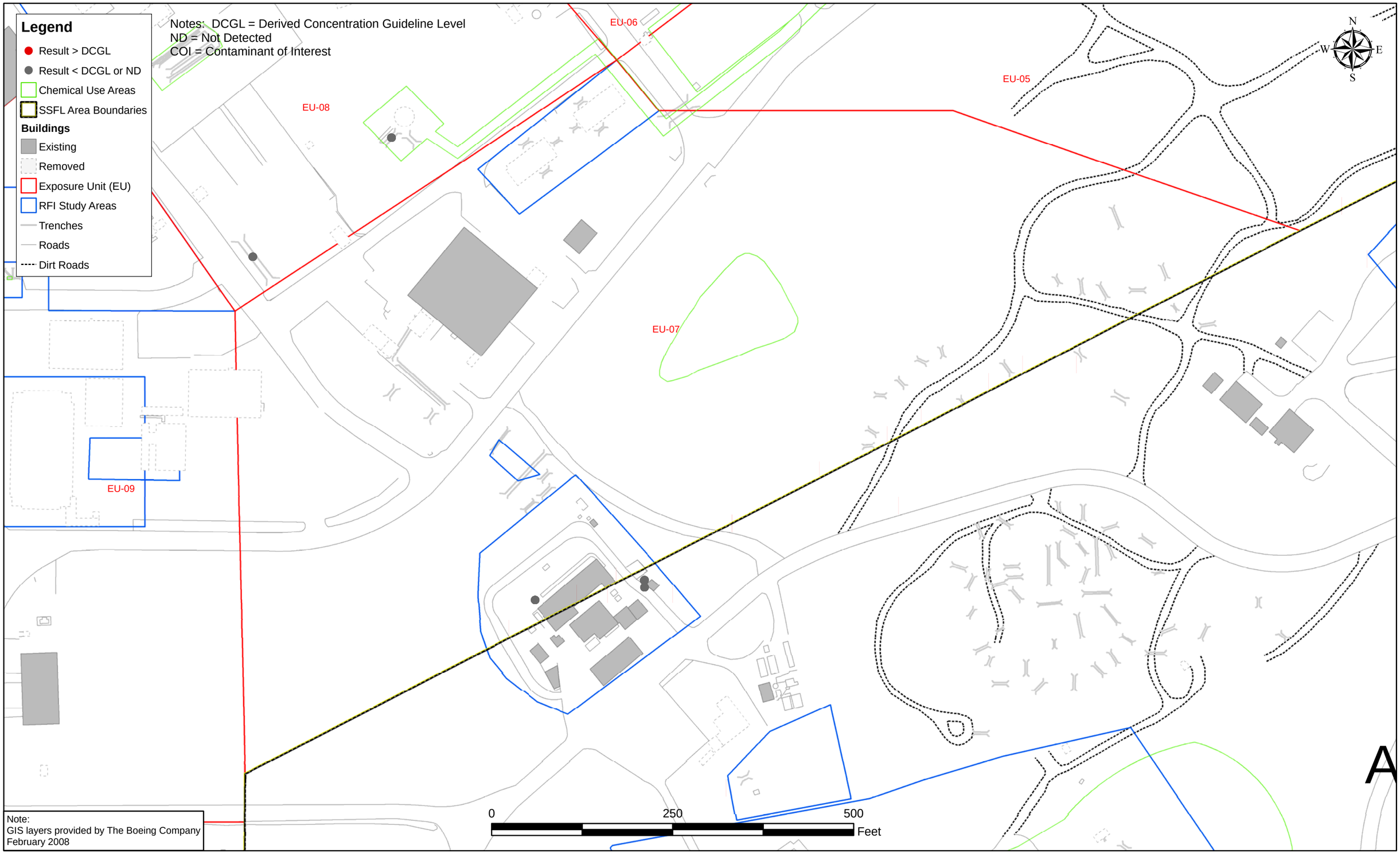
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F6-11**
**Radiological COIs in Soils - EU-06**
**(0-6 in bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

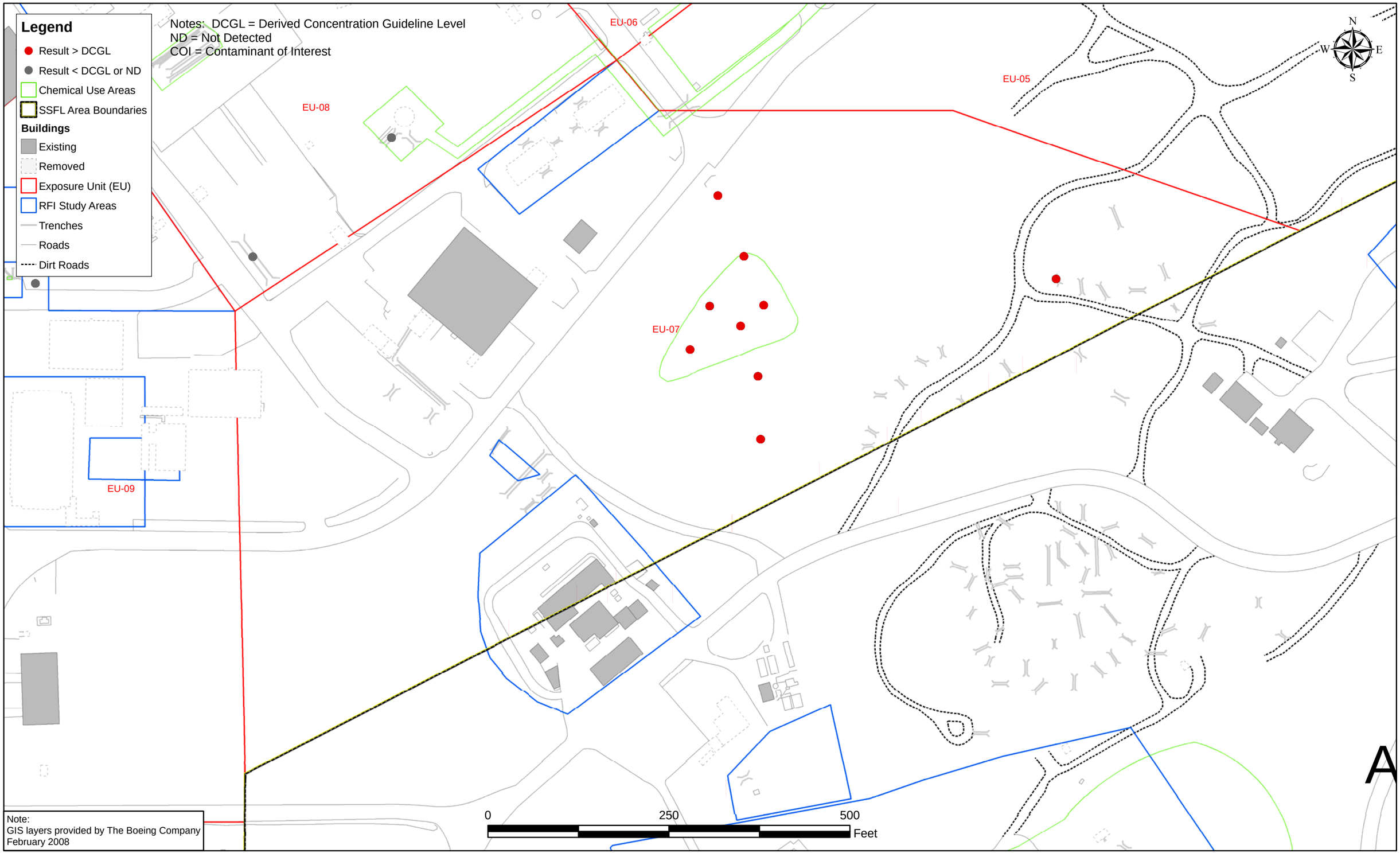
**Figure F7-0**
**EU-07 Chemical Use Areas**




CDM

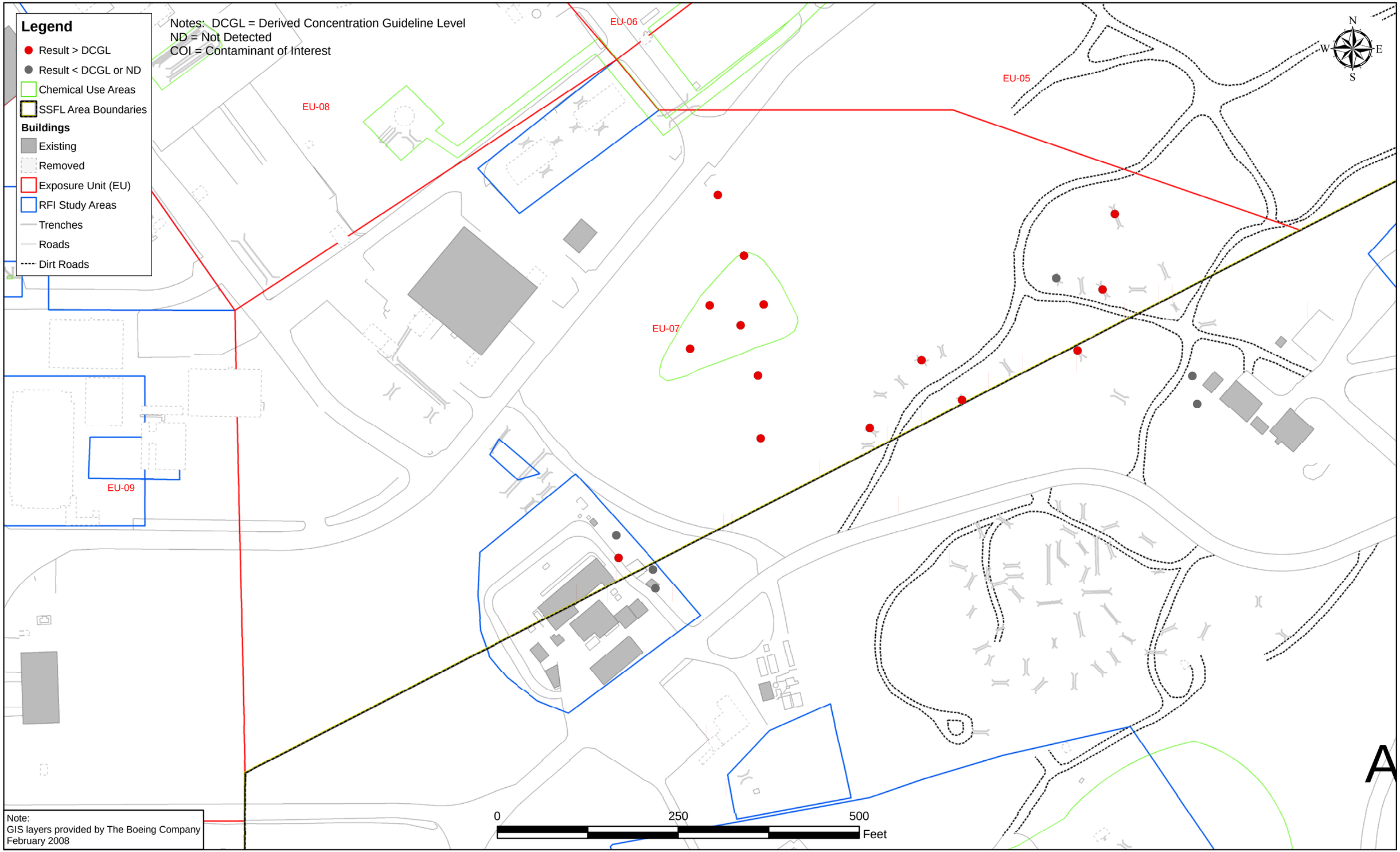
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F7-1**
**VOC COIs in Soils - EU-07**
**(0-2 ft bgs)**



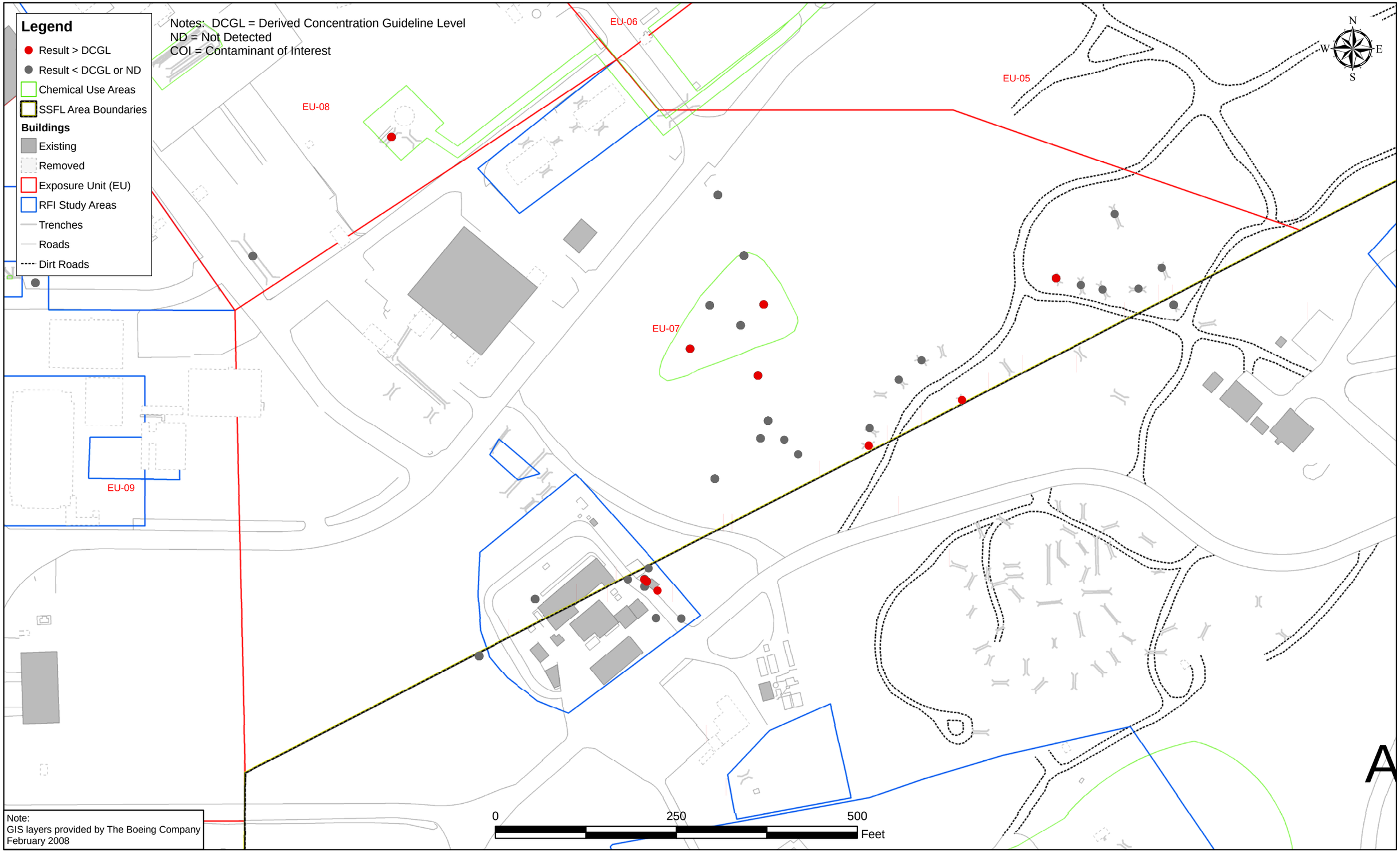

Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F7-2**
**SVOC COIs in Soils - EU-07**
**(0-2 ft bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

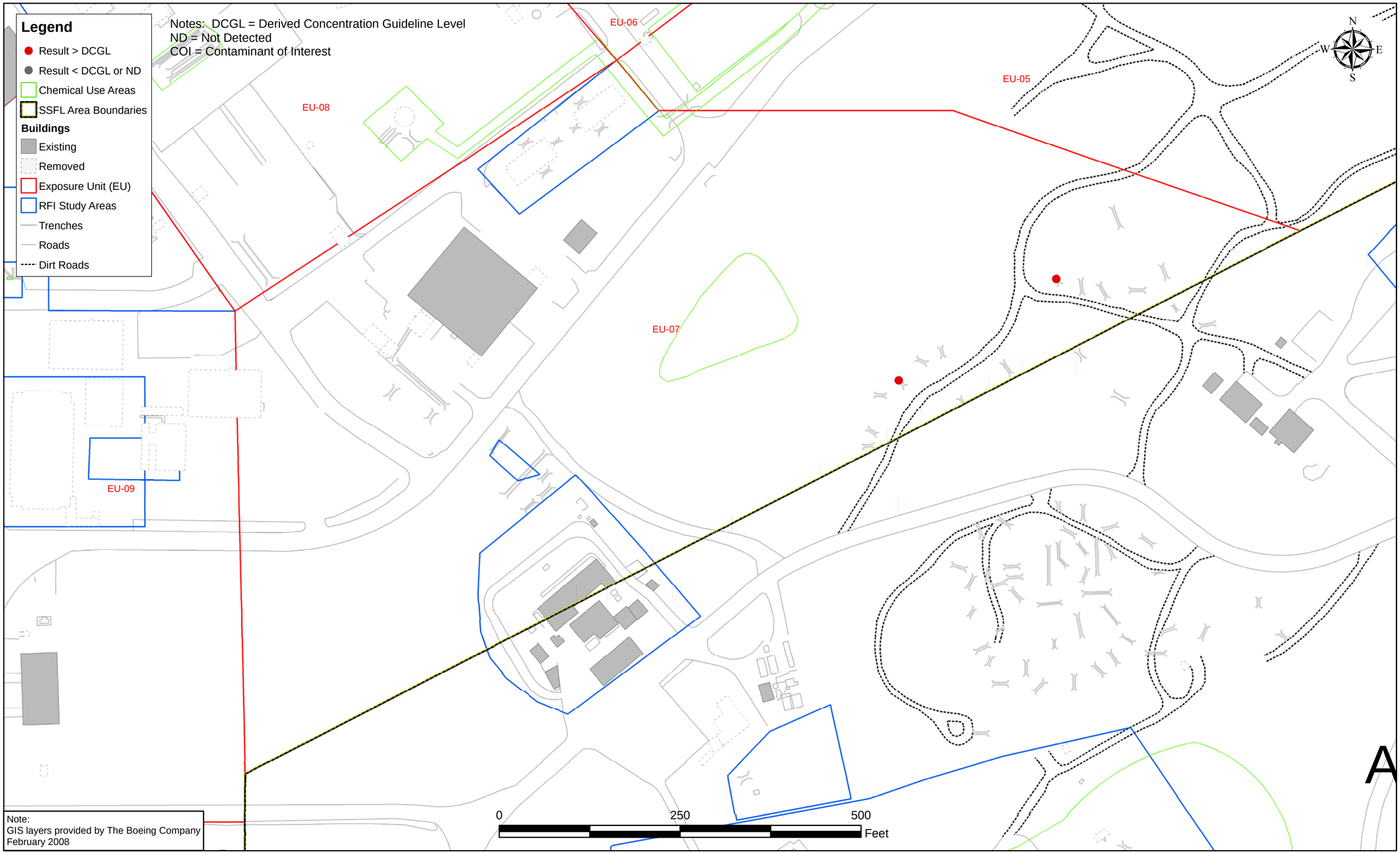
**Figure F7-3**
**PCB COIs in Soils - EU-07**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

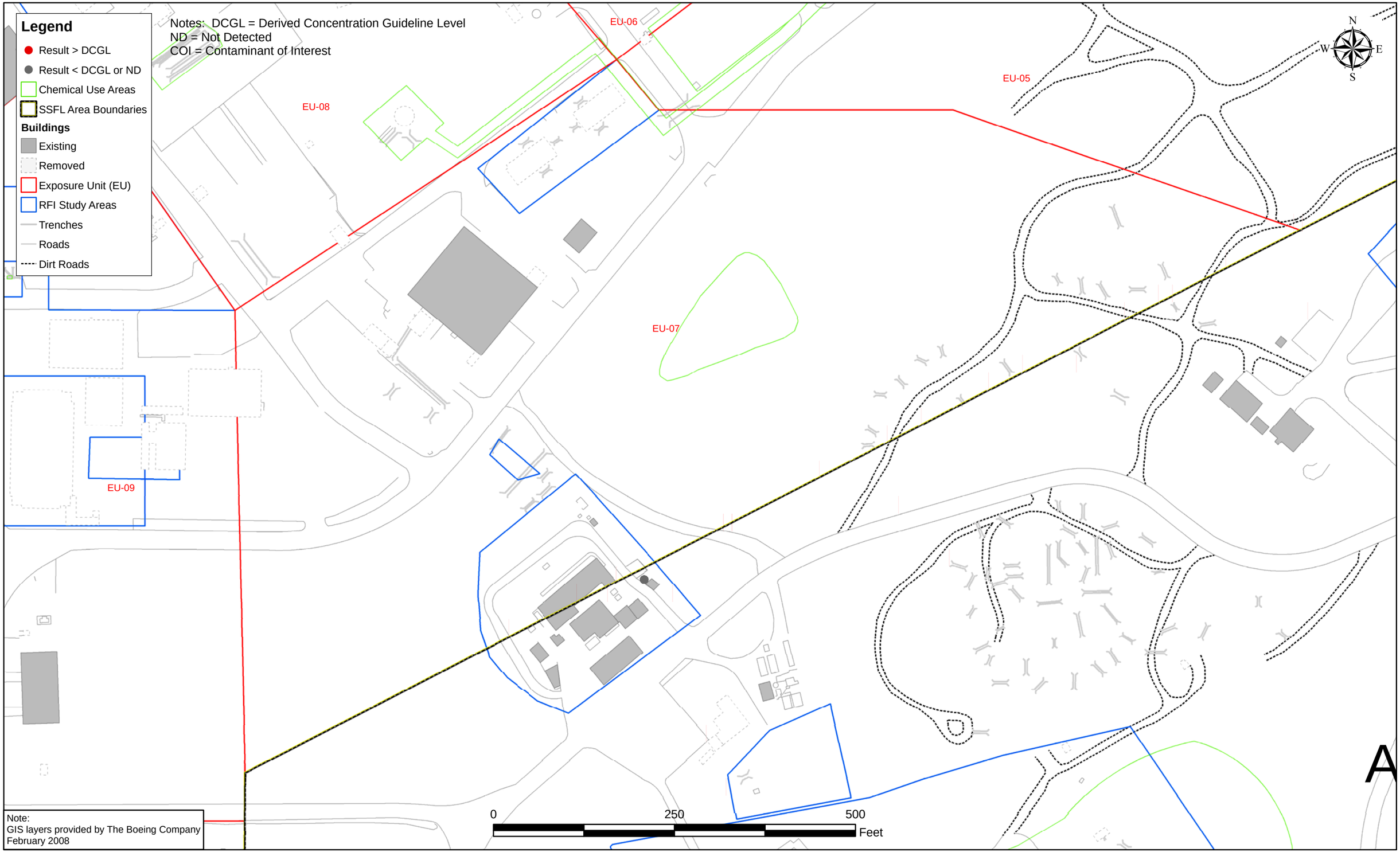
**Figure F7-4**
**Inorganic COIs in Soils - EU-07**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

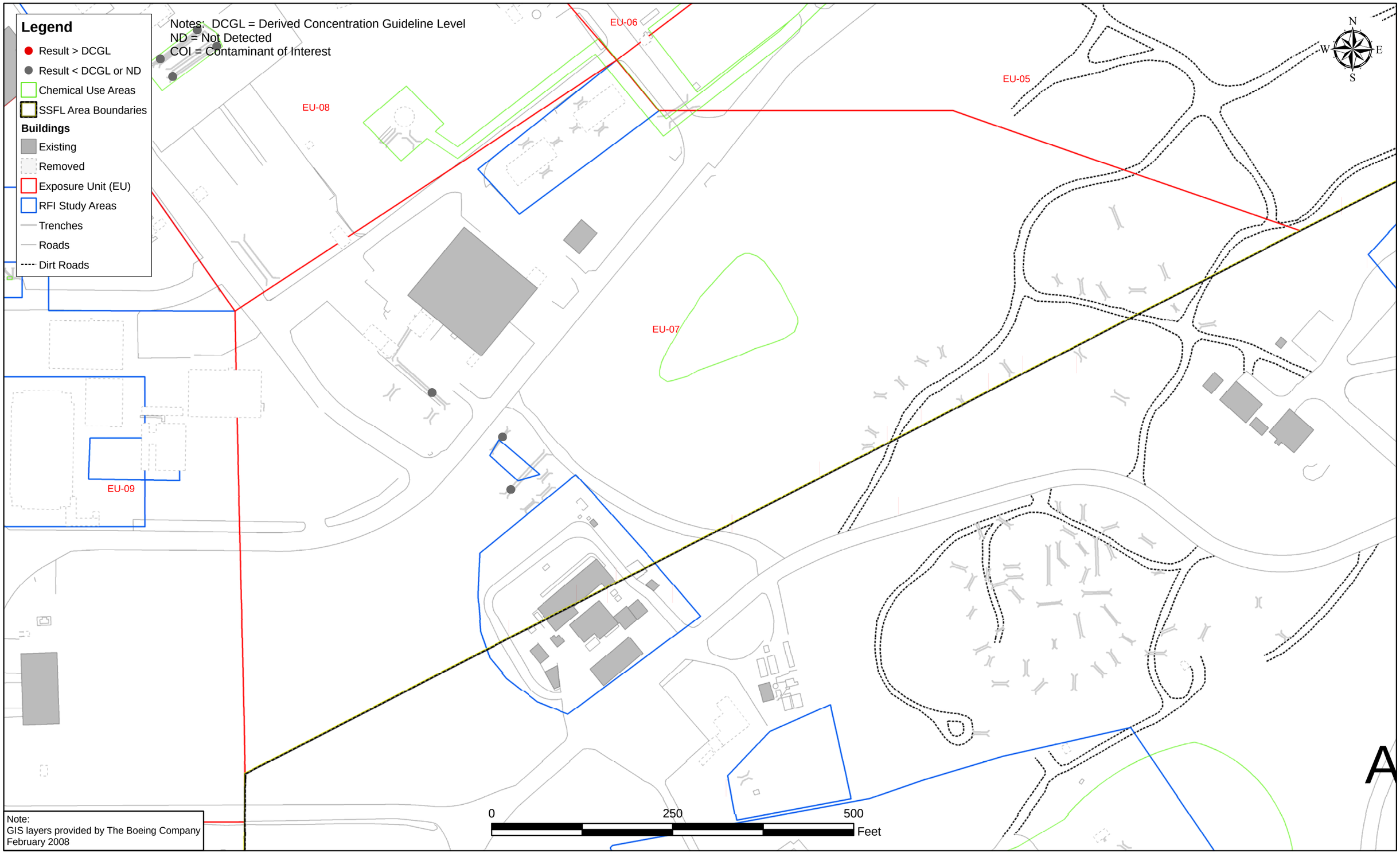
**Figure F7-5**
**Dioxin COIs in Soils - EU-07**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

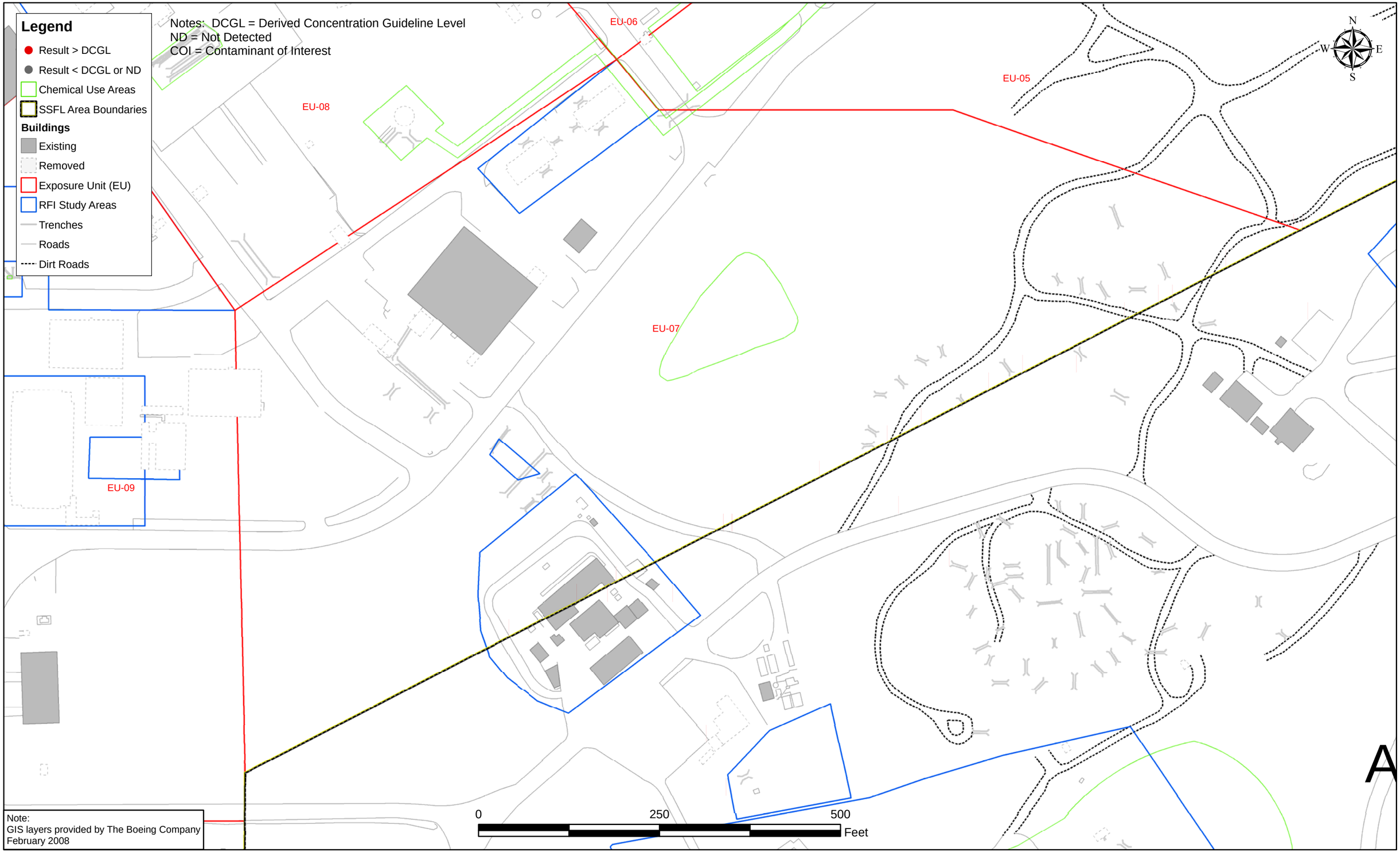
**Figure F7-6**
**VOC COIs in Soils - EU-07**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

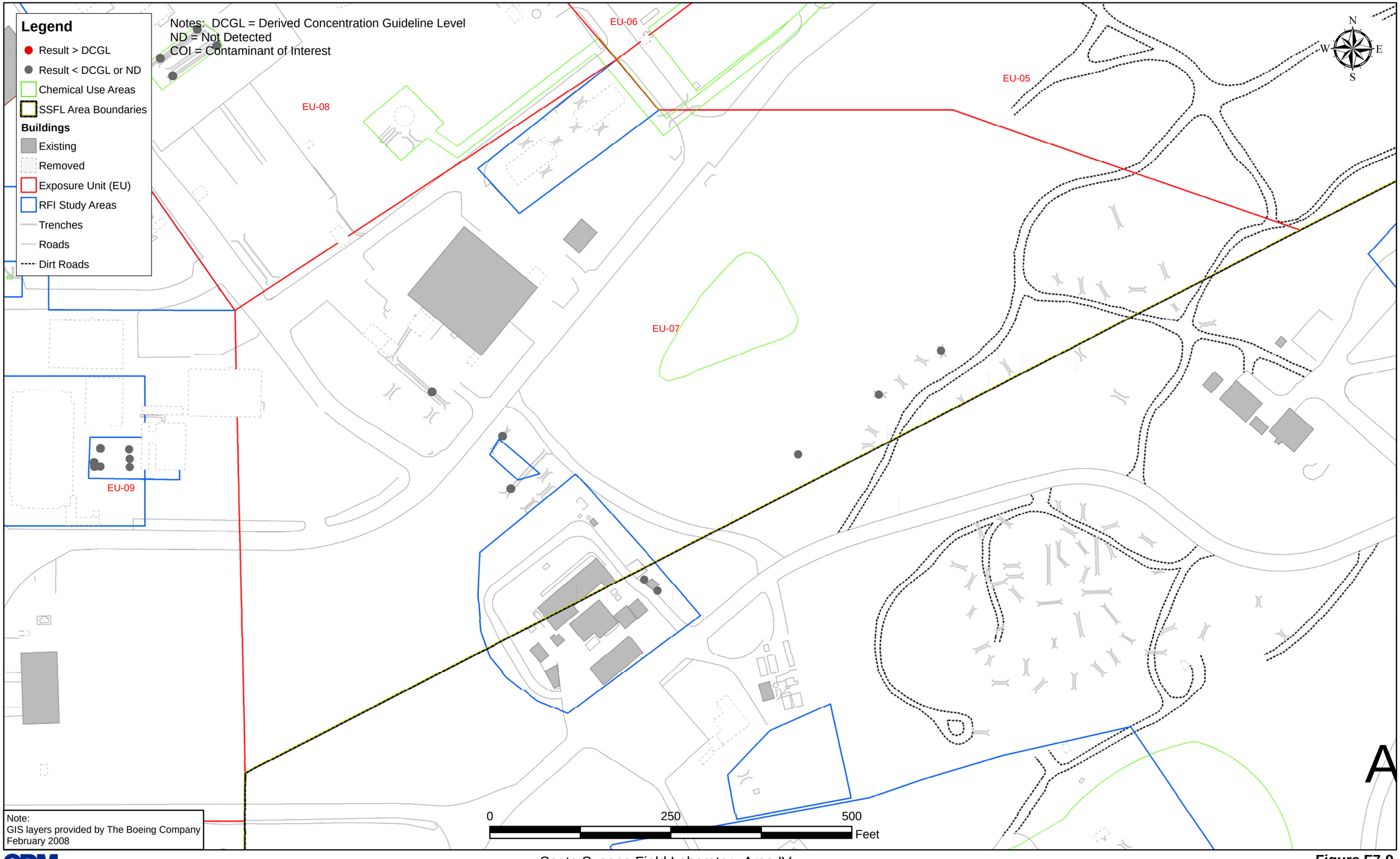
**Figure F7-7**
**SVOC COIs in Soils - EU-07**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

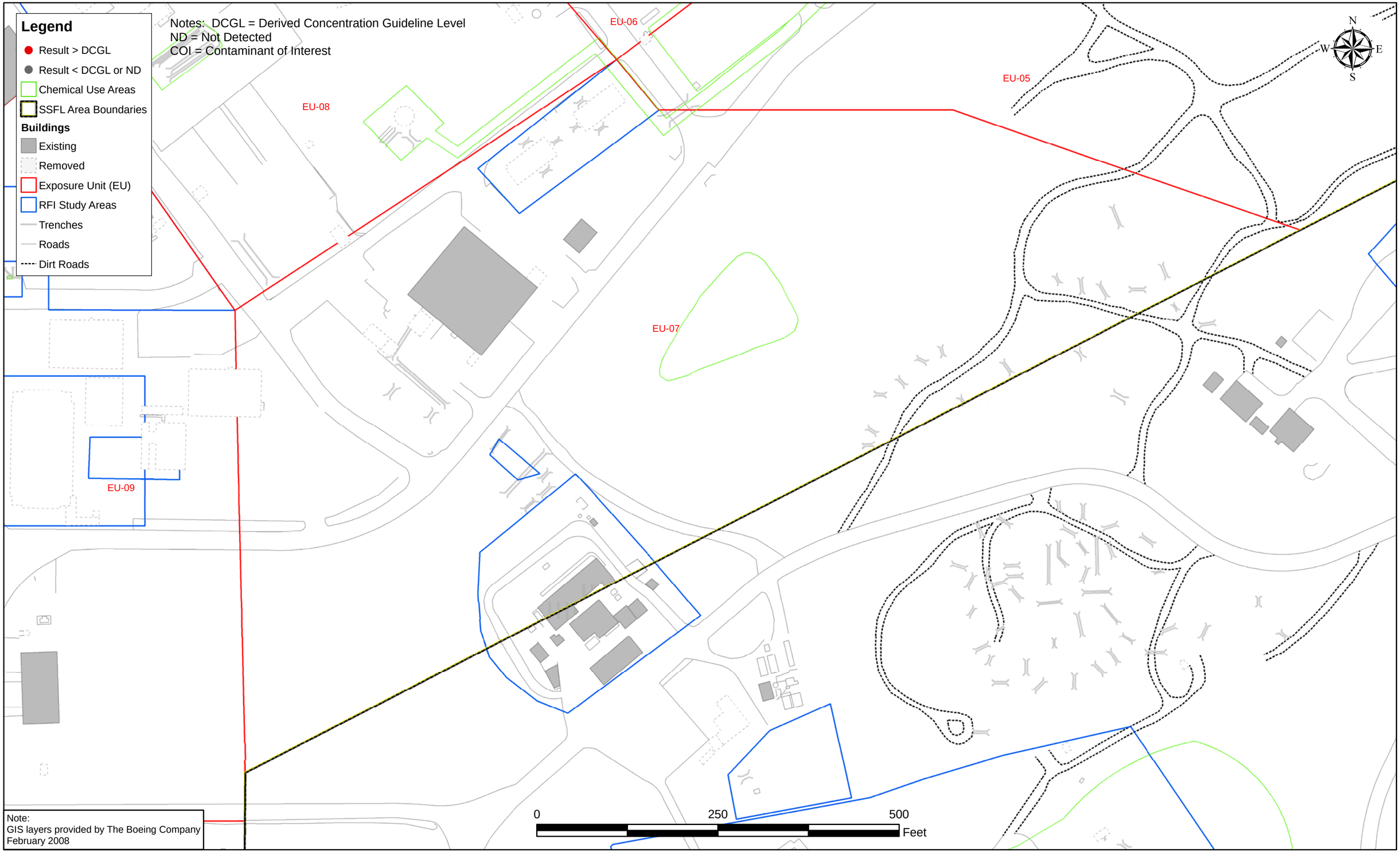
**Figure F7-8**
**PCB COIs in Soils - EU-07**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

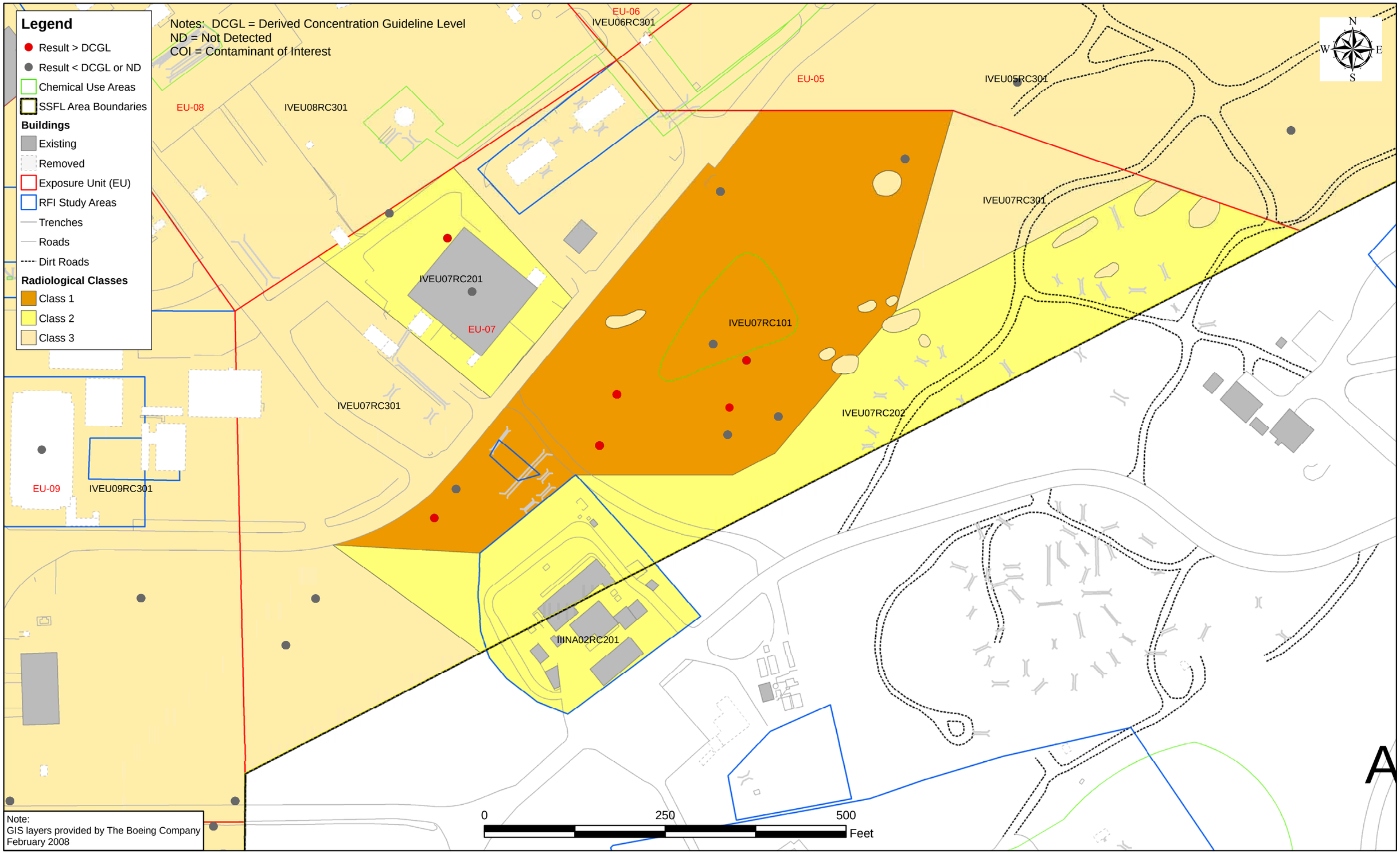
**Figure F7-9**
**Inorganic COIs in Soils - EU-07**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

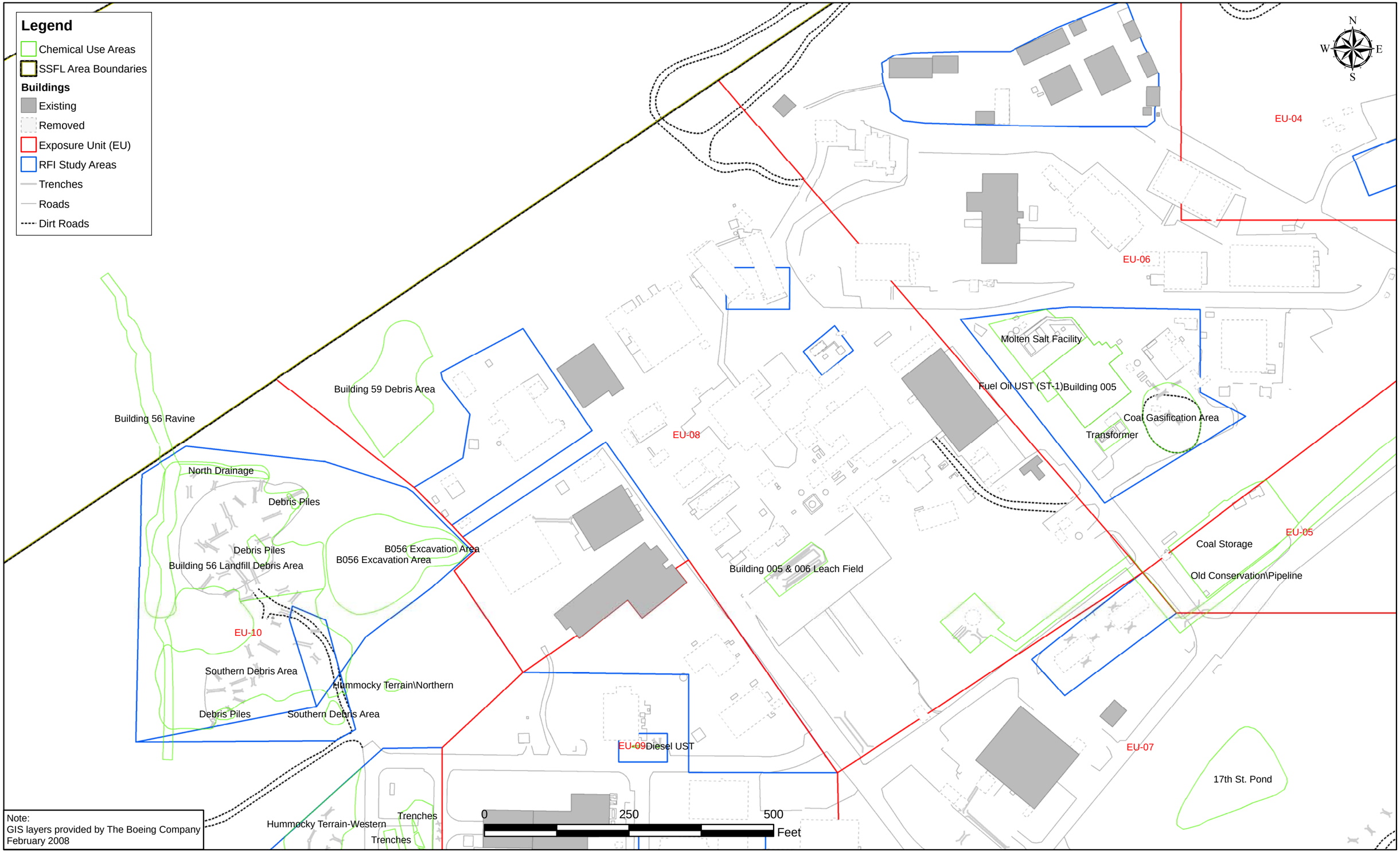
**Figure F7-10**
**Dioxin COIs in Soils - EU-07**
**(2-10 ft bgs)**




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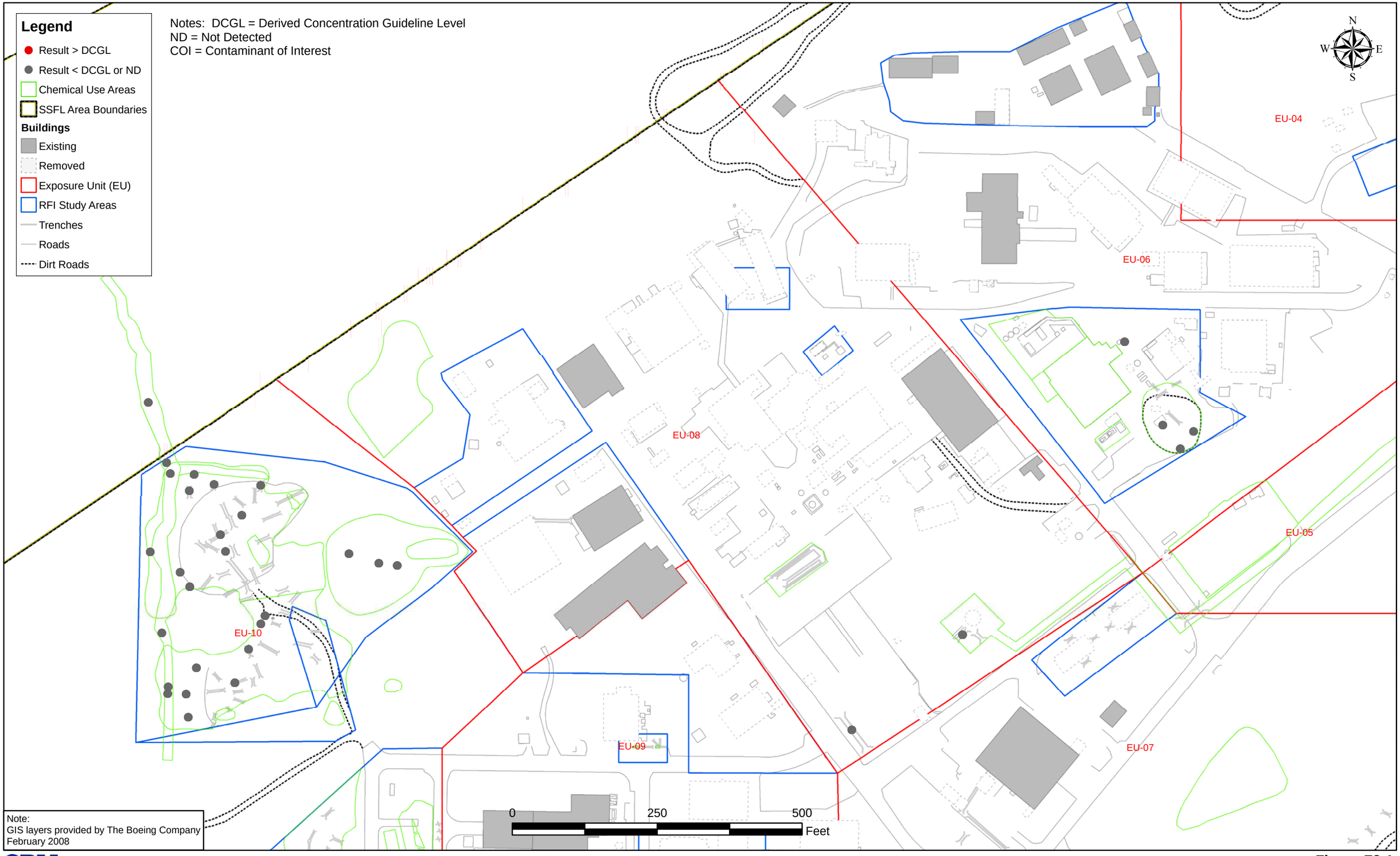
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F7-11**
**Radiological COIs in Soils - EU-07**
**(0-6 in bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

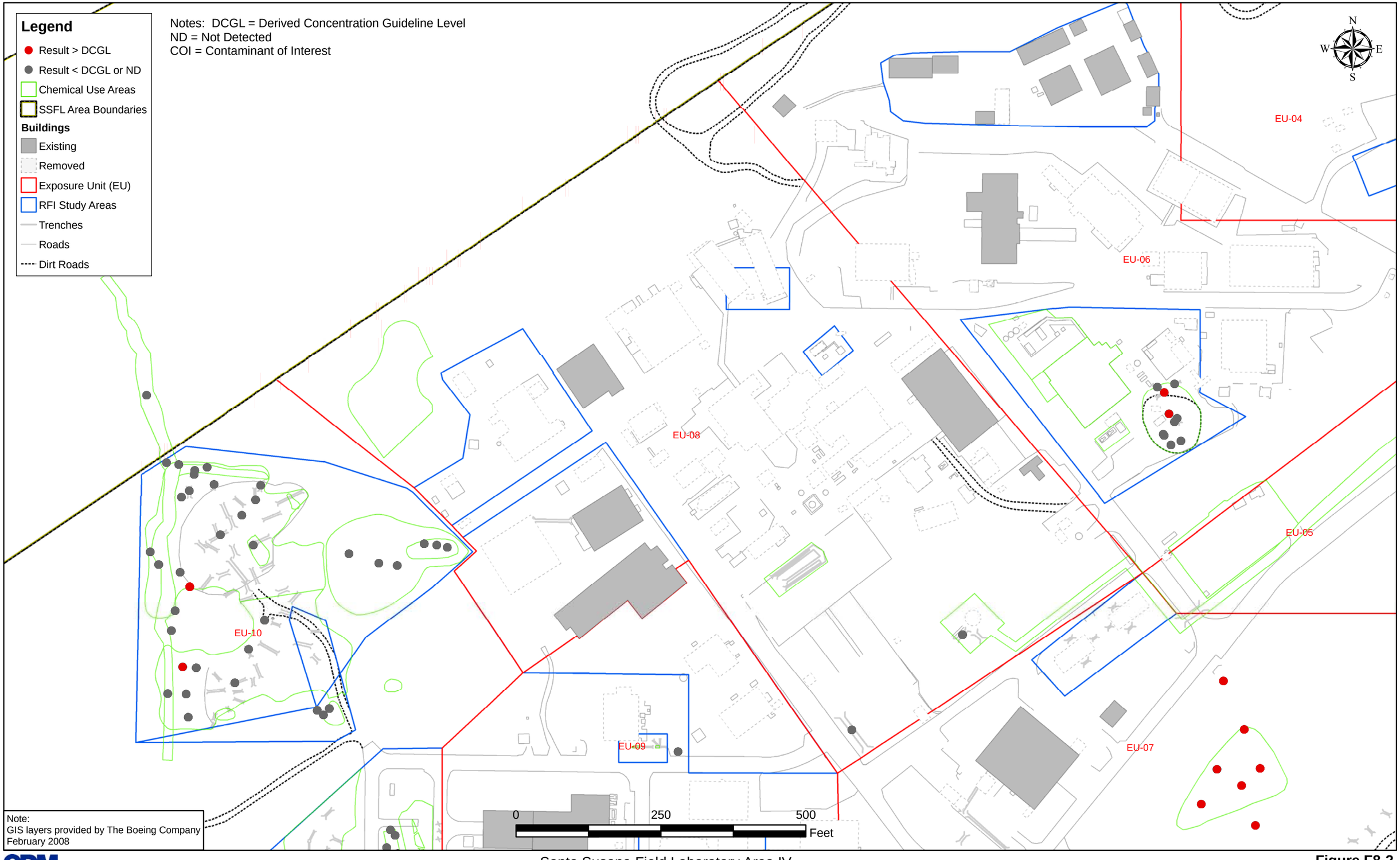
**Figure F8-0**
**EU-08 Chemical Use Areas**




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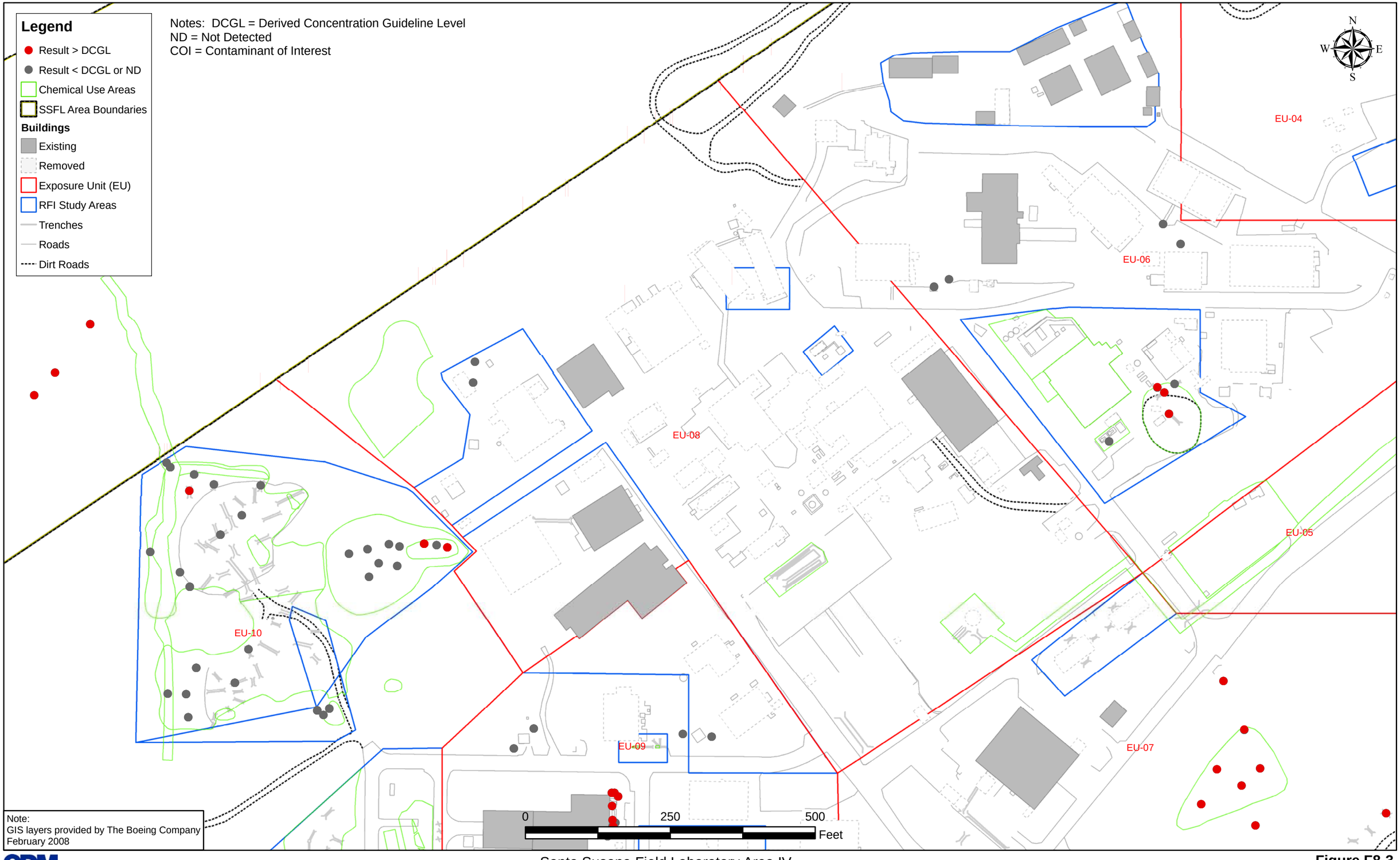
**Figure F8-1**
**VOC COIs in Soils - EU-08**
**(0-2 ft bgs)**




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Ventura County, California

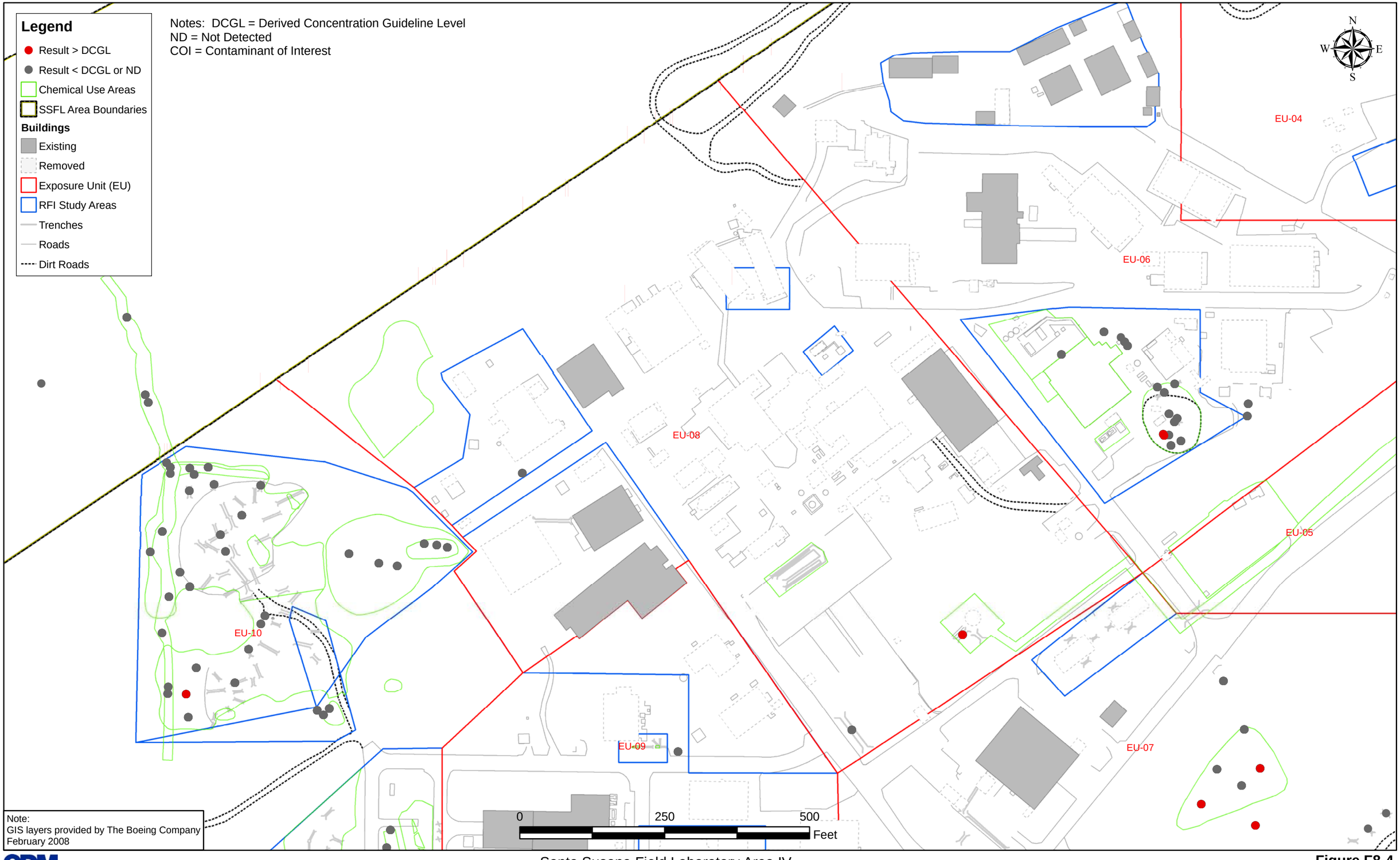
**Figure F8-2**
**SVOC COIs in Soils - EU-08**
**(0-2 ft bgs)**




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Ventura County, California

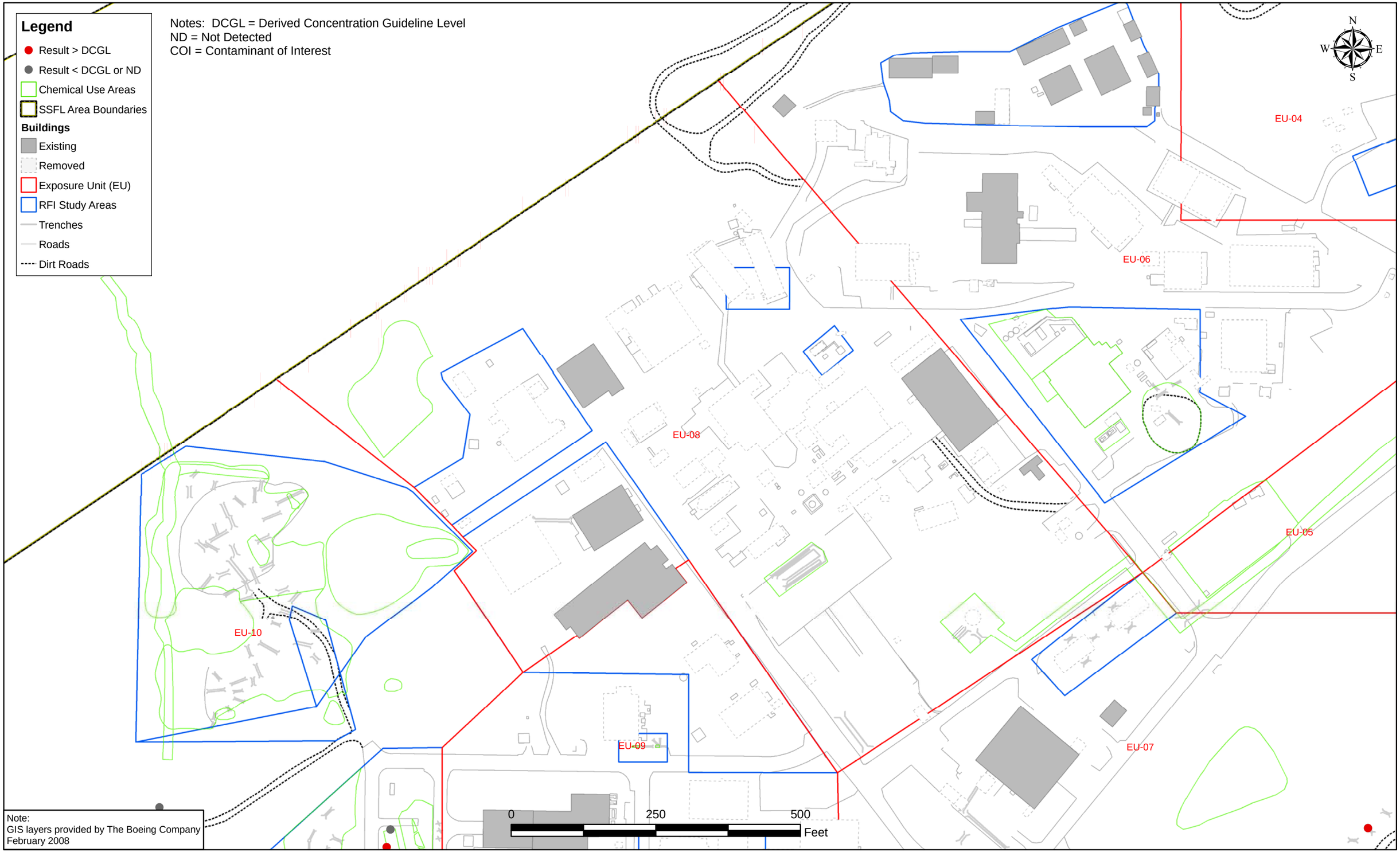
**Figure F8-3**
**PCB COIs in Soils - EU-08**
**(0-2 ft bgs)**




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Ventura County, California

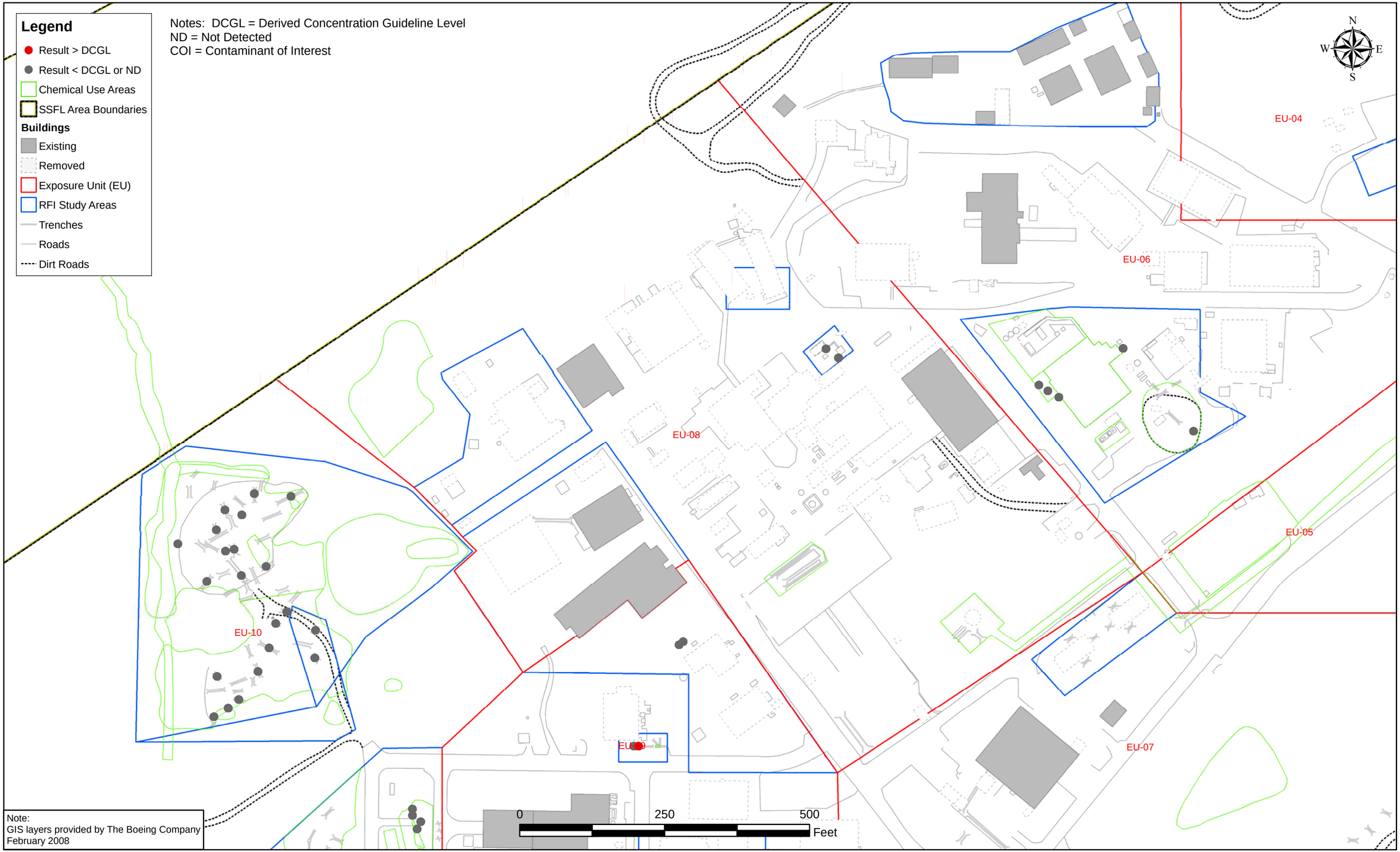
**Figure F8-4**
**Inorganic COIs in Soils - EU-08**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
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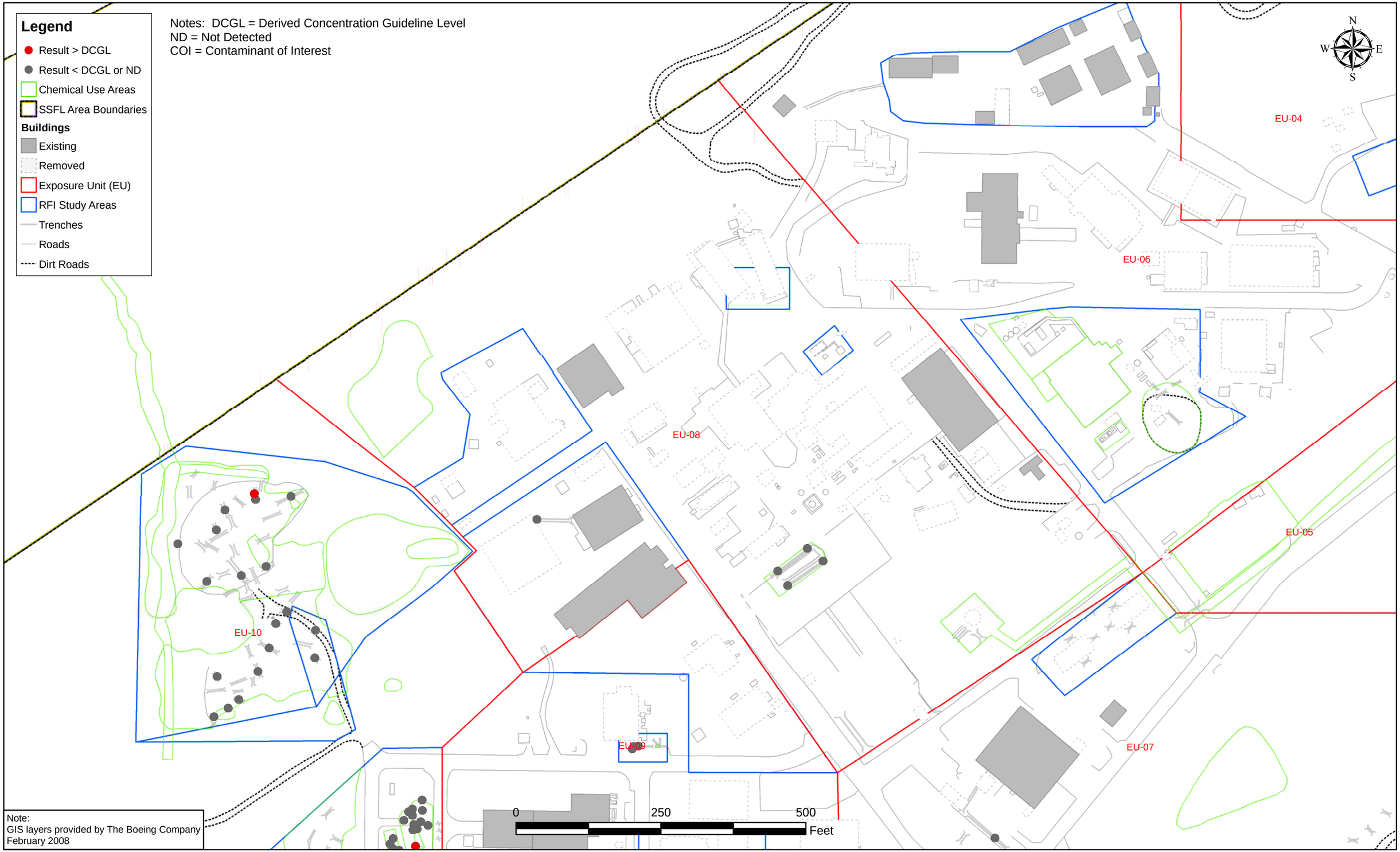
**Figure F8-5**
**Dioxin COIs in Soils - EU-08**
**(0-2 ft bgs)**




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Ventura County, California

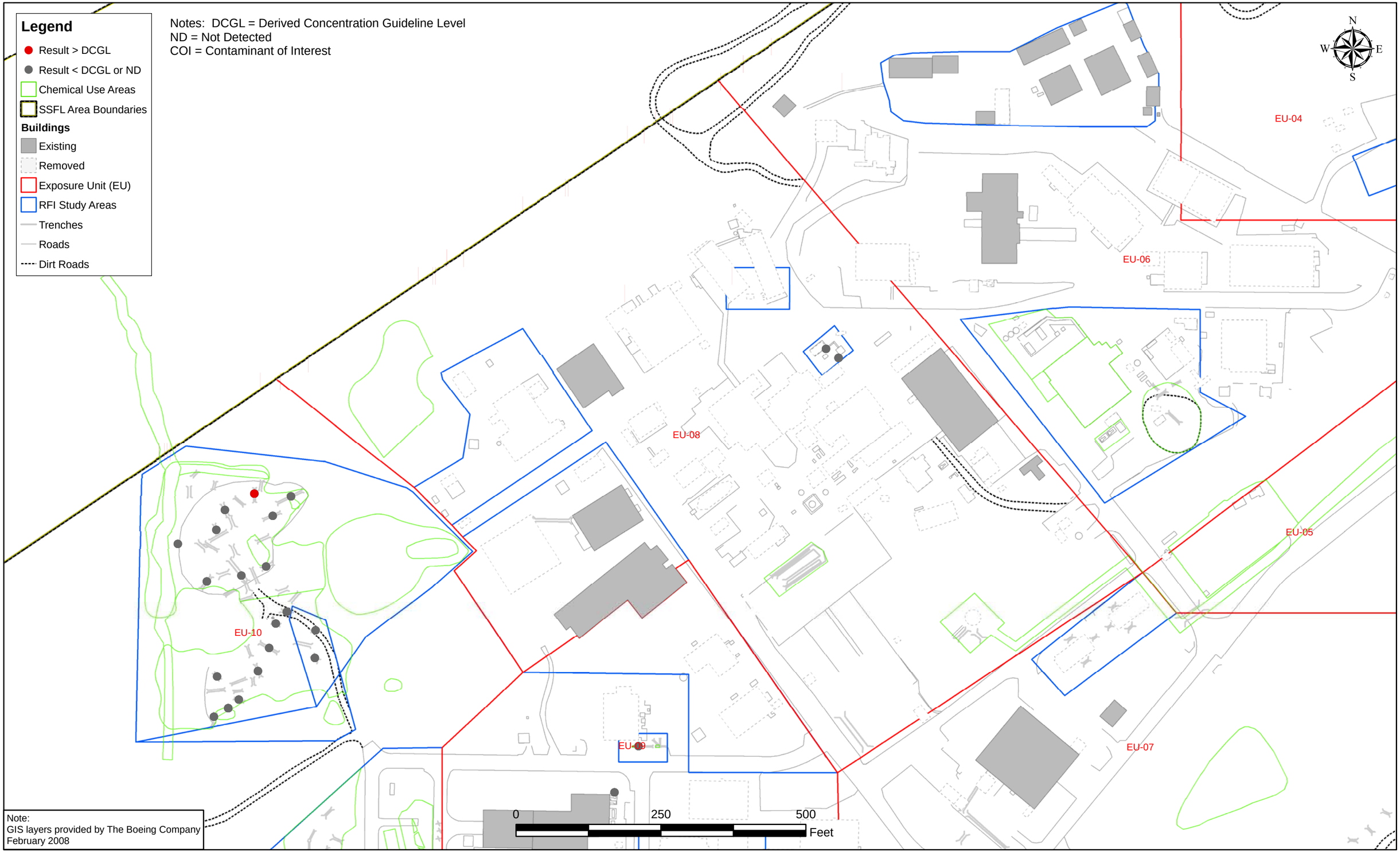
**Figure F8-6**
**VOC COIs in Soils - EU-08**
**(2-10 ft bgs)**




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Ventura County, California

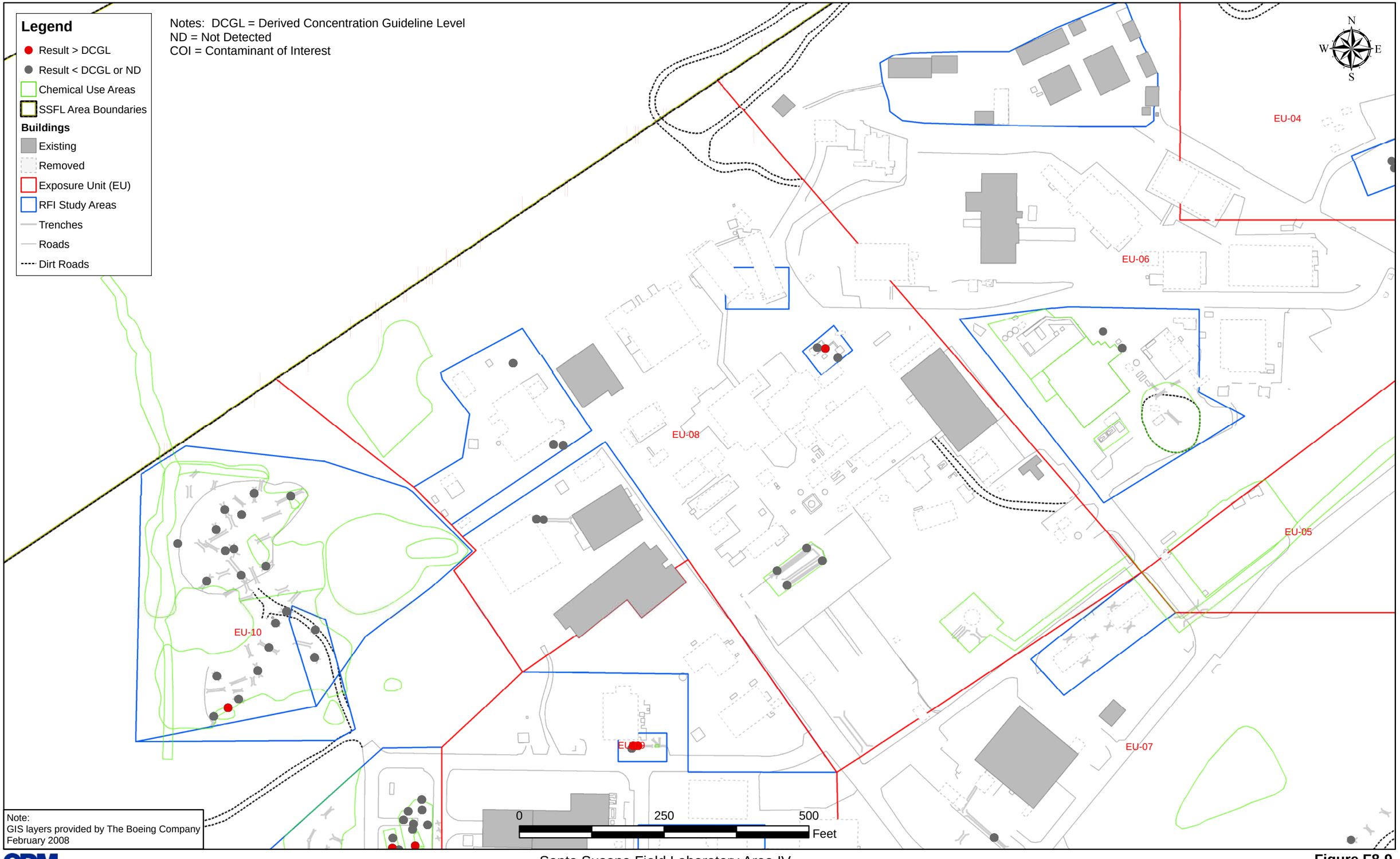
**Figure F8-7**
**SVOC COIs in Soils - EU-08**
**(2-10 ft bgs)**




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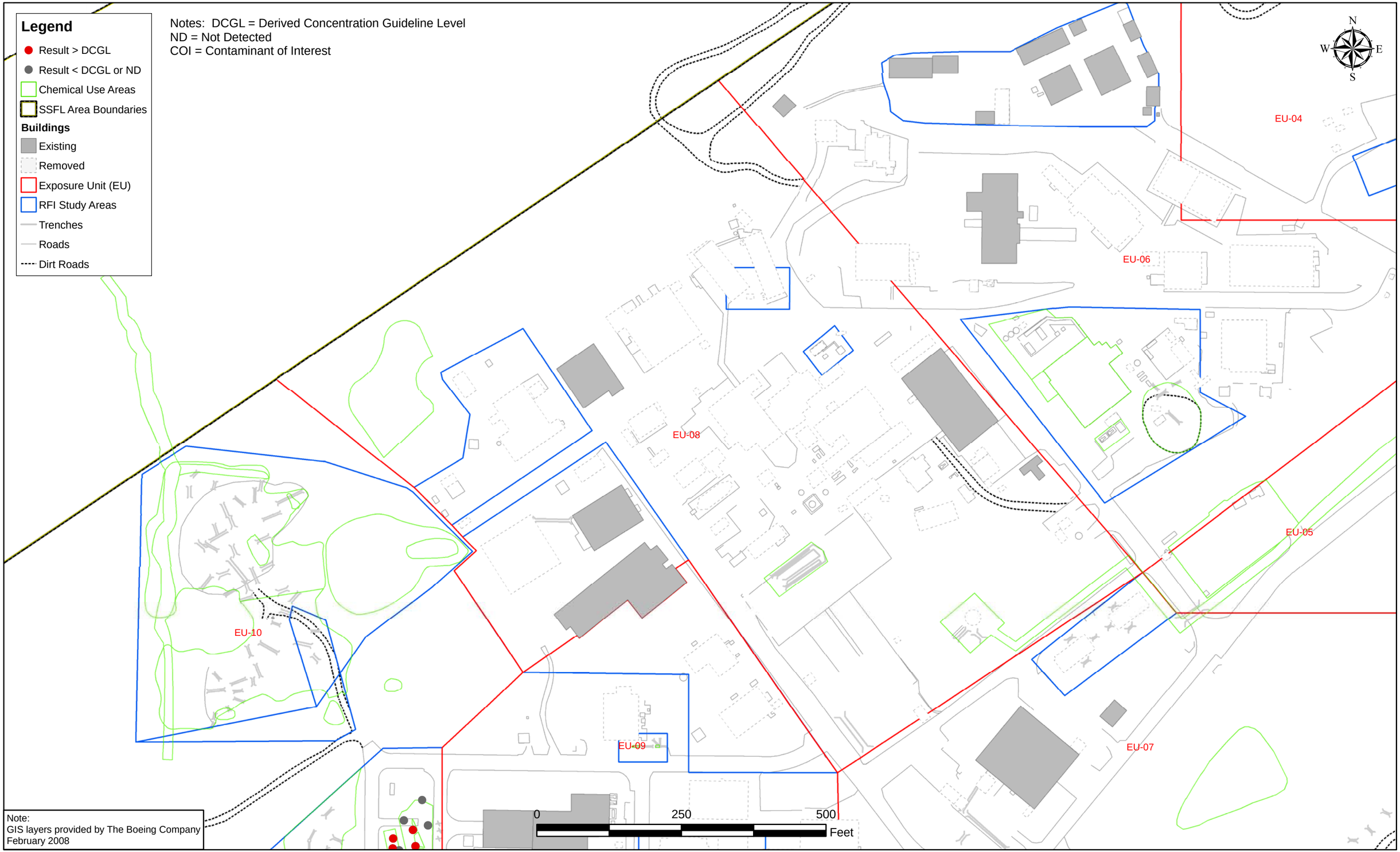
**Figure F8-8**
**PCB COIs in Soils - EU-08**
**(2-10 ft bgs)**




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Ventura County, California

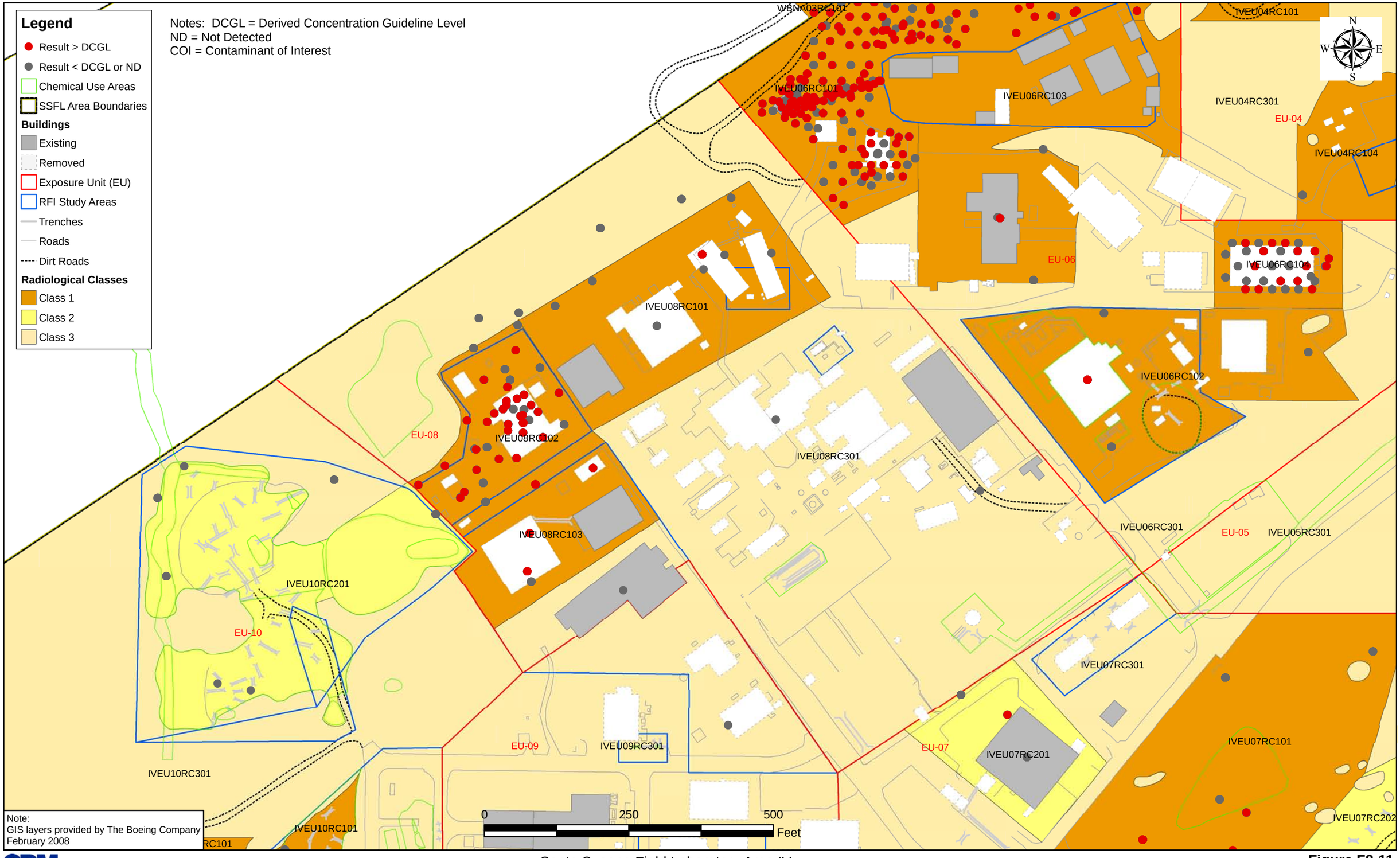
**Figure F8-9**
**Inorganic COIs in Soils - EU-08**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

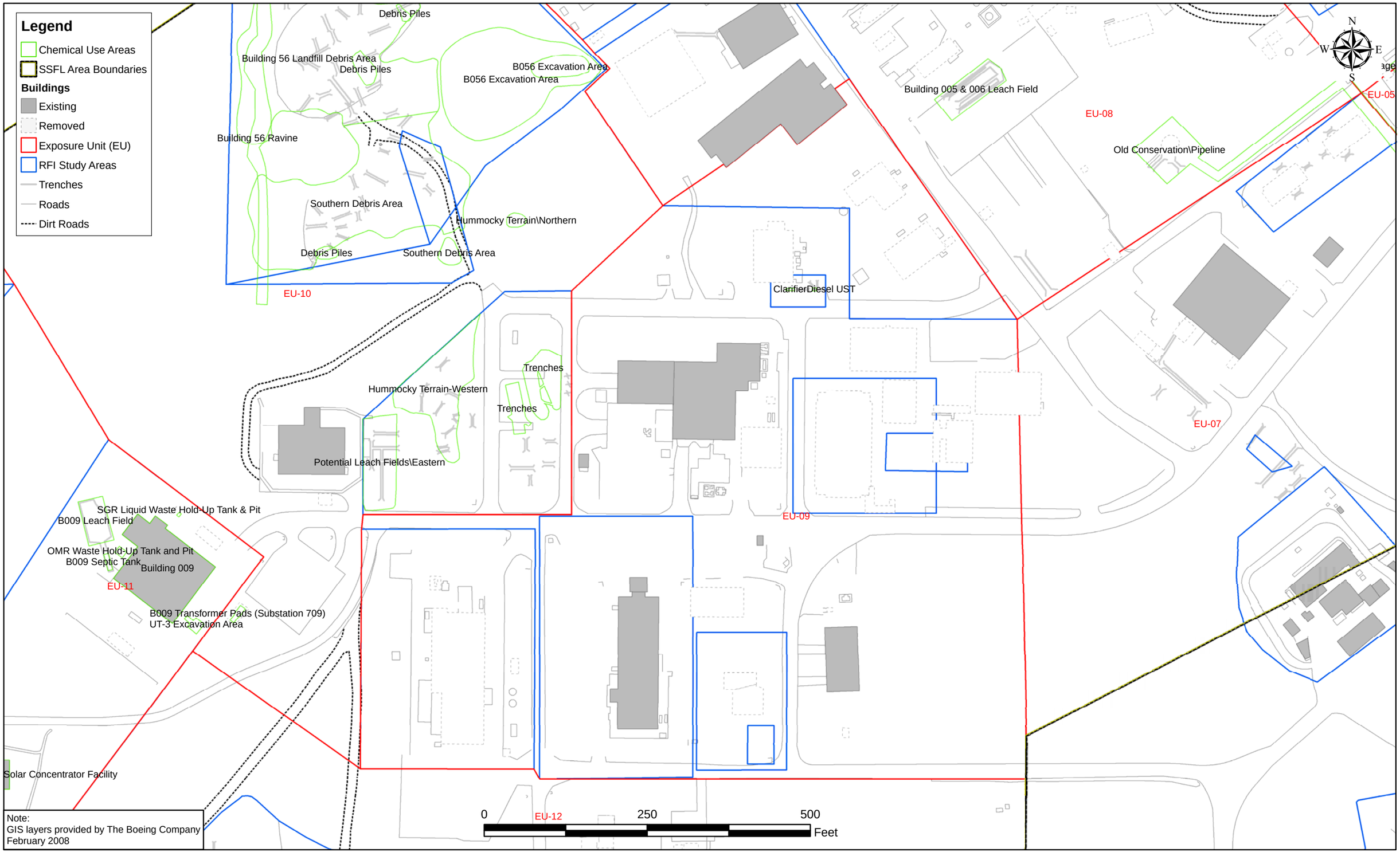
**Figure F8-10**
**Dioxin COIs in Soils - EU-08**
**(2-10 ft bgs)**




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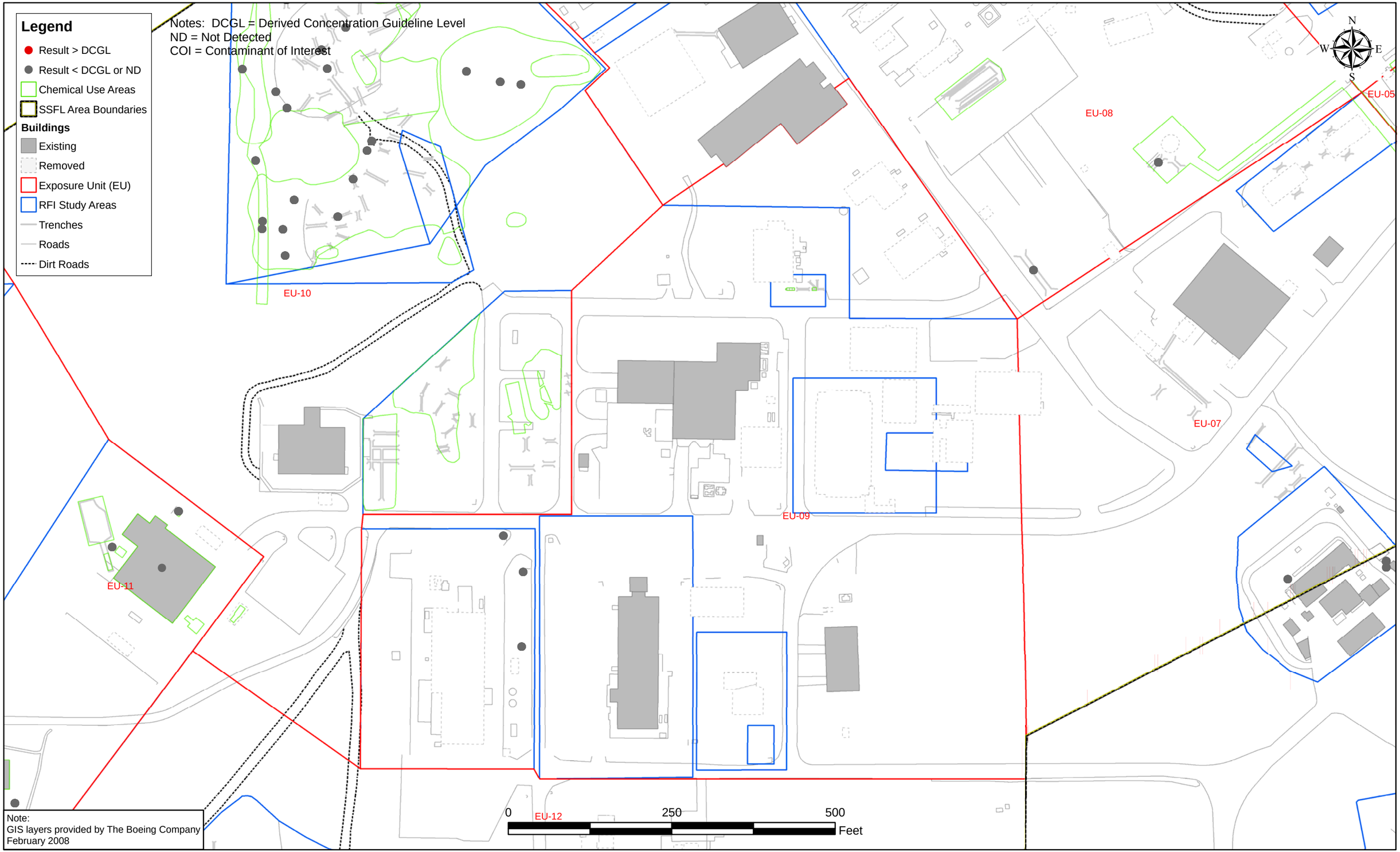
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F8-11**
**Radiological COIs in Soils - EU-08**
**(0-6 in bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

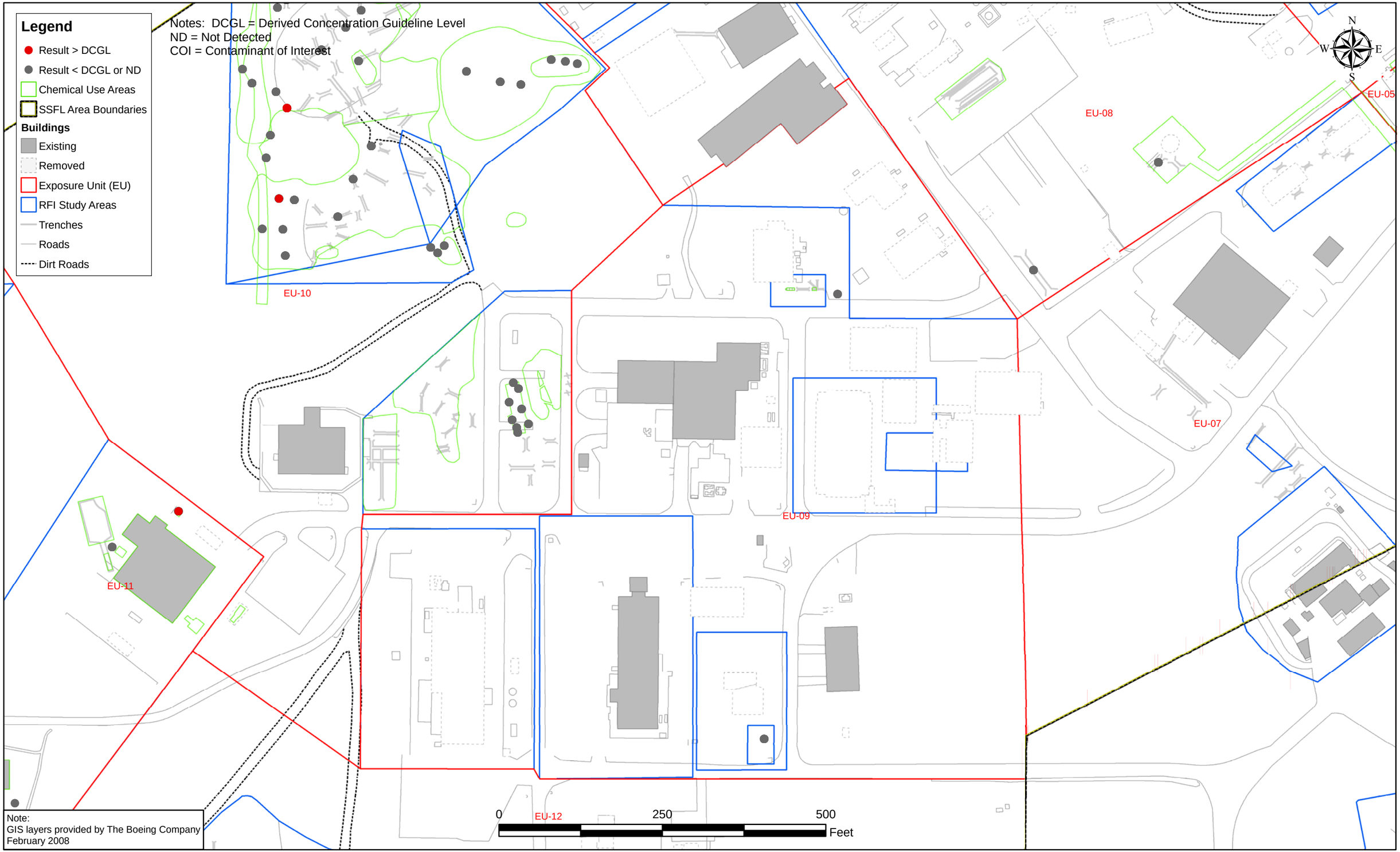
**Figure F9-0**
**EU-09 Chemical Use Areas**




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Ventura County, California

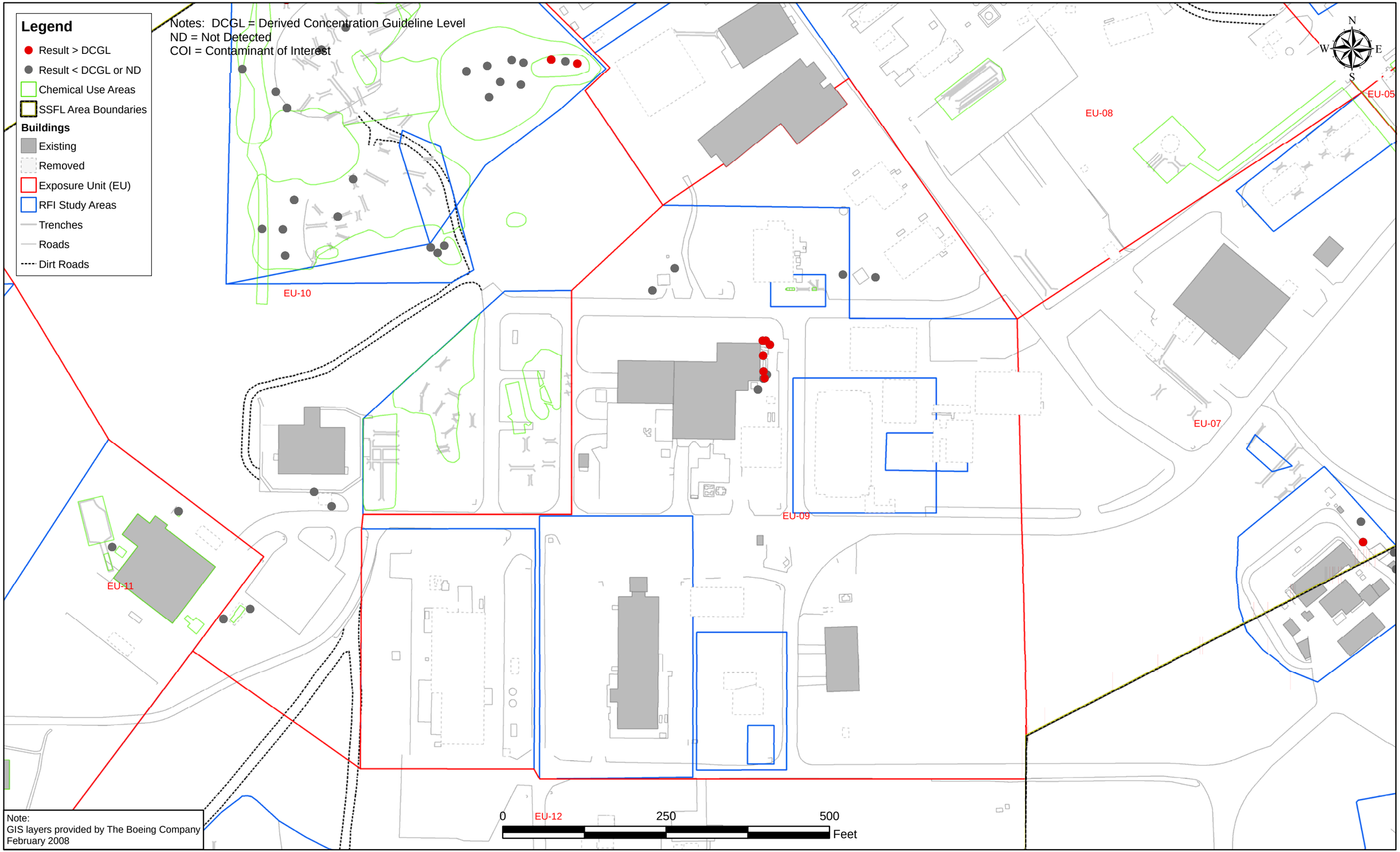
**Figure F9-1**
**VOC COIs in Soils - EU-09**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

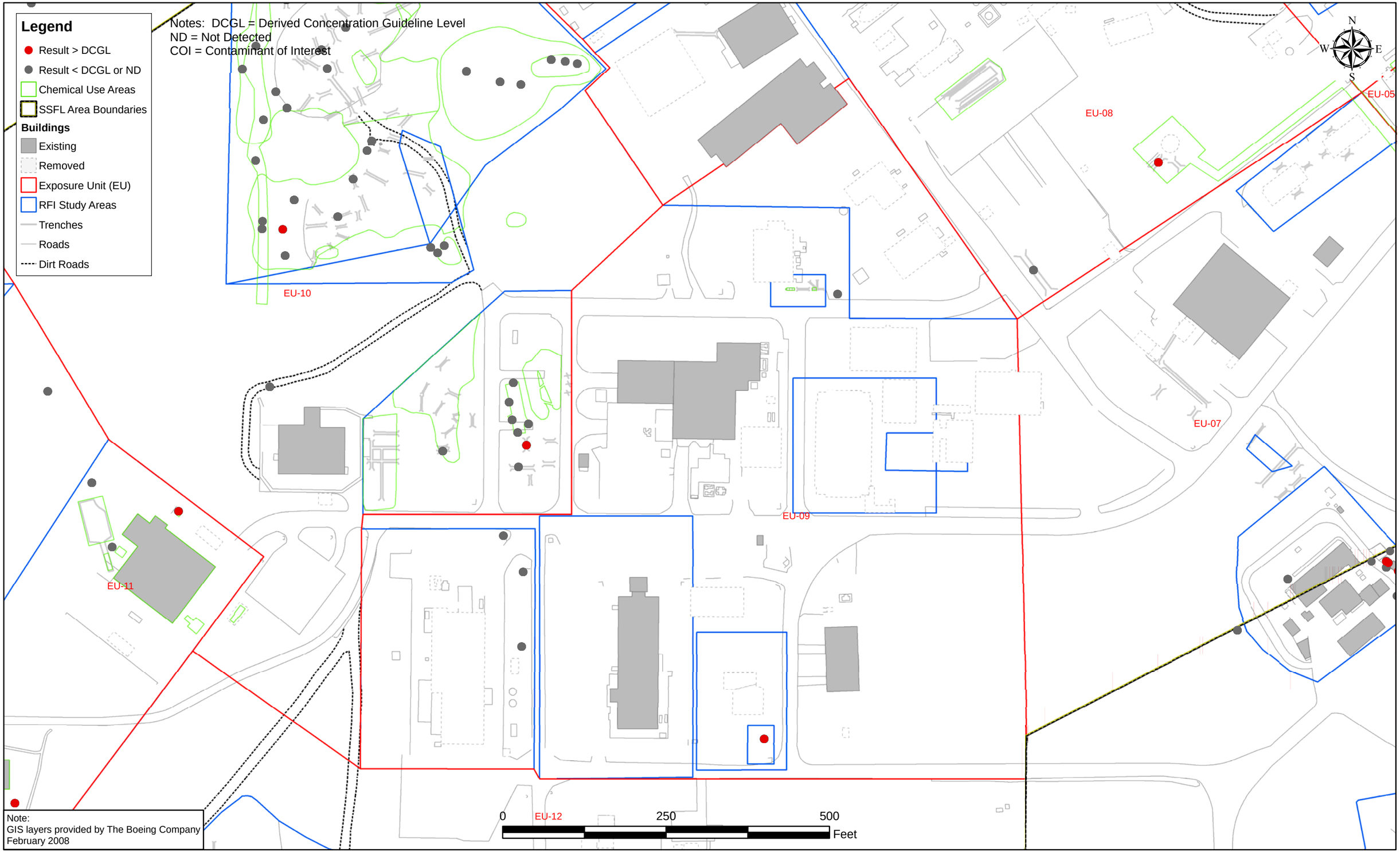
**Figure F9-2**
**SVOC COIs in Soils - EU-09**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
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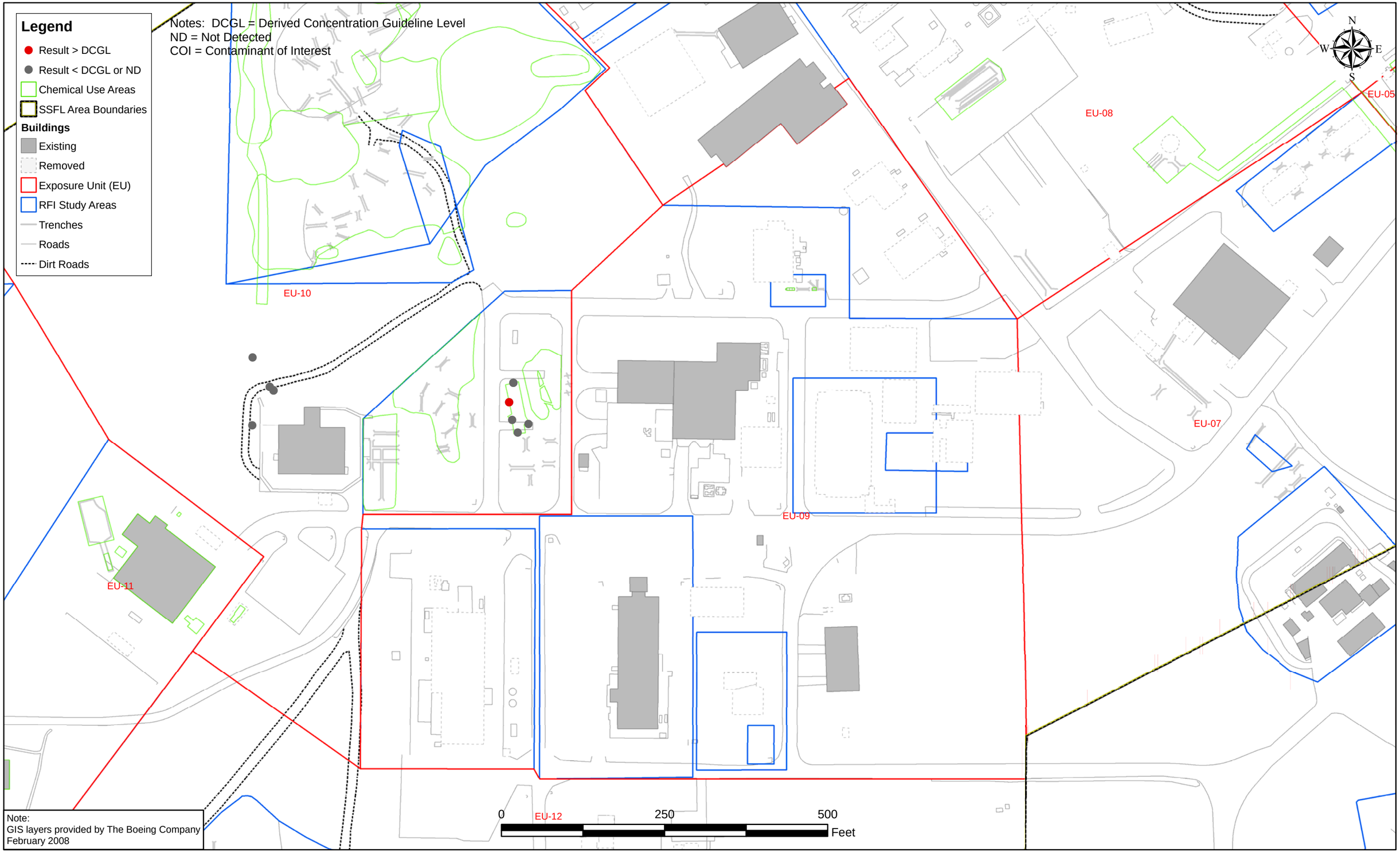
**Figure F9-3**
**PCB COIs in Soils - EU-09**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

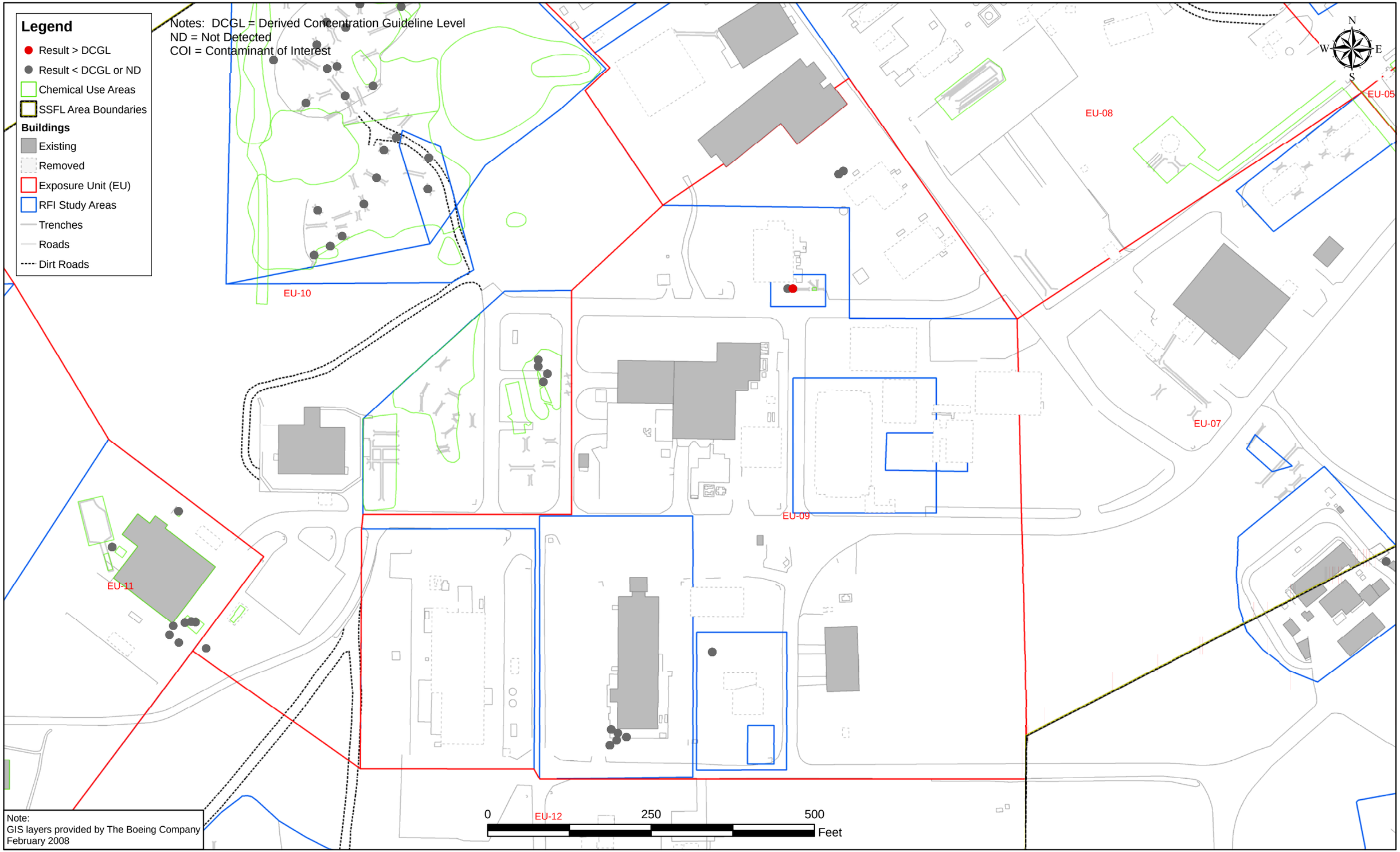
**Figure F9-4**
**Inorganic COIs in Soils - EU-09**
**(0-2 ft bgs)**




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Ventura County, California

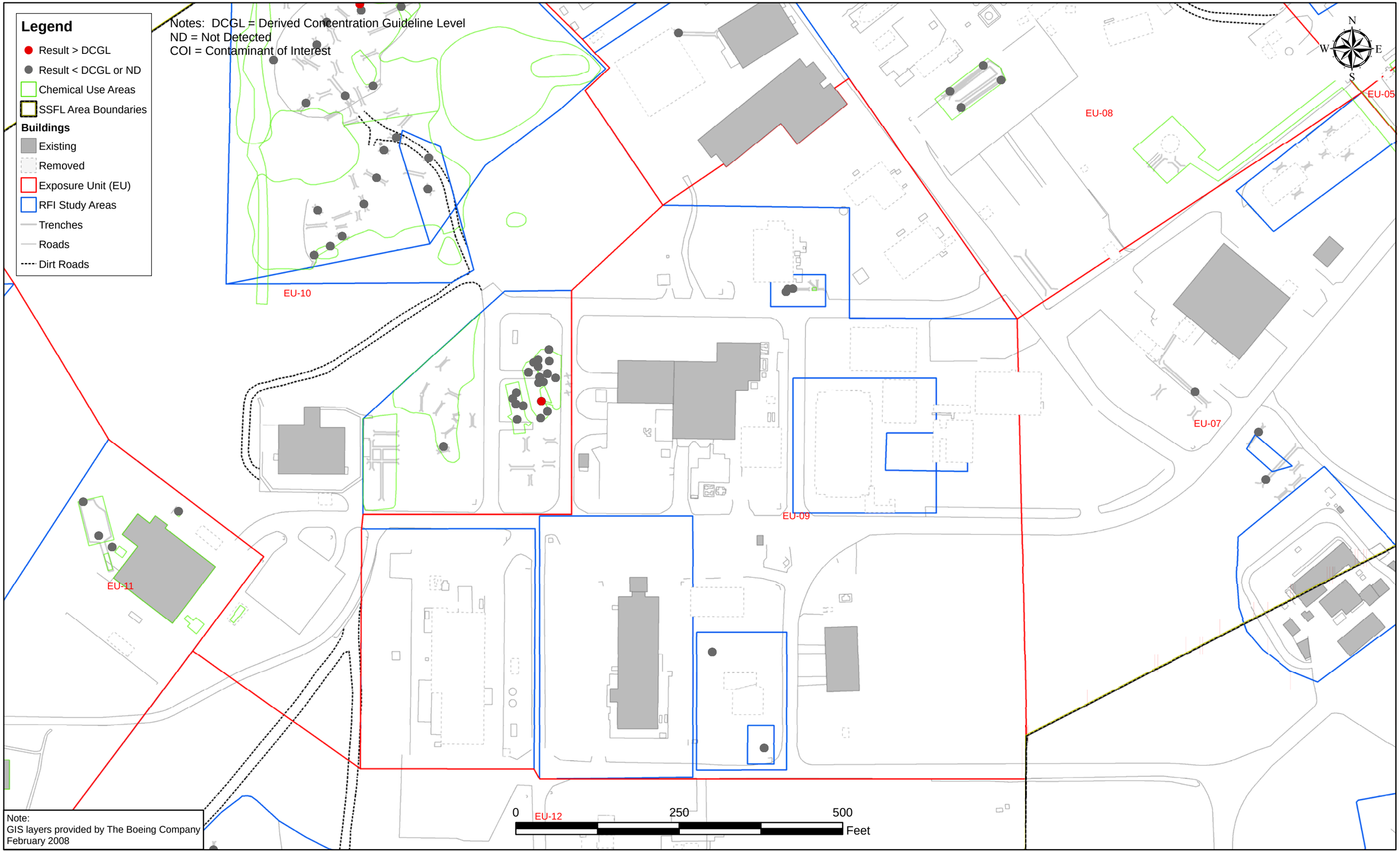
**Figure F9-5**
**Dioxin COIs in Soils - EU-09**
**(0-2 ft bgs)**




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Ventura County, California

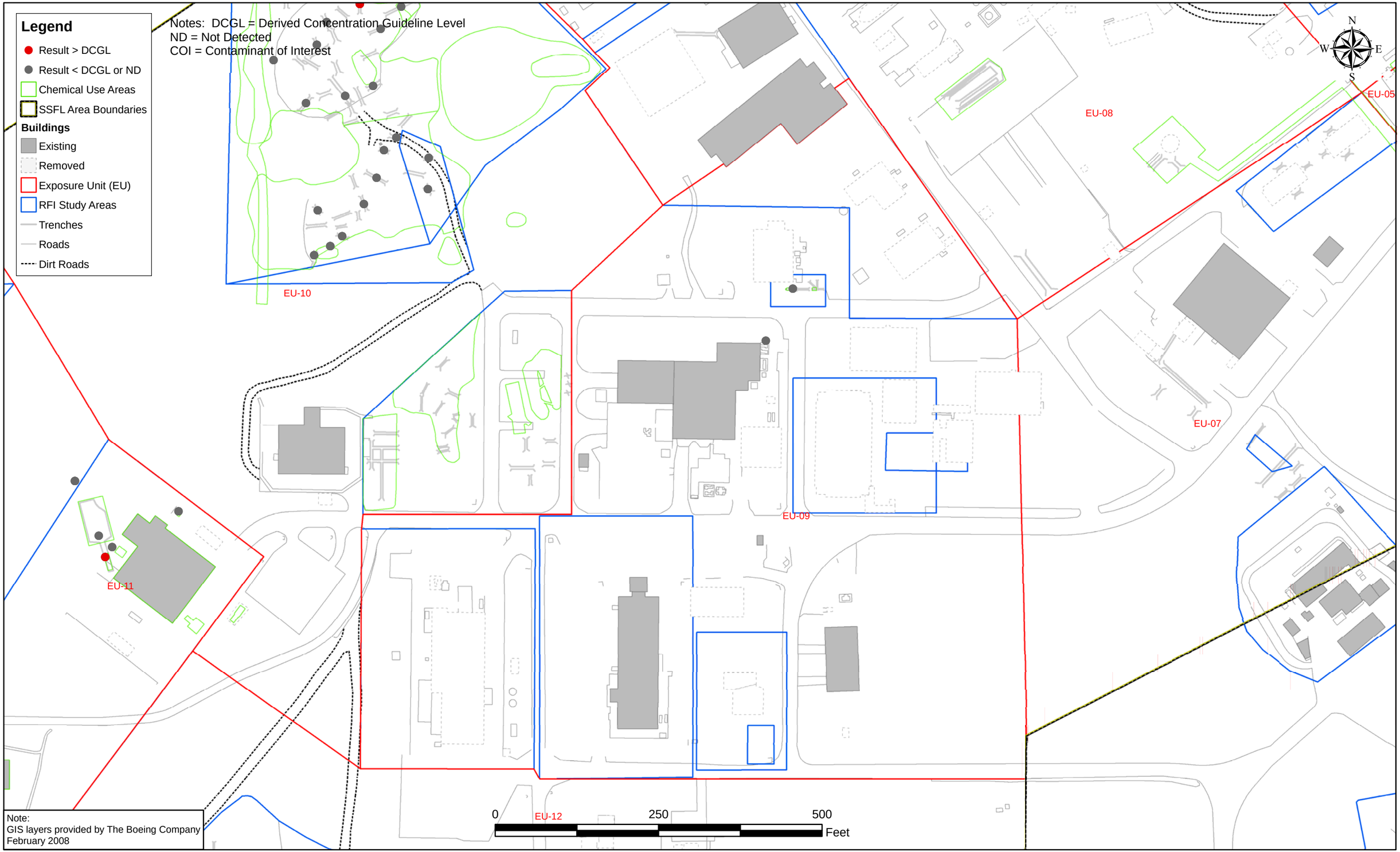
**Figure F9-6**
**VOC COIs in Soils - EU-09**
**(2-10 ft bgs)**




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Ventura County, California

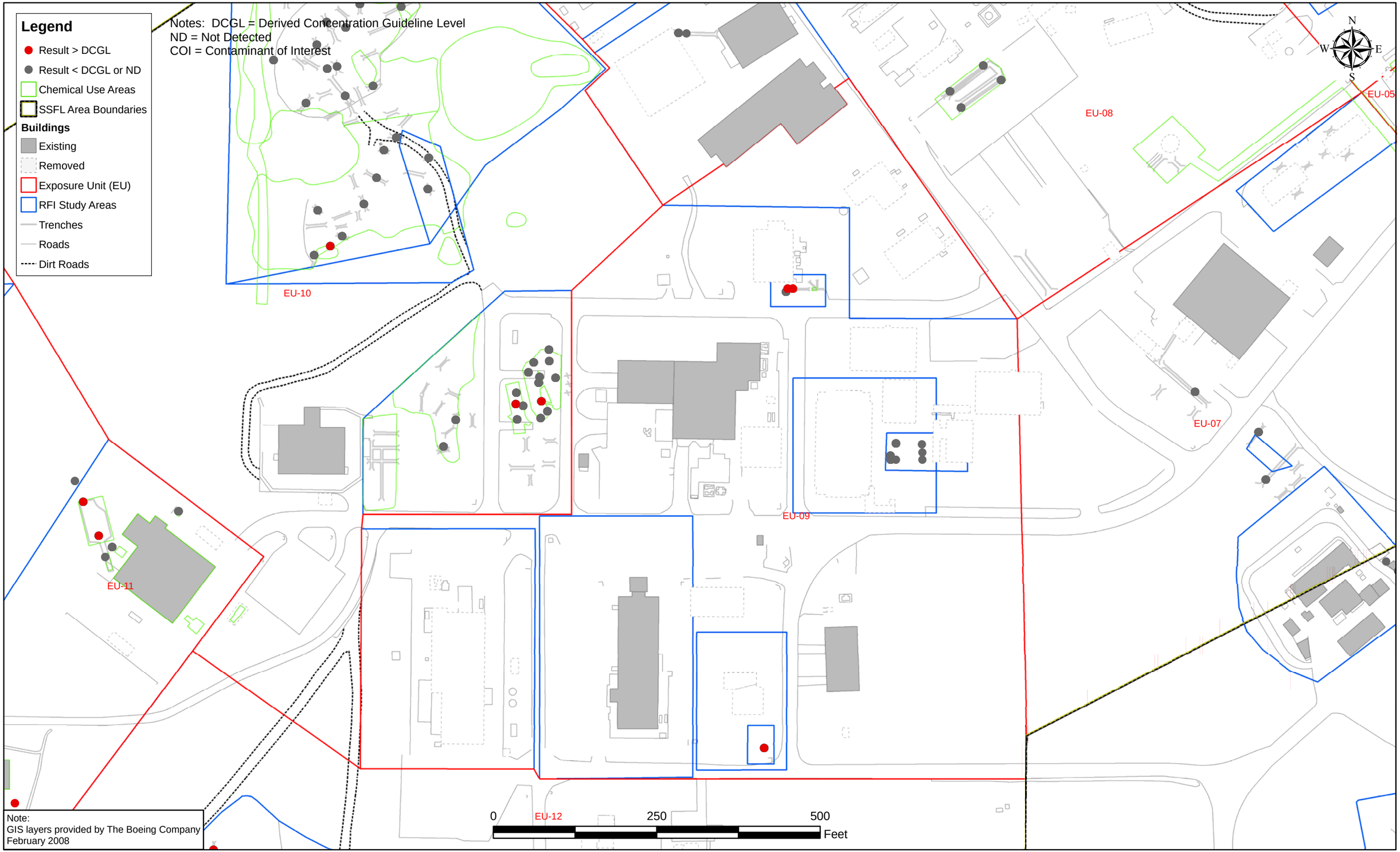
**Figure F9-7**
**SVOC COIs in Soils - EU-09**
**(2-10 ft bgs)**




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Ventura County, California

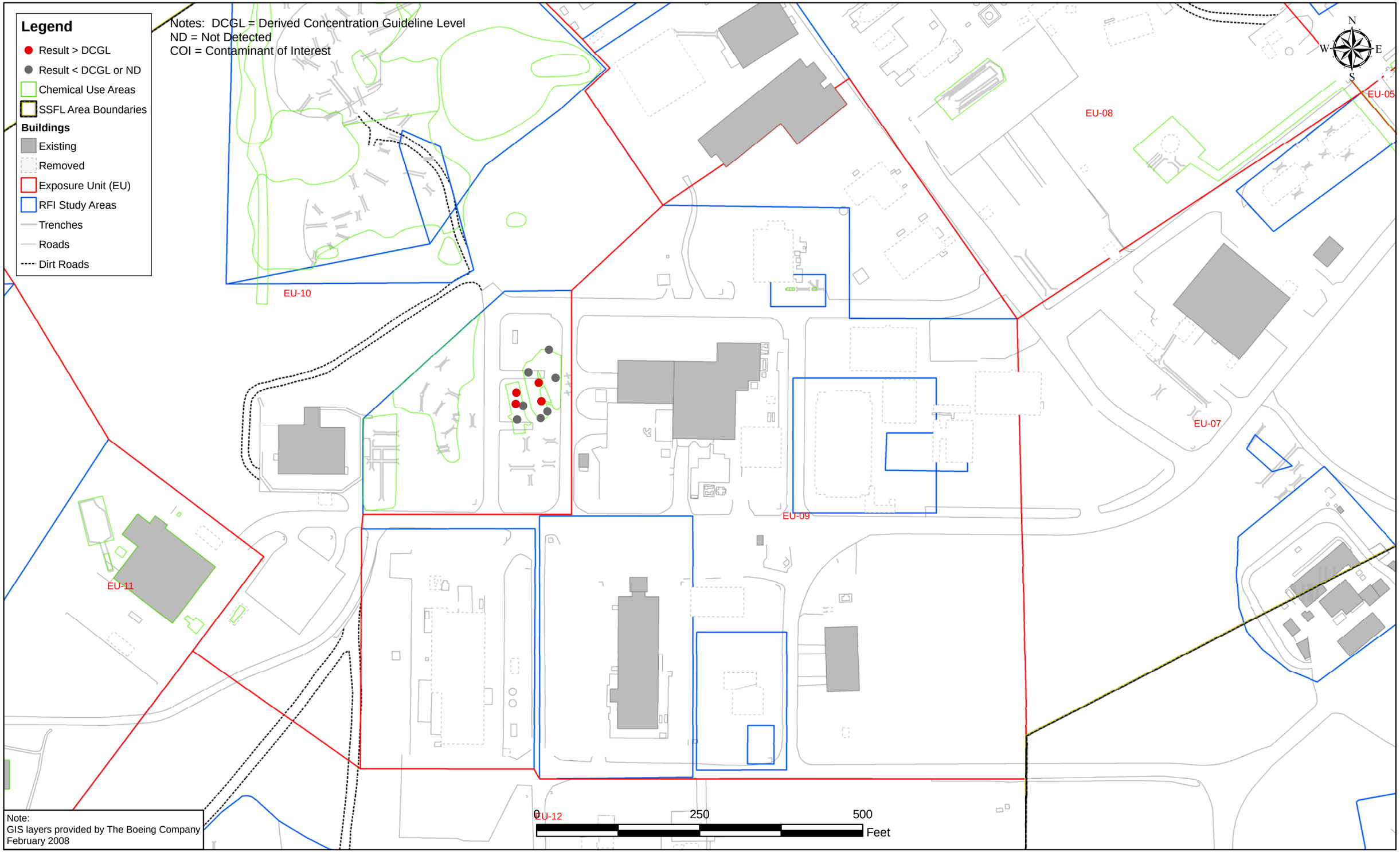
**Figure F9-8**
**PCB COIs in Soils - EU-09**
**(2-10 ft bgs)**




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Ventura County, California

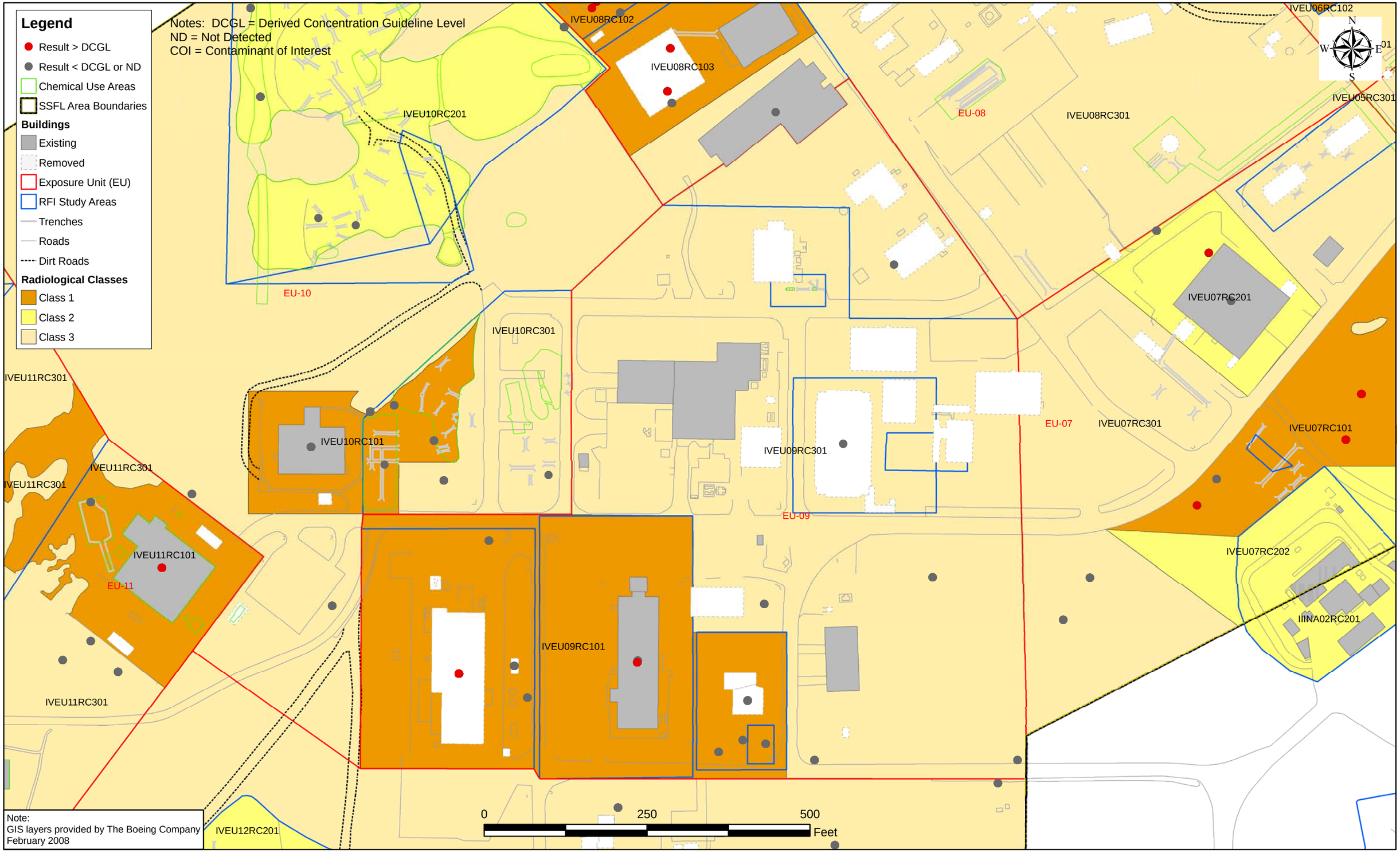
**Figure F9-9**
**Inorganic COIs in Soils - EU-09**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

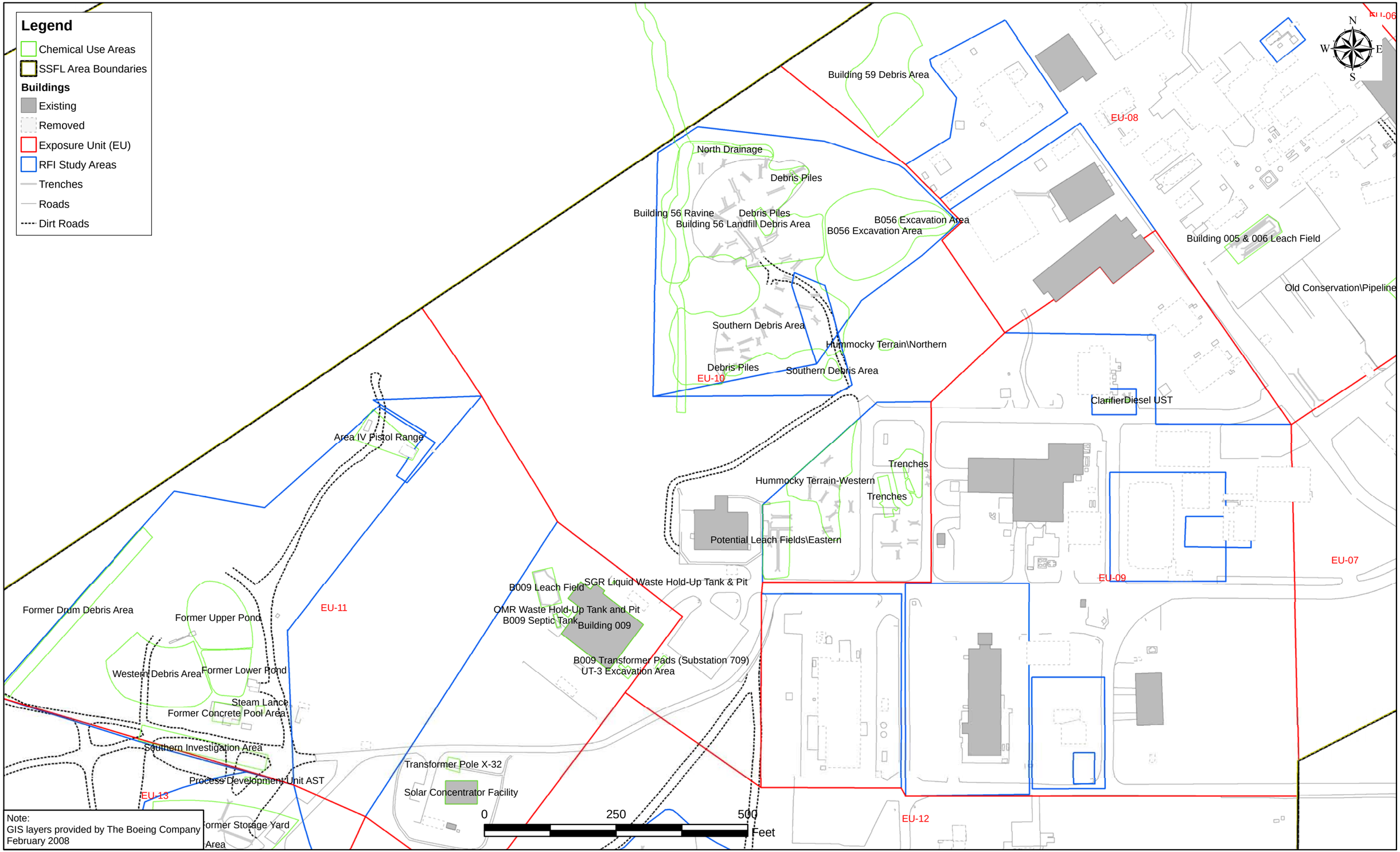
**Figure F9-10**
**Dioxin COIs in Soils - EU-09**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

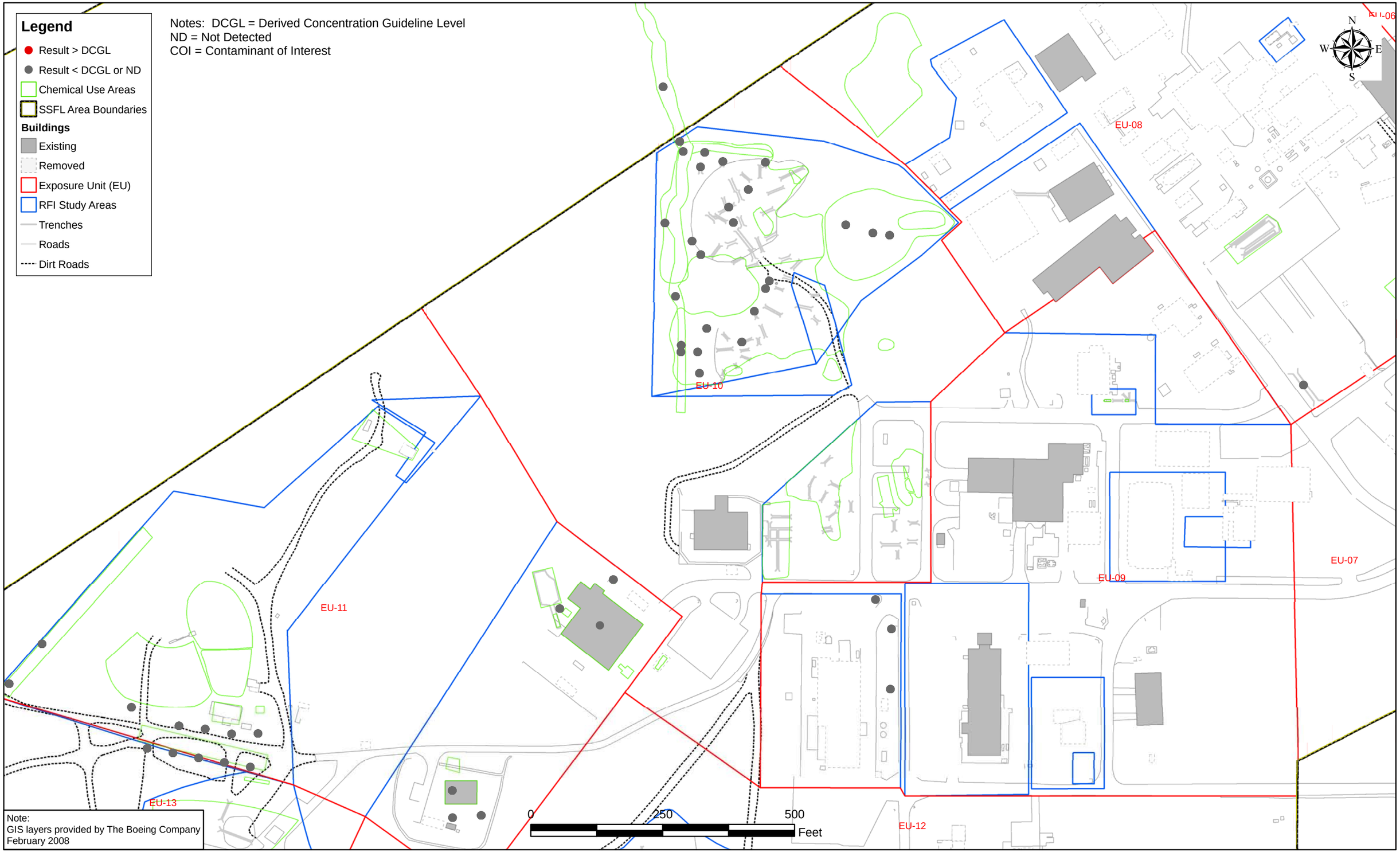
**Figure F9-11**
**Radiological COIs in Soils - EU-09**
**(0-6 in bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

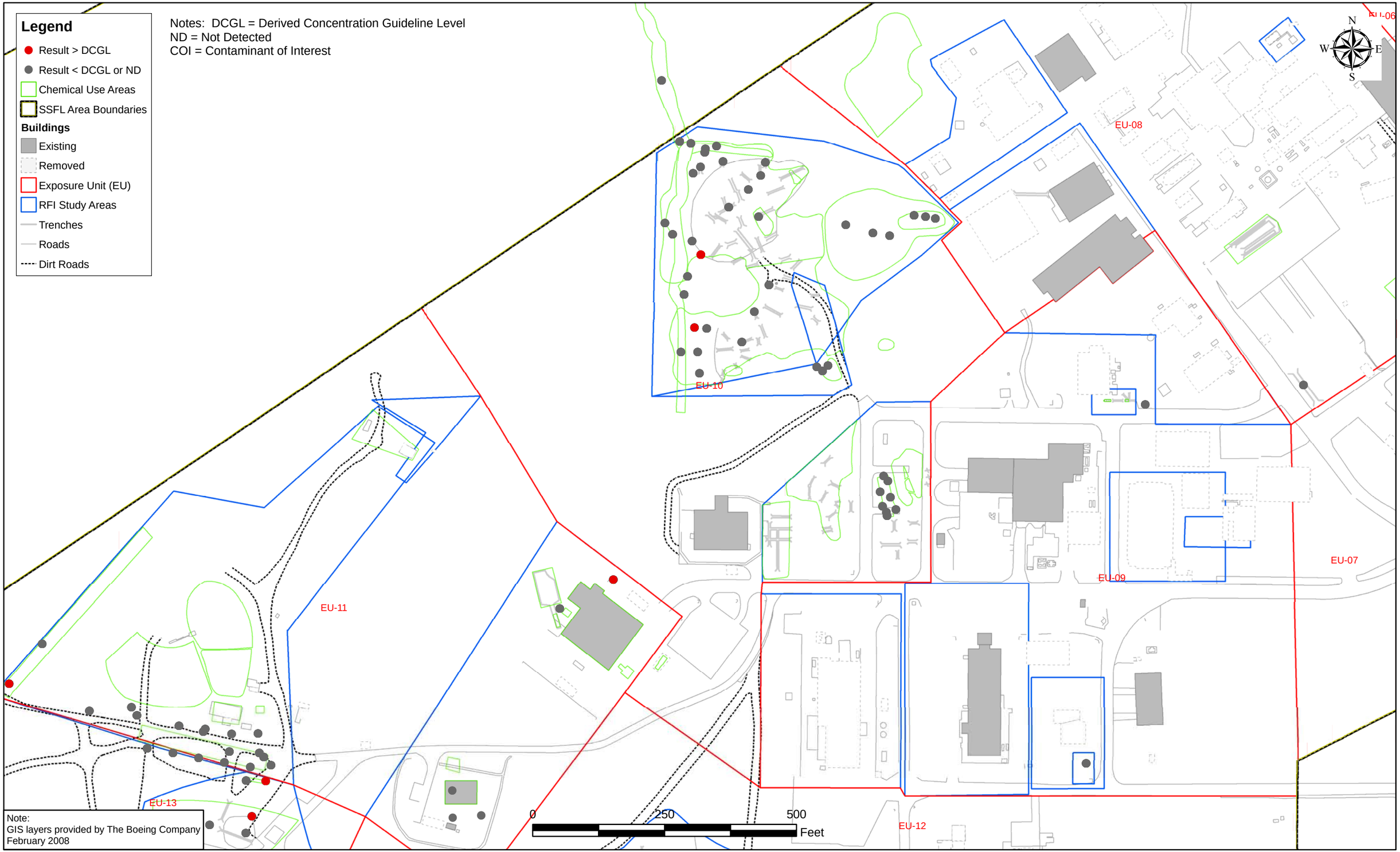
**Figure F10-0**
**EU-10 Chemical Use Areas**




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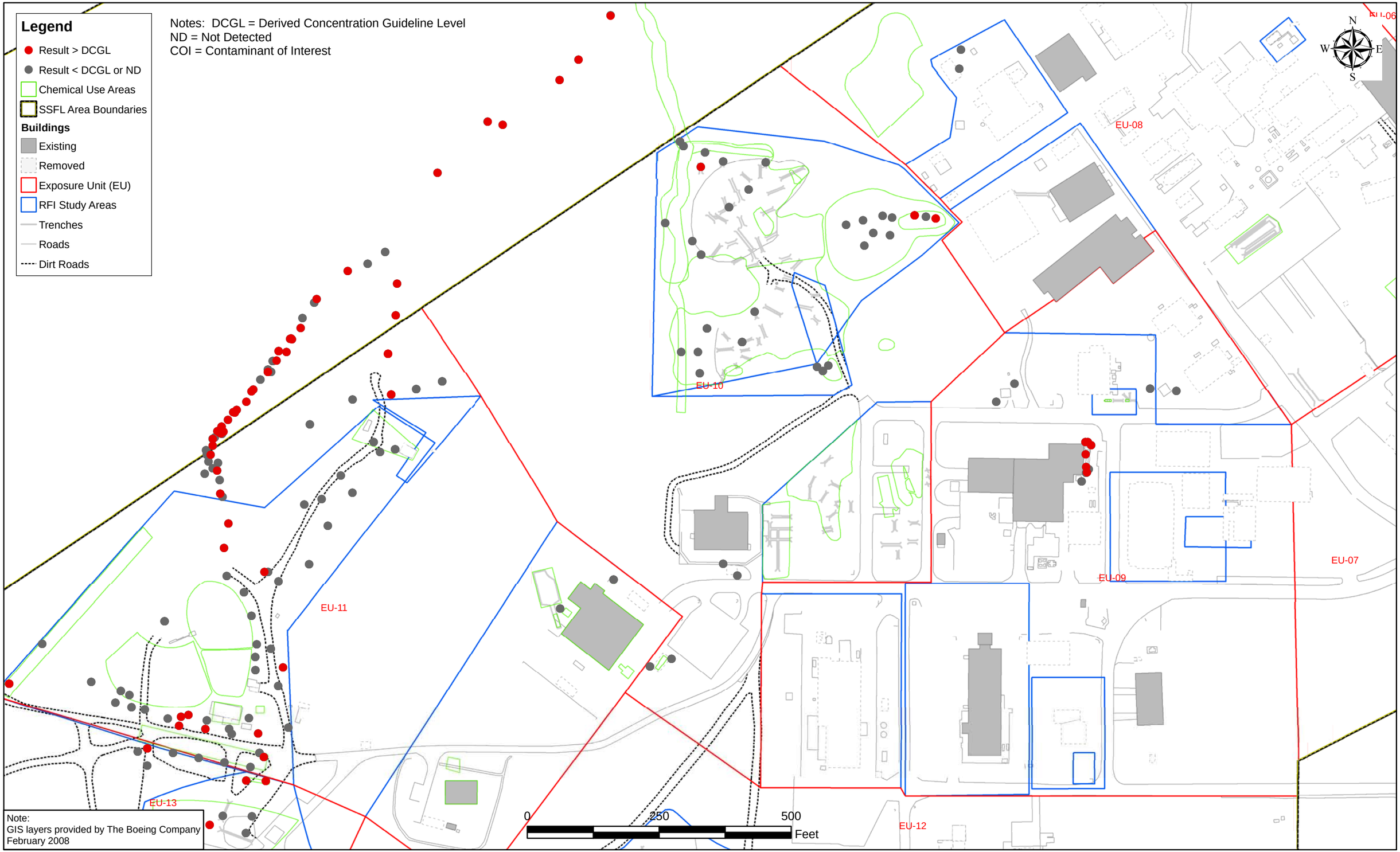
**Figure F10-1**
**VOC COIs in Soils - EU-10**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

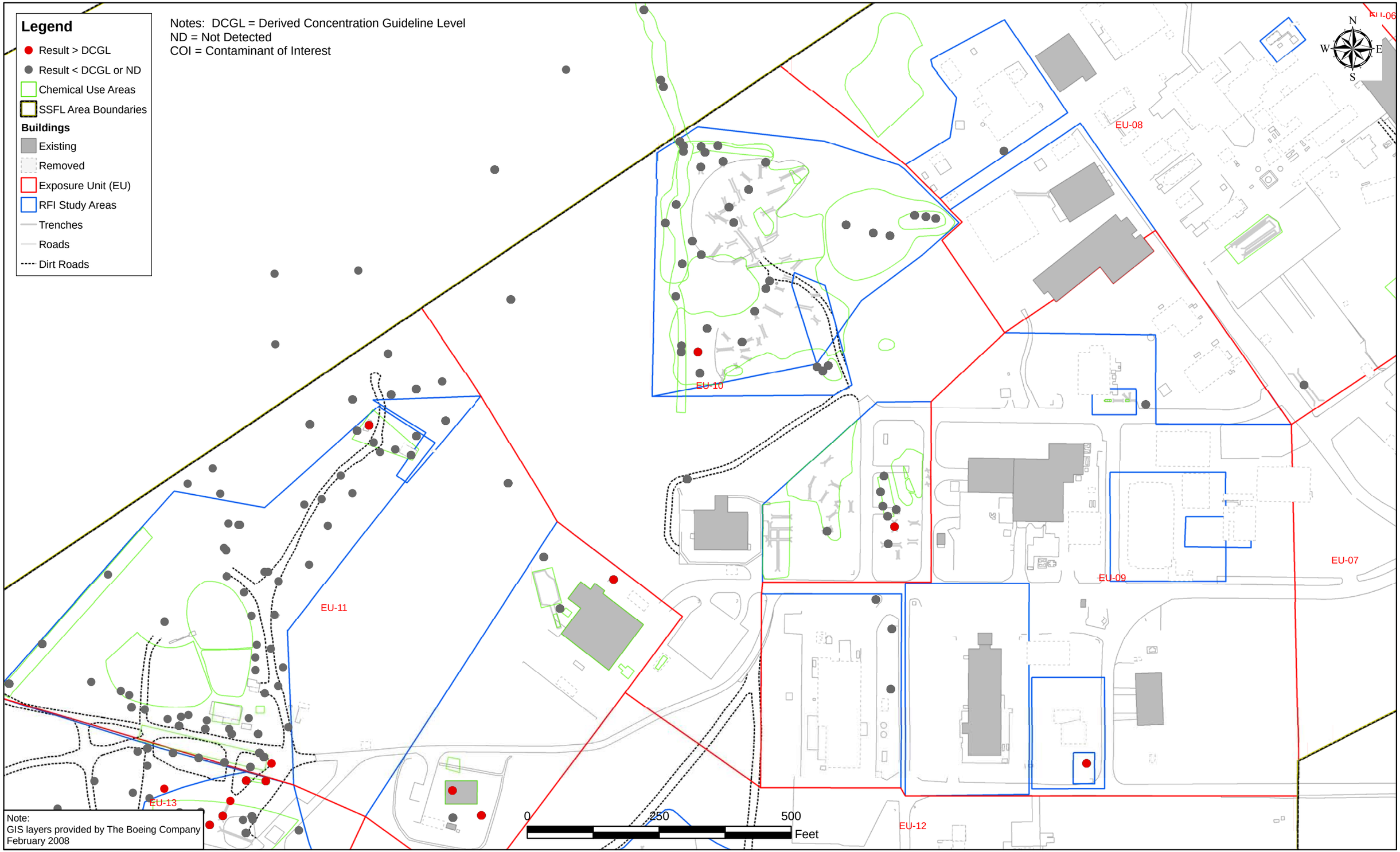
**Figure F10-2**
**SVOC COIs in Soils - EU-10**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

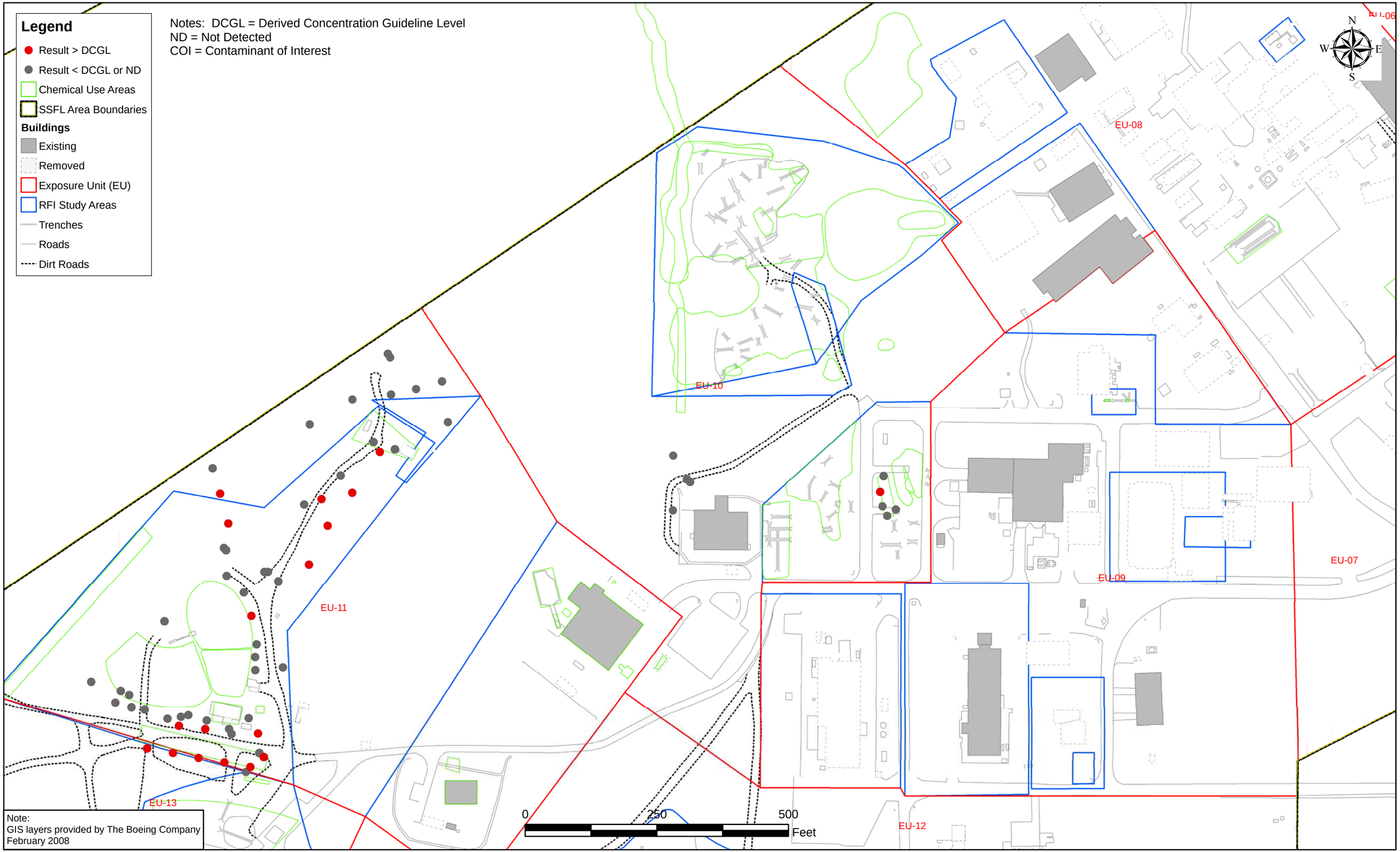
**Figure F10-3**
**PCB COIs in Soils - EU-10**
**(0-2 ft bgs)**




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Ventura County, California

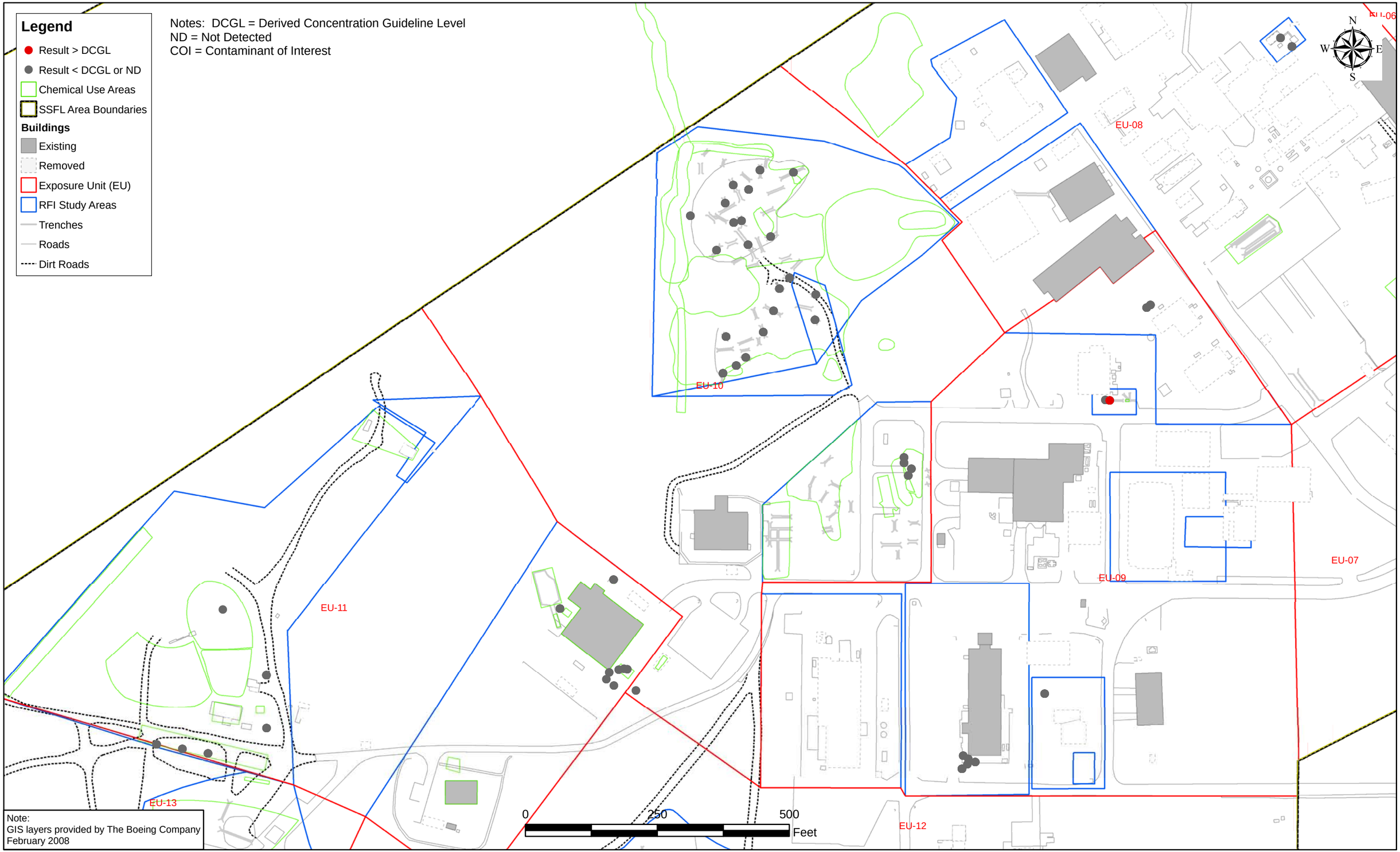
**Figure F10-4**
**Inorganic COIs in Soils - EU-10**
**(0-2 ft bgs)**




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Ventura County, California

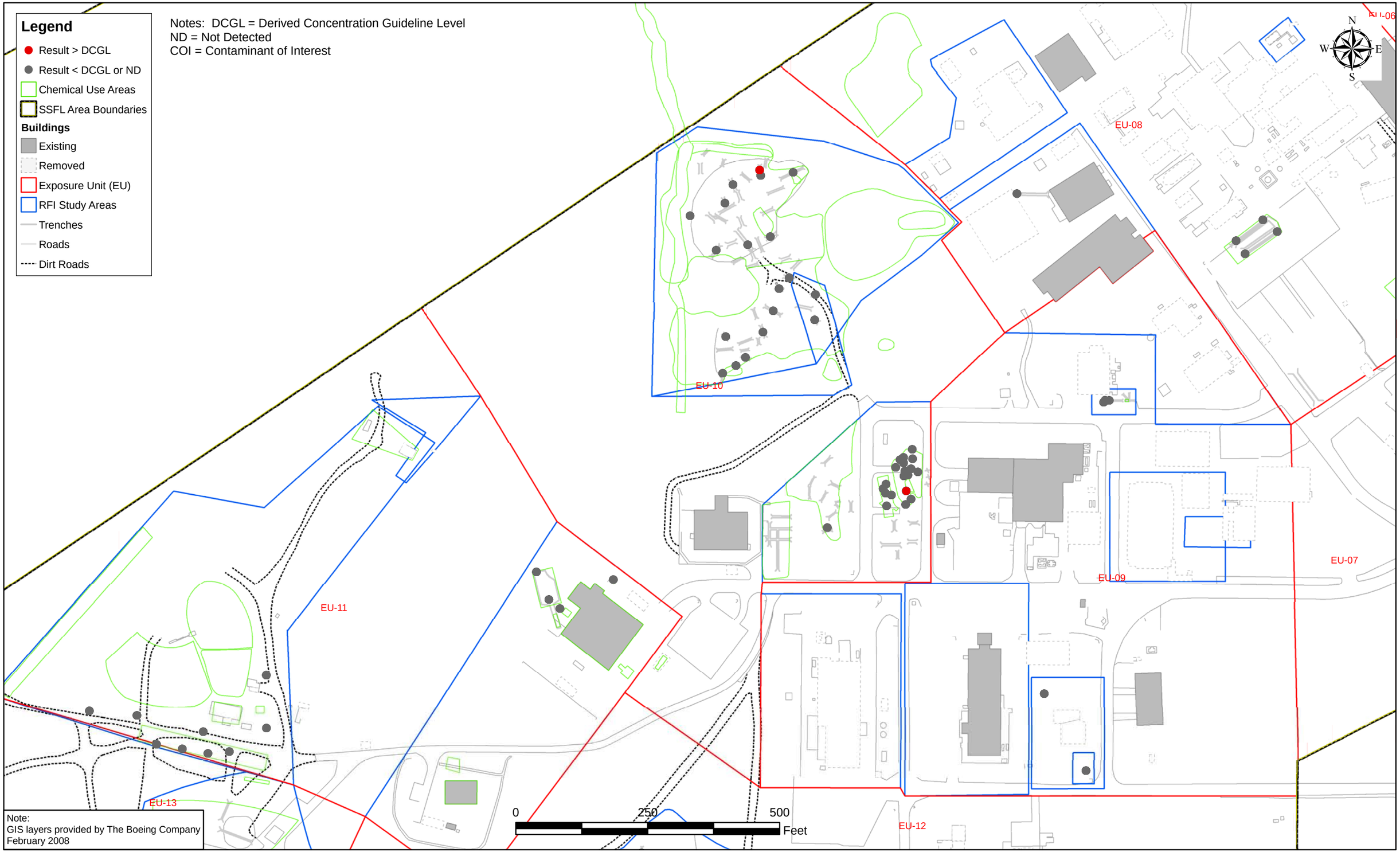
**Figure F10-5**
**Dioxin COIs in Soils - EU-10**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

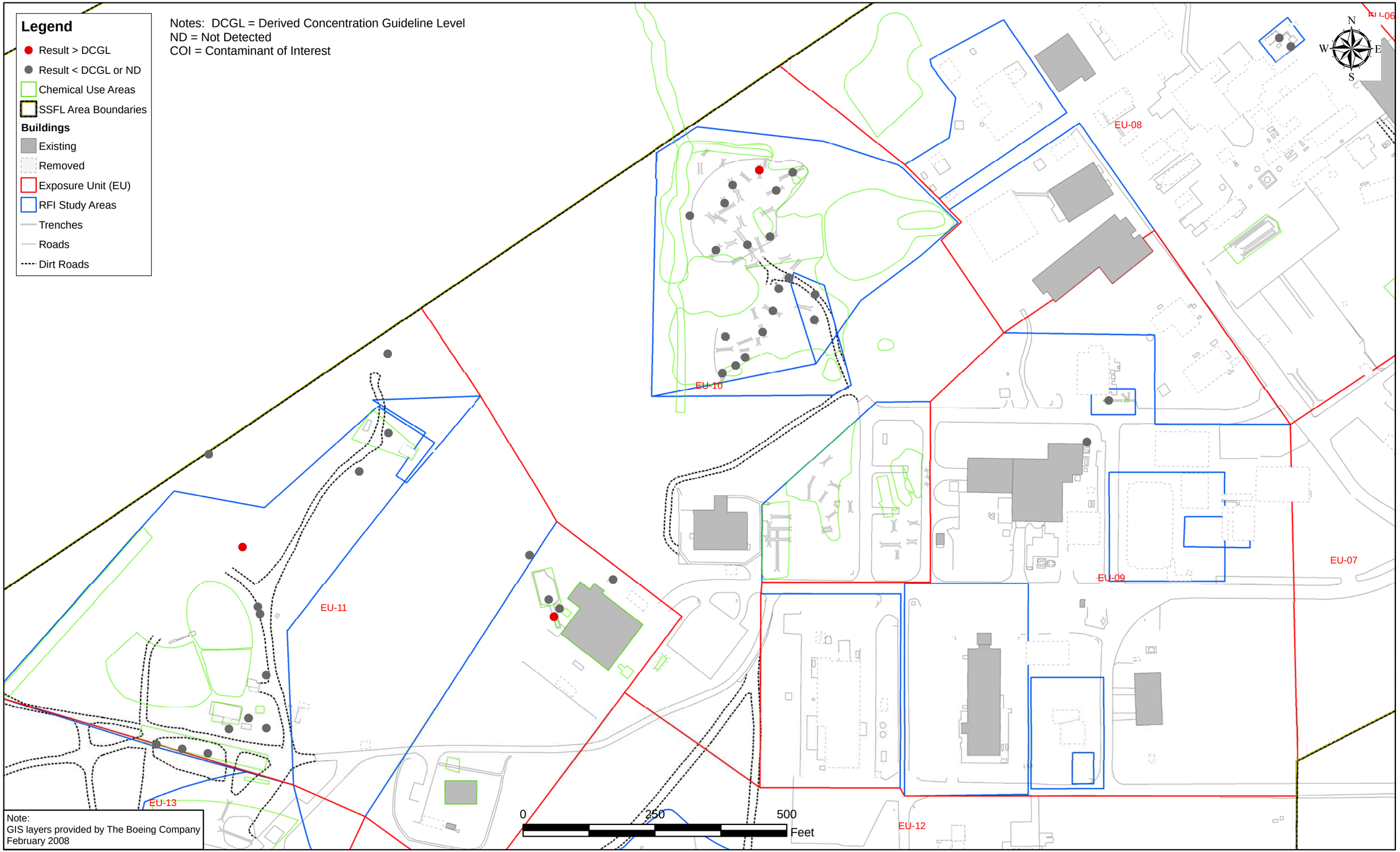
**Figure F10-6**
**VOC COIs in Soils - EU-10**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

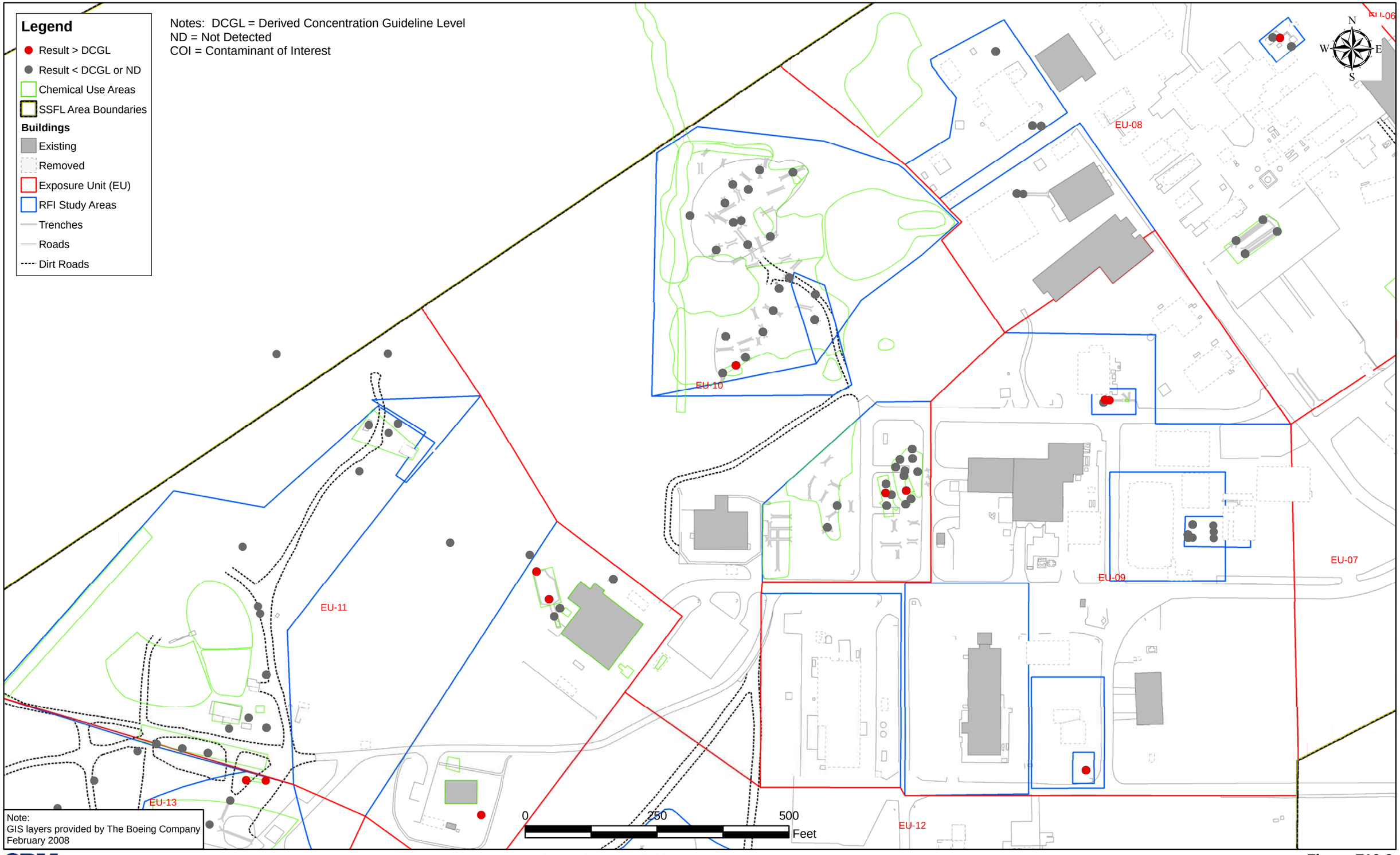
**Figure F10-7**
**SVOC COIs in Soils - EU-10**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

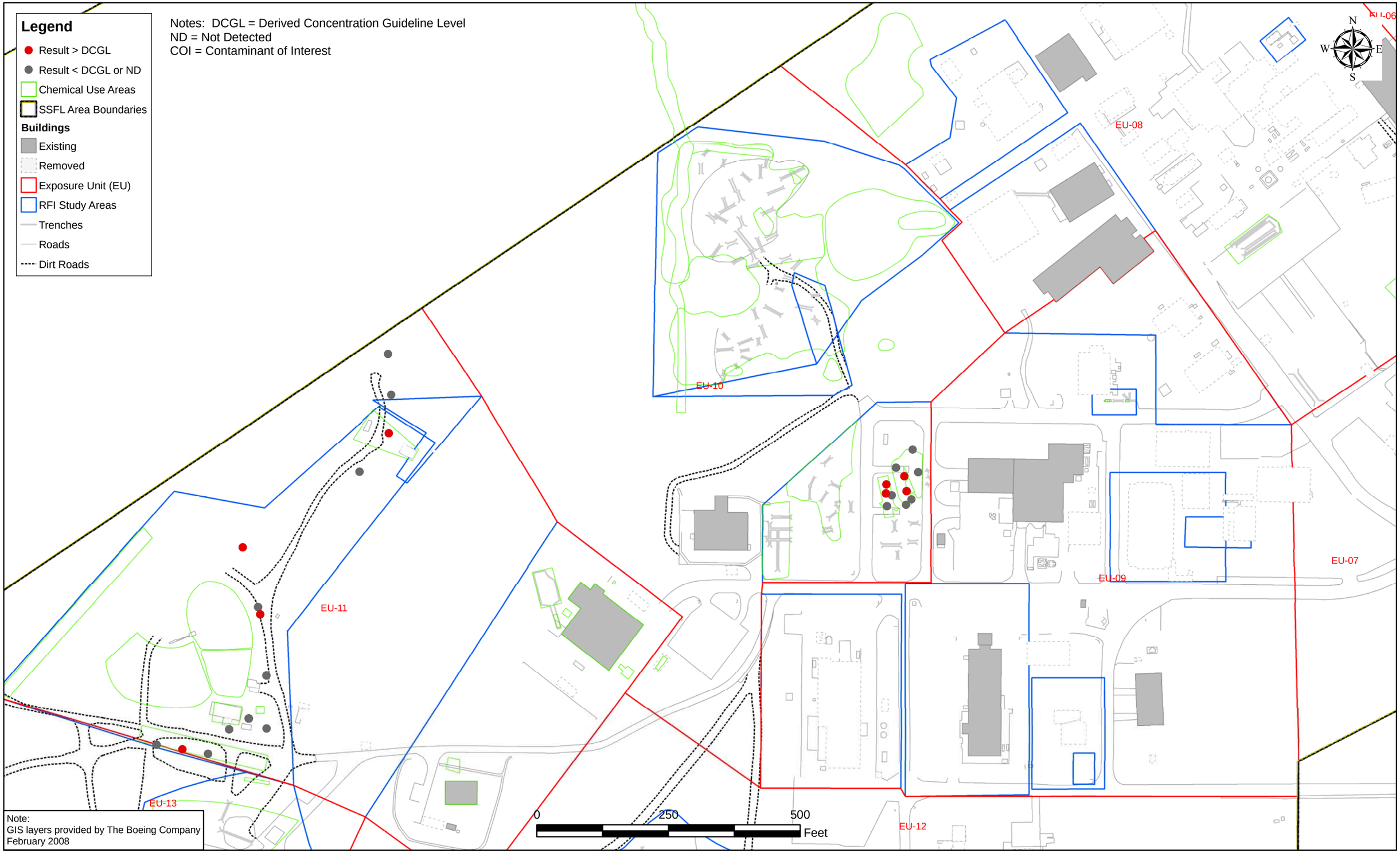
**Figure F10-8**
**PCB COIs in Soils - EU-10**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

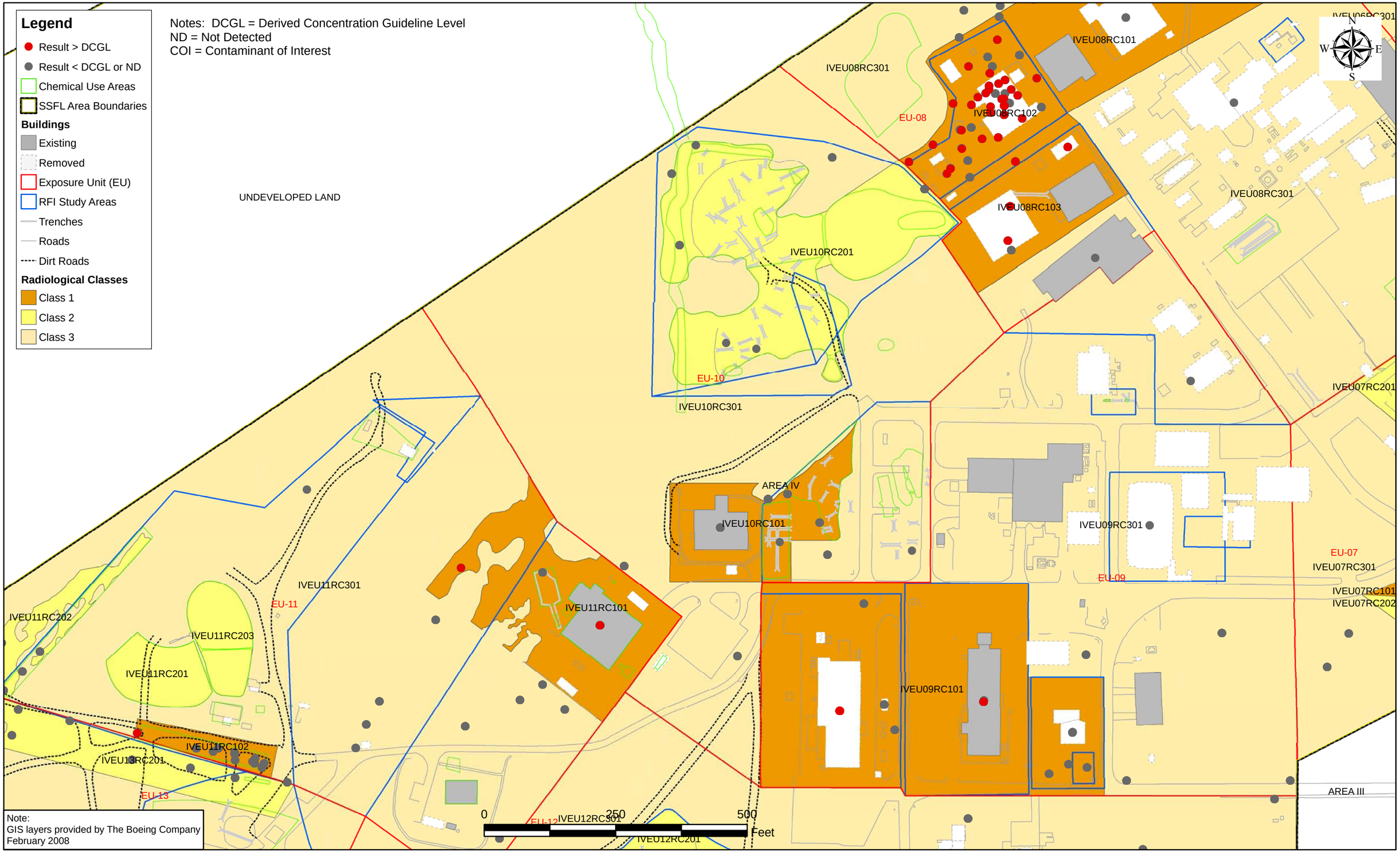
**Figure F10-9**
**Inorganic COIs in Soils - EU-10**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

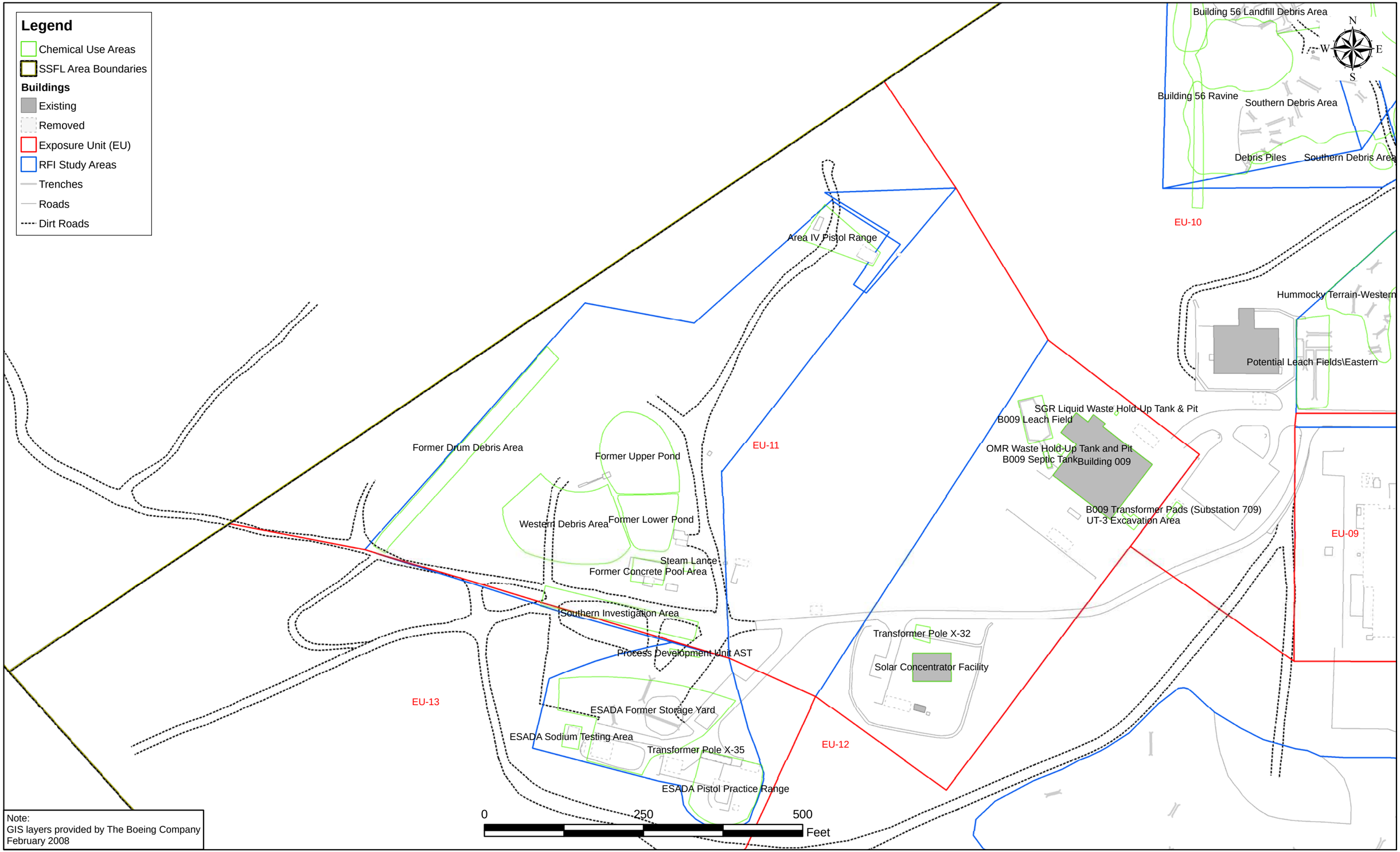
**Figure F10-10**
**Dioxin COIs in Soils - EU-10**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

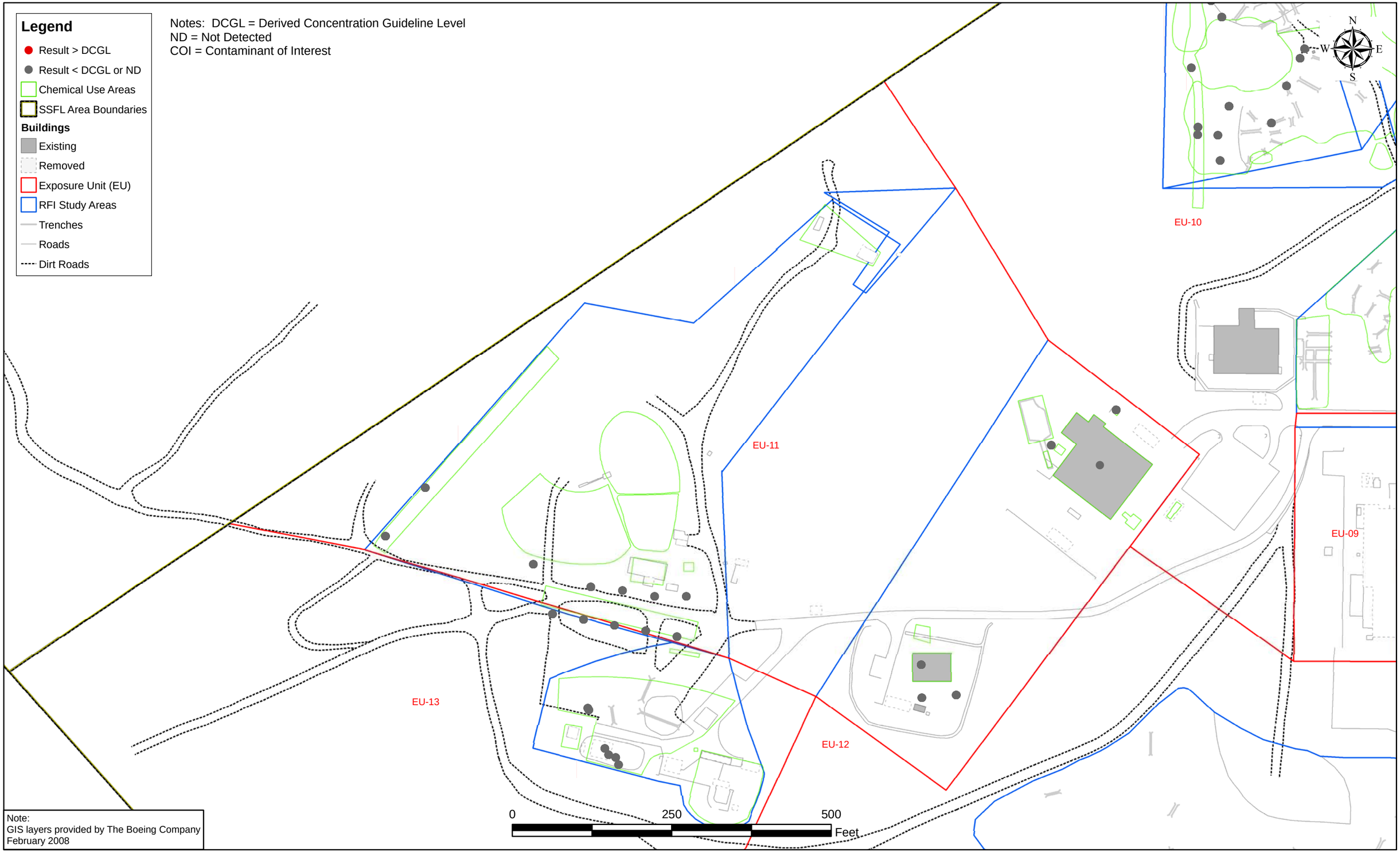
**Figure F10-11**
**Radiological COIs in Soils - EU-10**
**(0-6 in bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

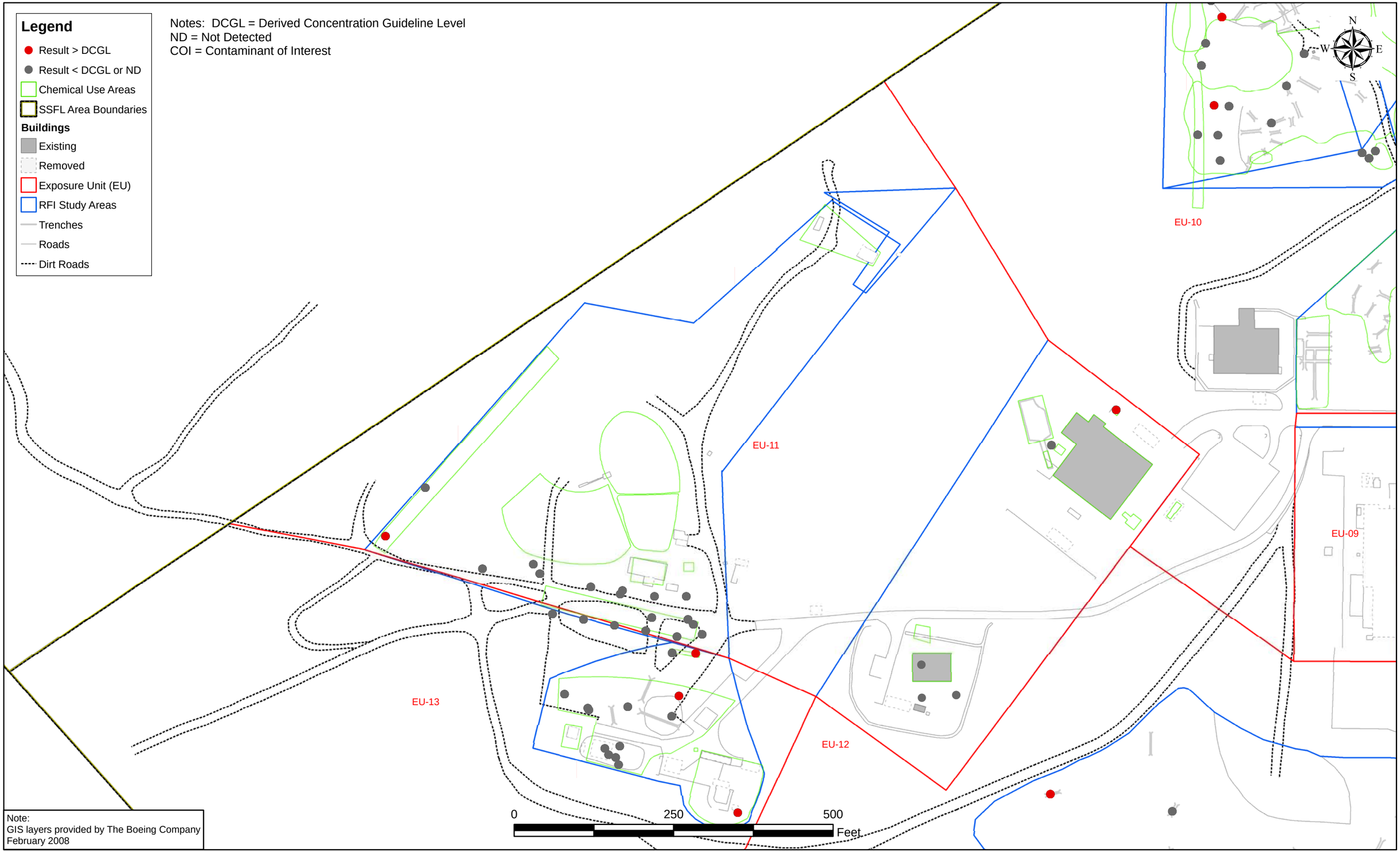
**Figure F11-0**
**EU-11 Chemical Use Areas**




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Ventura County, California

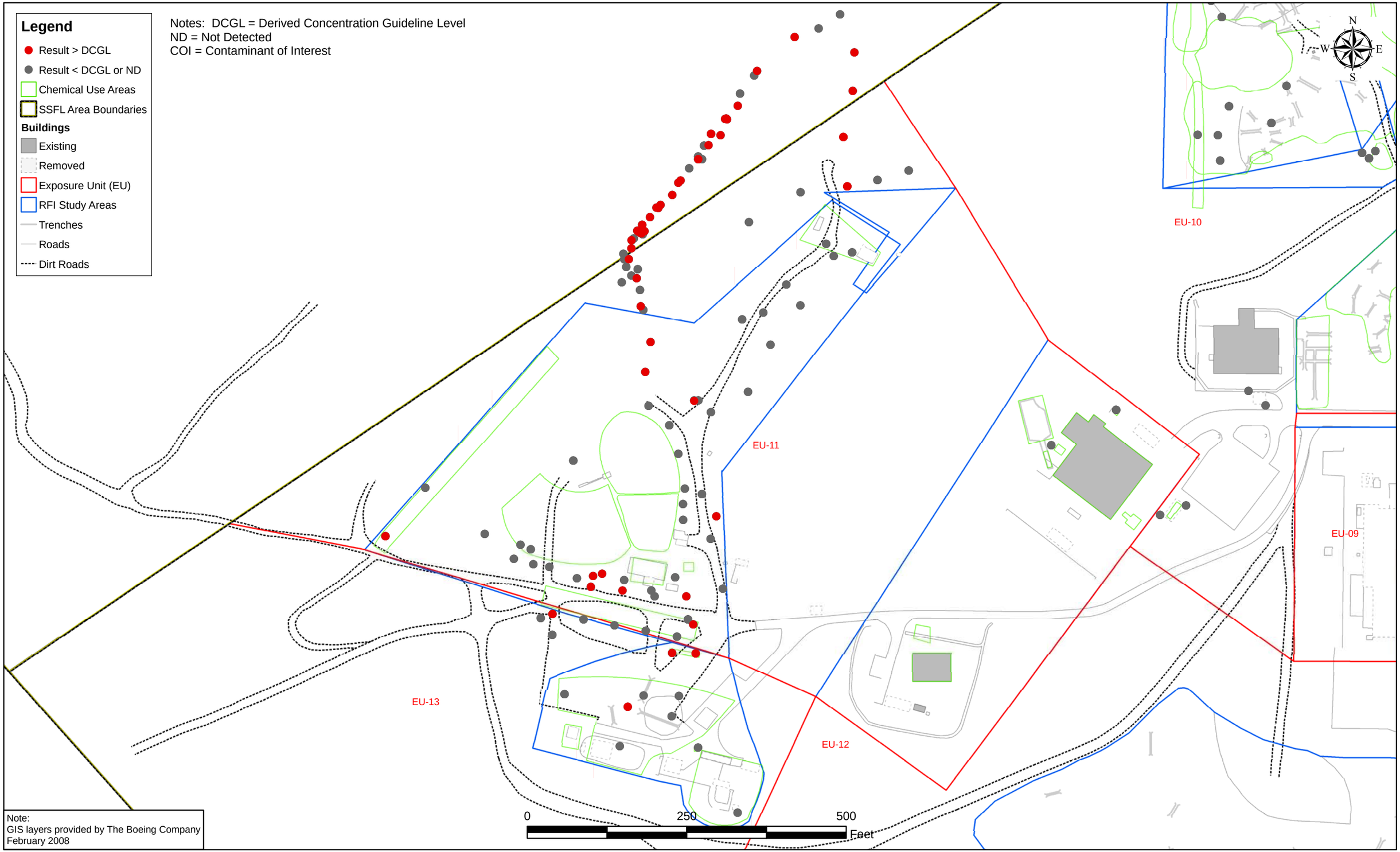
**Figure F11-1**
**VOC COIs in Soils - EU-11**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

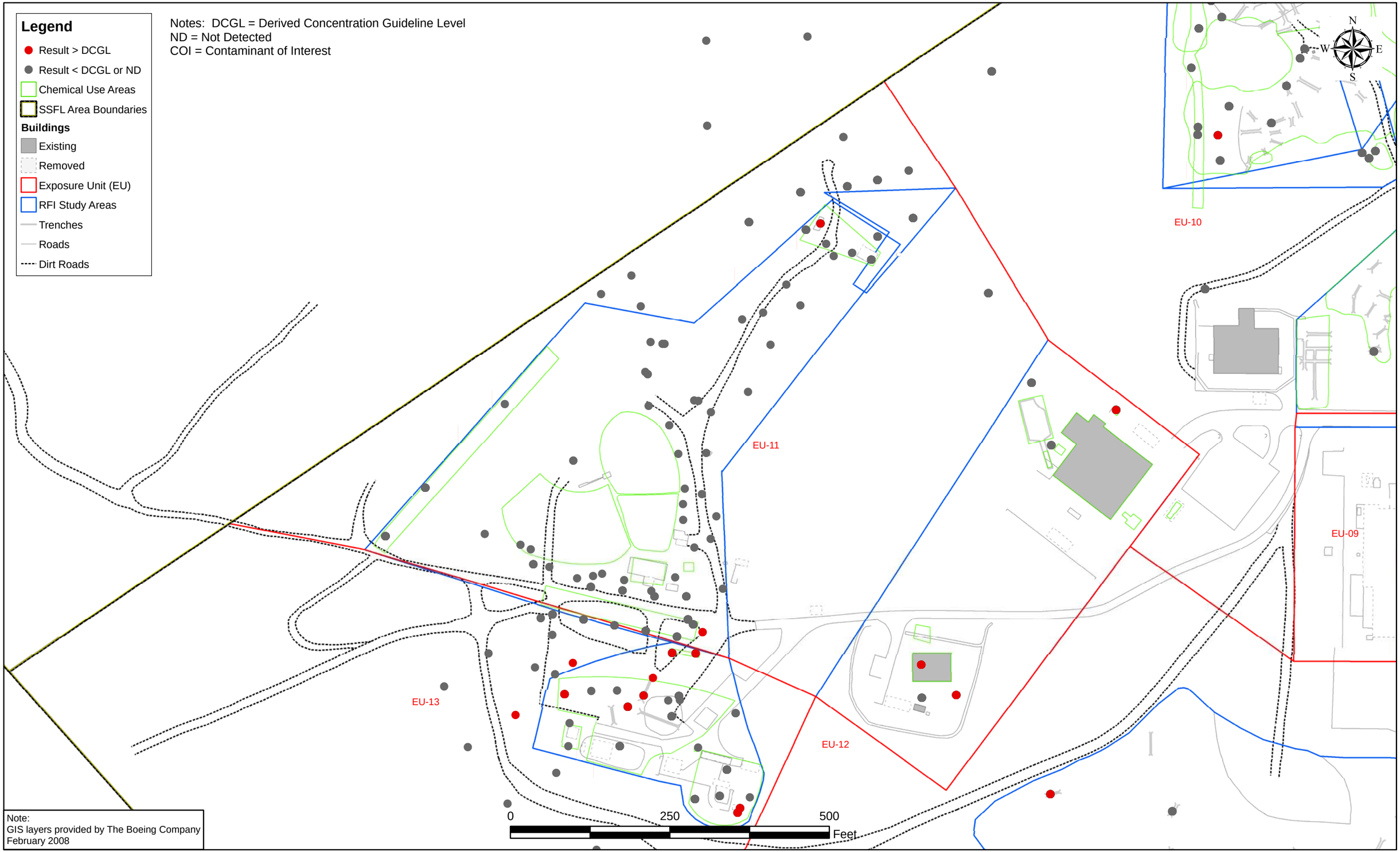
**Figure F11-2**
**SVOC COIs in Soils - EU-11**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

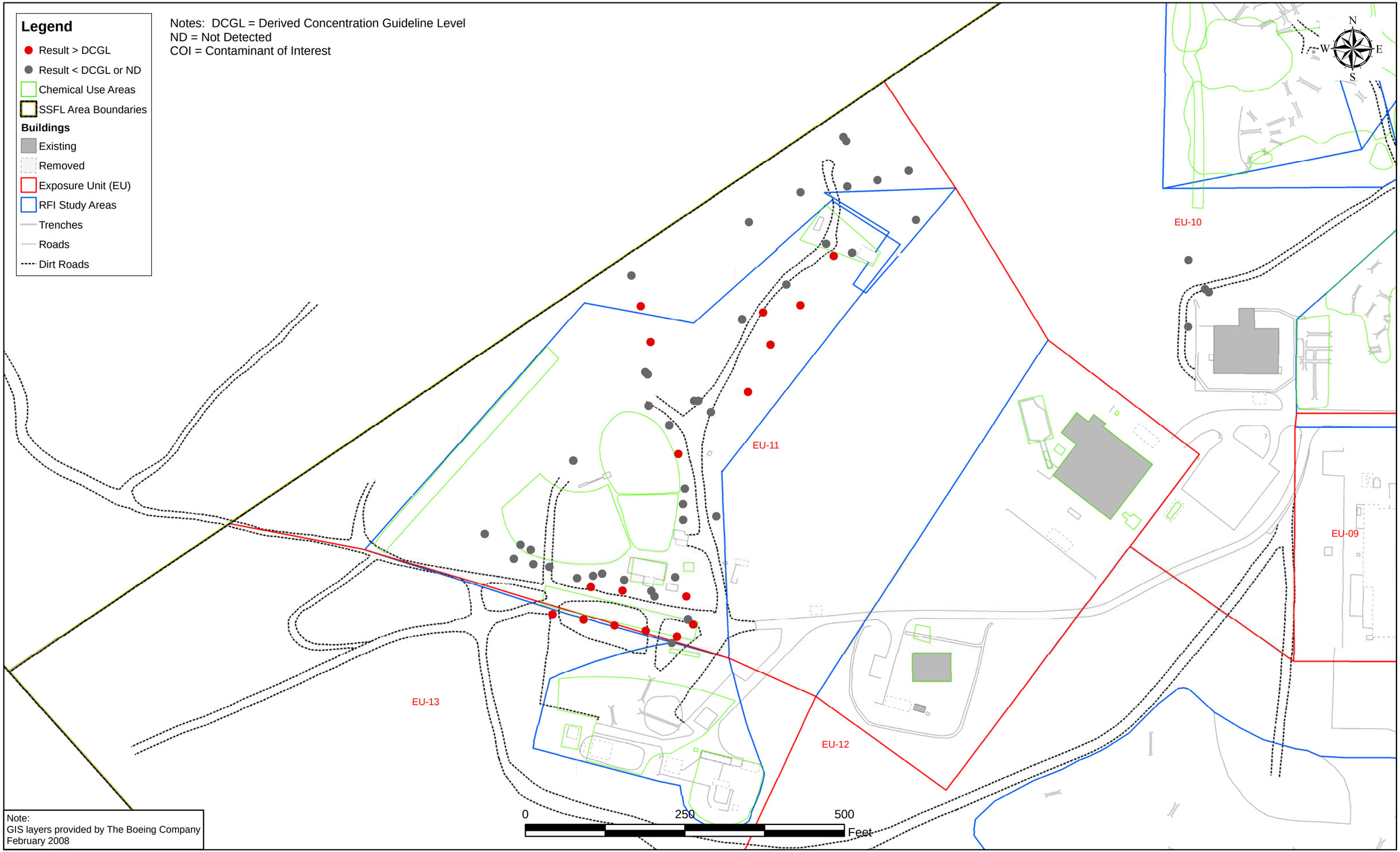
**Figure F11-3**
**PCB COIs in Soils - EU-11**
**(0-2 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

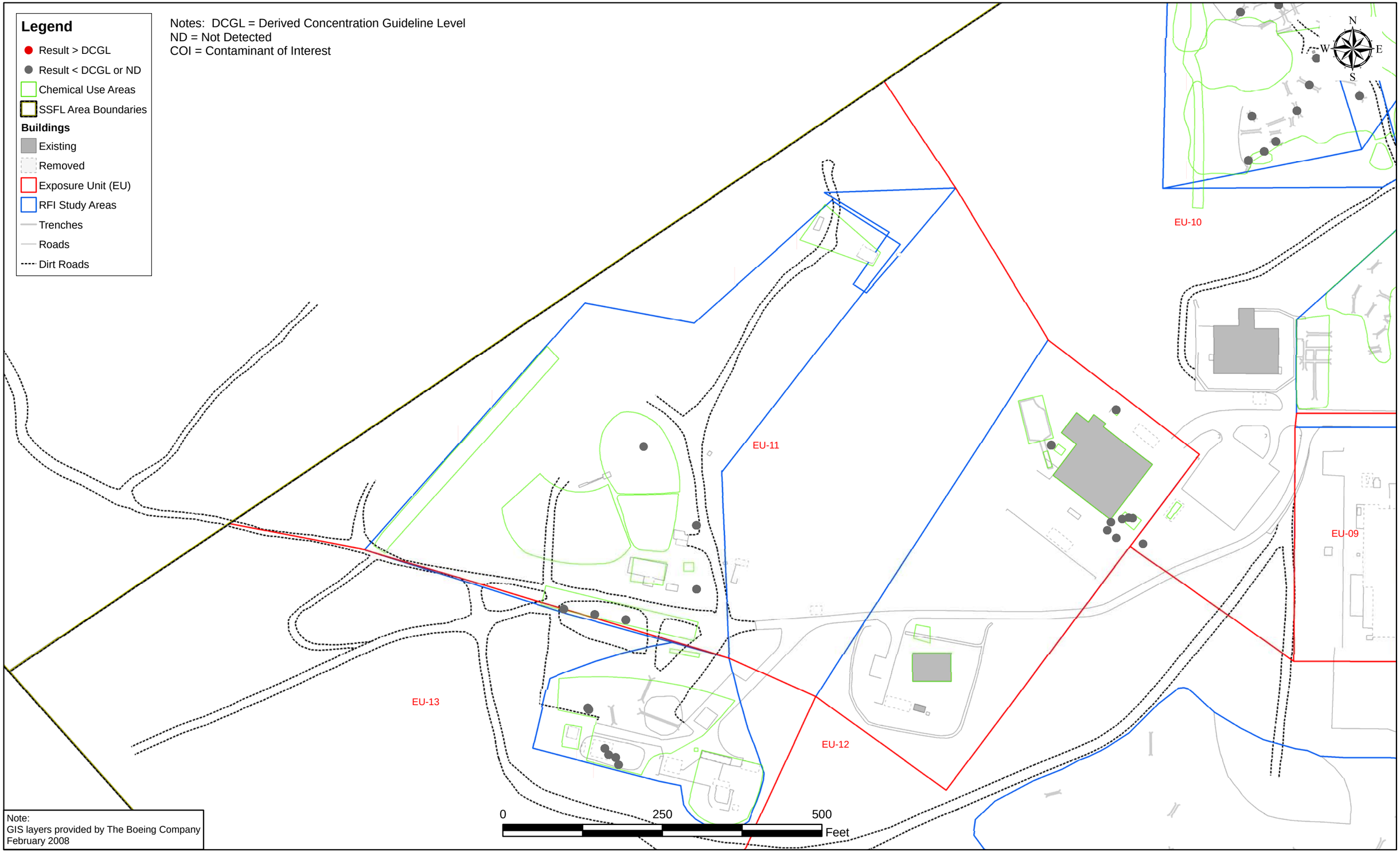
**Figure F11-4**
**Inorganic COIs in Soils - EU-11**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

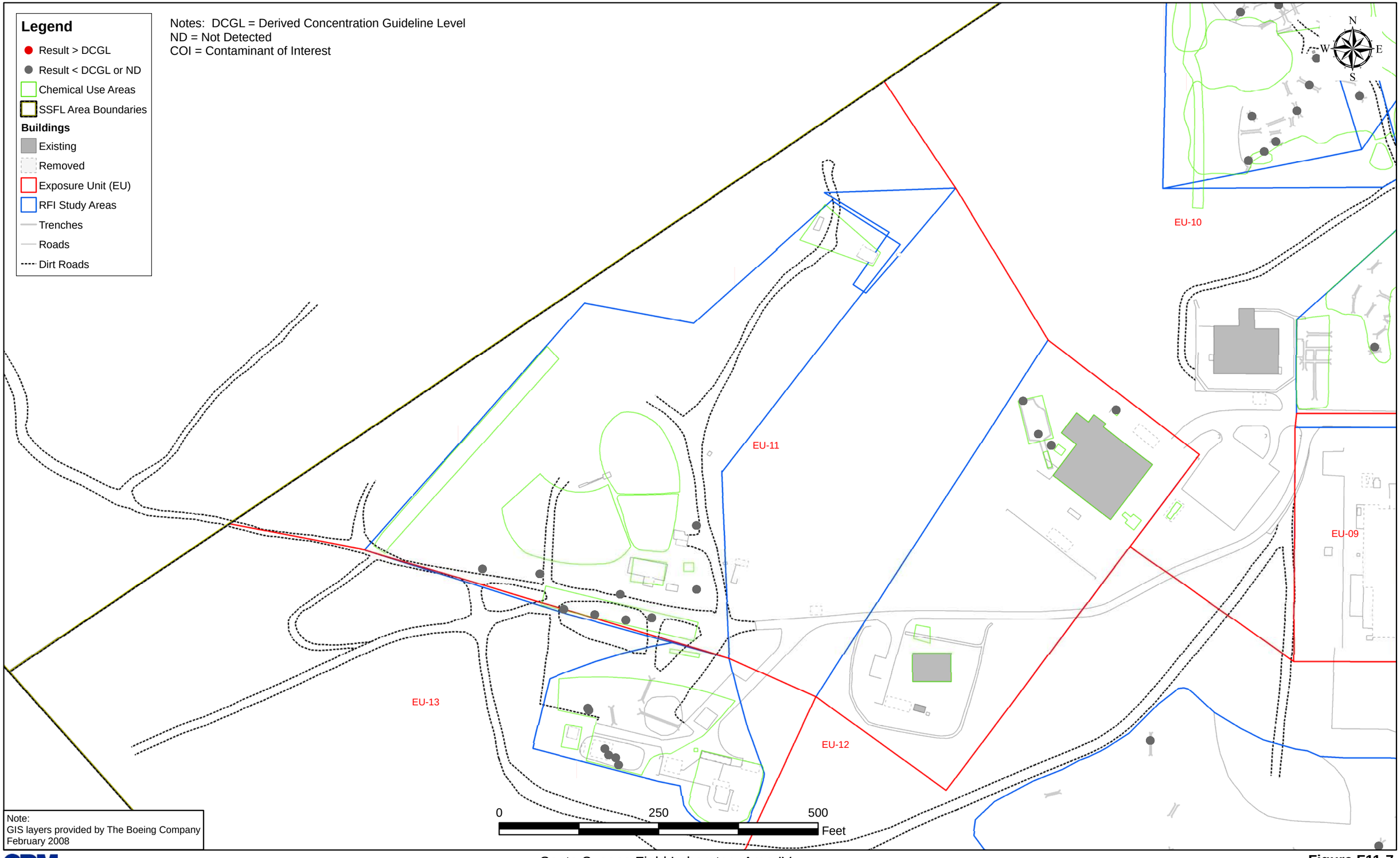
**Figure F11-5**
**Dioxin COIs in Soils - EU-11**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

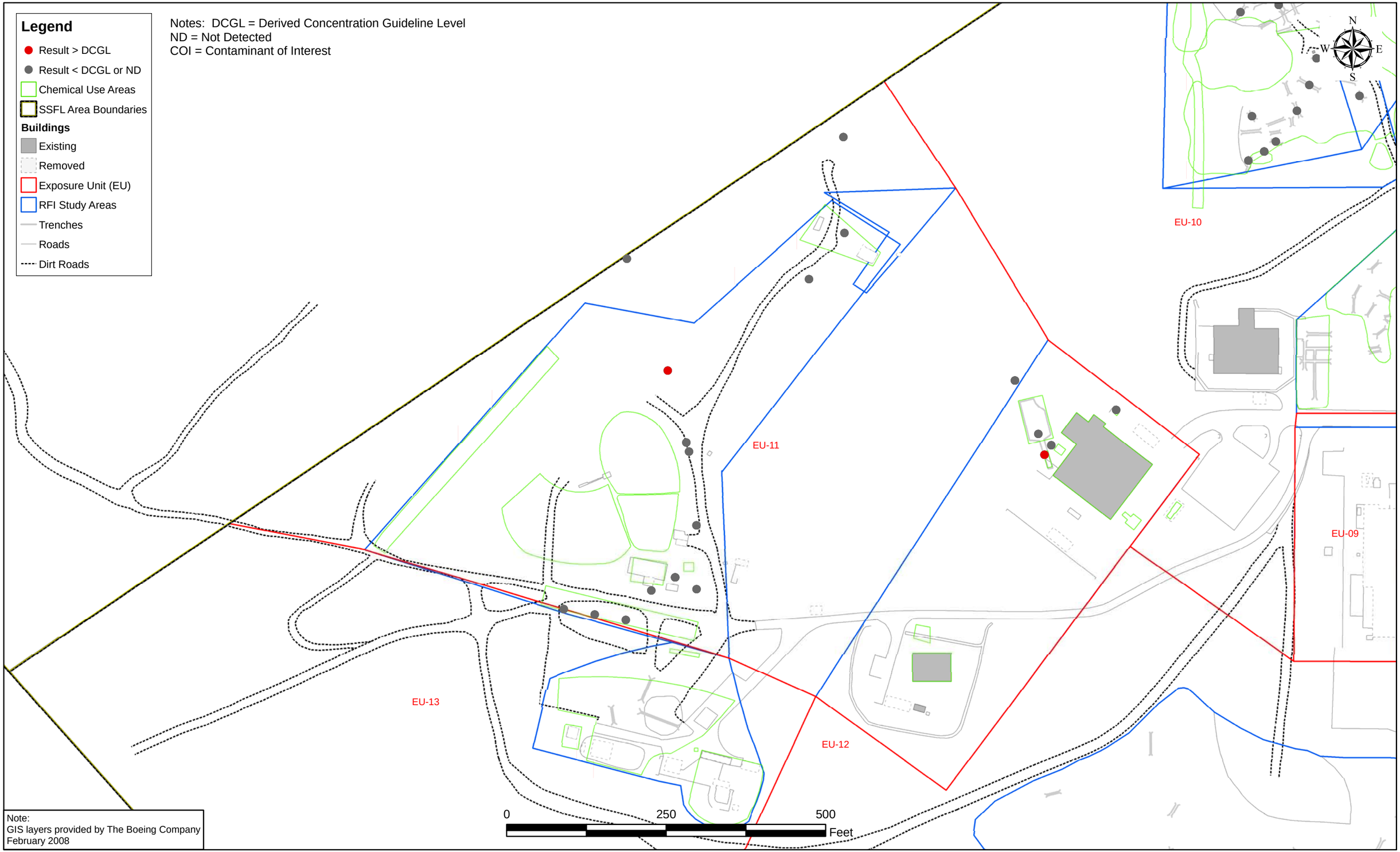
**Figure F11-6**
**VOC COIs in Soils - EU-11**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

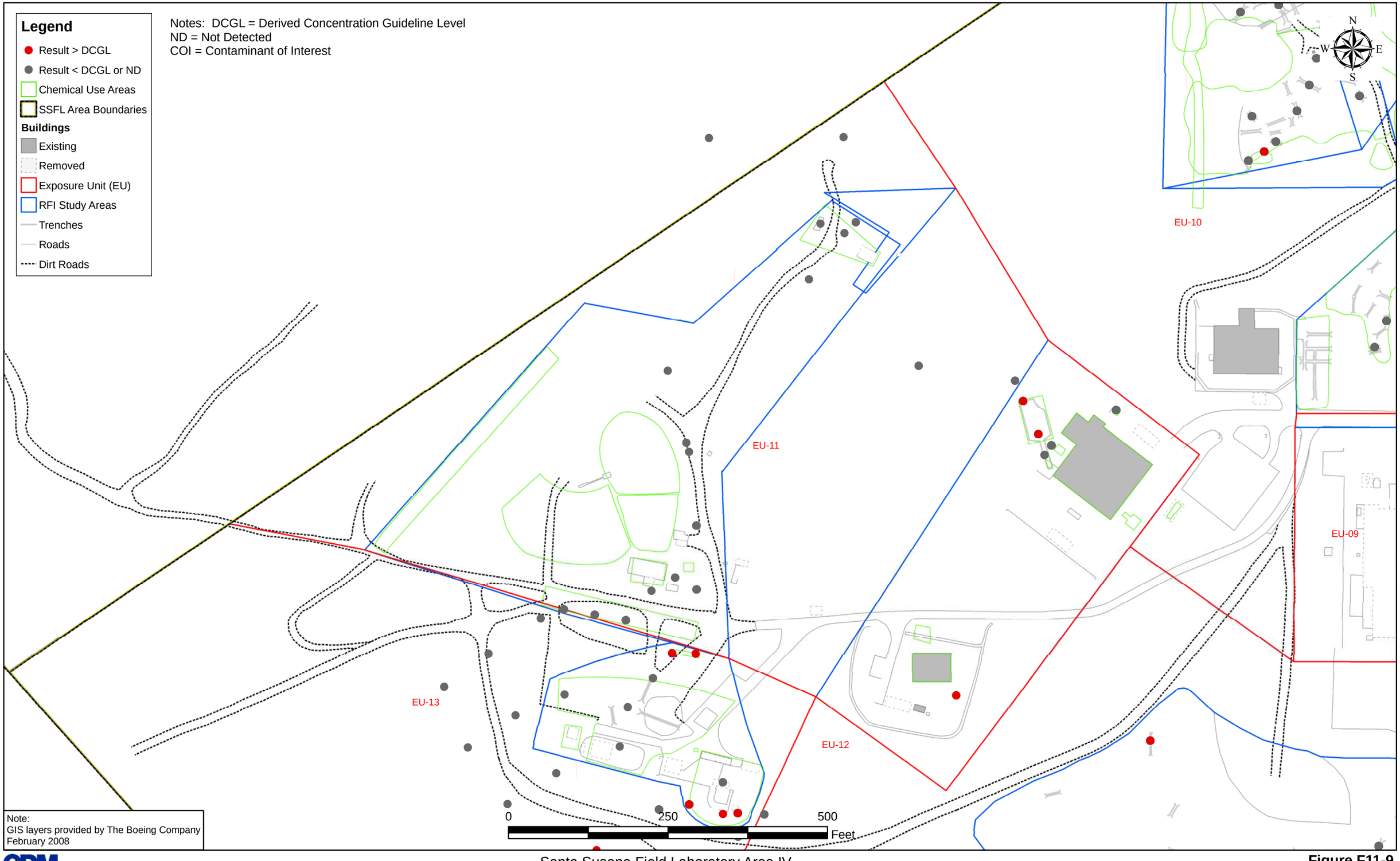
**Figure F11-7**
**SVOC COIs in Soils - EU-11**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

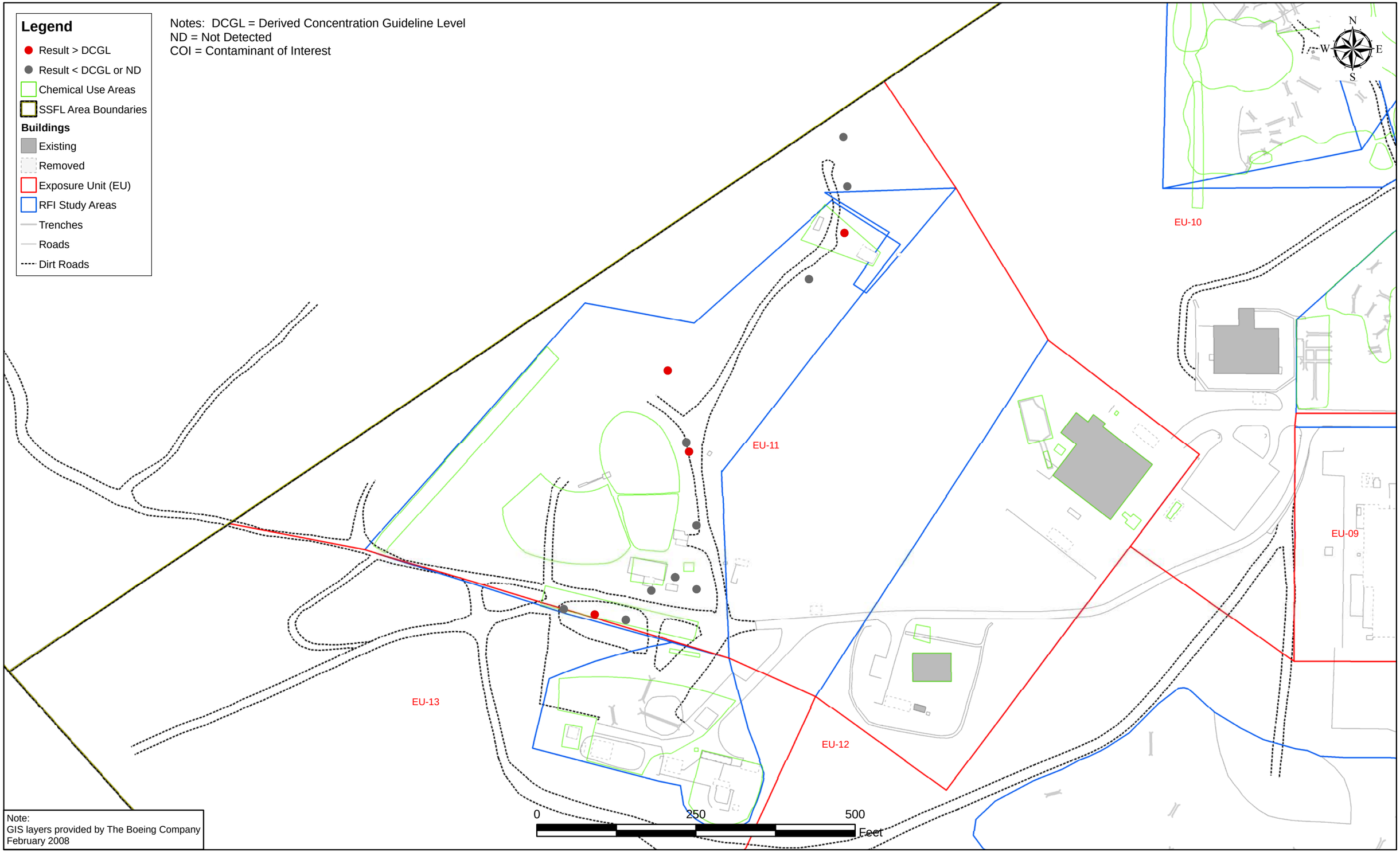
**Figure F11-8**
**PCB COIs in Soils - EU-11**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

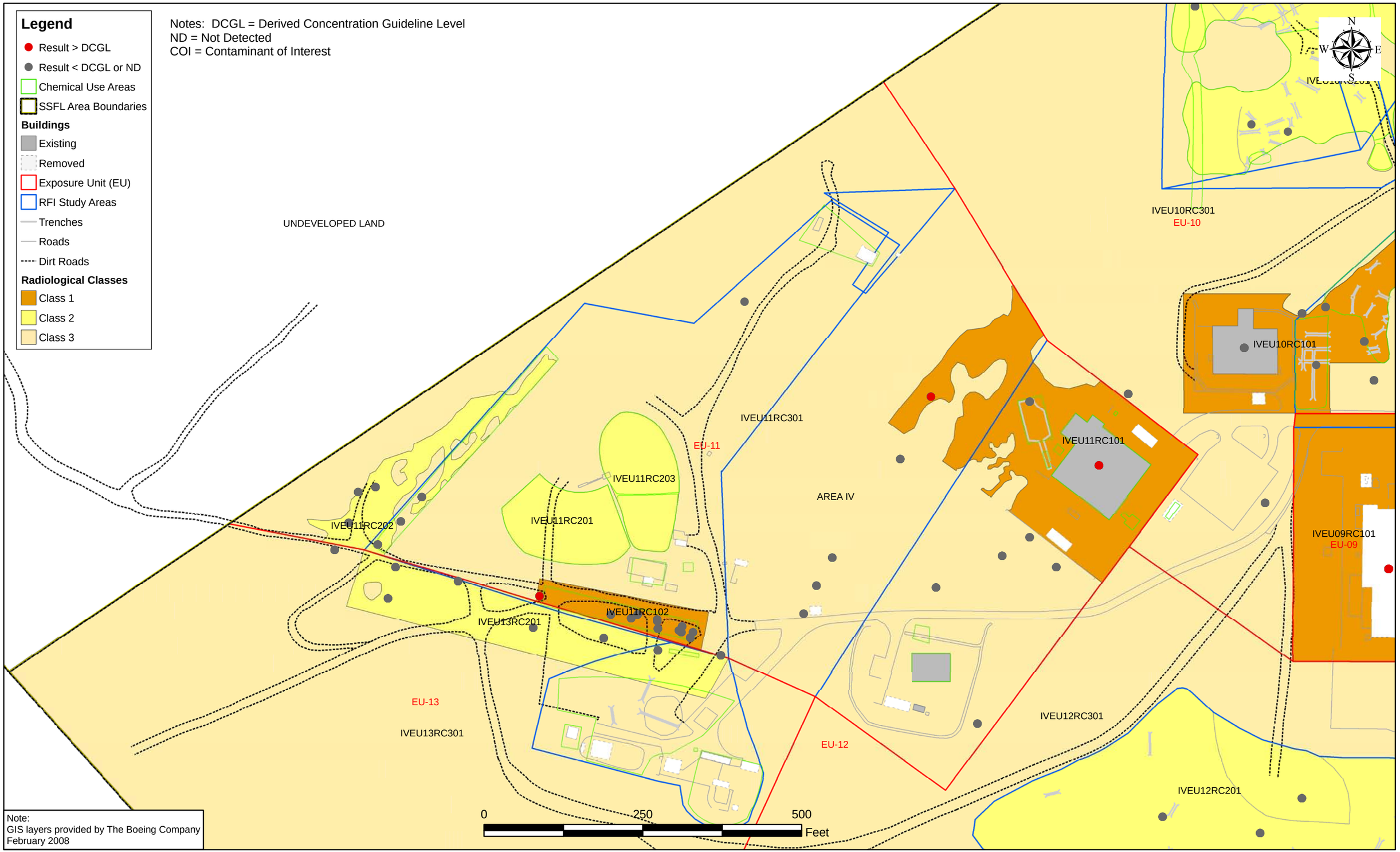
**Figure F11-9**
**Inorganic COIs in Soils - EU-11**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

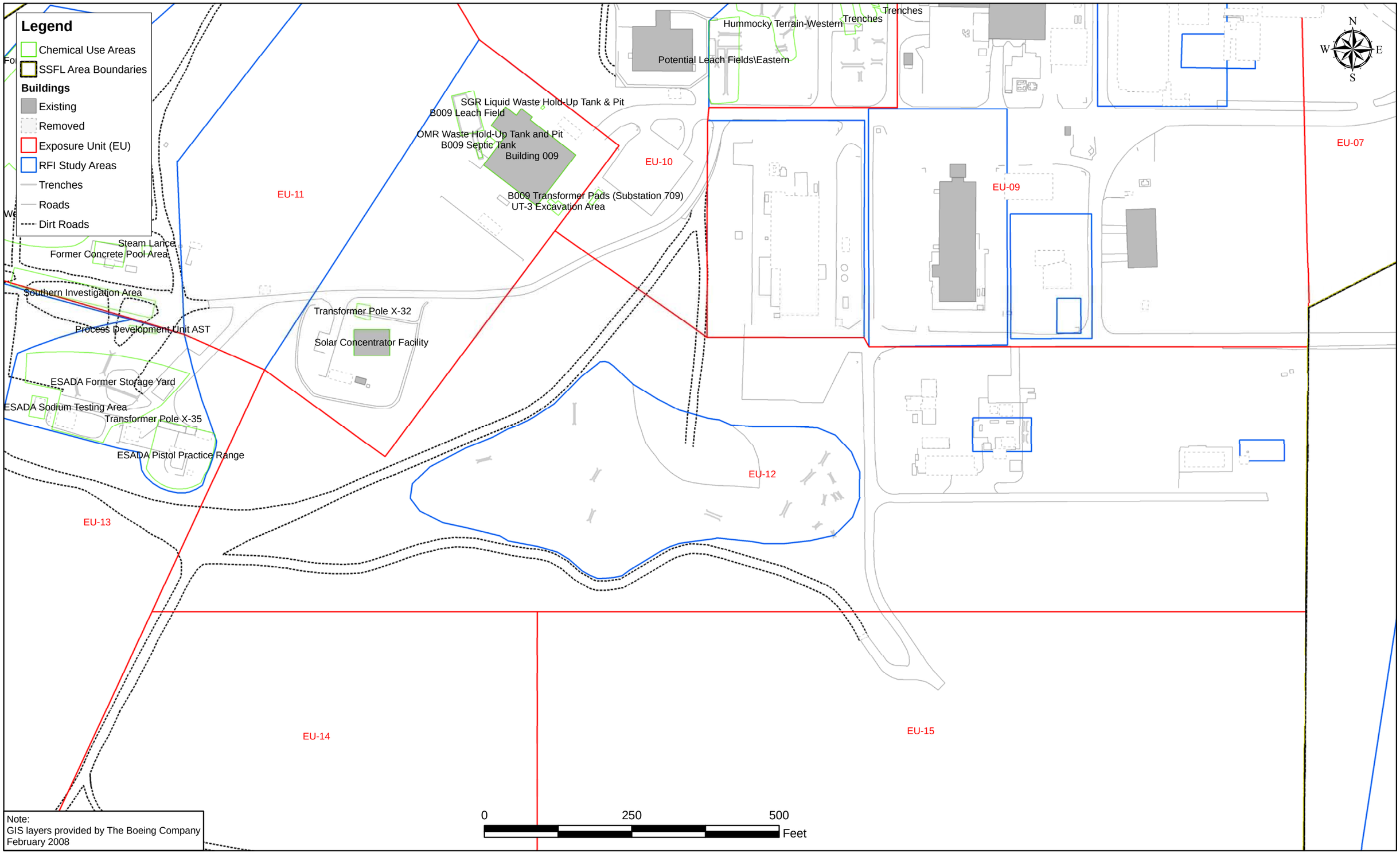
**Figure F11-10**
**Dioxin COIs in Soils - EU-11**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

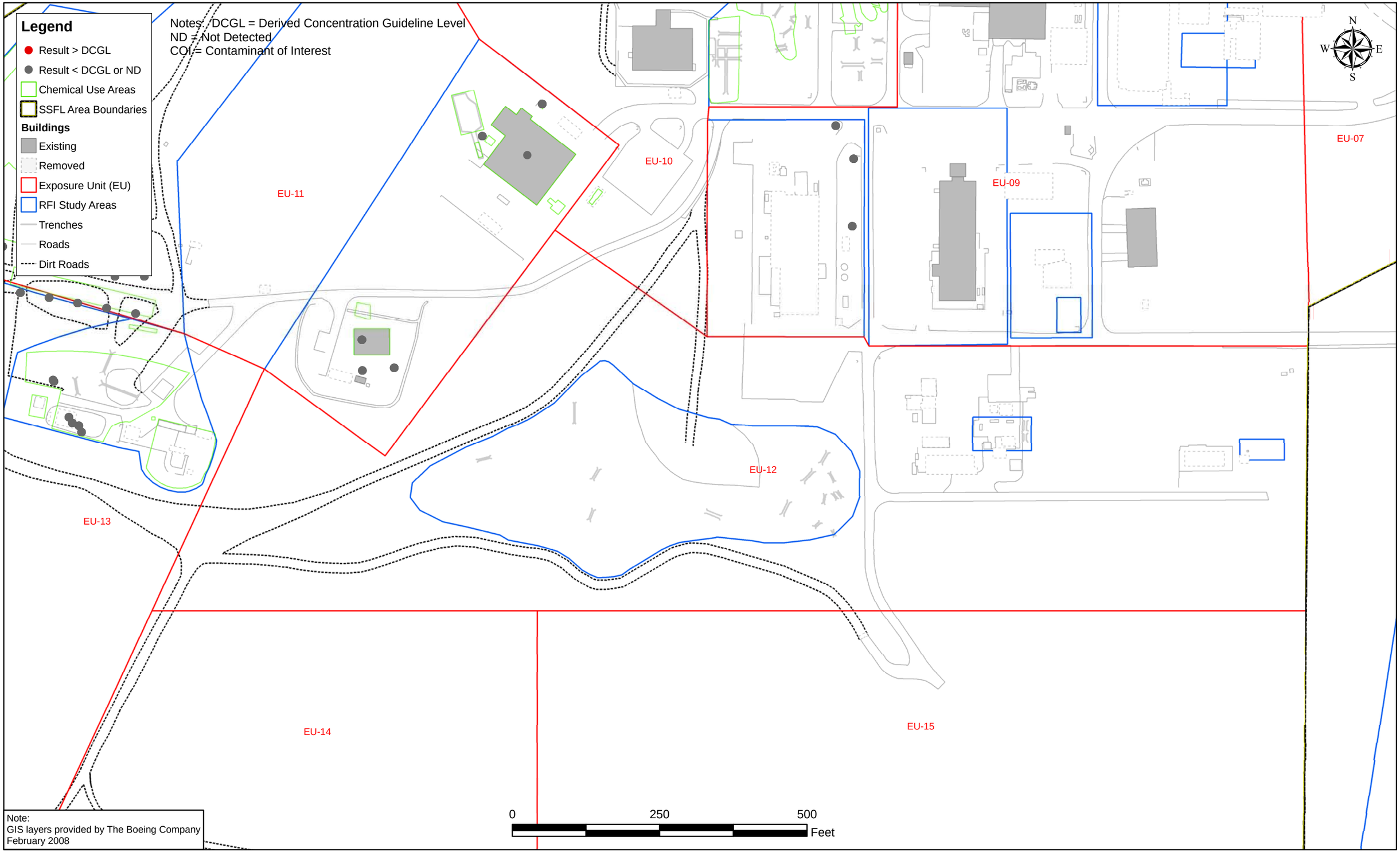
**Figure F11-11**
**Radiological COIs in Soils - EU-11**
**(0-6 in bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

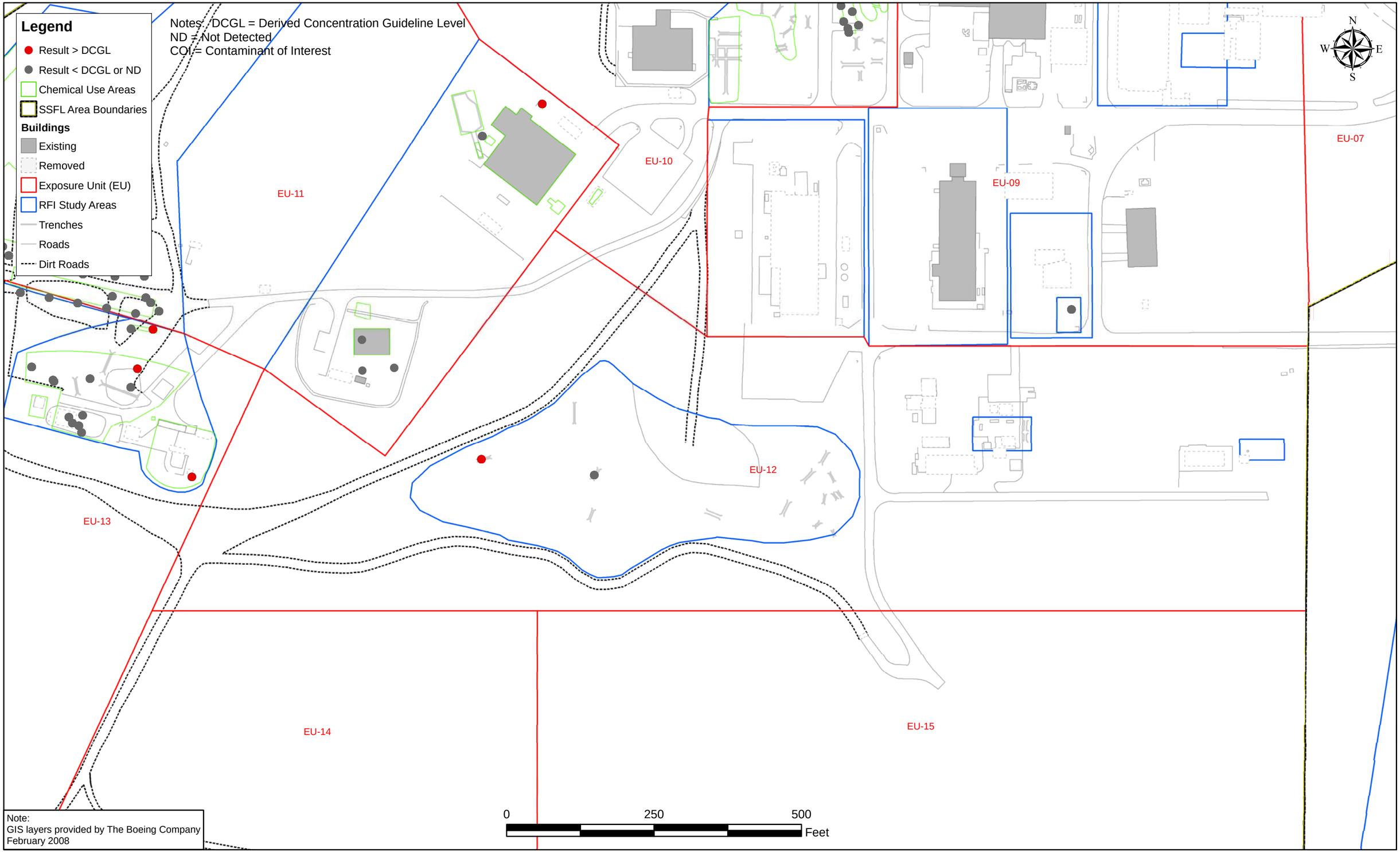
**Figure F12-0**
**EU-12 Chemical Use Areas**




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Santa Susana Field Laboratory Area IV
Ventura County, California

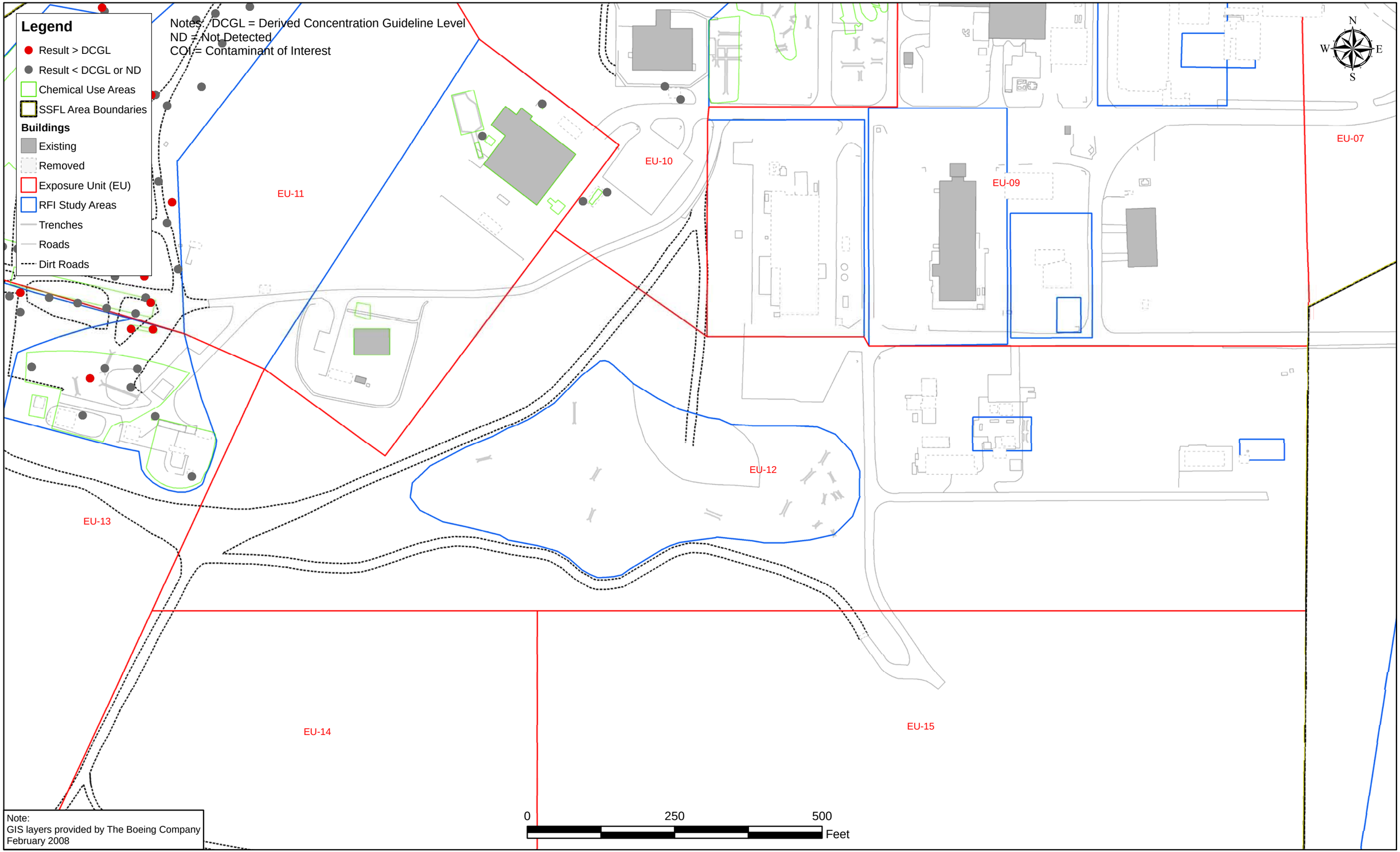
**Figure F12-1**
**VOC COIs in Soils - EU-12**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

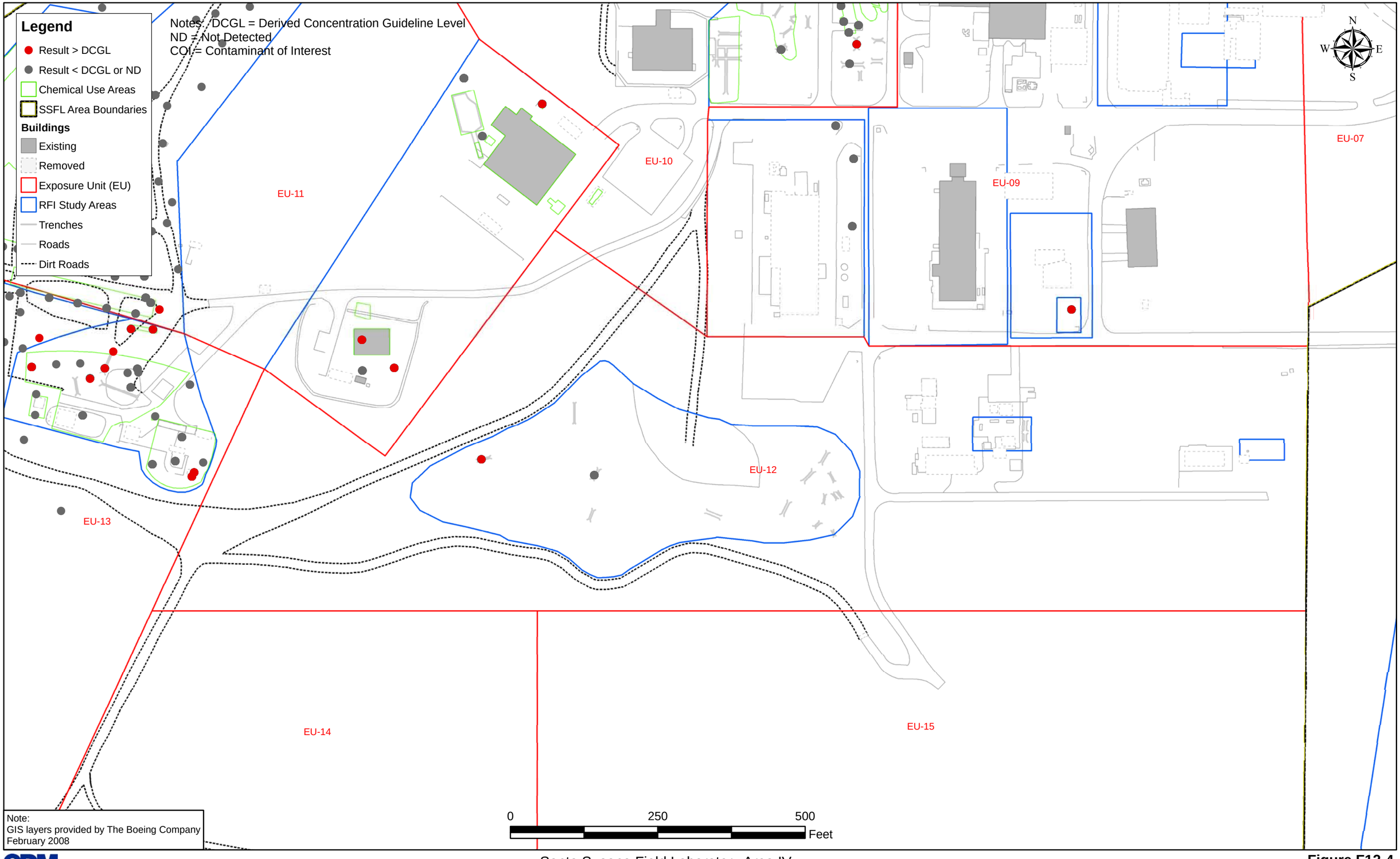
**Figure F12-2**
**SVOC COIs in Soils - EU-12**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

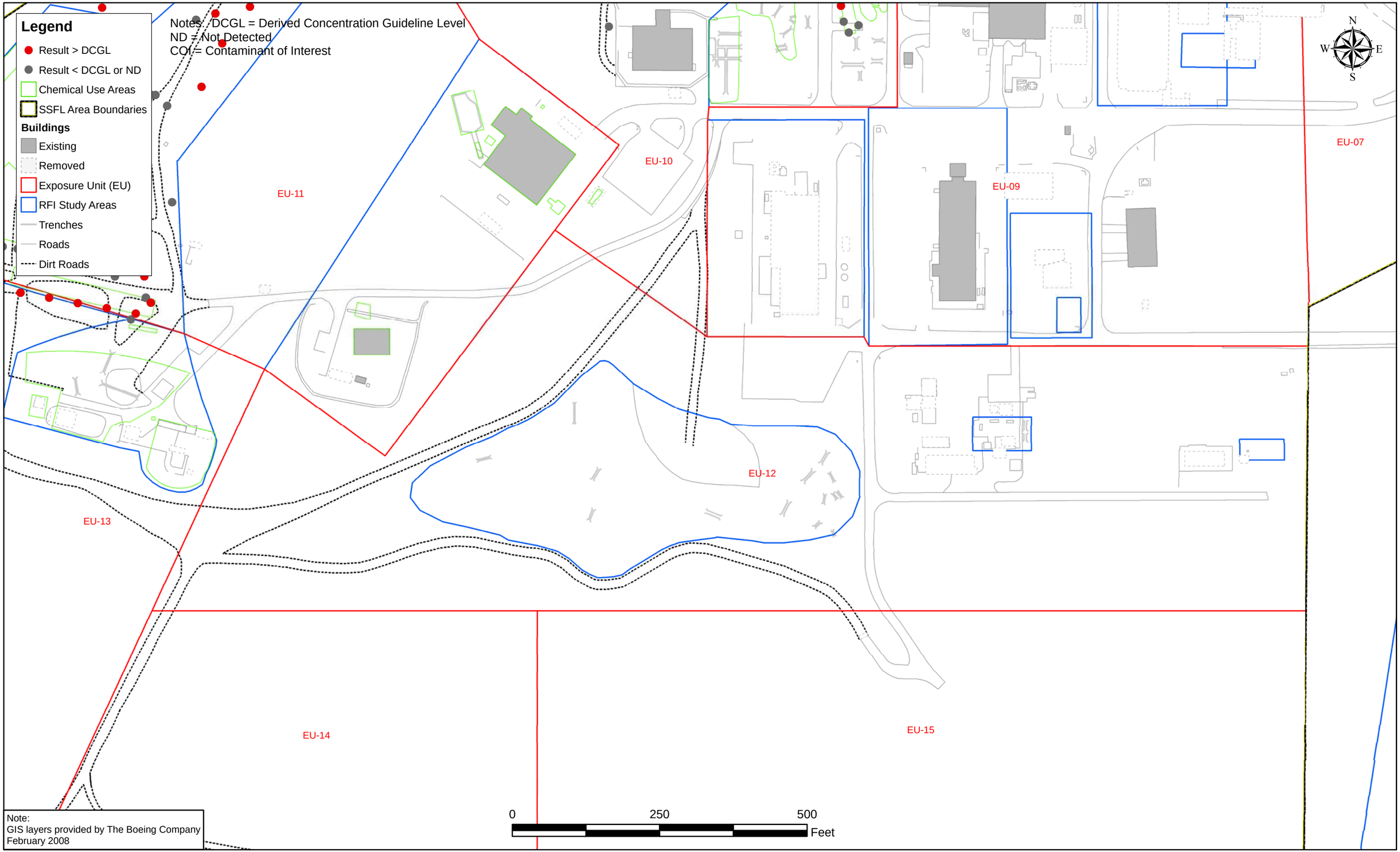
**Figure F12-3**
**PCB COIs in Soils - EU-12**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

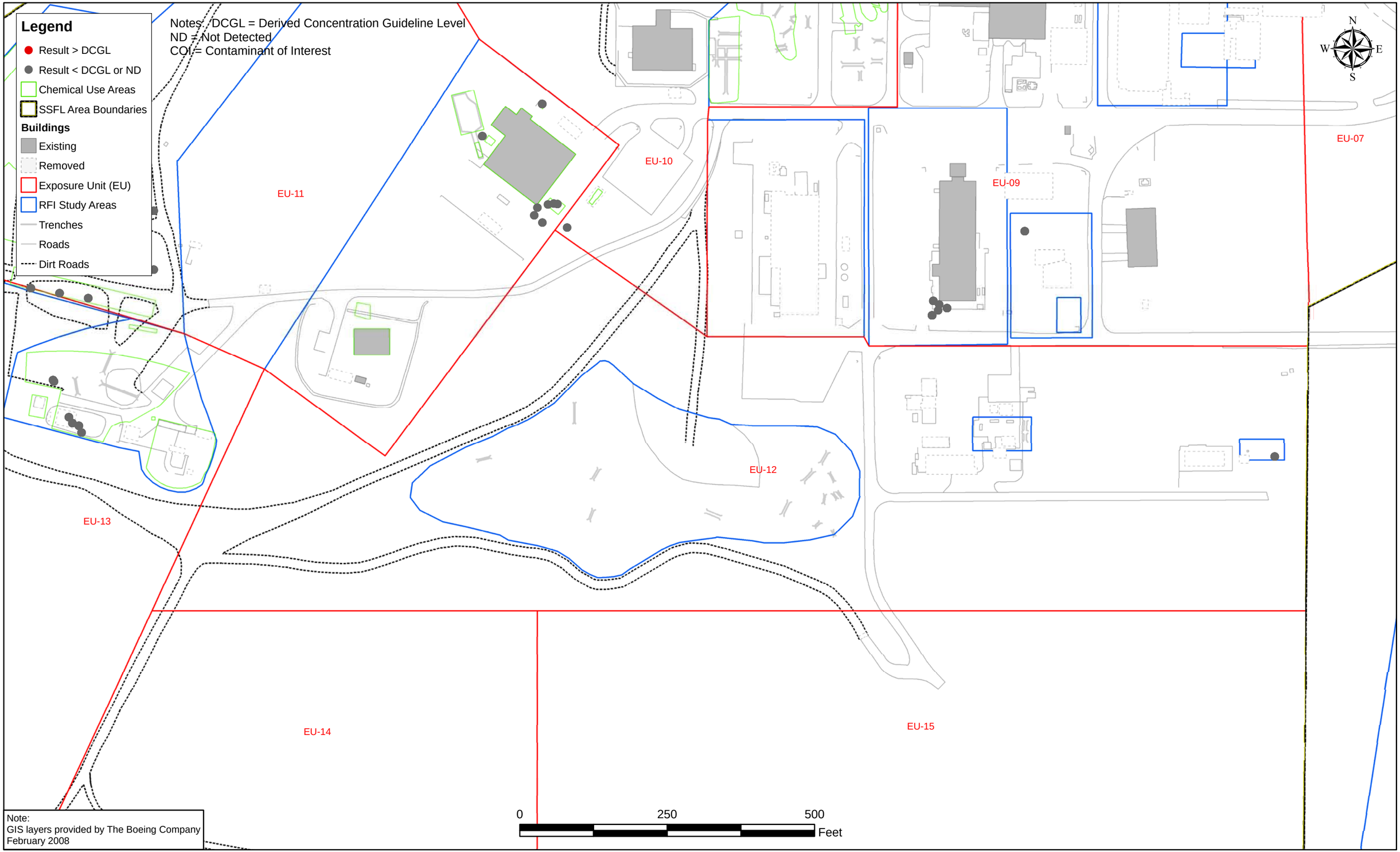
**Figure F12-4**
**Inorganic COIs in Soils - EU-12**
**(0-2 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

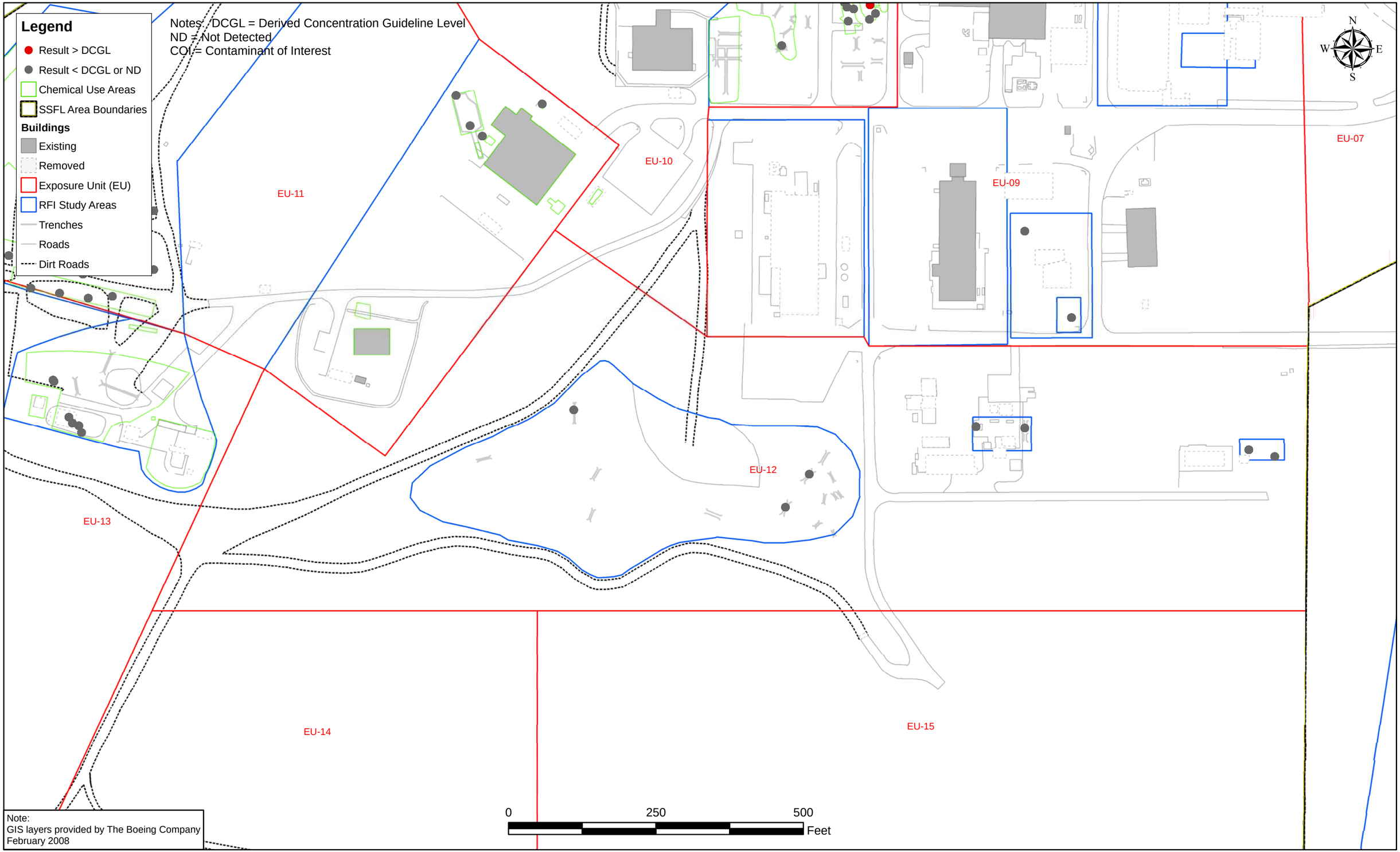
**Figure F12-5**
**Dioxin COIs in Soils - EU-12**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

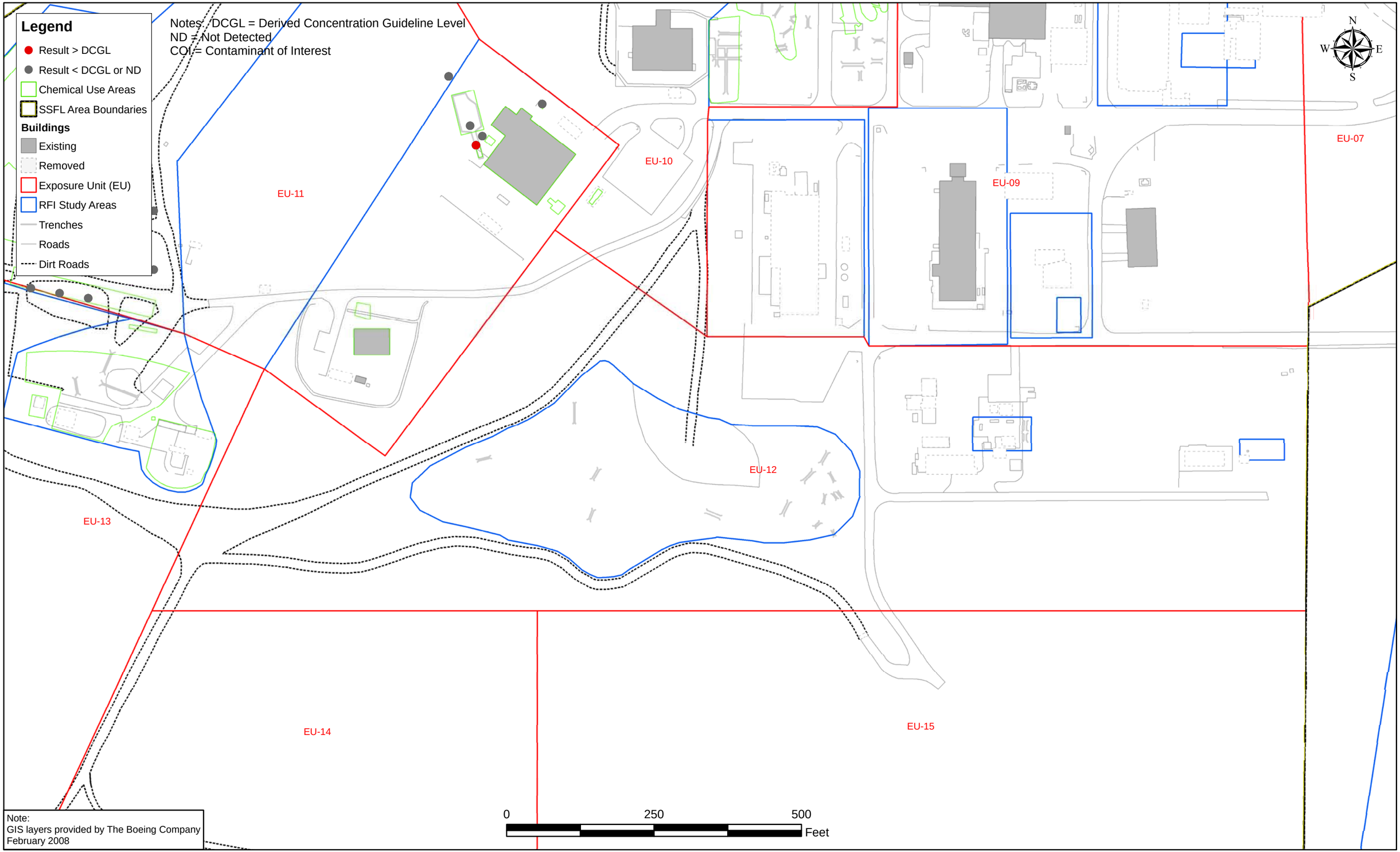
**Figure F12-6**
**VOC COIs in Soils - EU-12**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

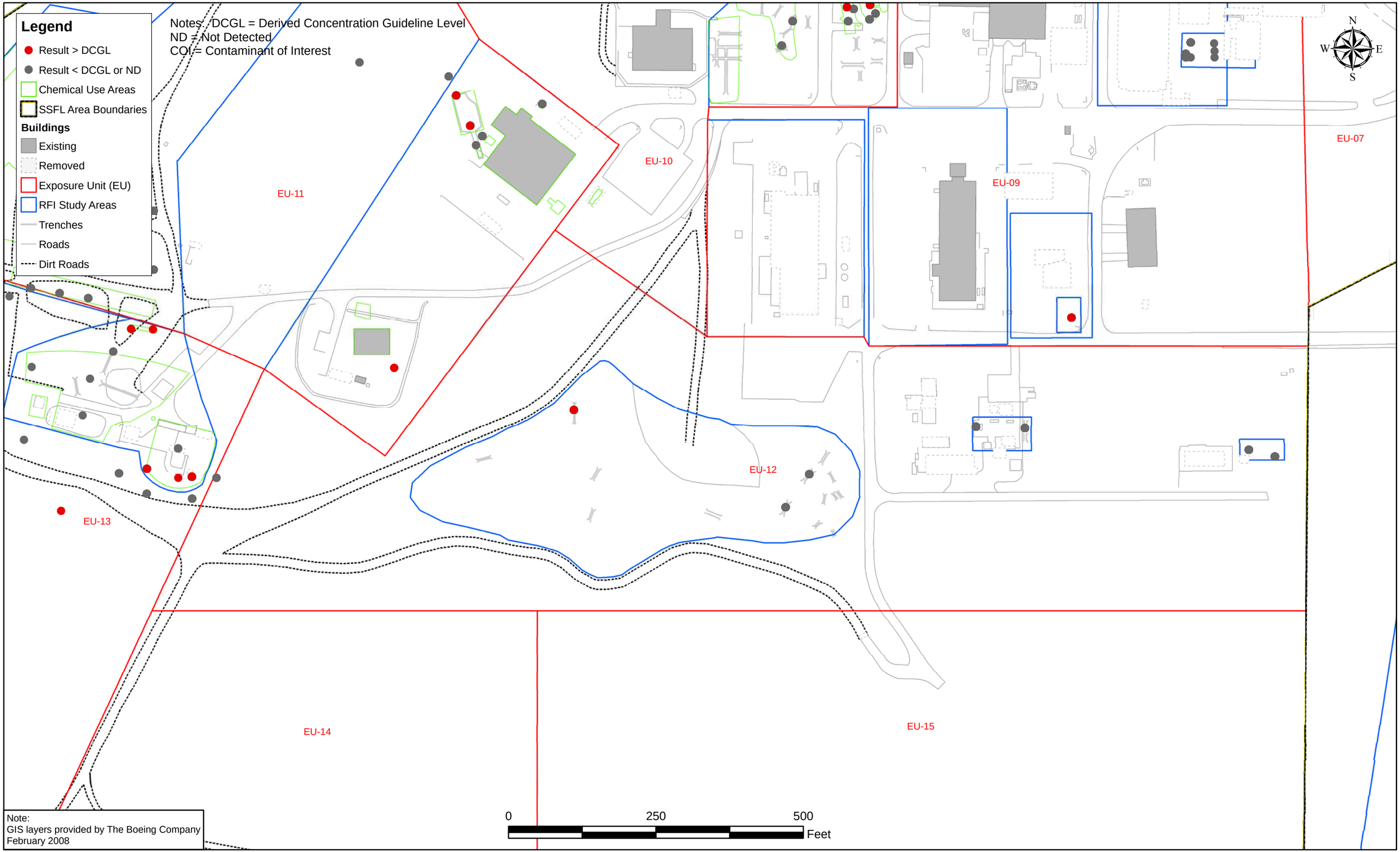
**Figure F12-7**
**SVOC COIs in Soils - EU-12**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

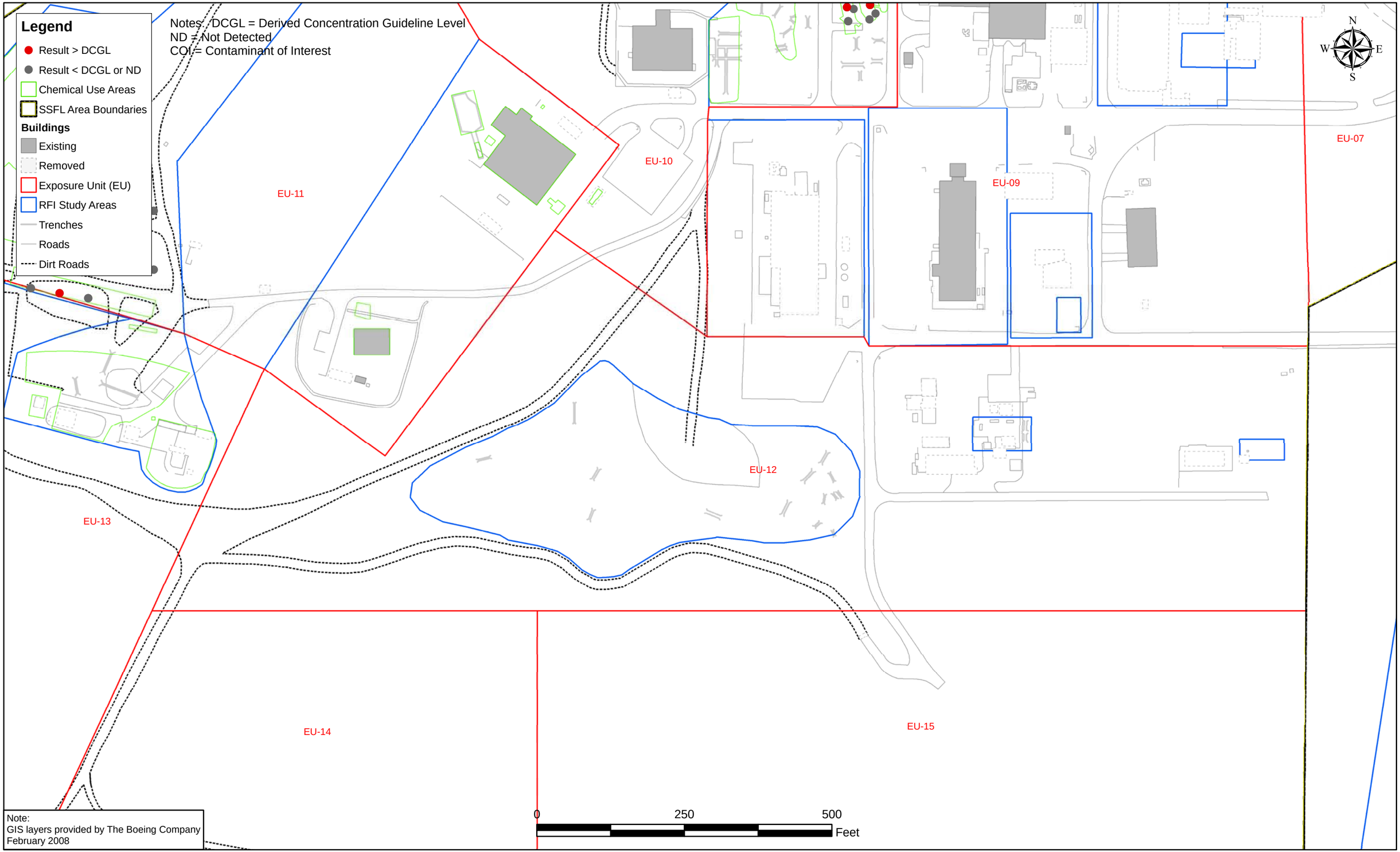
**Figure F12-8**
**PCB COIs in Soils - EU-12**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

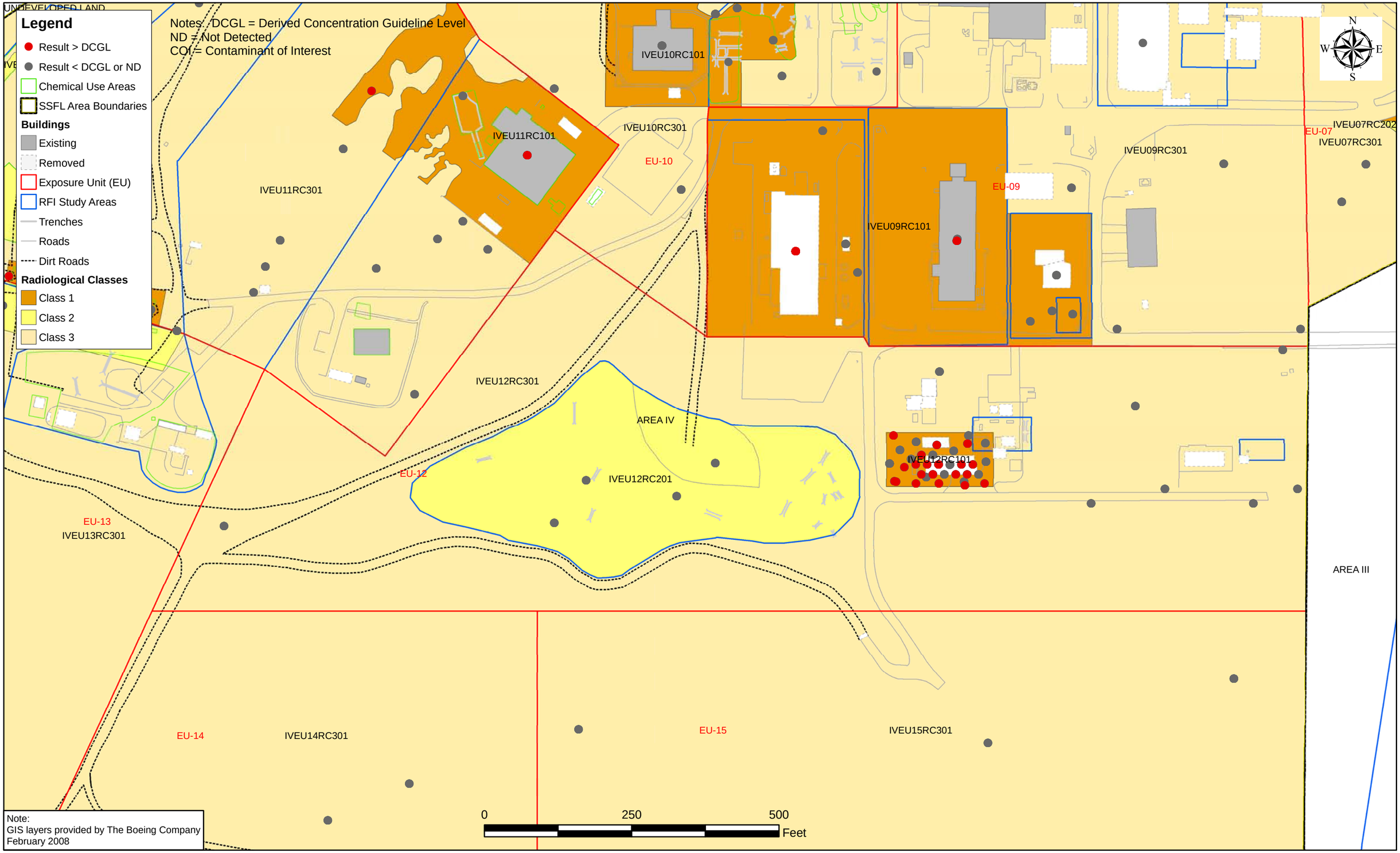
**Figure F12-9**
**Inorganic COIs in Soils - EU-12**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

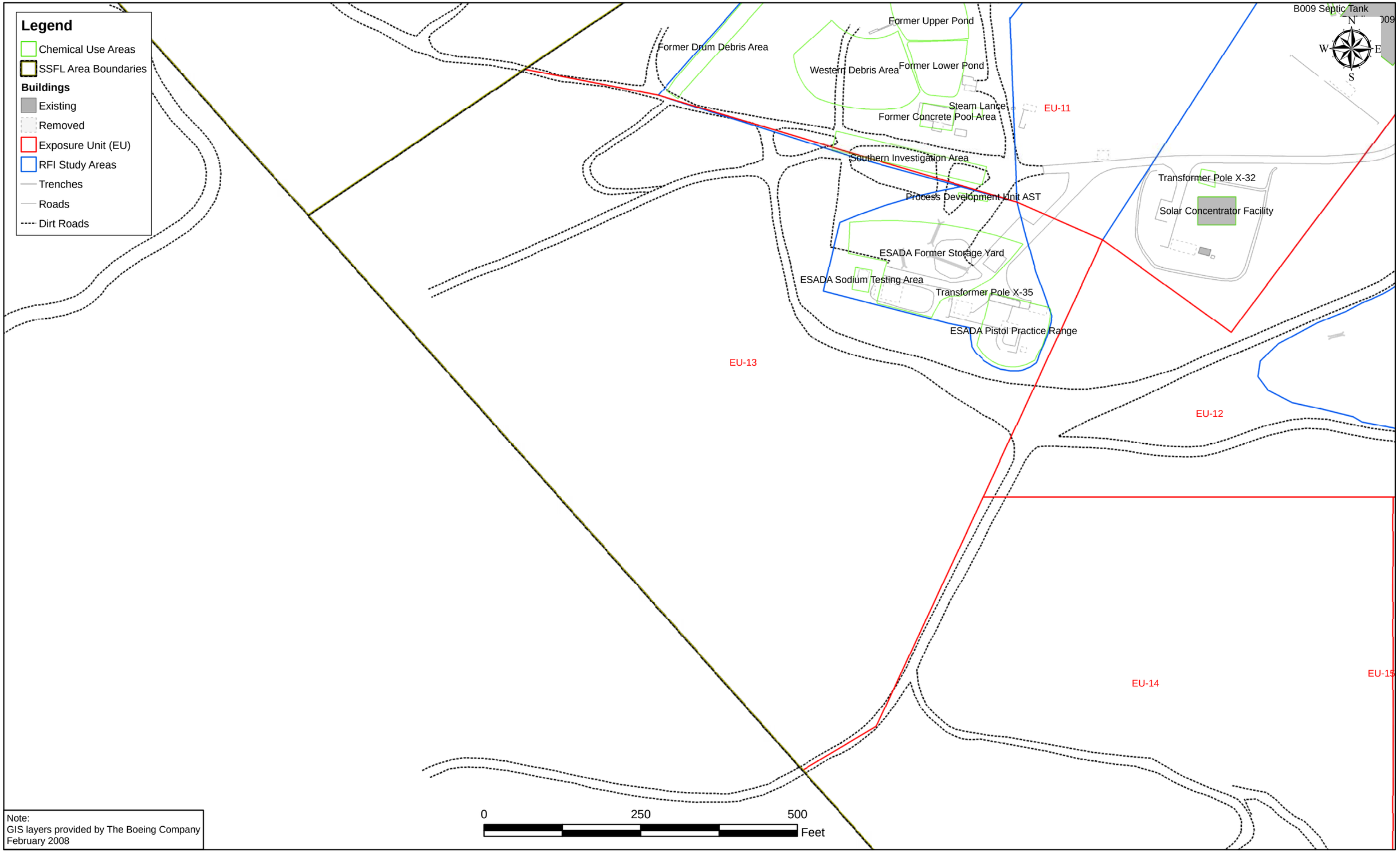
**Figure F12-10**
**Dioxin COIs in Soils - EU-12**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F12-11**
**Radiological COIs in Soils - EU-12**
**(0-6 in bgs)**

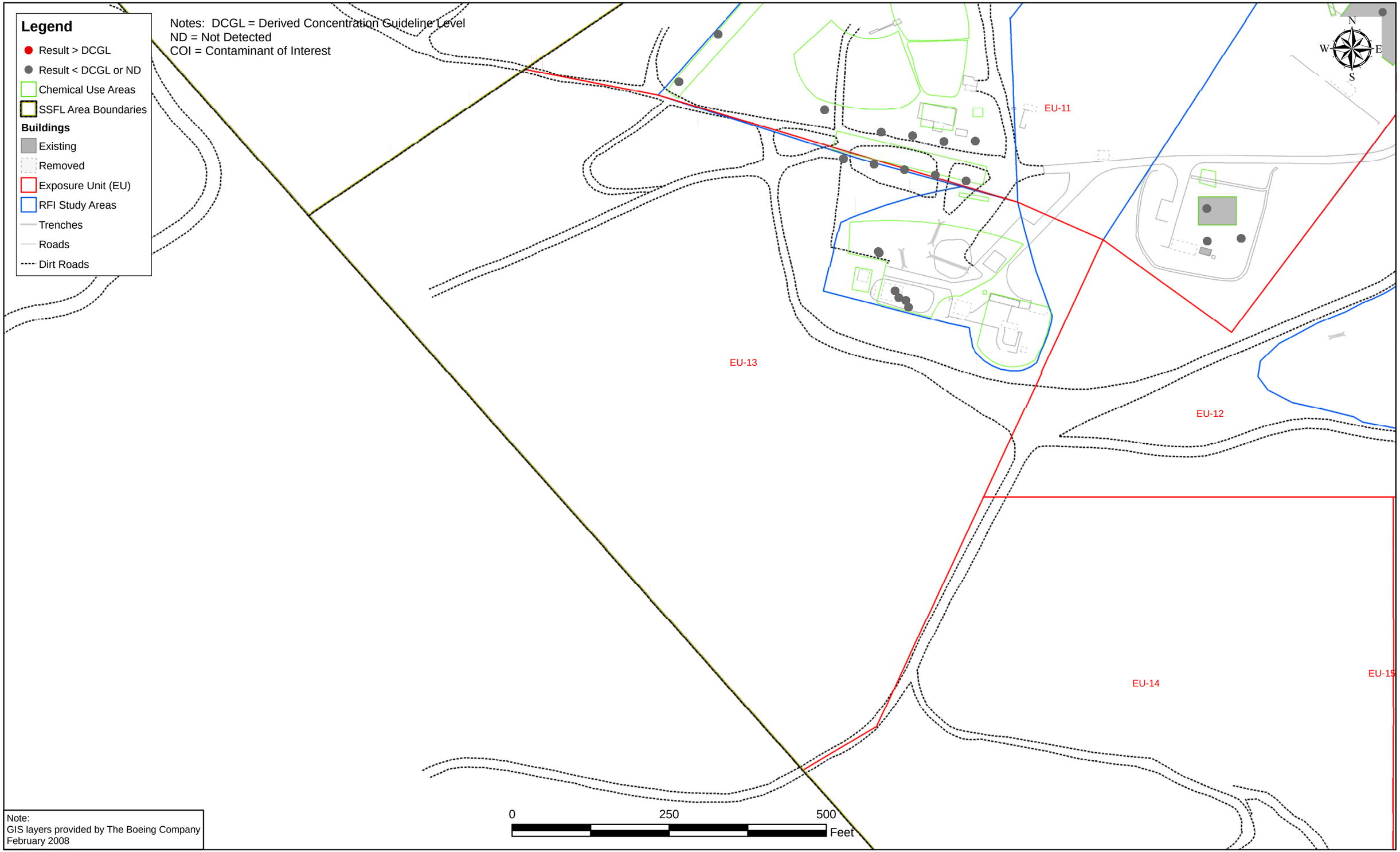



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Ventura County, California

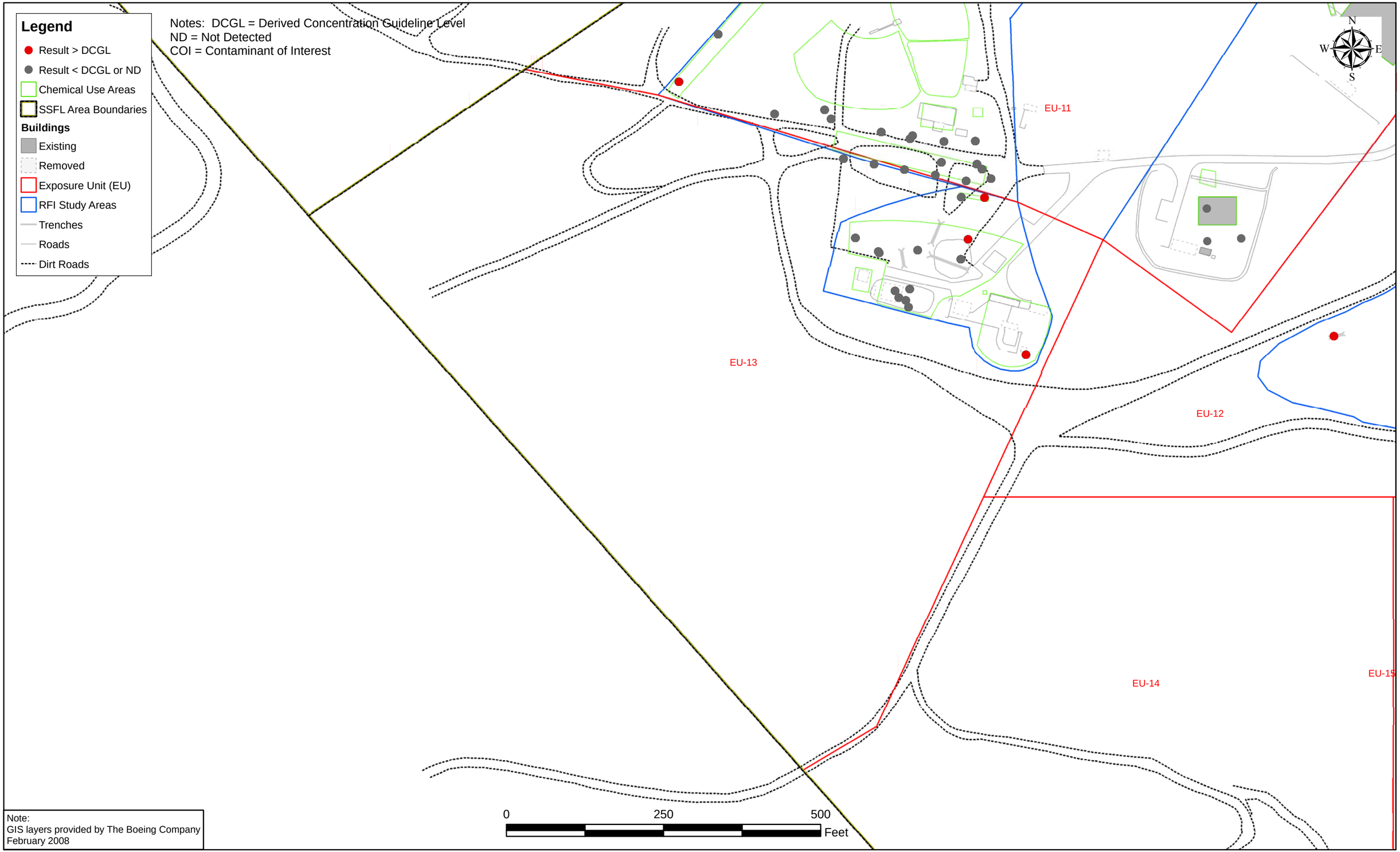
**Figure F13-0**
**EU-13 Chemical Use Areas**




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Ventura County, California

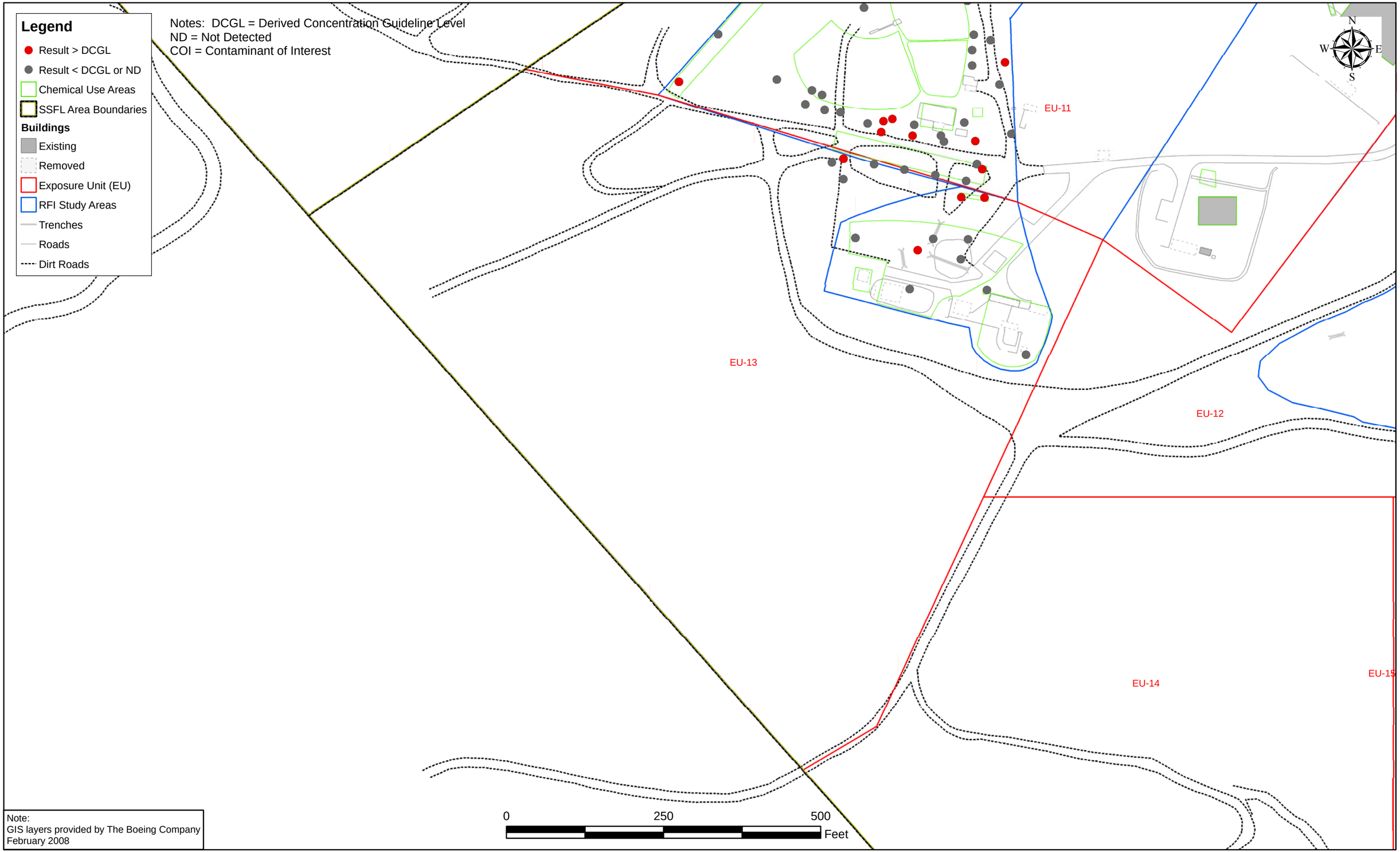
**Figure F13-1**
**VOC COIs in Soils - EU-13**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F13-2**
**SVOC COIs in Soils - EU-13**
**(0-2 ft bgs)**

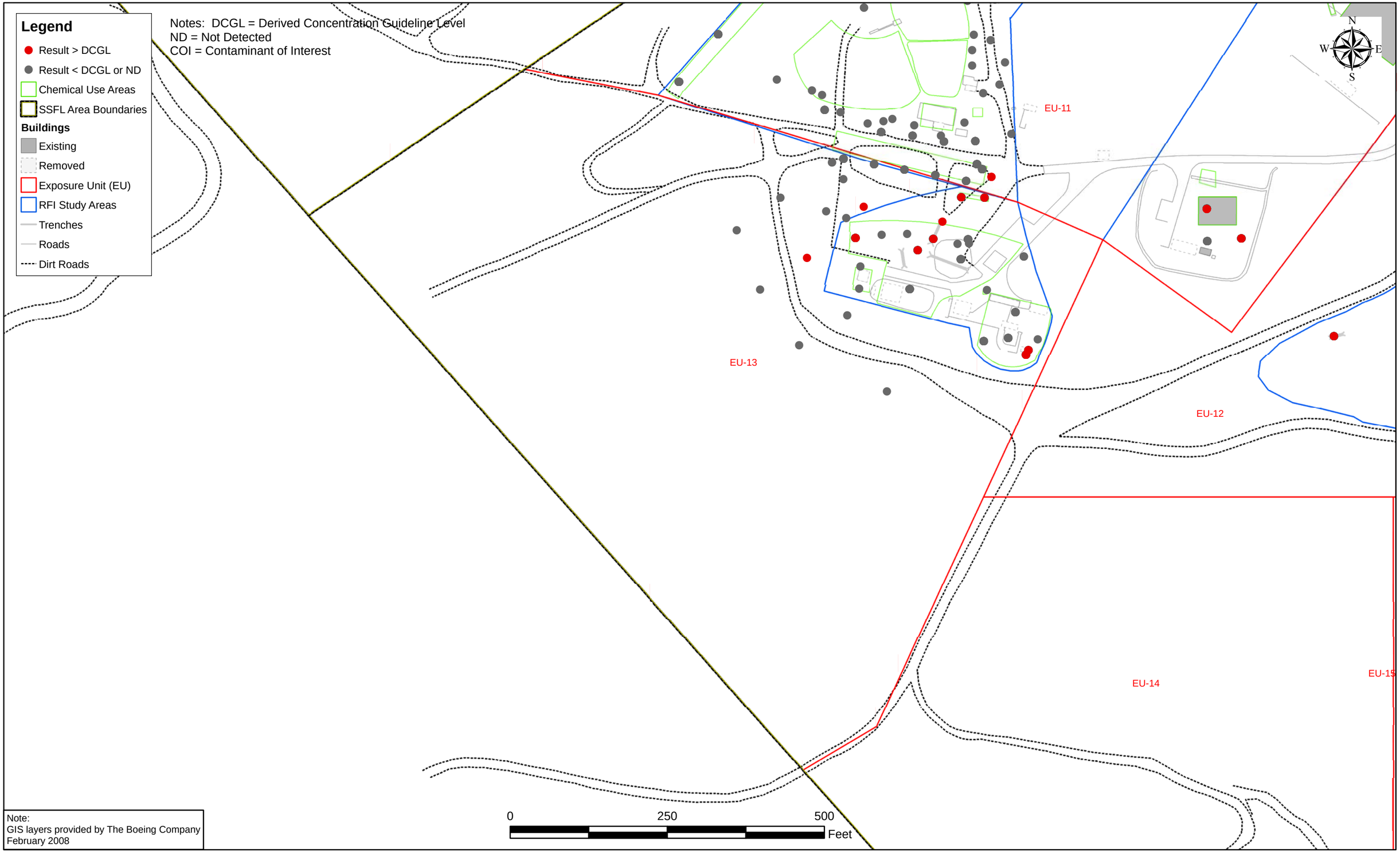



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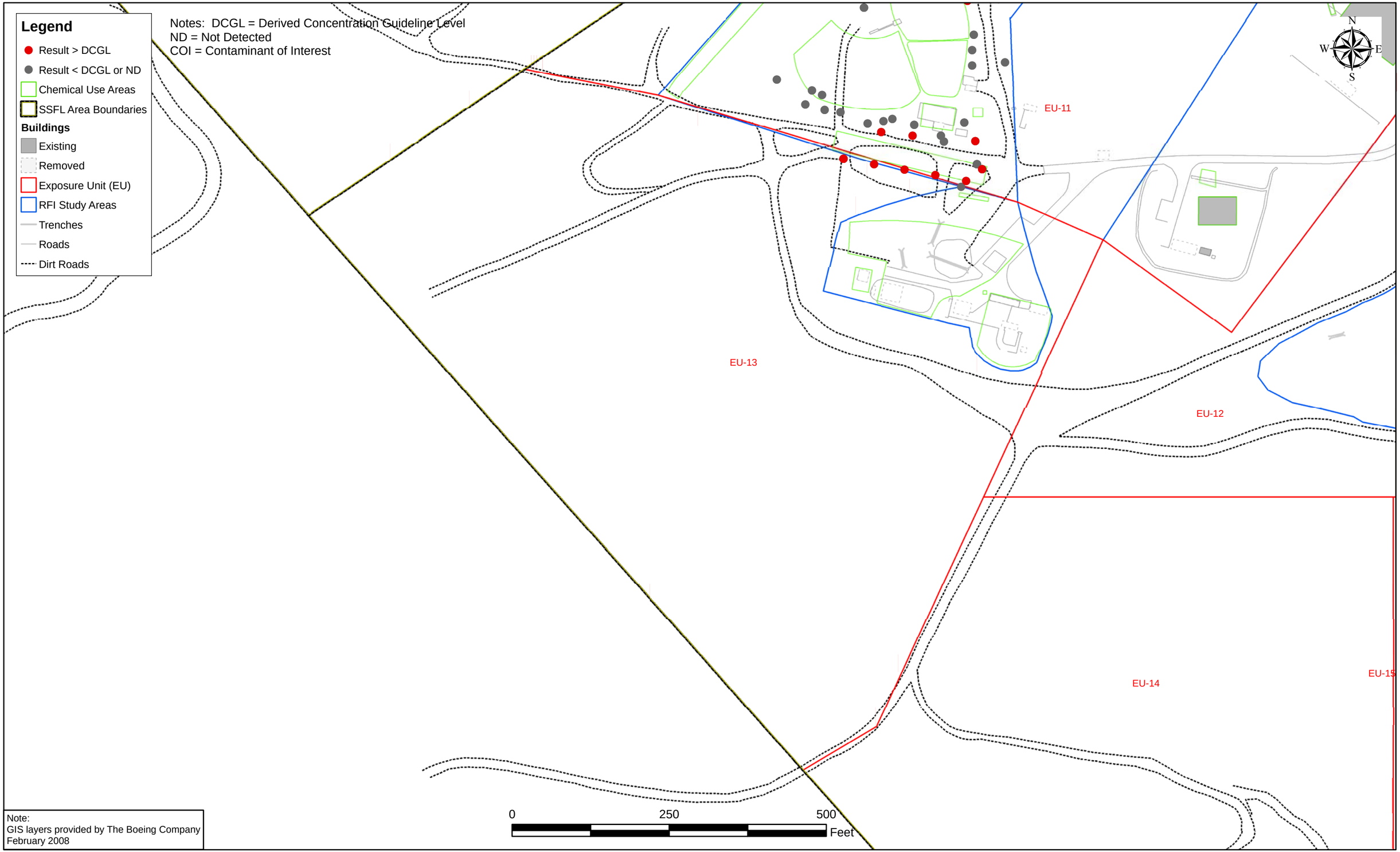
**Figure F13-3**
**PCB COIs in Soils - EU-13**
**(0-2 ft bgs)**




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Ventura County, California

**Figure F13-4**
**Inorganic COIs in Soils - EU-13**
**(0-2 ft bgs)**

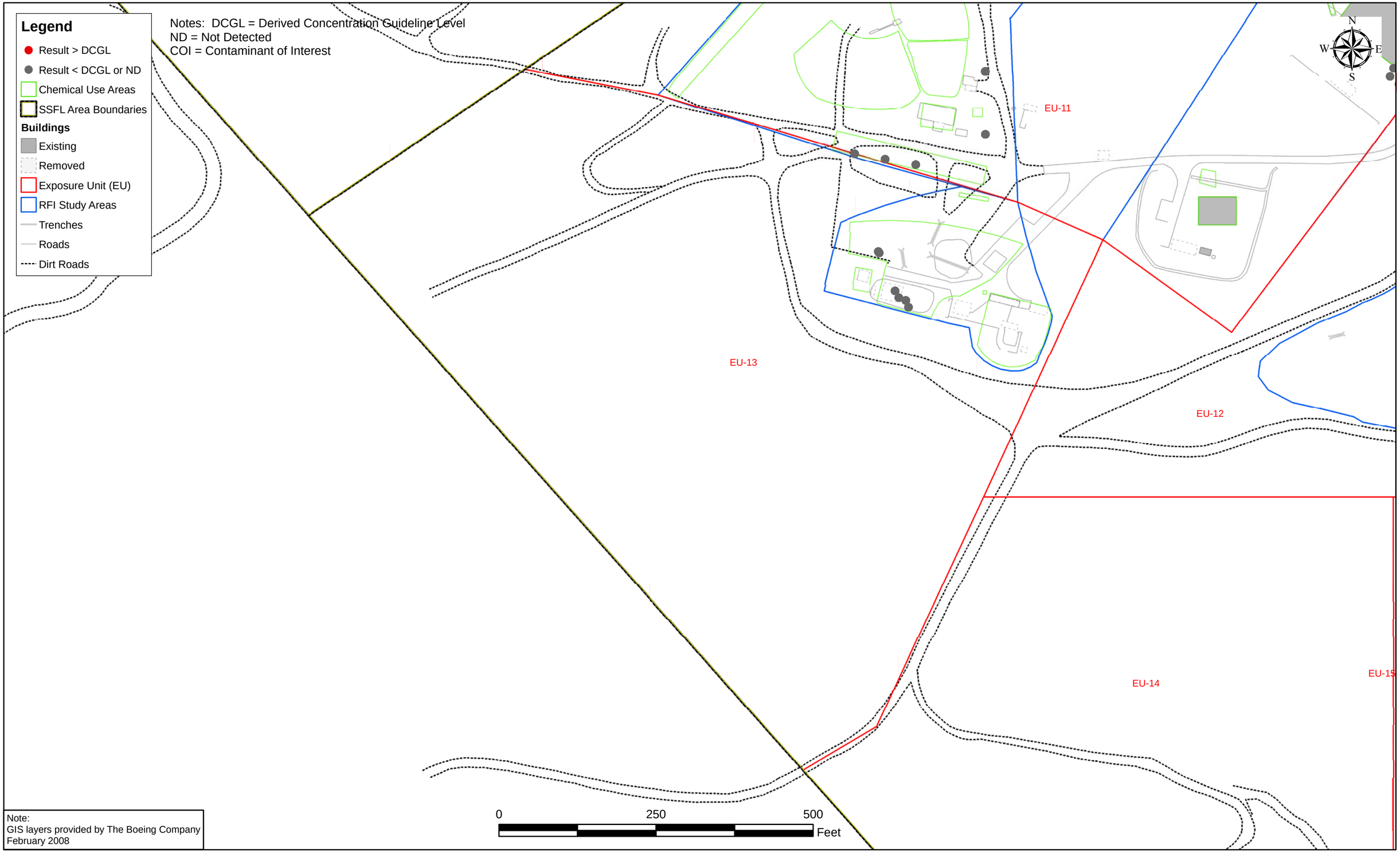



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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F13-5**
**Dioxin COIs in Soils - EU-13**
**(0-2 ft bgs)**

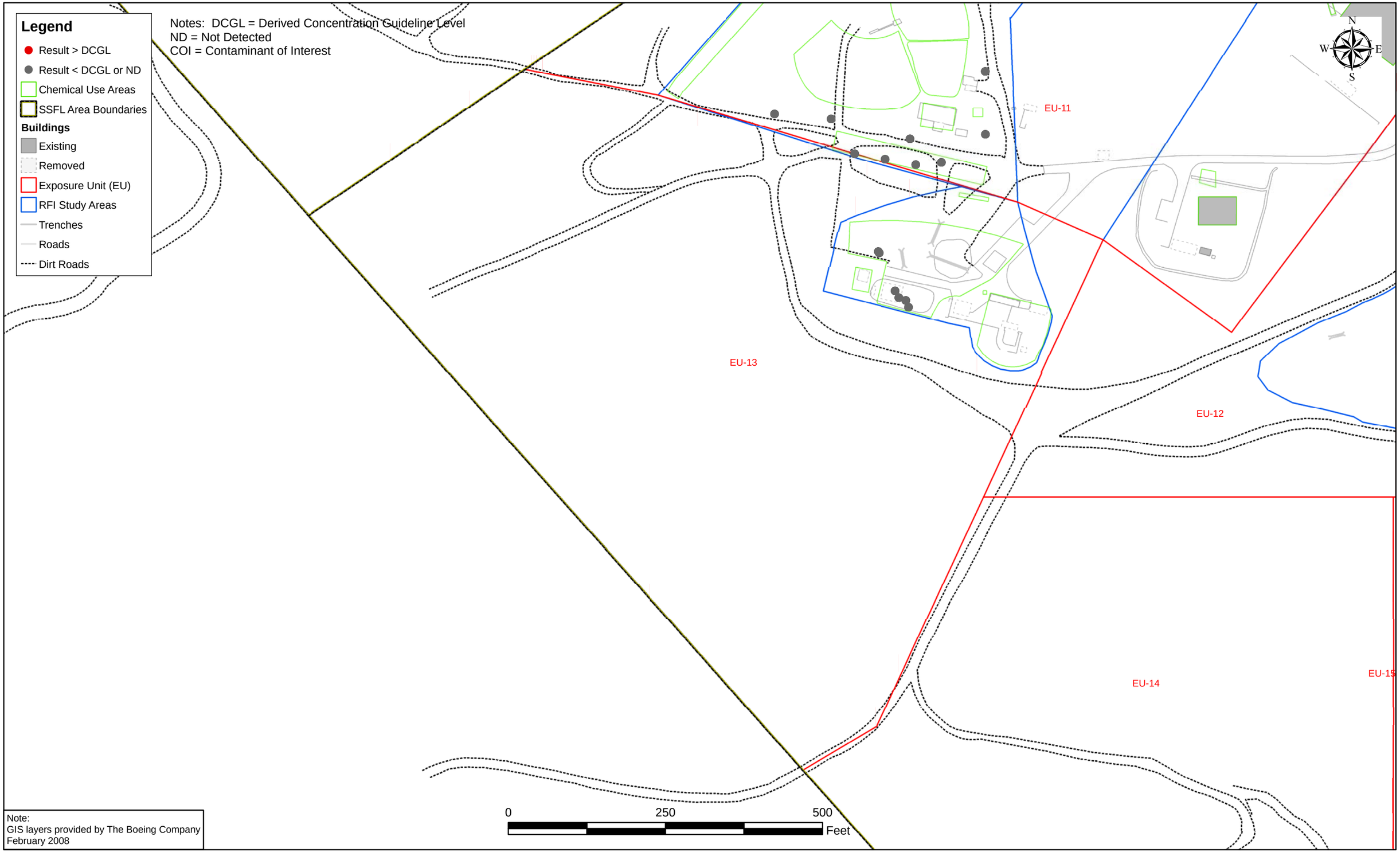



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Ventura County, California

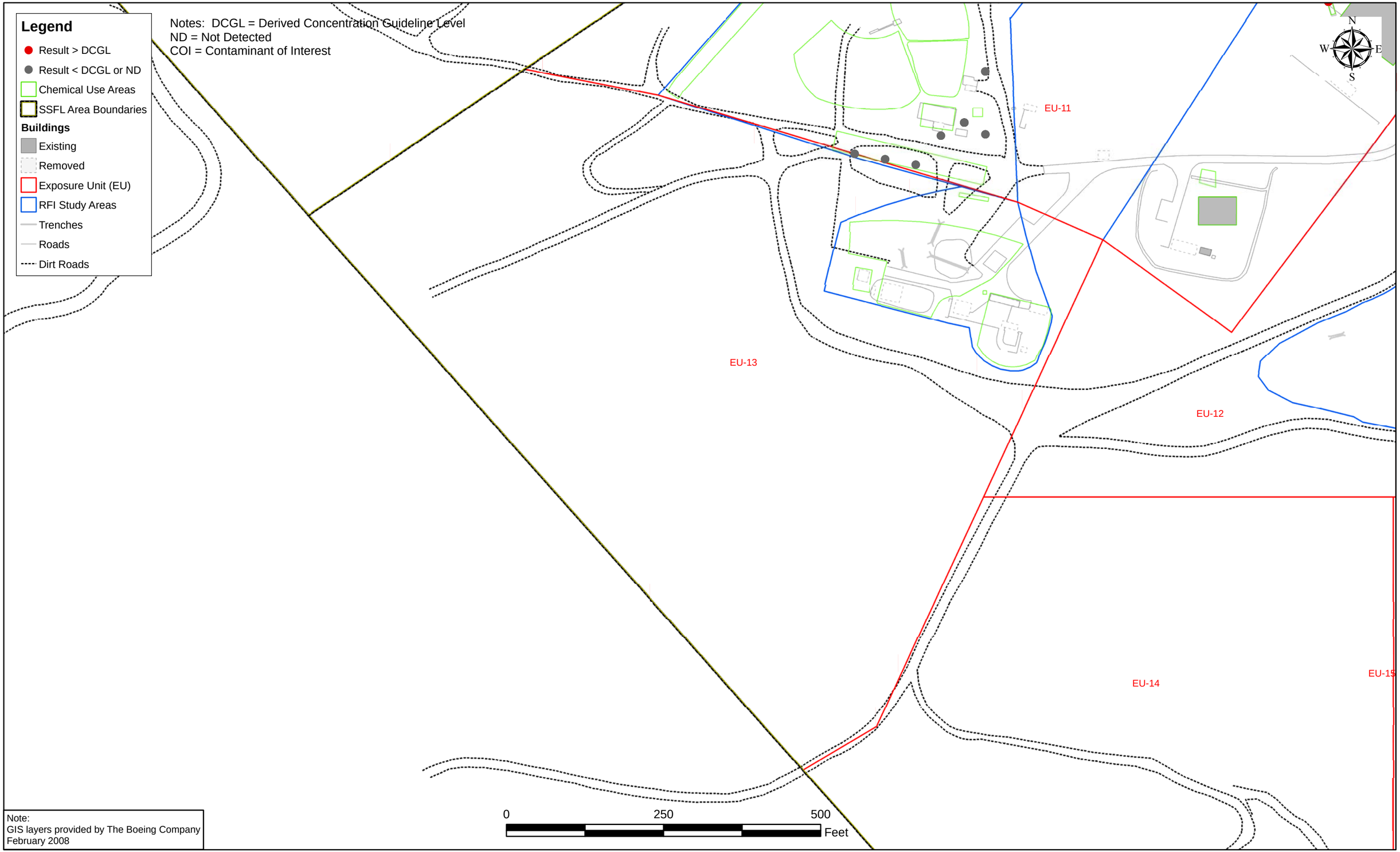
**Figure F13-6**
**VOC COIs in Soils - EU-13**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

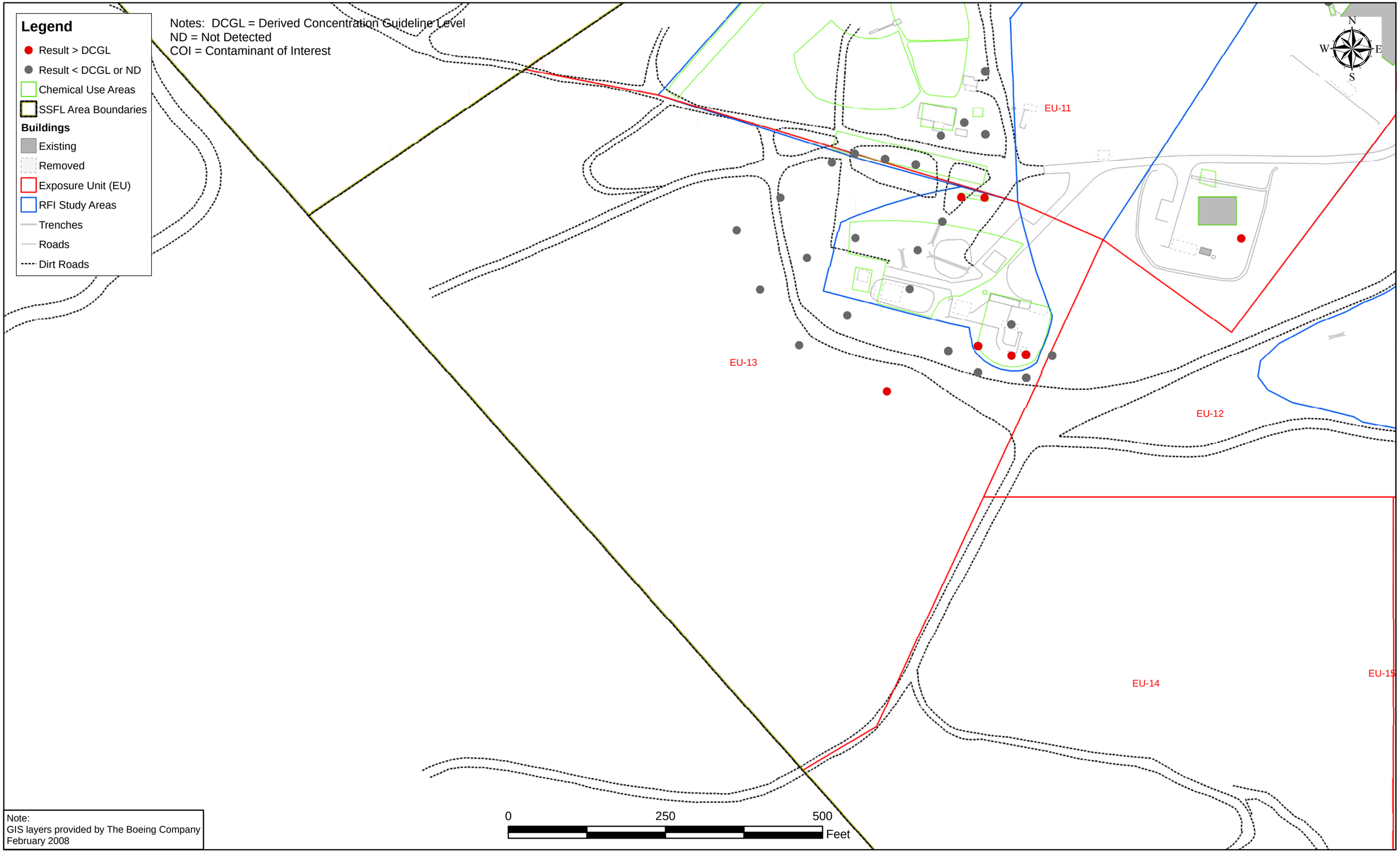
**Figure F13-7**
**SVOC COIs in Soils - EU-13**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

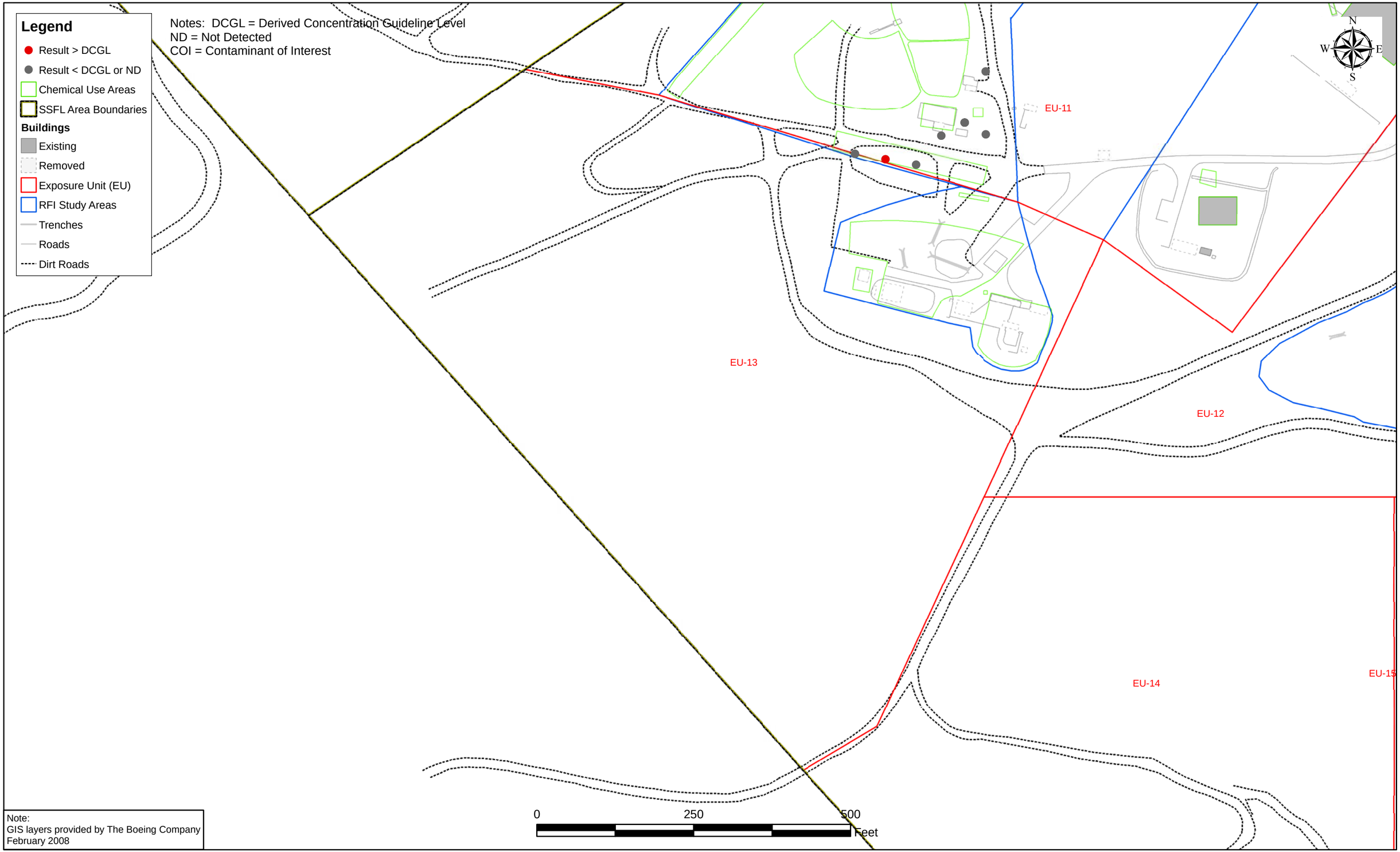
**Figure F13-8**
**PCB COIs in Soils - EU-13**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F13-9**
**Inorganic COIs in Soils - EU-13**
**(2-10 ft bgs)**

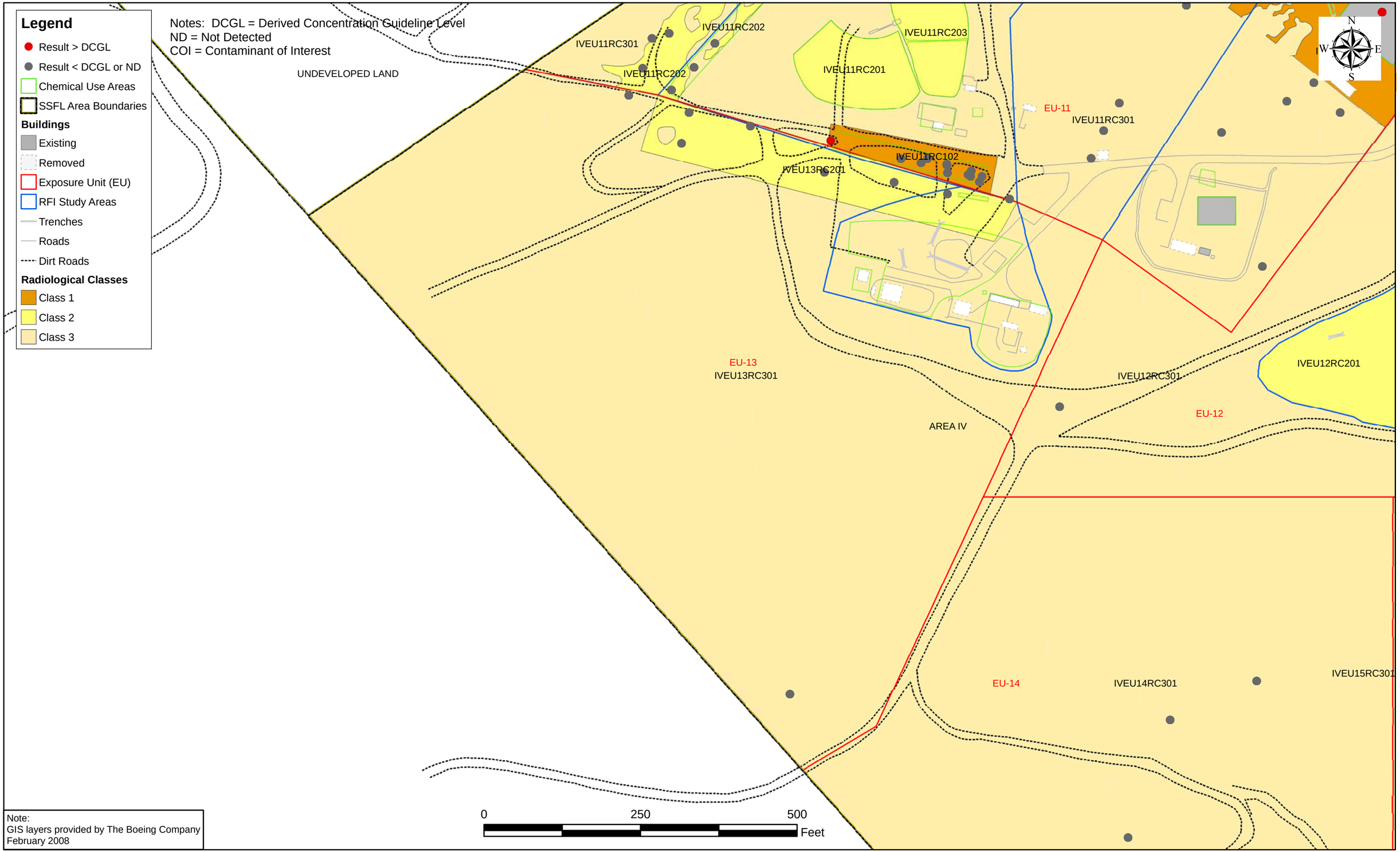



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Ventura County, California

**Figure F13-10**
**Dioxin COIs in Soils - EU-13**
**(2-10 ft bgs)**

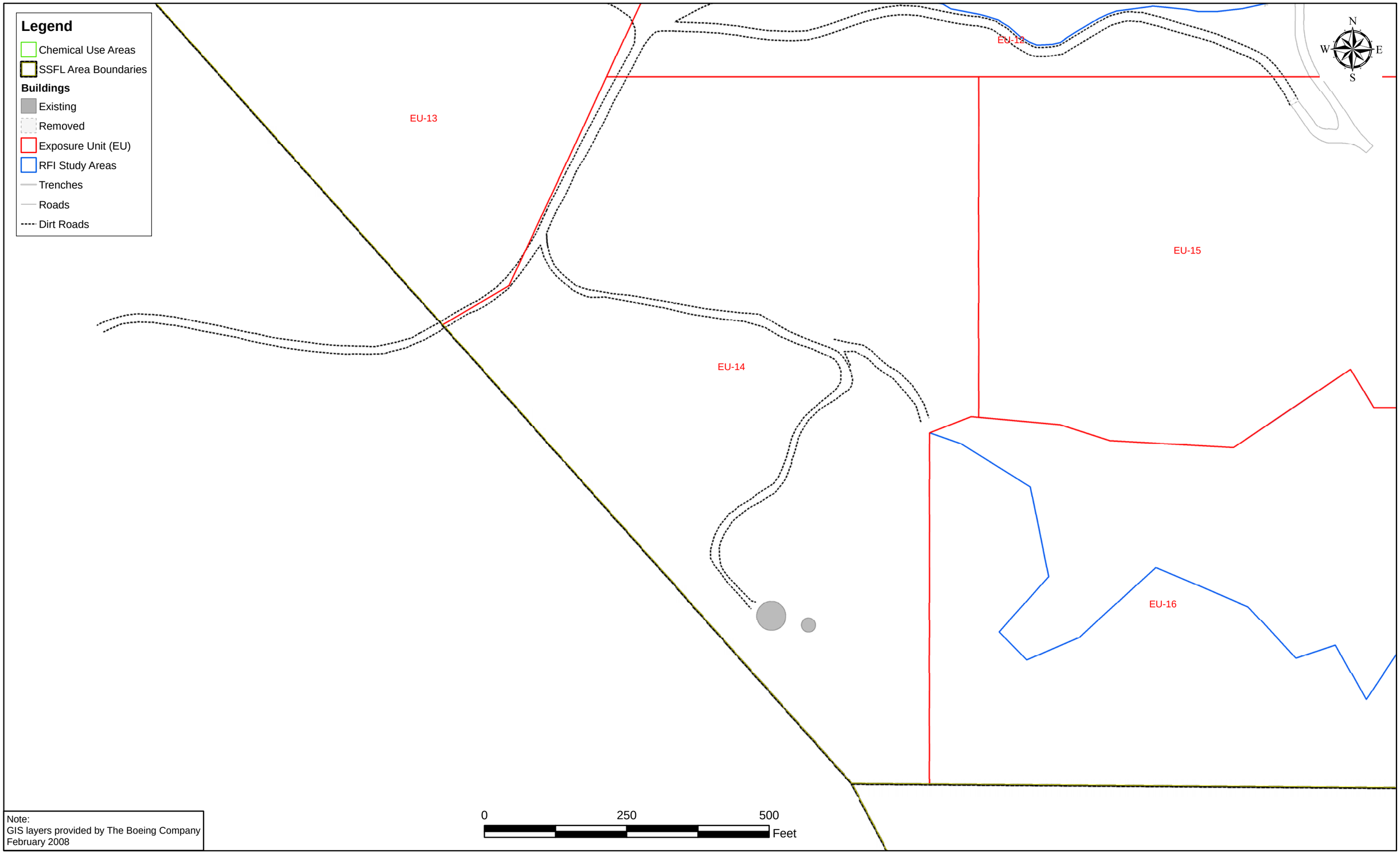


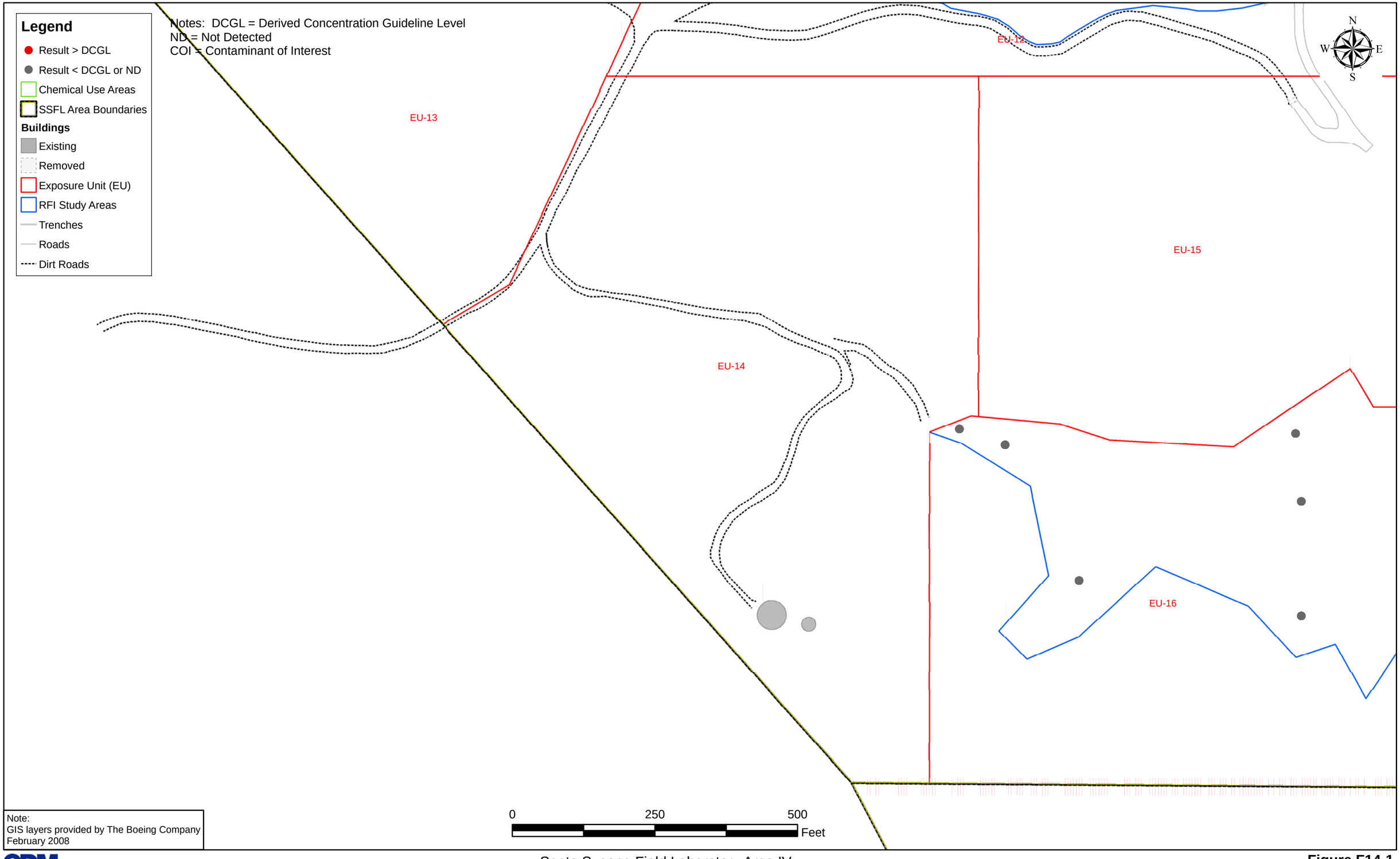

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Ventura County, California

**Figure F13-11**
**Radiological COIs in Soils - EU-13**
**(0-6 in bgs)**

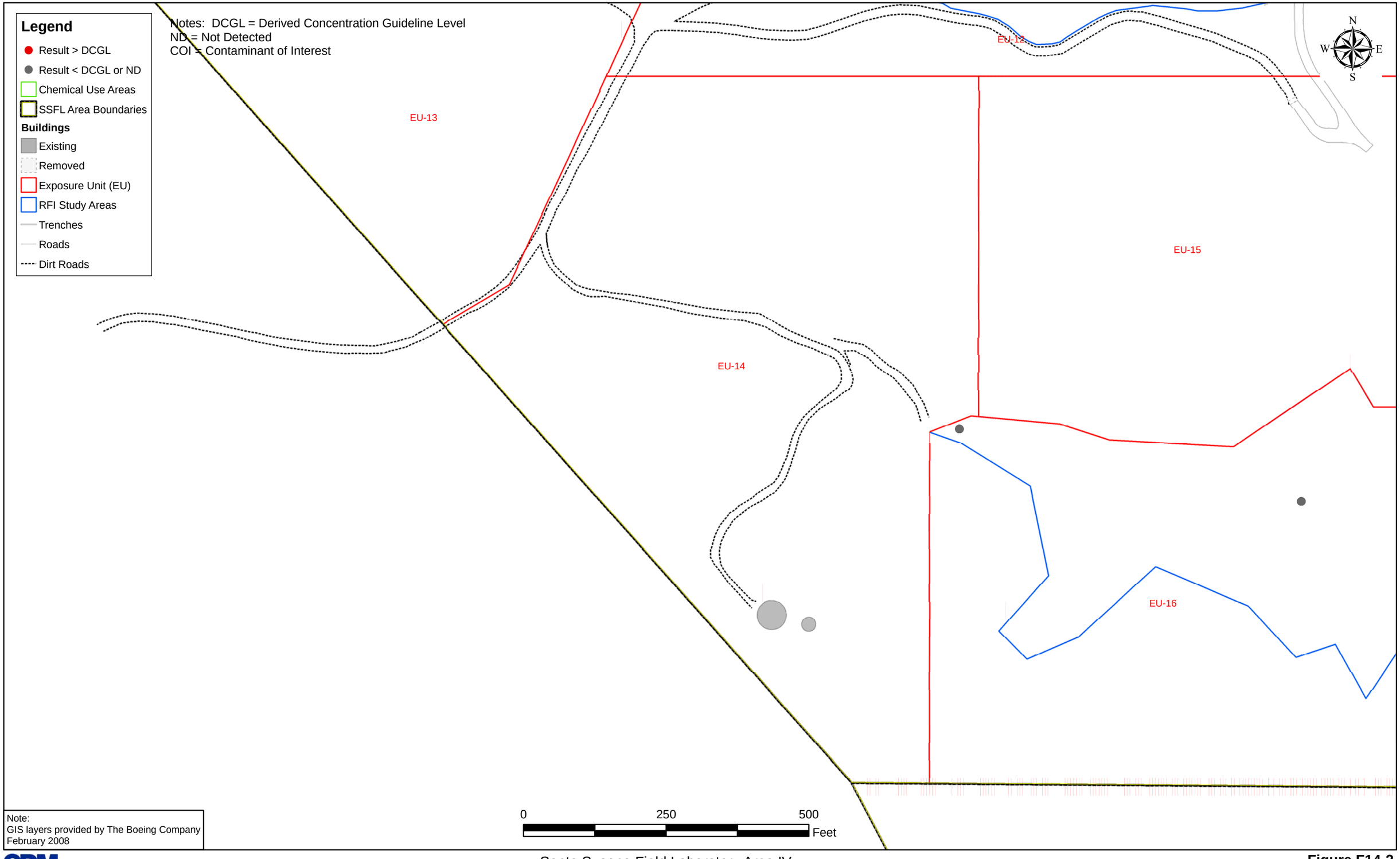

Legend
Chemical Use Areas
SSFL Area Boundaries
Buildings
Existing
Removed
Exposure Unit (EU)
RFI Study Areas
Trenches
Roads
Dirt Roads
EU-12
EU-13
EU-14
EU-15
EU-16
N
W
E
S
0
250
500
Feet
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Ventura County, California

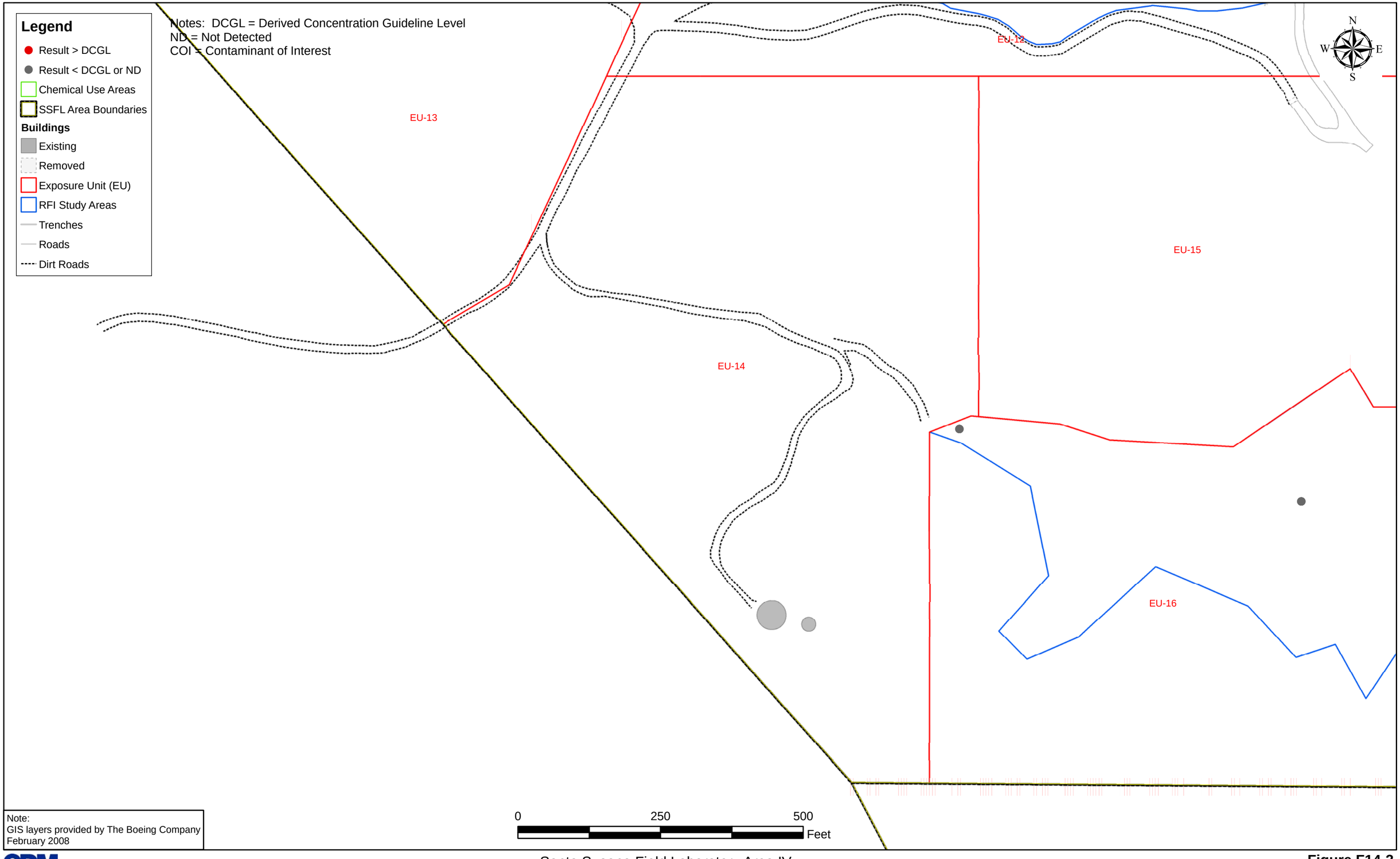
**Figure F14-1**
**VOC COIs in Soils - EU-14**
**(0-2 ft bgs)**




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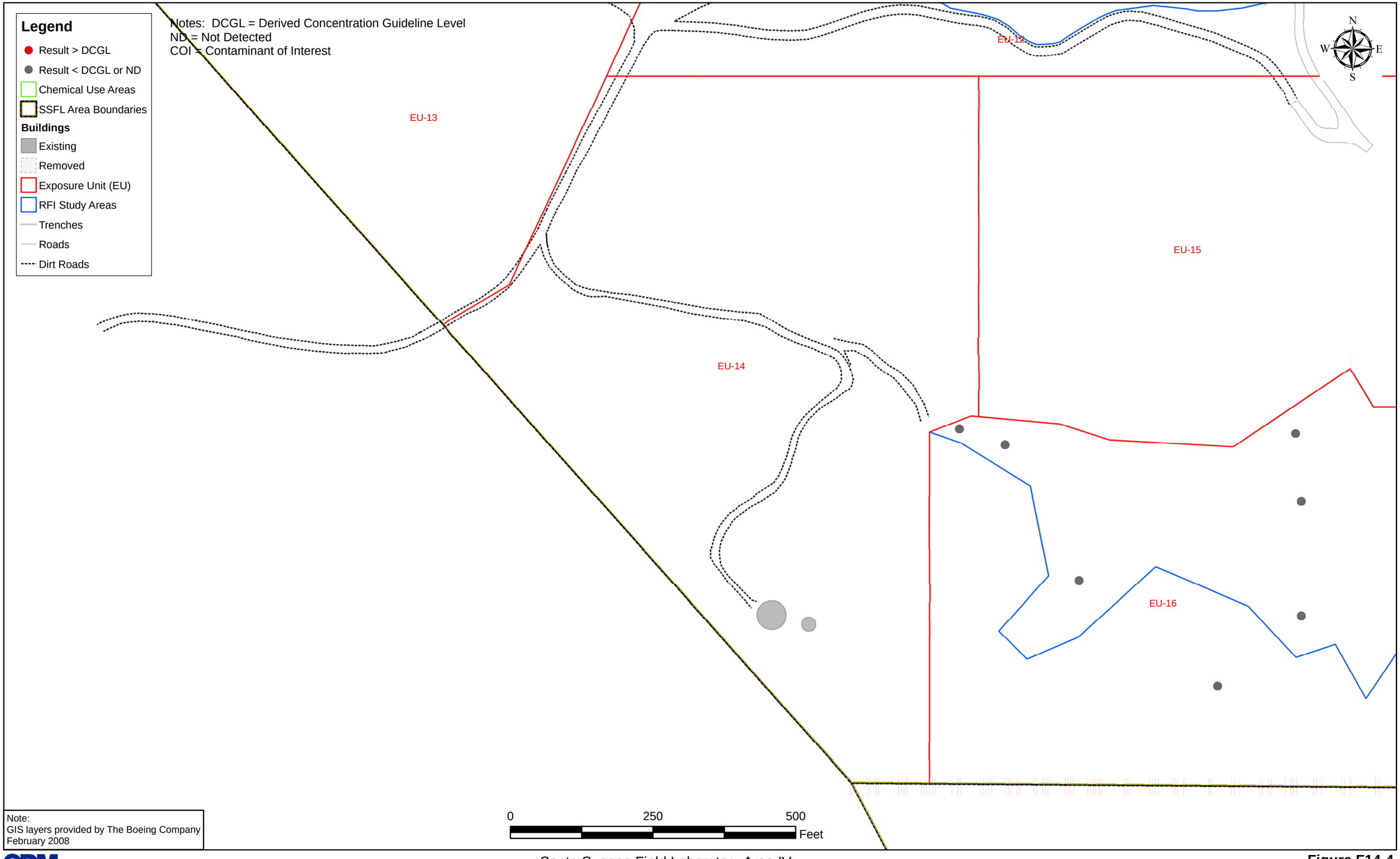
**Figure F14-2**
**SVOC COIs in Soils - EU-14**
**(0-2 ft bgs)**




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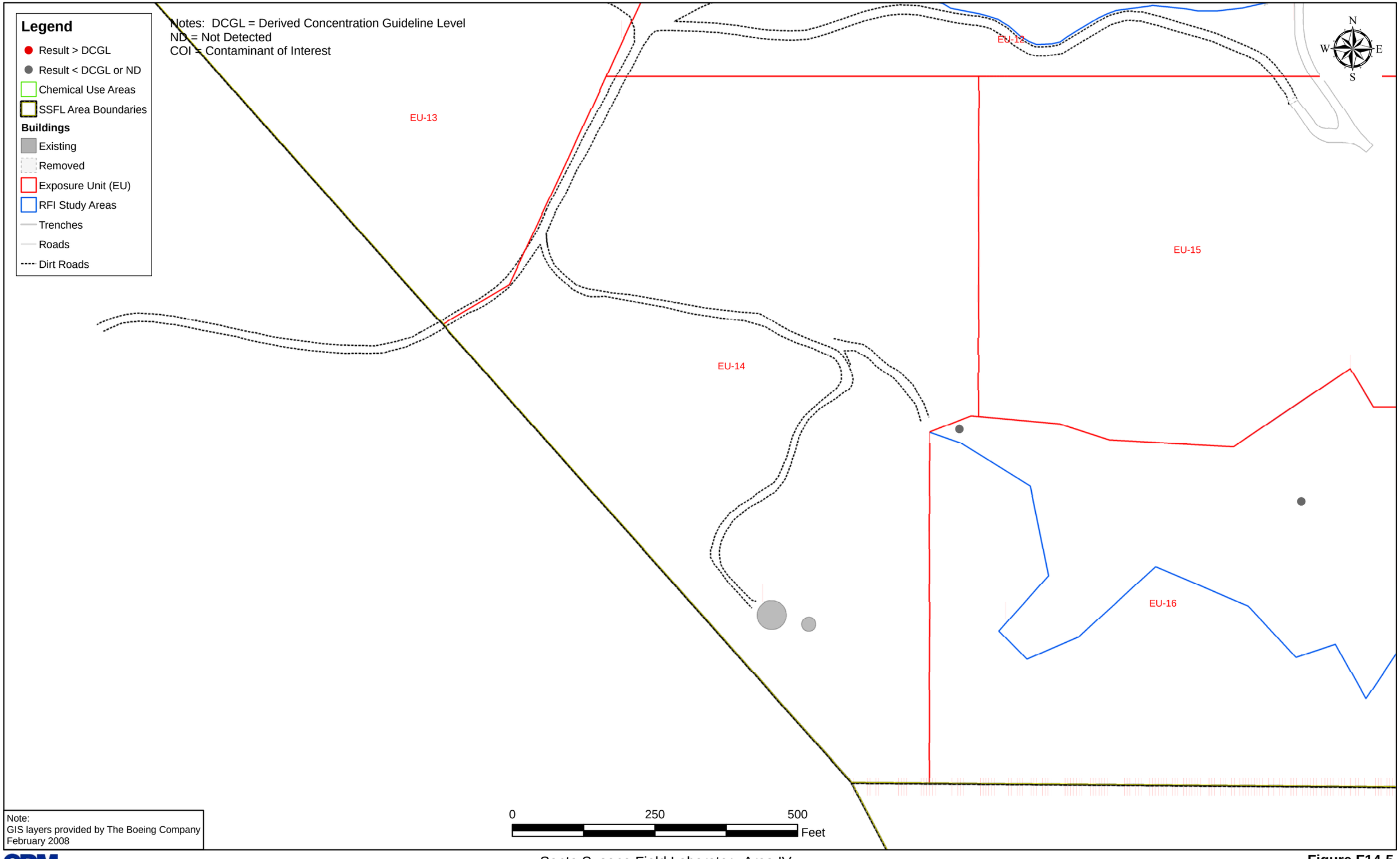
**Figure F14-3**
**PCB COIs in Soils - EU-14**
**(0-2 ft bgs)**




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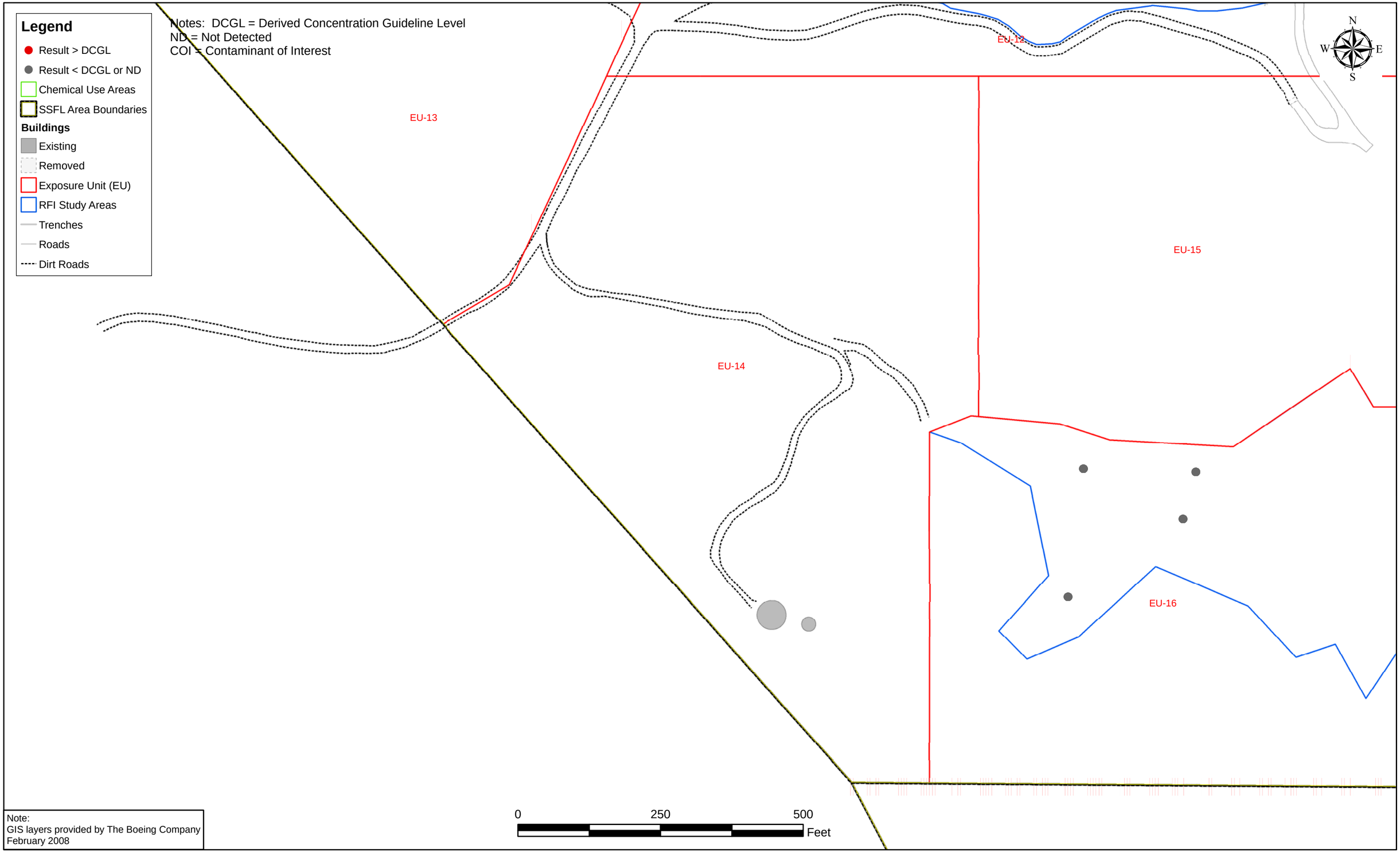
**Figure F14-4**
**Inorganic COIs in Soils - EU-14**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

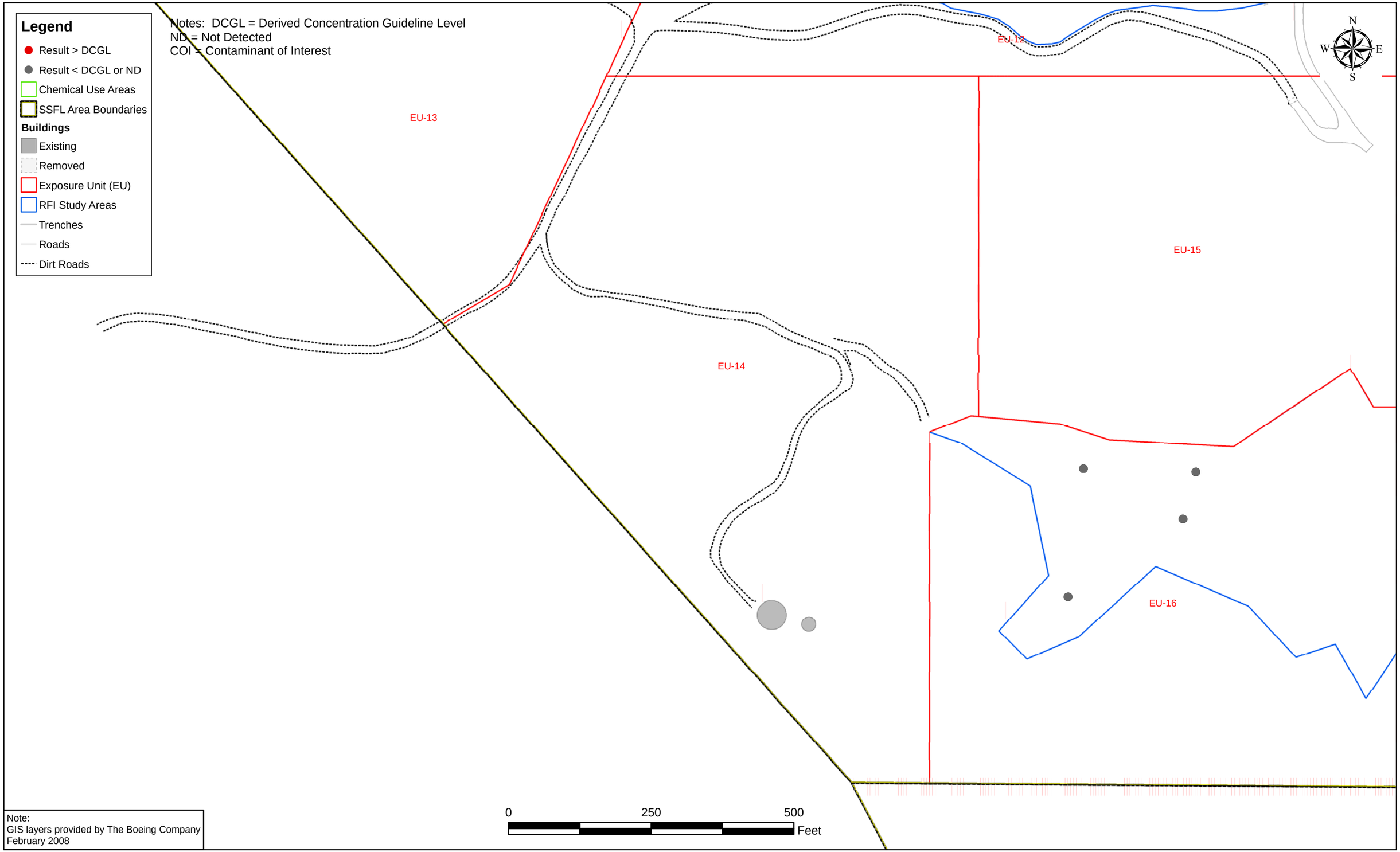
**Figure F14-5**
**Dioxin COIs in Soils - EU-14**
**(0-2 ft bgs)**




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Ventura County, California

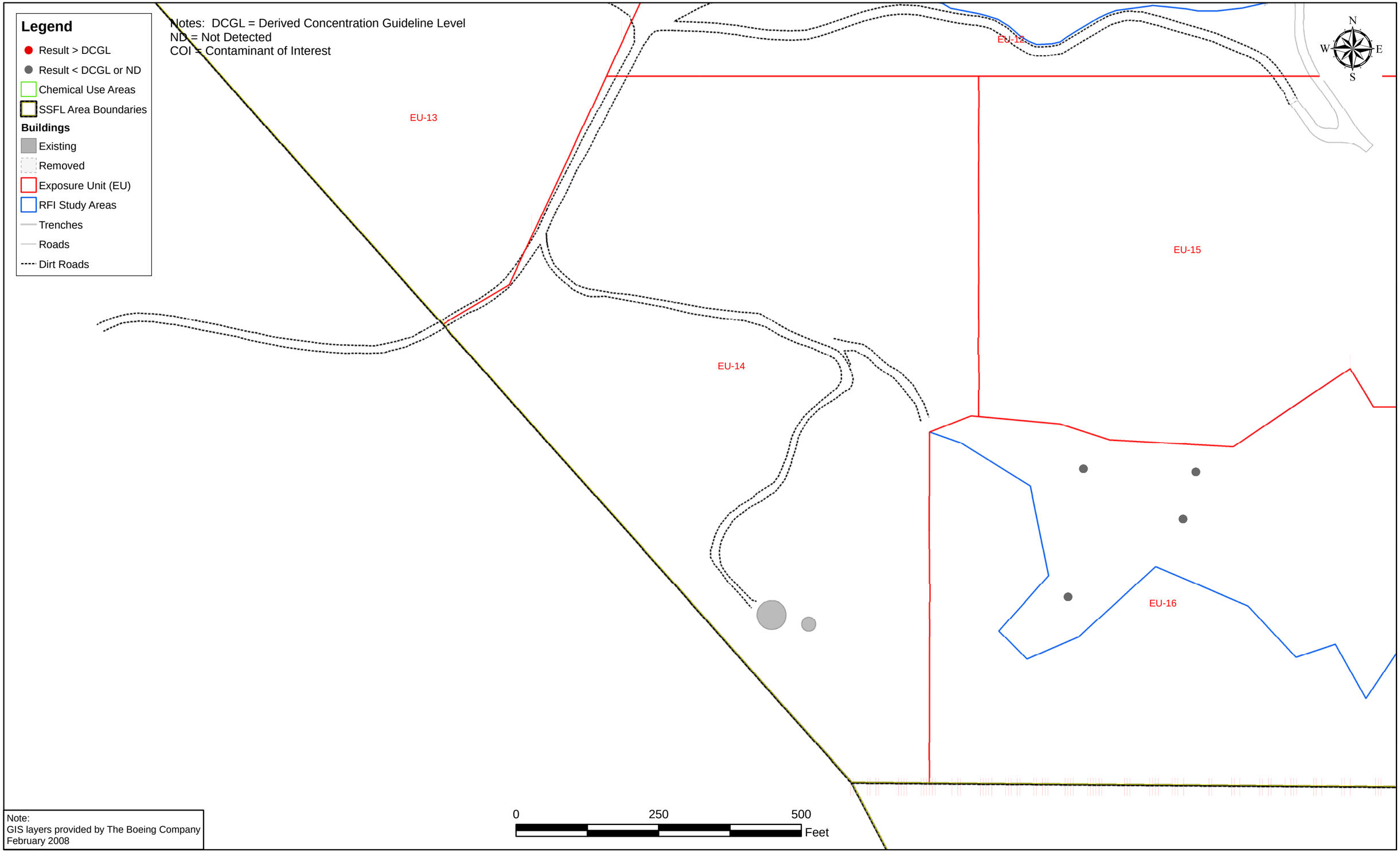
**Figure F14-6**
**VOC COIs in Soils - EU-14**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

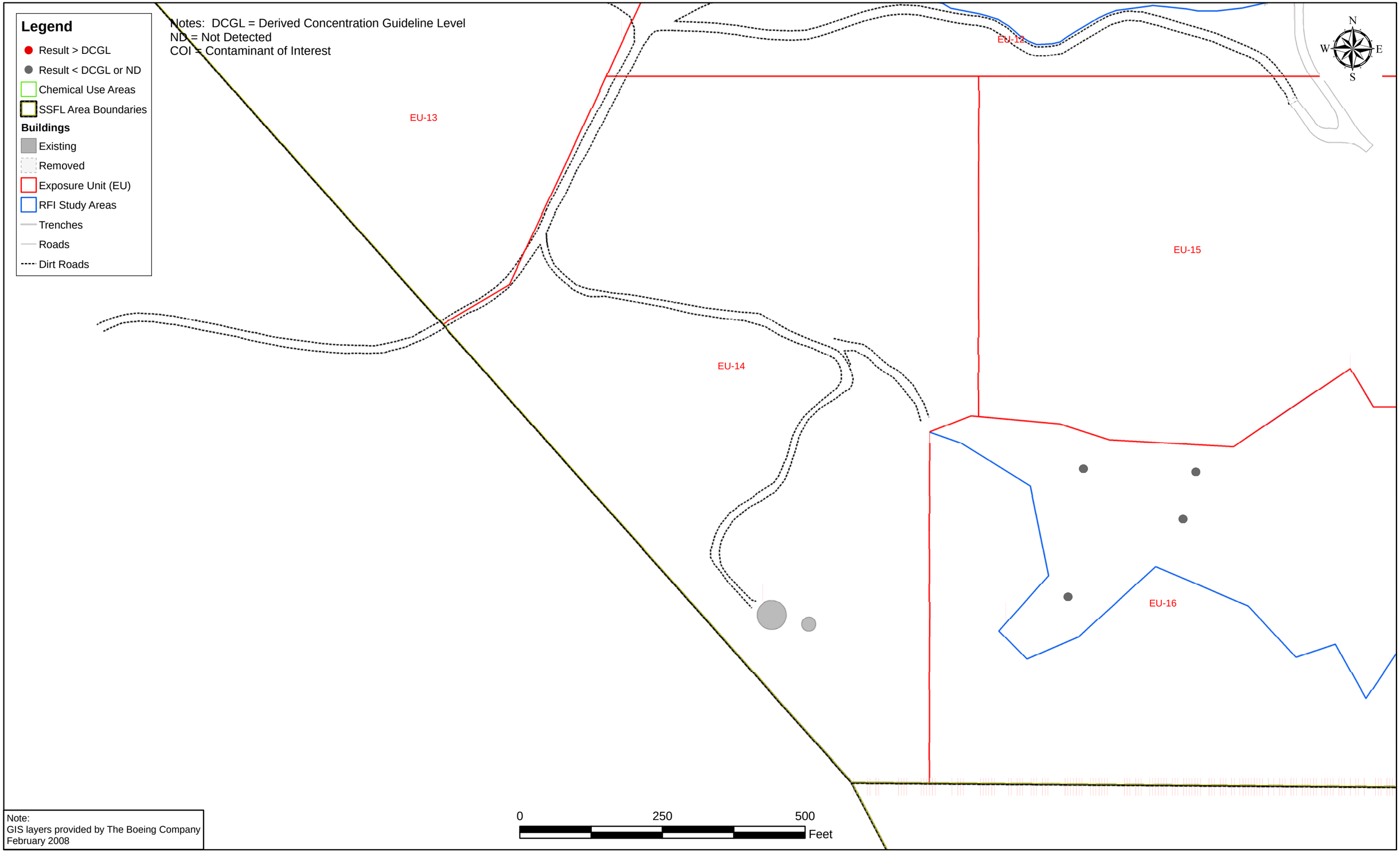
**Figure F14-7**
**SVOC COIs in Soils - EU-14**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

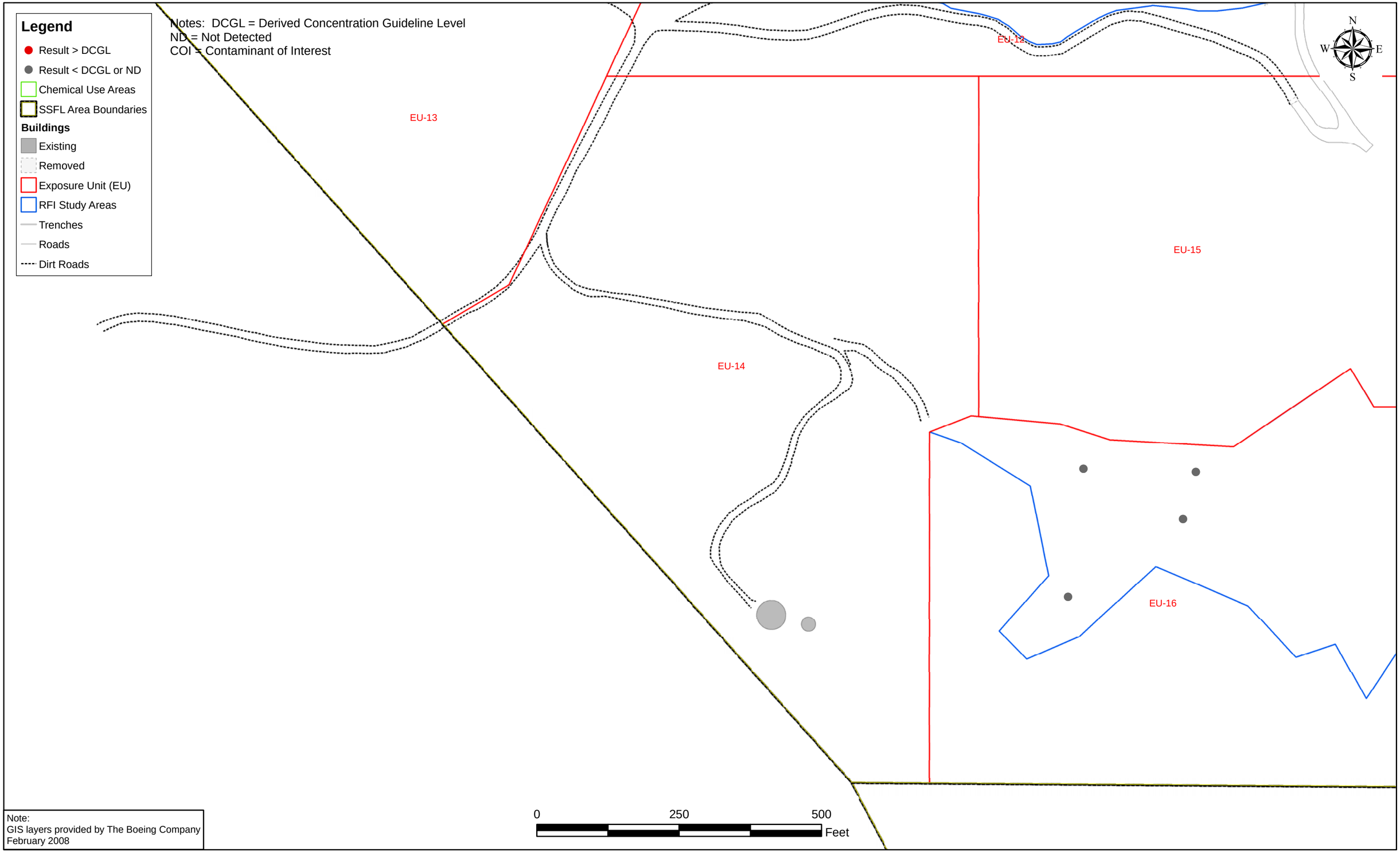
**Figure F14-8**
**PCB COIs in Soils - EU-14**
**(2-10 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

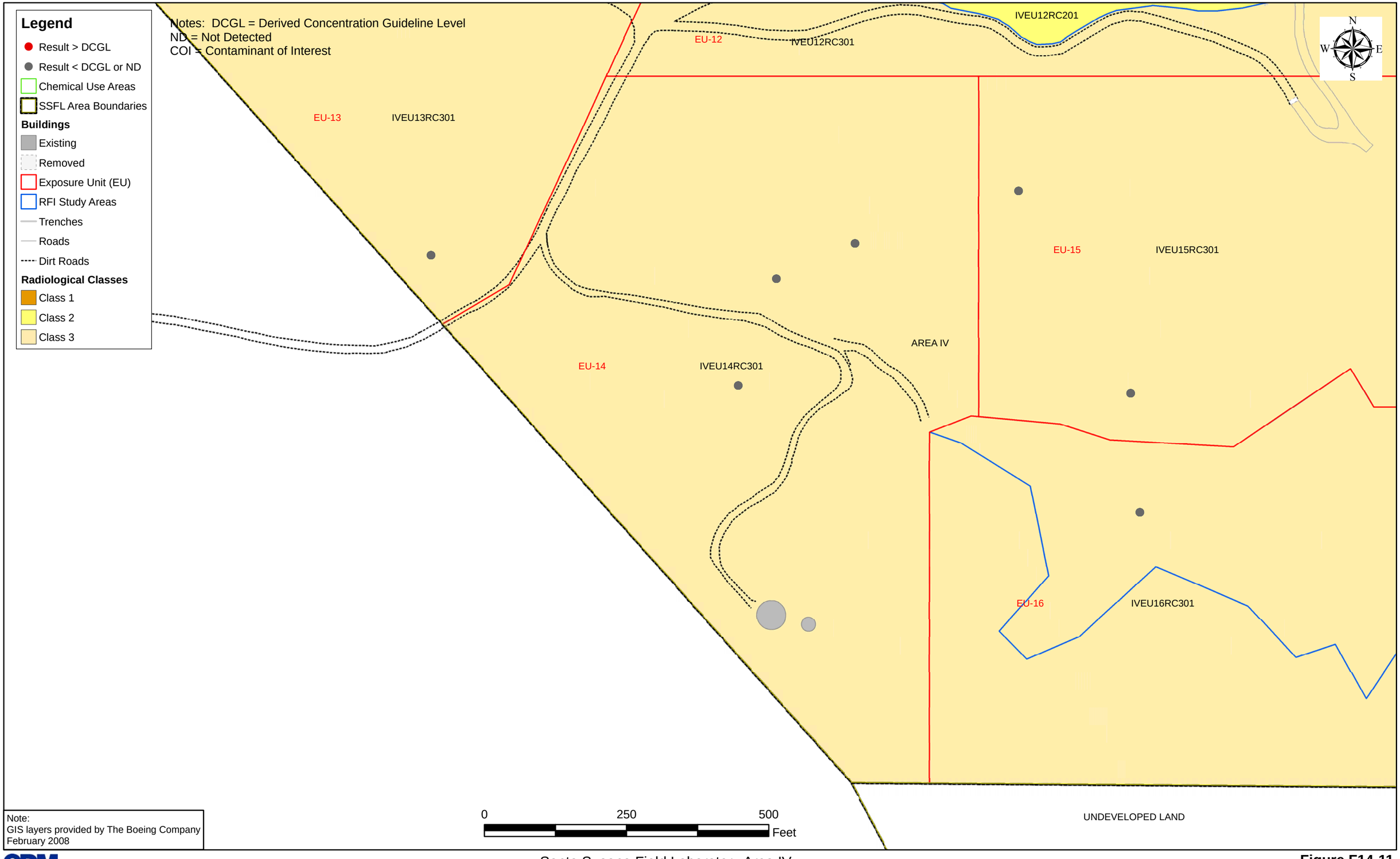
**Figure F14-9**
**Inorganic COIs in Soils - EU-14**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

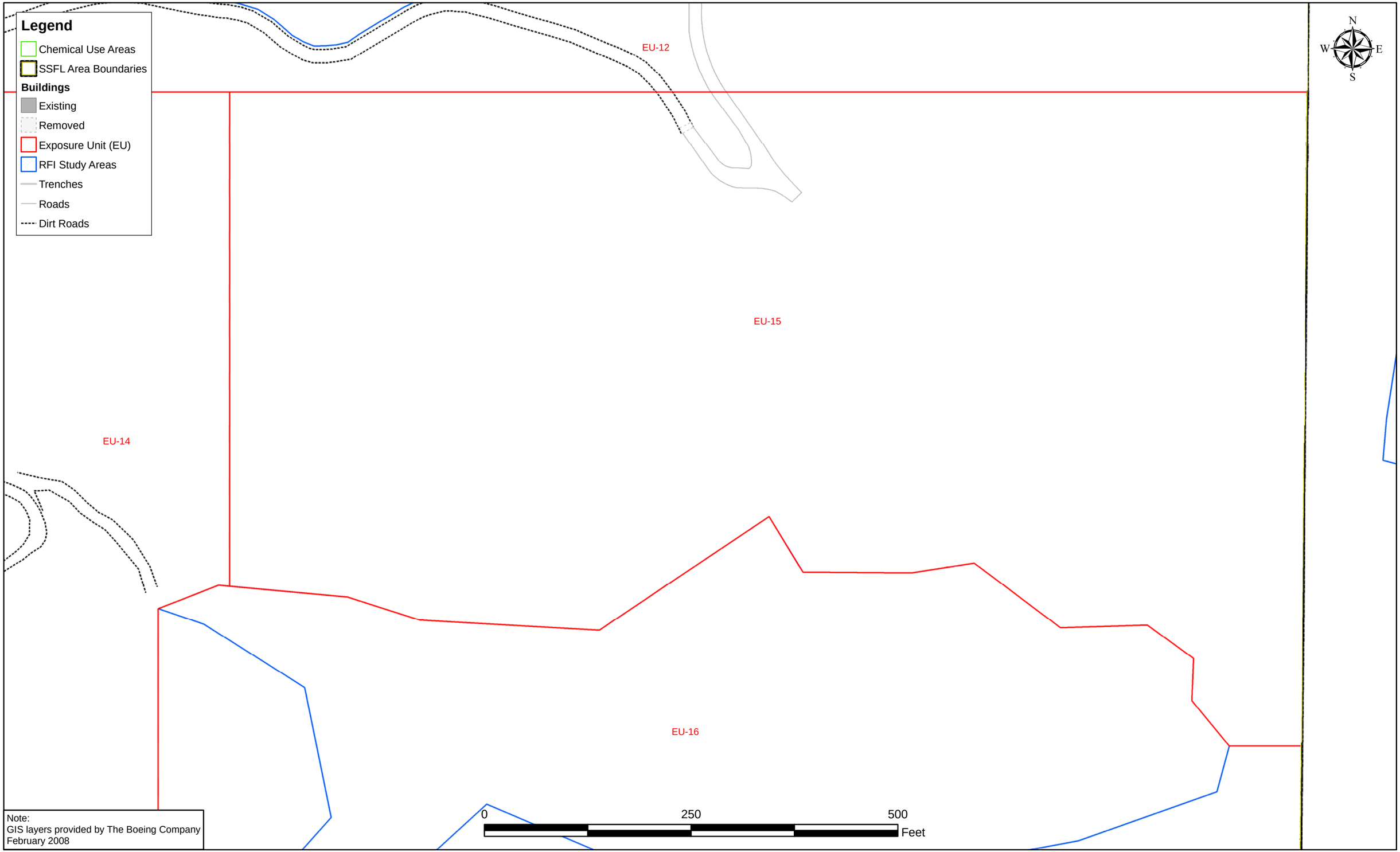
**Figure F14-10**
**Dioxin COIs in Soils - EU-14**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

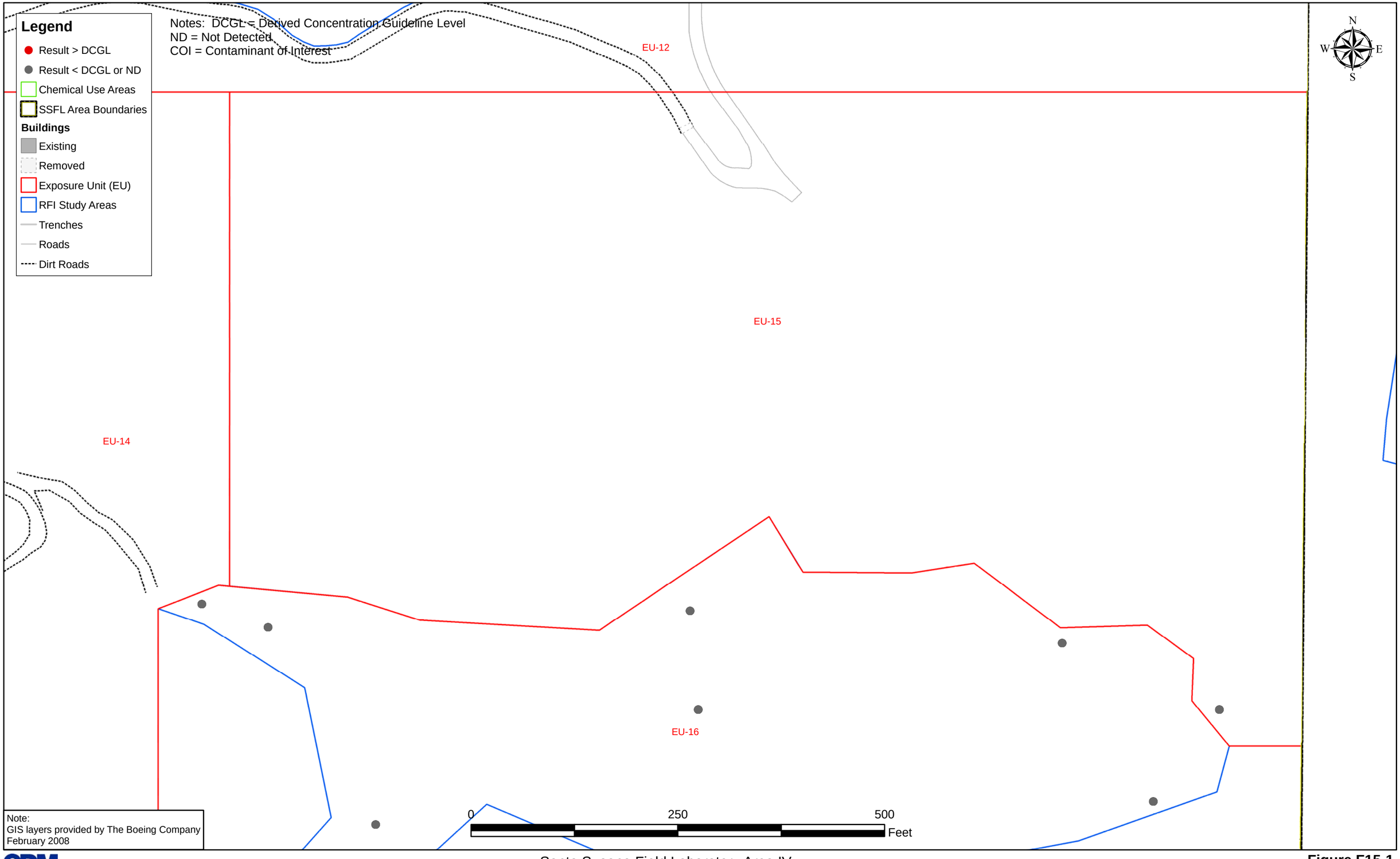
**Figure F14-11**
**Radiological COIs in Soils - EU-14**
**(0-6 in bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

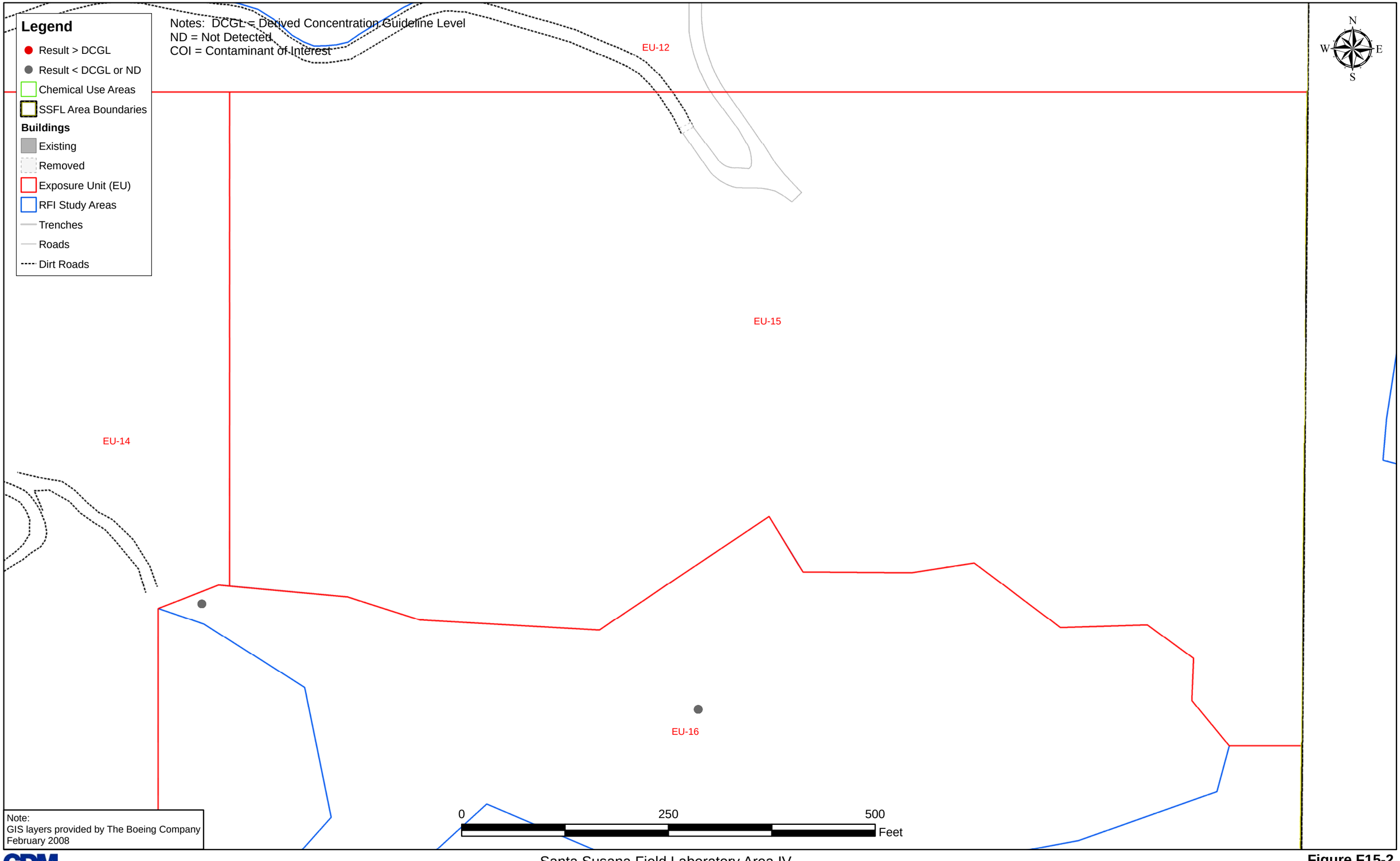
**Figure F15-0**
**EU-15 Chemical Use Areas**




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Santa Susana Field Laboratory Area IV
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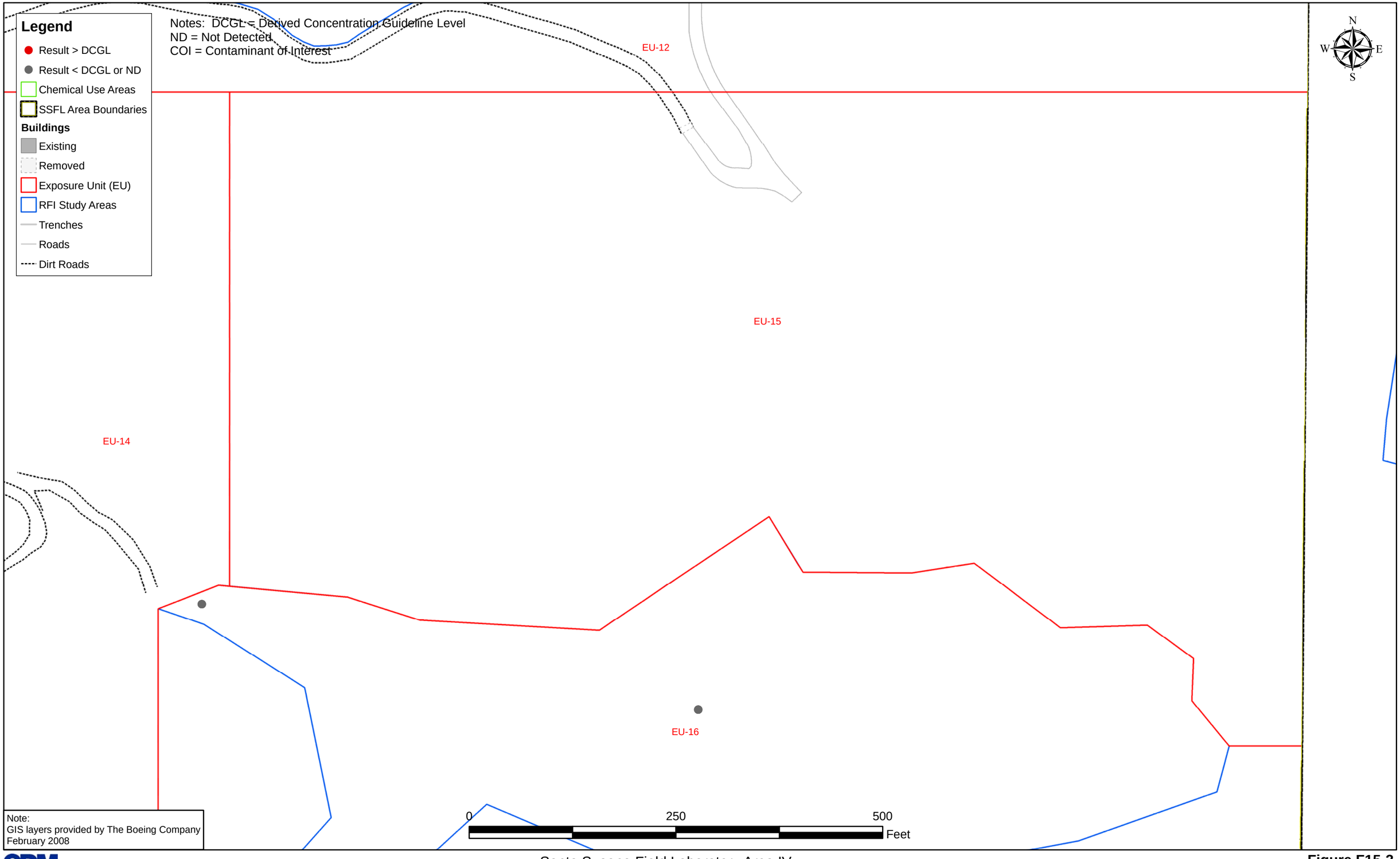
**Figure F15-1**
**VOC COIs in Soils - EU-15**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

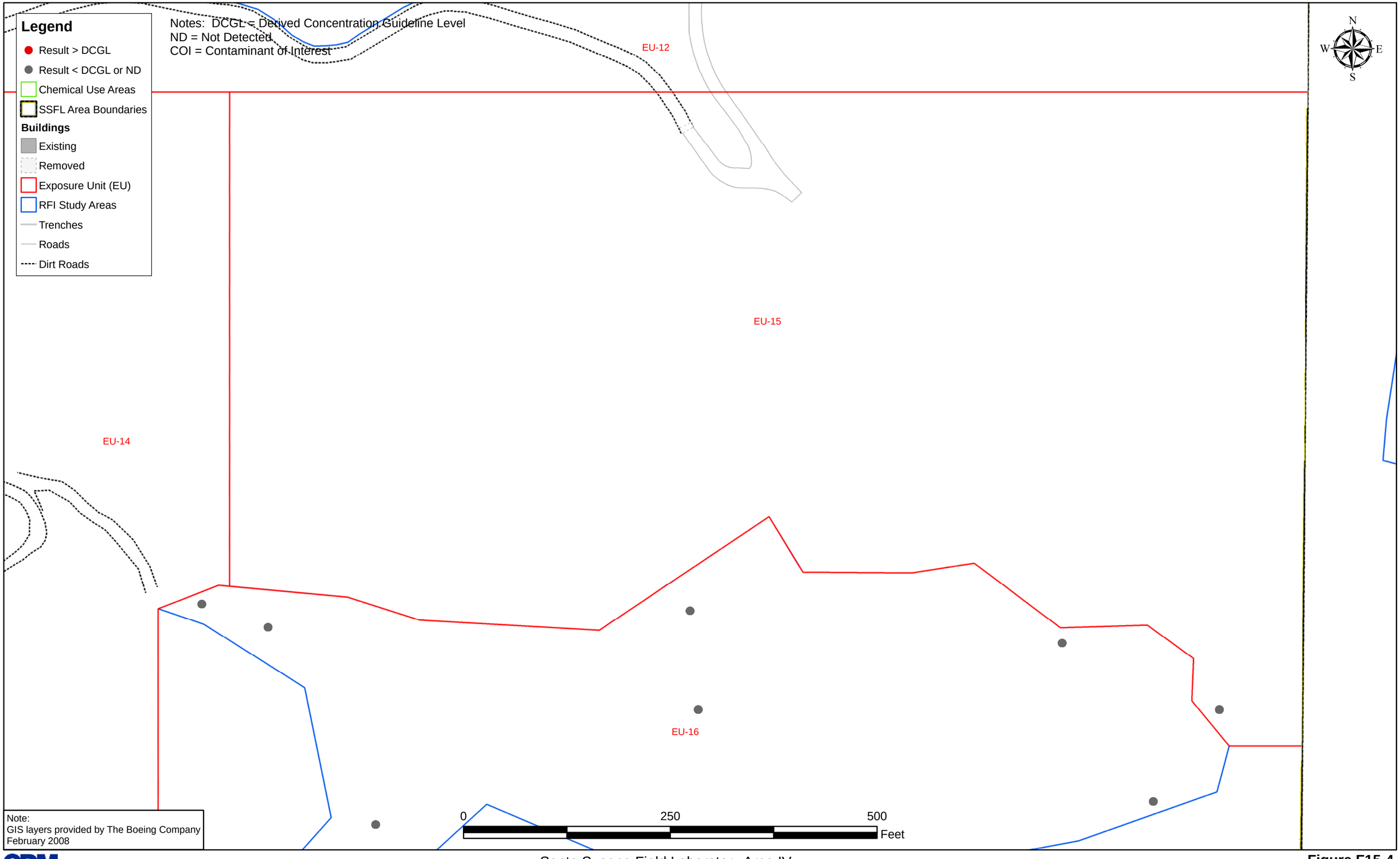
**Figure F15-2**
**SVOC COIs in Soils - EU-15**
**(0-2 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

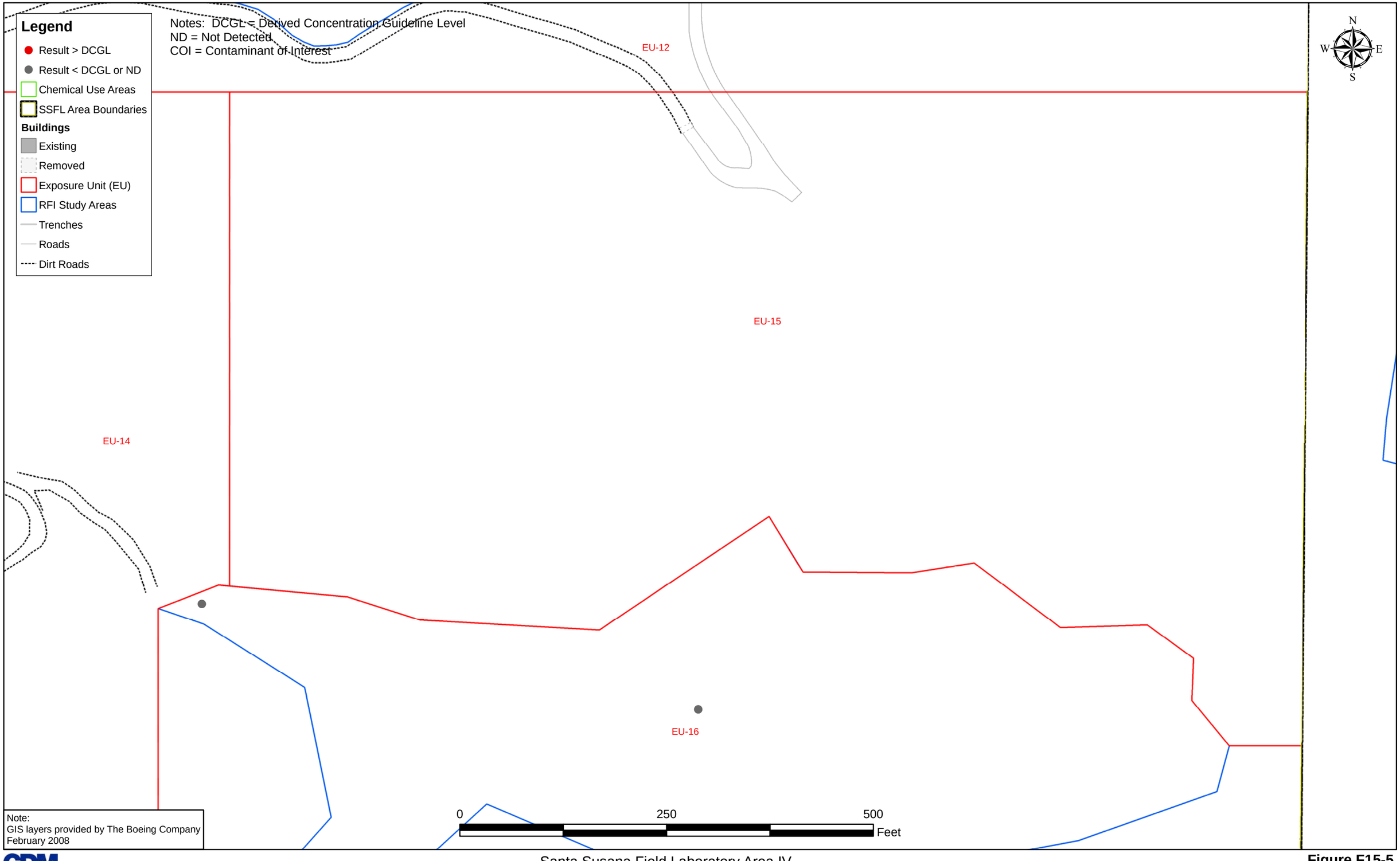
**Figure F15-3**
**PCB COIs in Soils - EU-15**
**(0-2 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

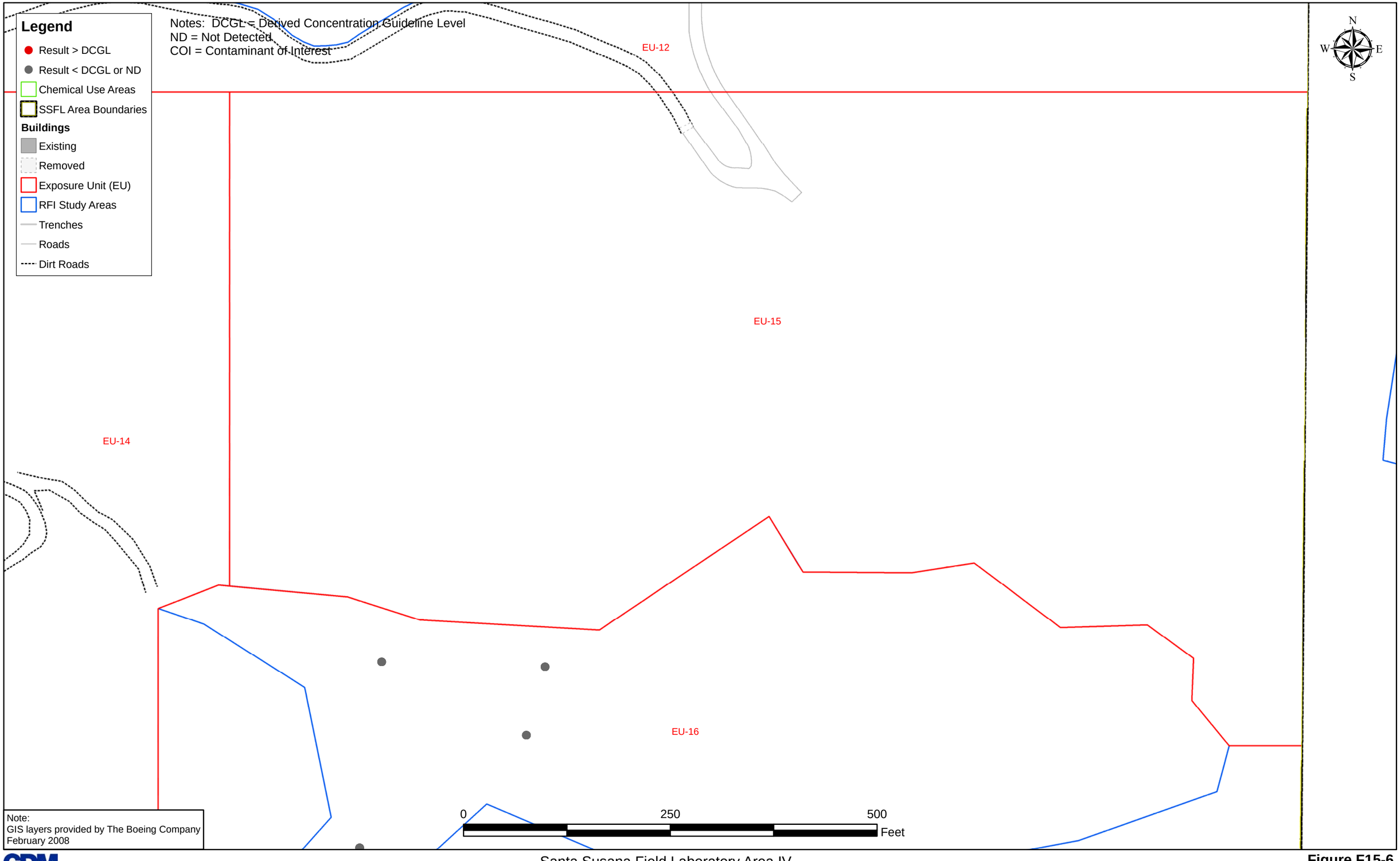
**Figure F15-4**
**Inorganic COIs in Soils - EU-15**
**(0-2 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

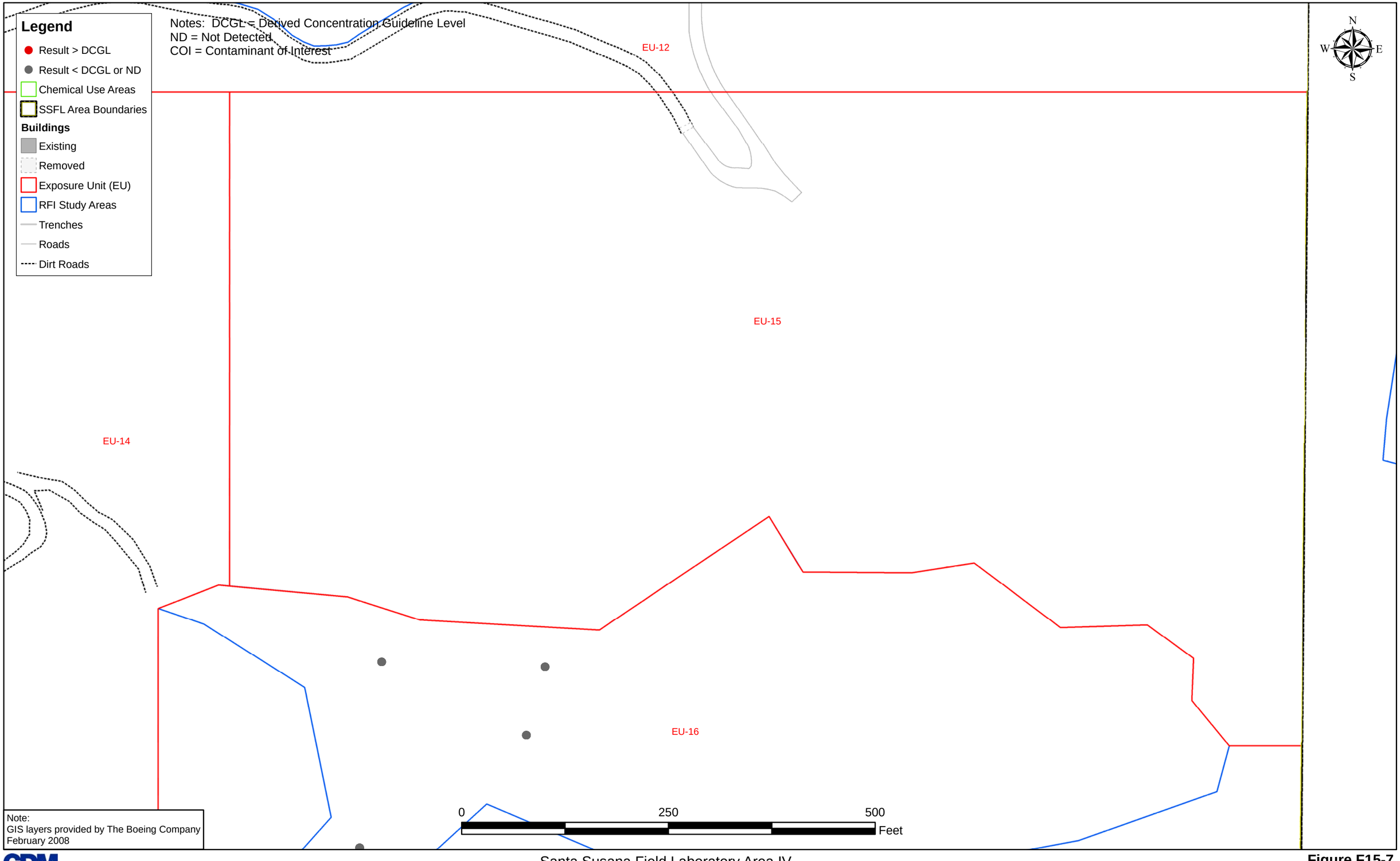
**Figure F15-5**
**Dioxin COIs in Soils - EU-15**
**(0-2 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

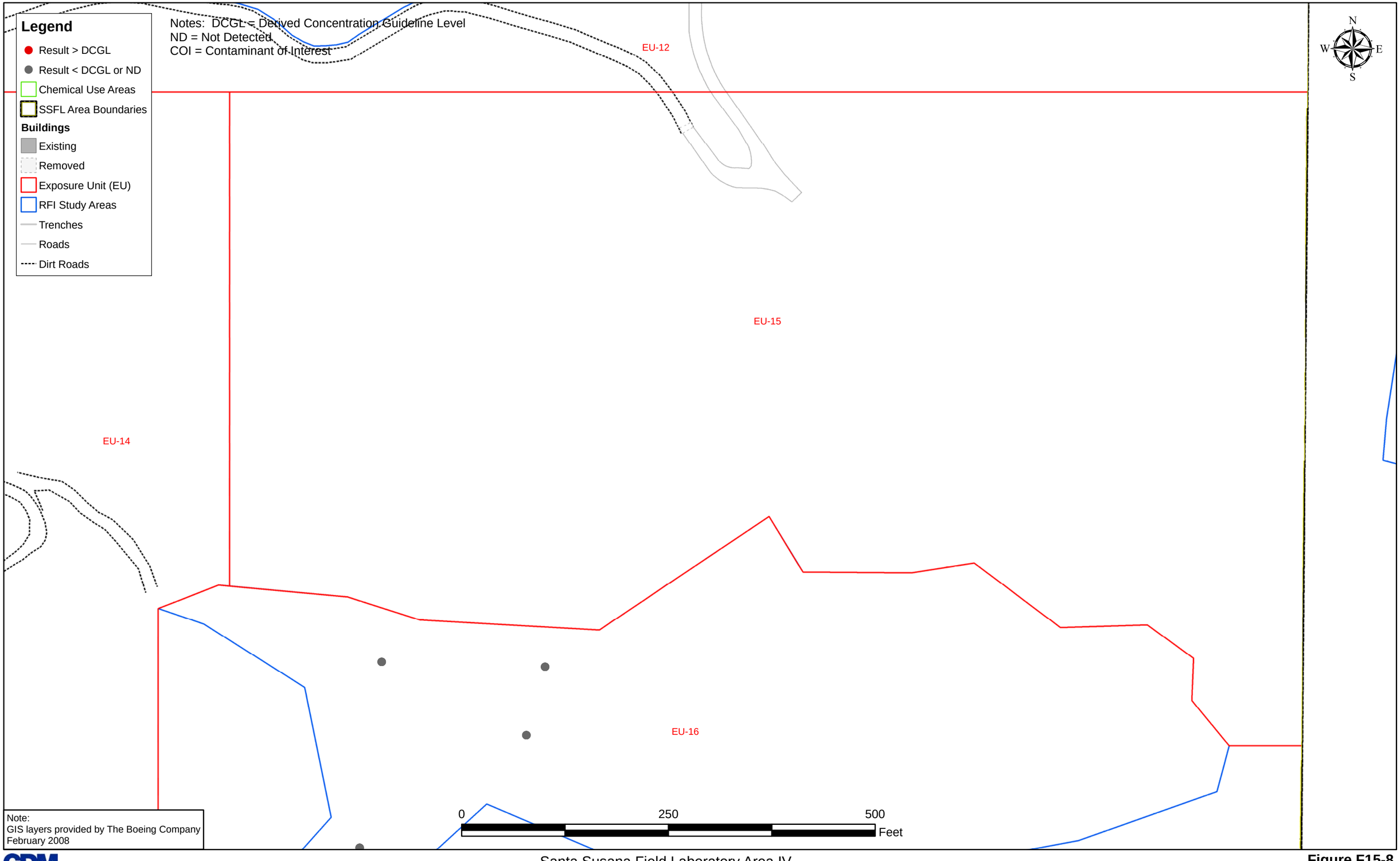
**Figure F15-6**
**VOC COIs in Soils - EU-15**
**(2-10 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

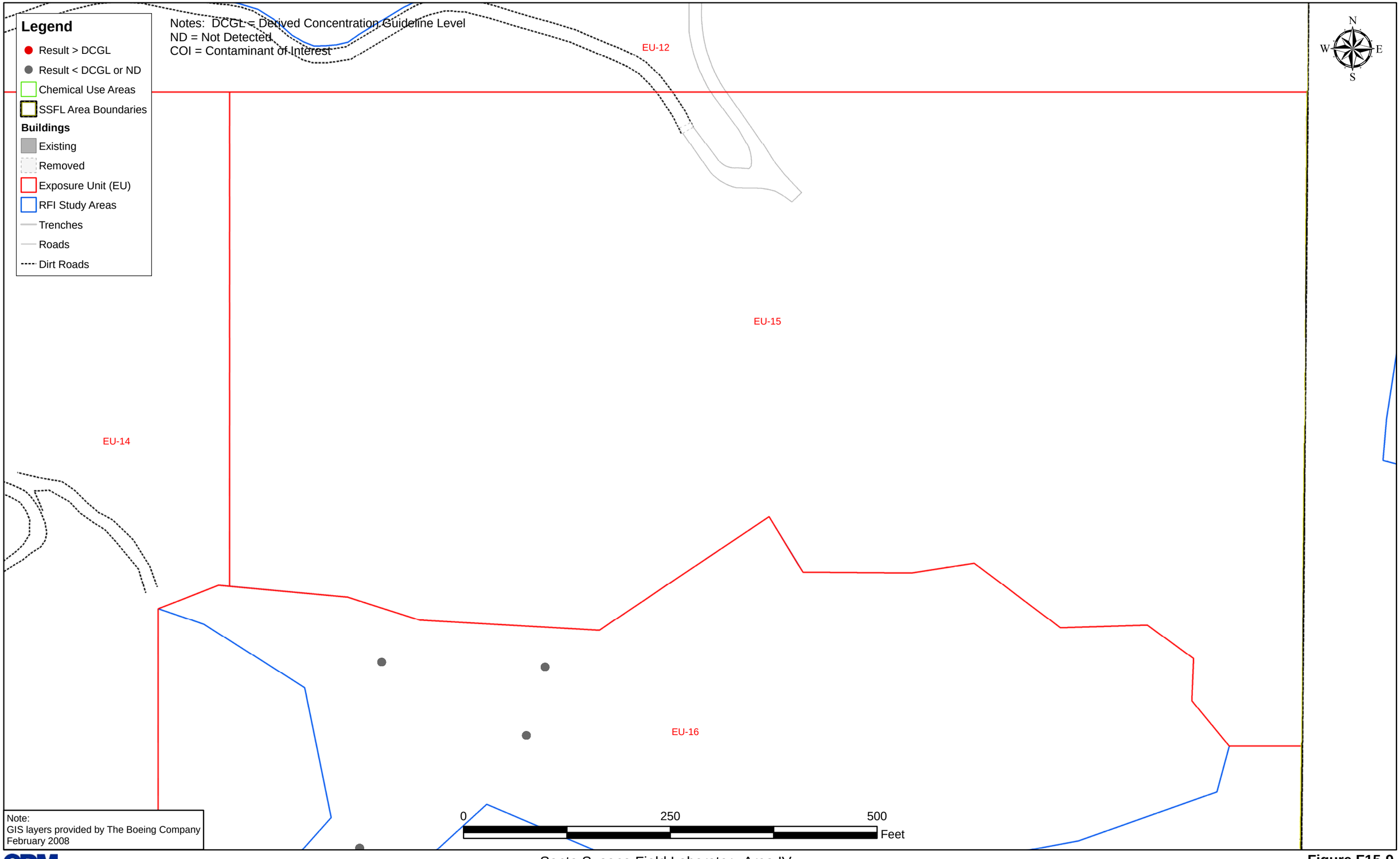
**Figure F15-7**
**SVOC COIs in Soils - EU-15**
**(2-10 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

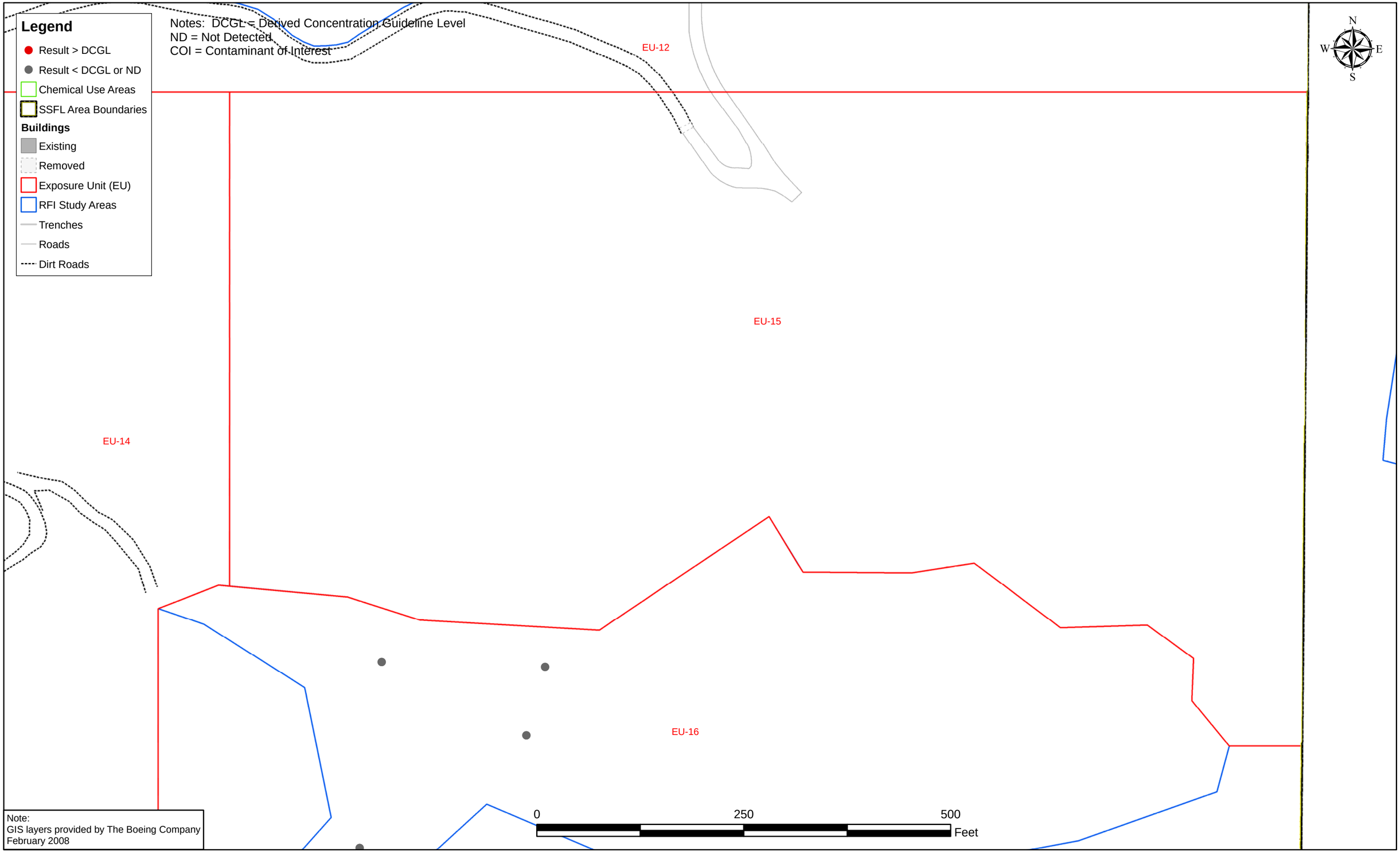
**Figure F15-8**
**PCB COIs in Soils - EU-15**
**(2-10 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

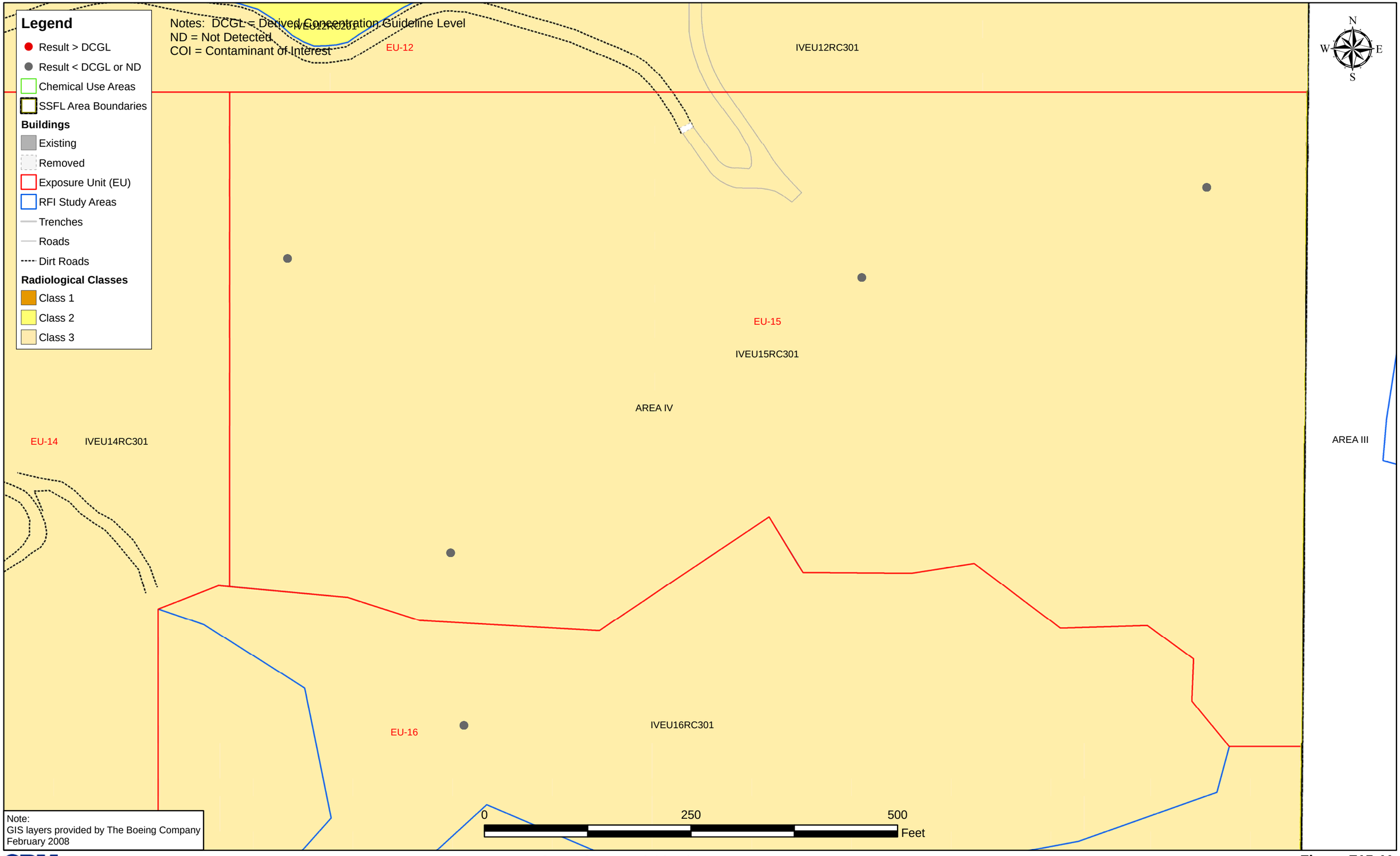
**Figure F15-9**
**Inorganic COIs in Soils - EU-15**
**(2-10 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

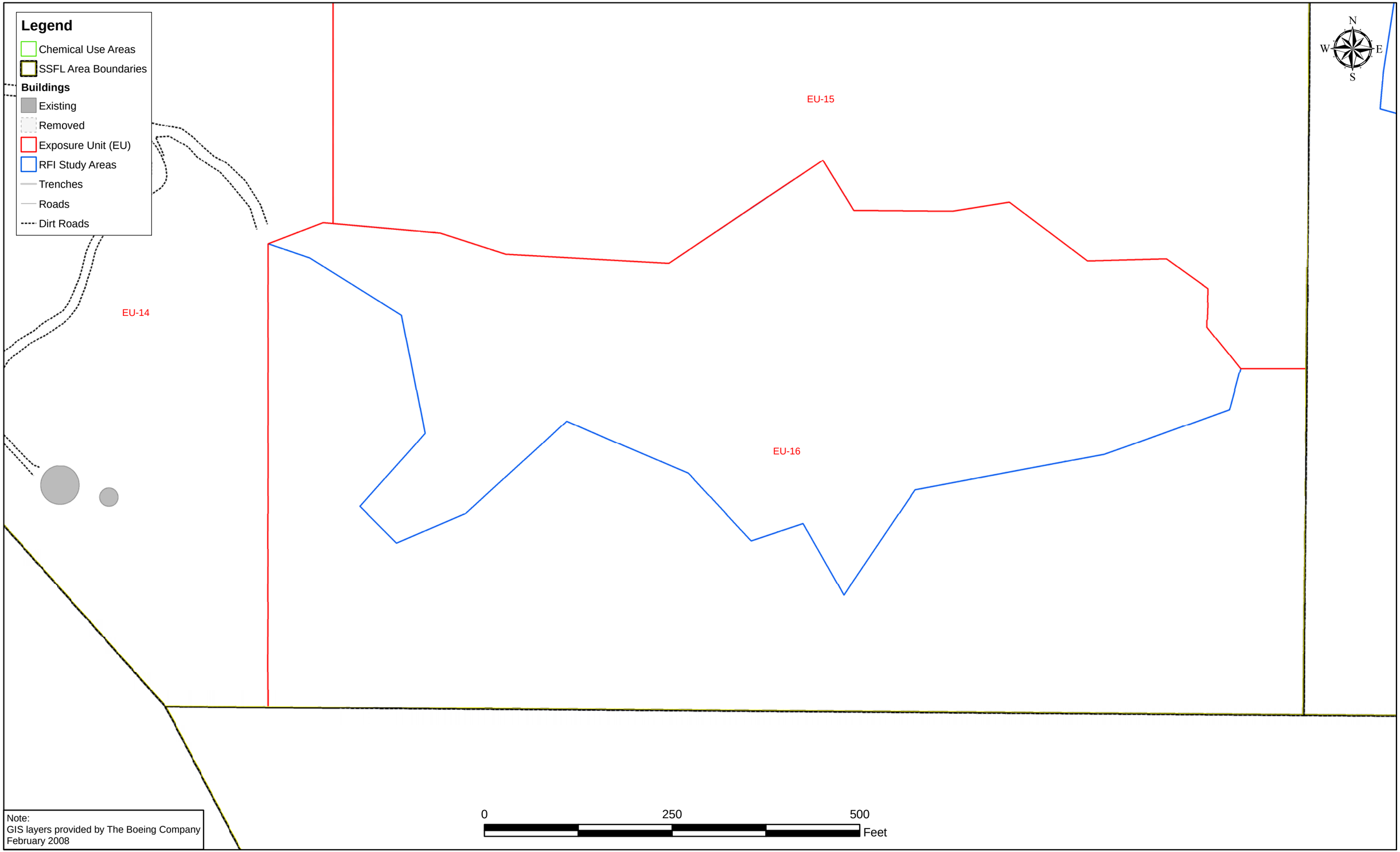
**Figure F15-10**
**Dioxin COIs in Soils - EU-15**
**(2-10 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

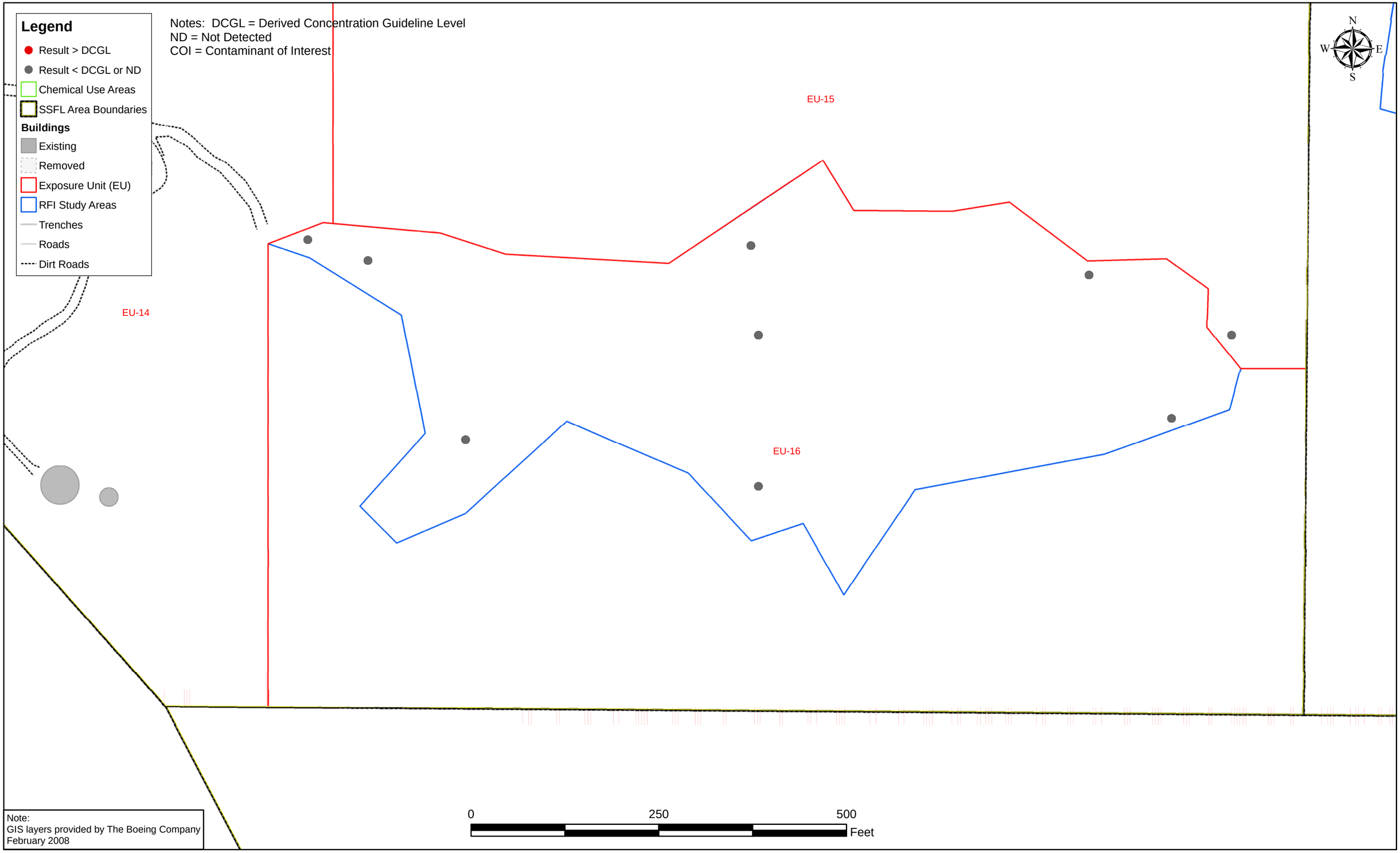
**Figure F15-11**
**Radiological COIs in Soils - EU-15**
**(0-6 in bgs)**




CDM

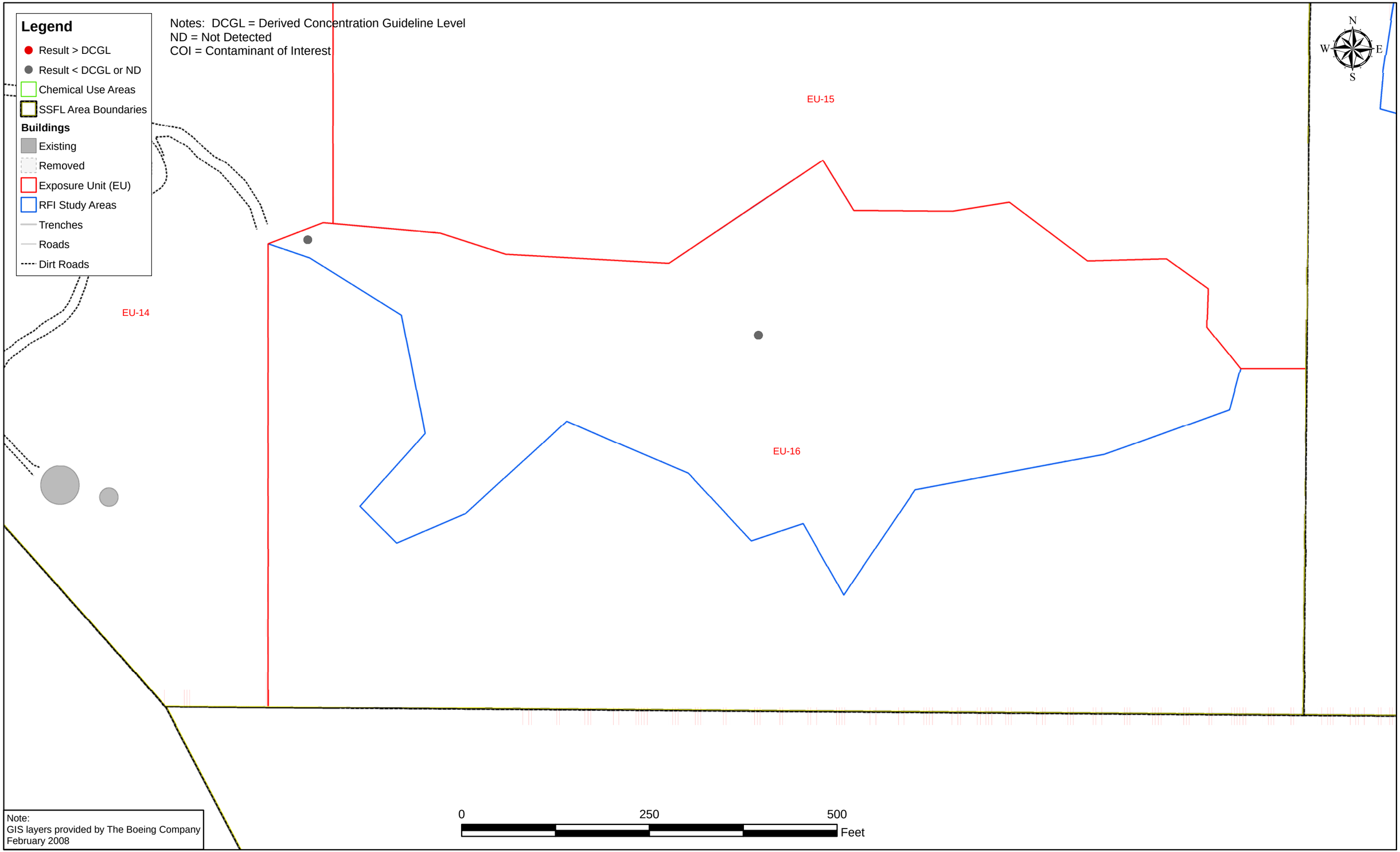
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F16-0**
**EU-16 Chemical Use Areas**



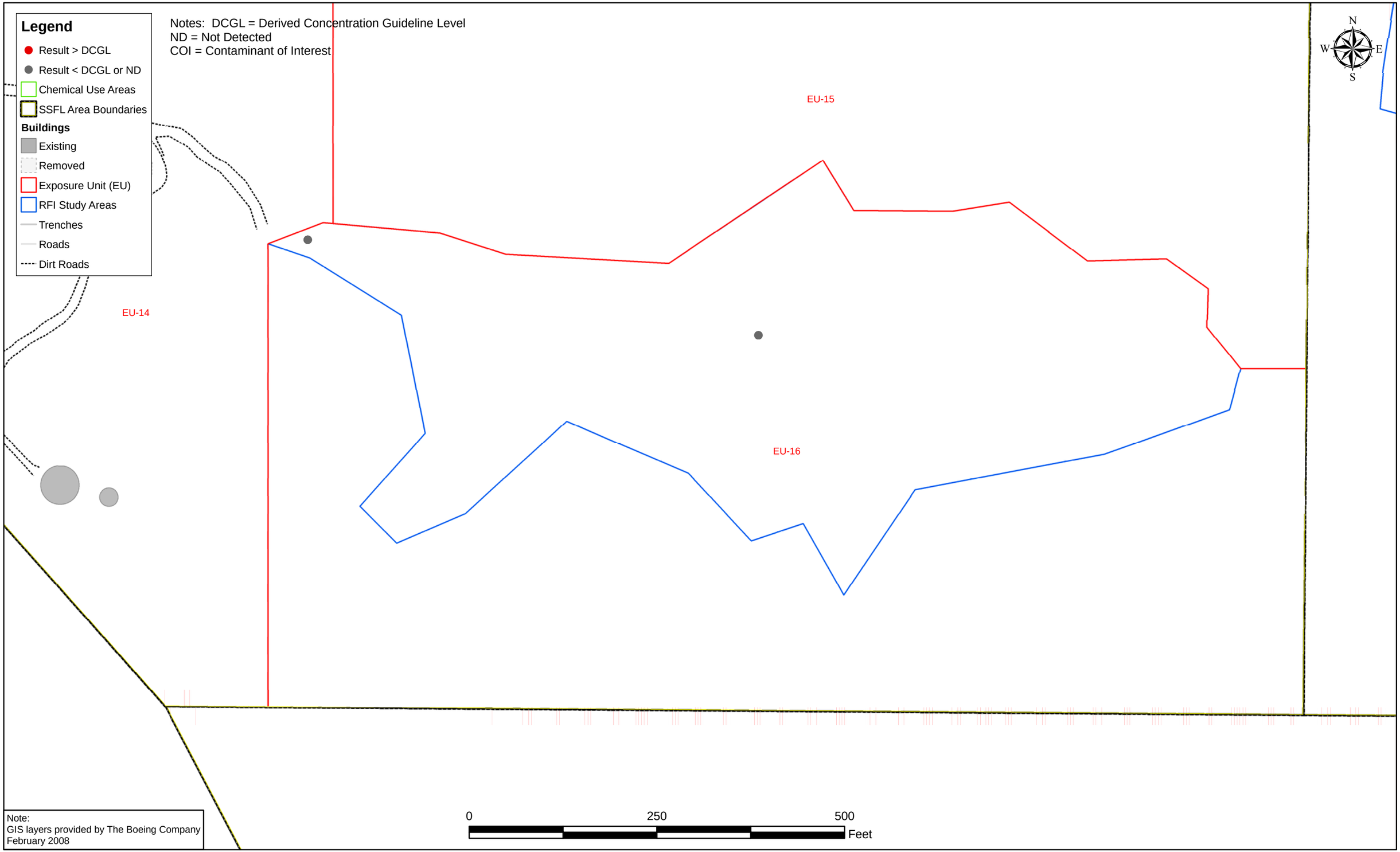

Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F16-1**
**VOC COIs in Soils - EU-16**
**(0-2 ft bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

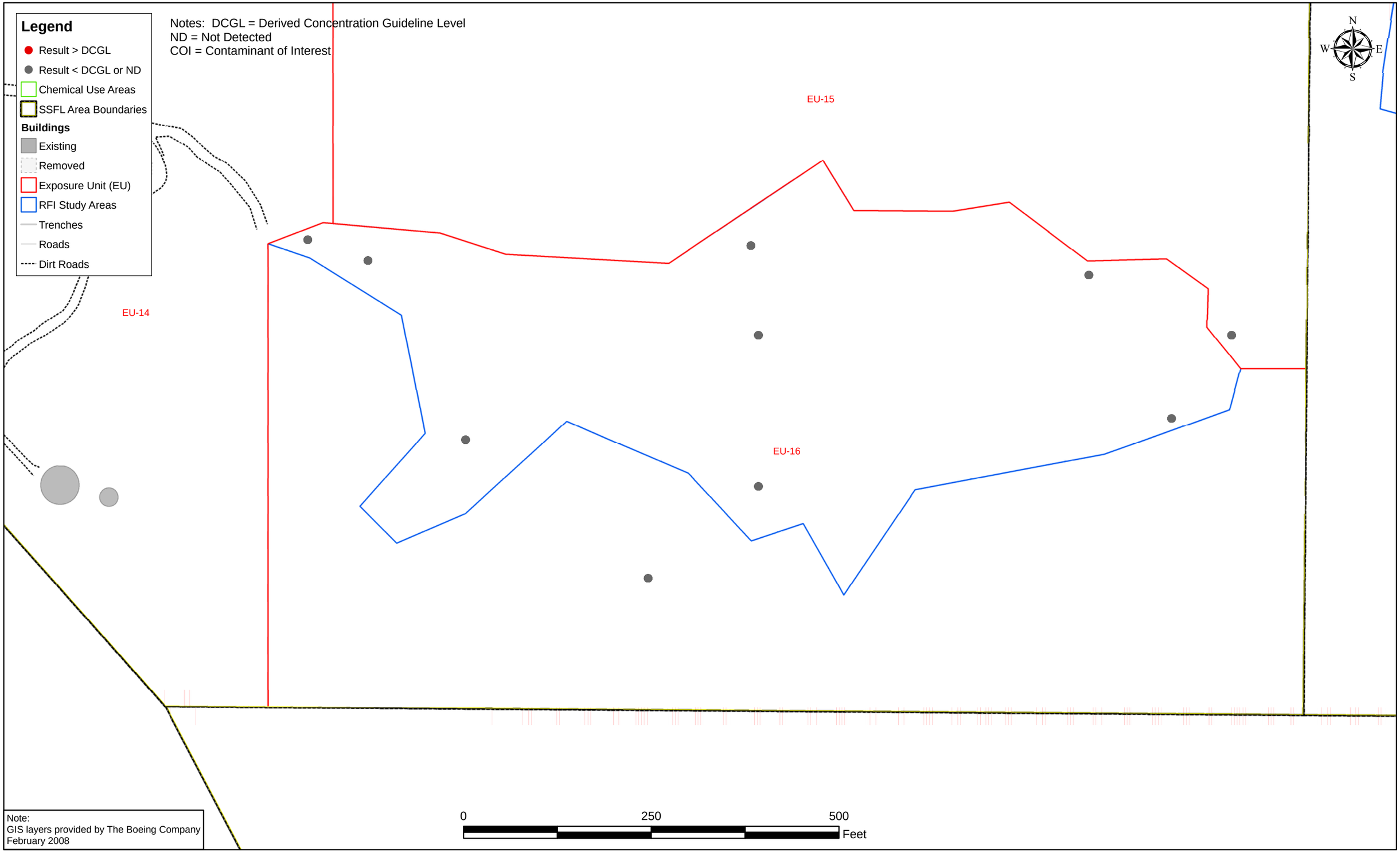
**Figure F16-2**
**SVOC COIs in Soils - EU-16**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

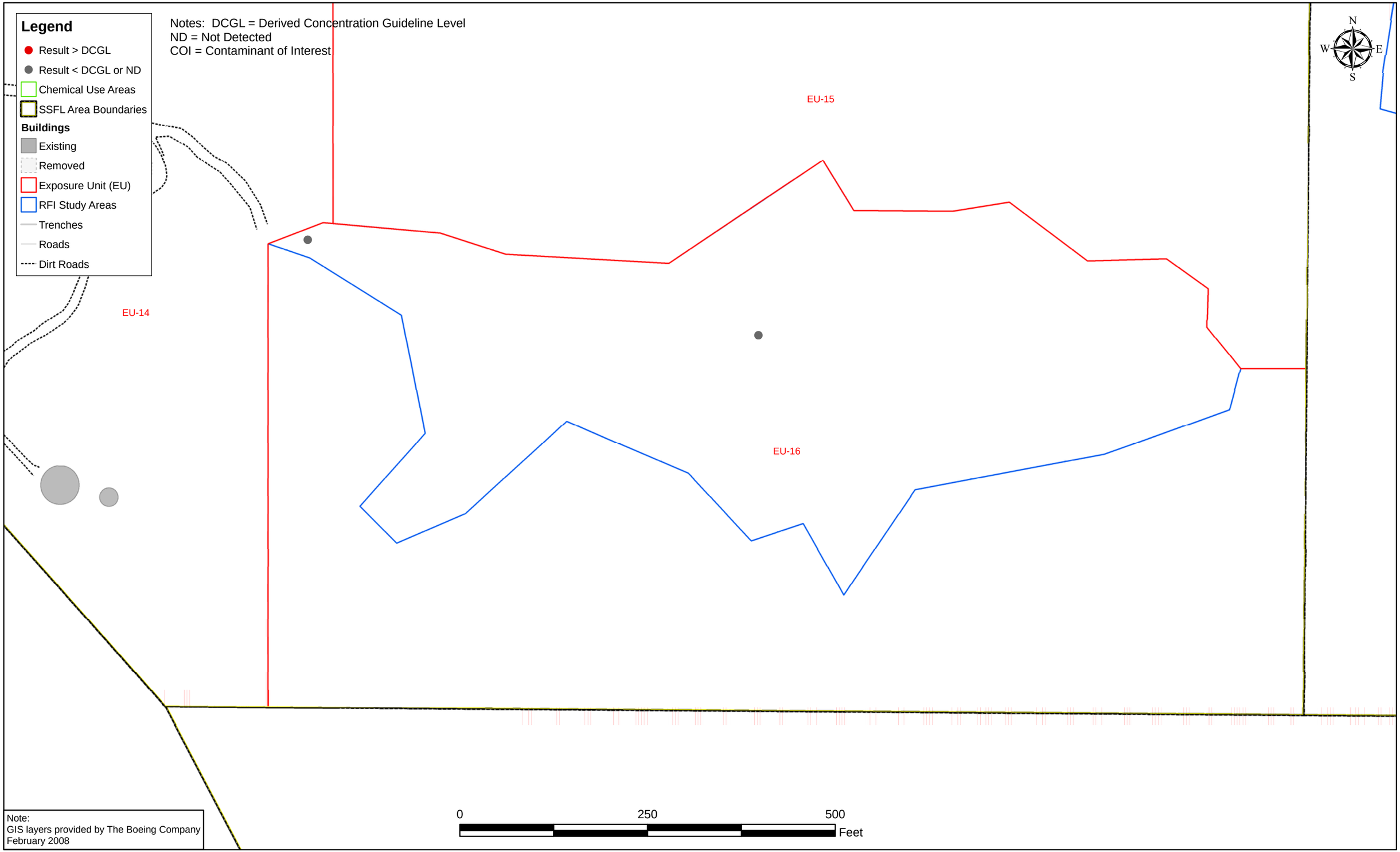
**Figure F16-3**
**PCB COIs in Soils - EU-16**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

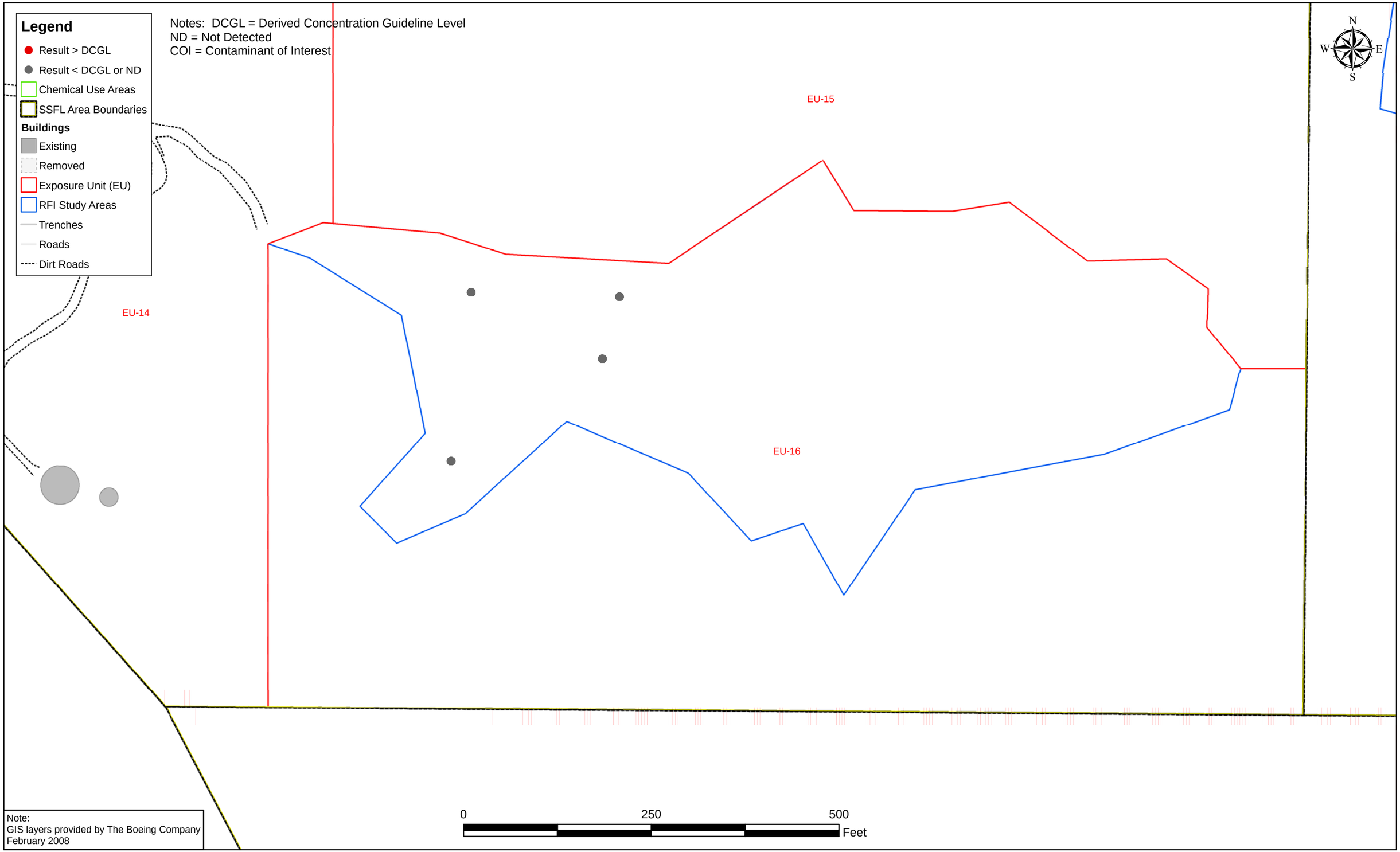
**Figure F16-4**
**Inorganic COIs in Soils - EU-16**
**(0-2 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

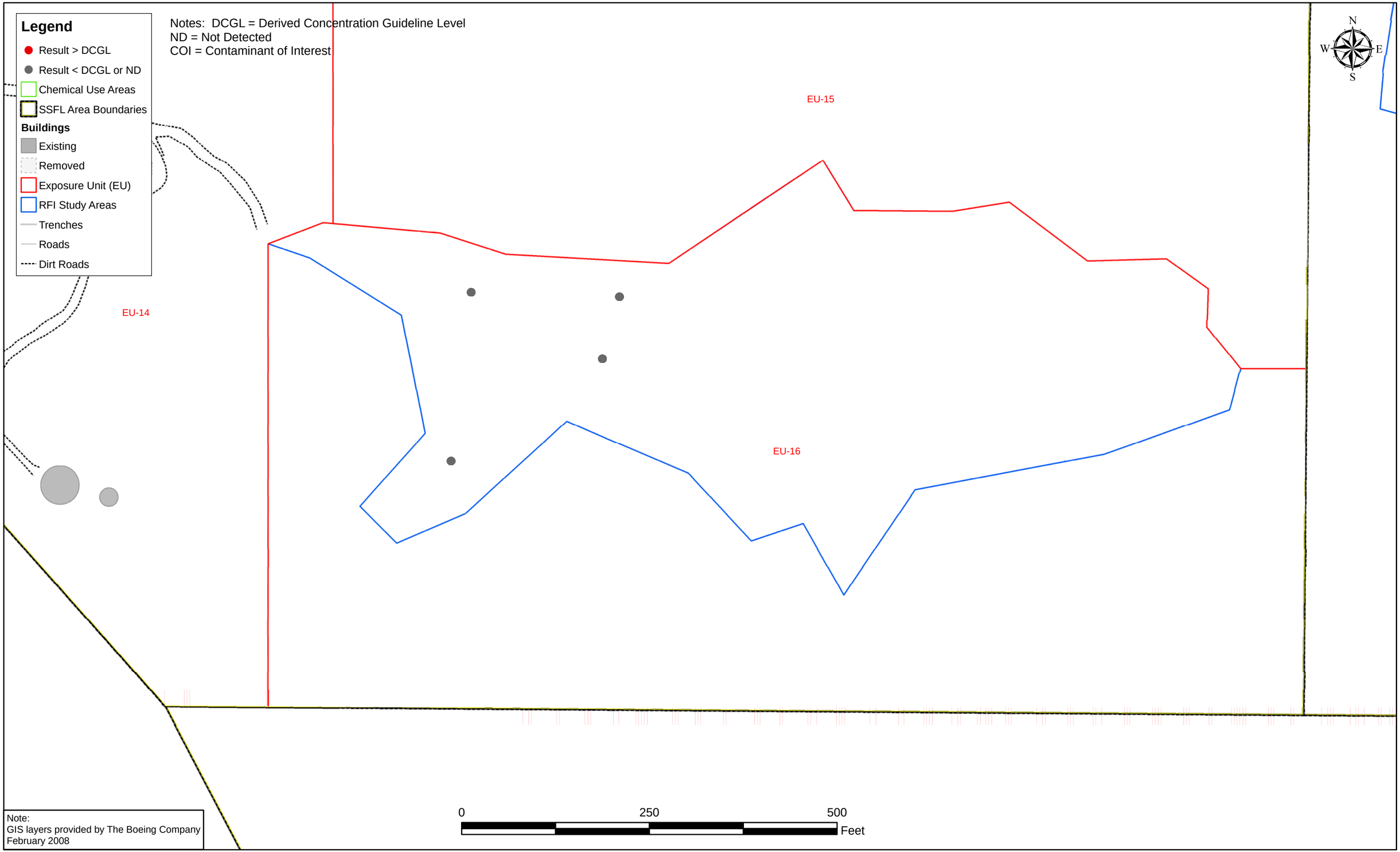
**Figure F16-5**
**Dioxin COIs in Soils - EU-16**
**(0-2 ft bgs)**




CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

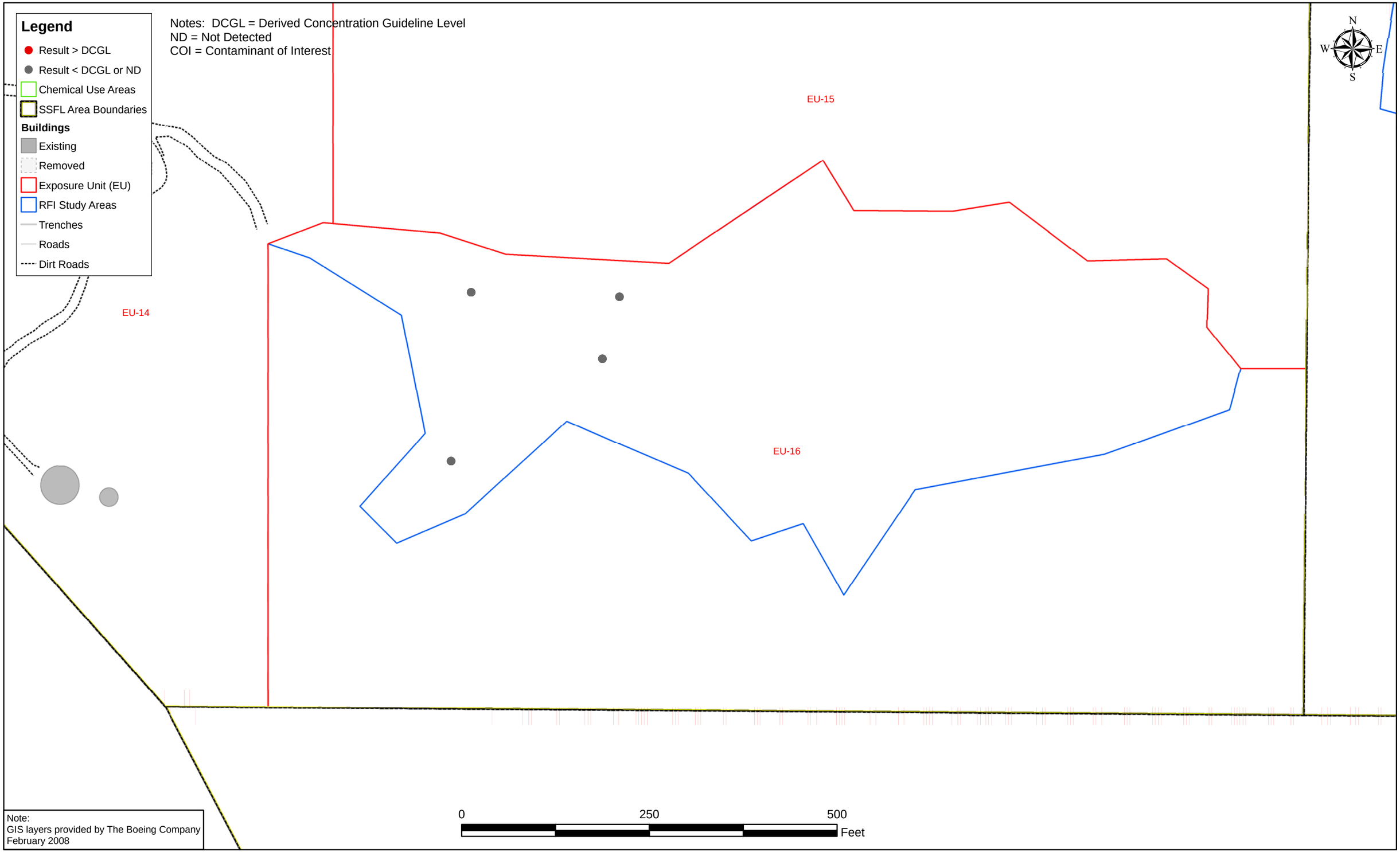
**Figure F16-6**
**VOC COIs in Soils - EU-16**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

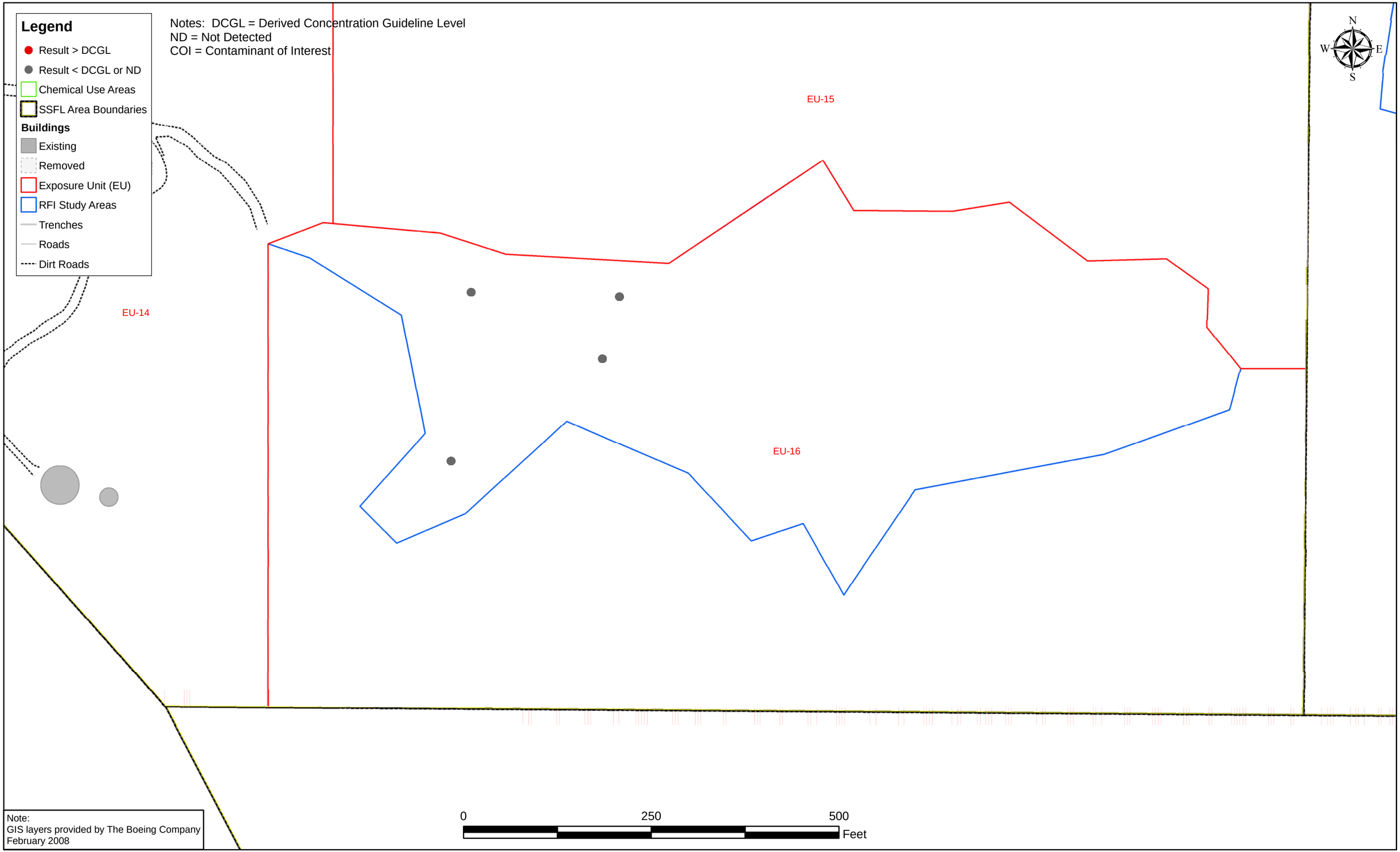
**Figure F16-7**
**SVOC COIs in Soils - EU-16**
**(2-10 ft bgs)**




CDM

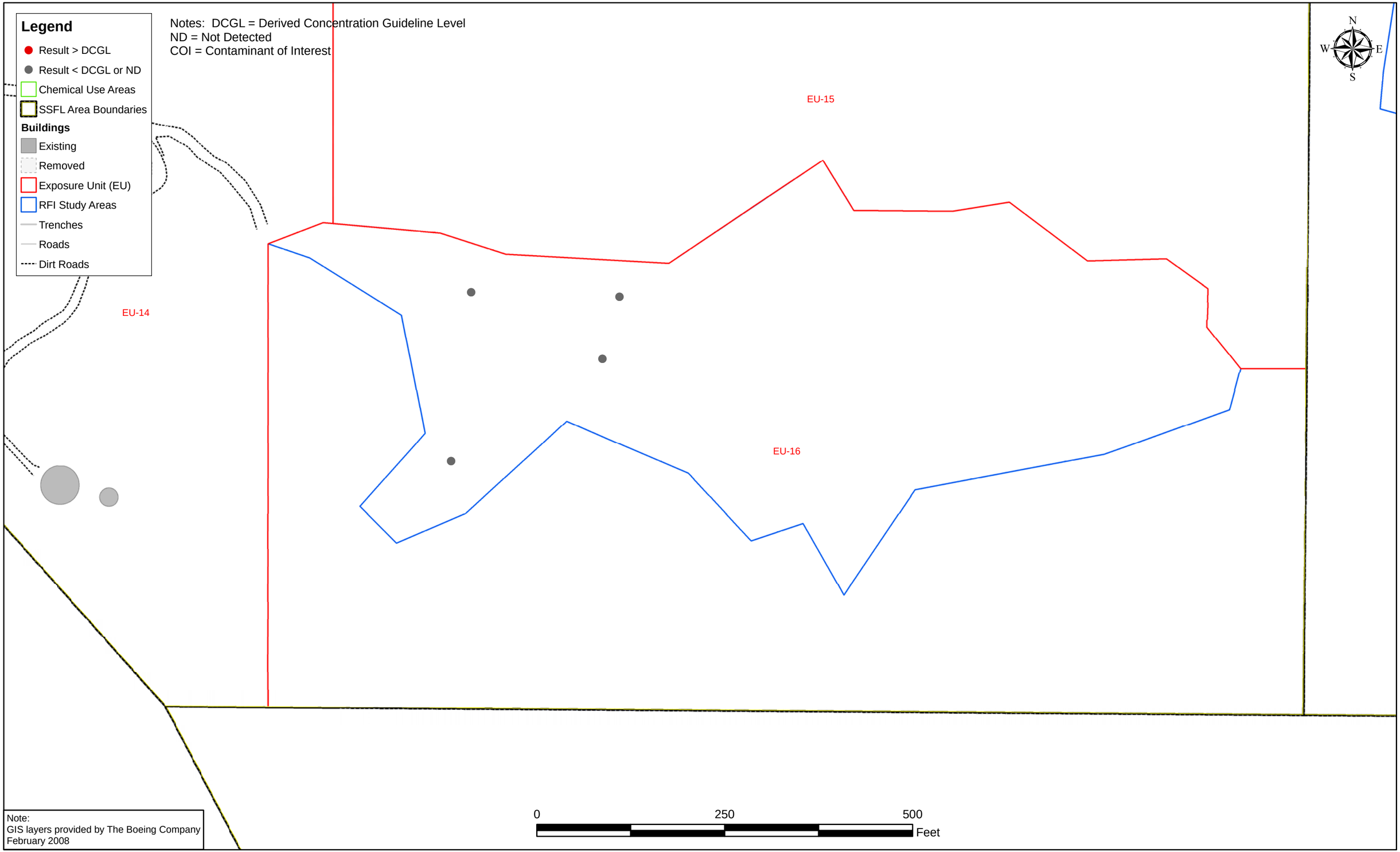
Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F16-8**
**PCB COIs in Soils - EU-16**
**(2-10 ft bgs)**




Santa Susana Field Laboratory Area IV
Ventura County, California

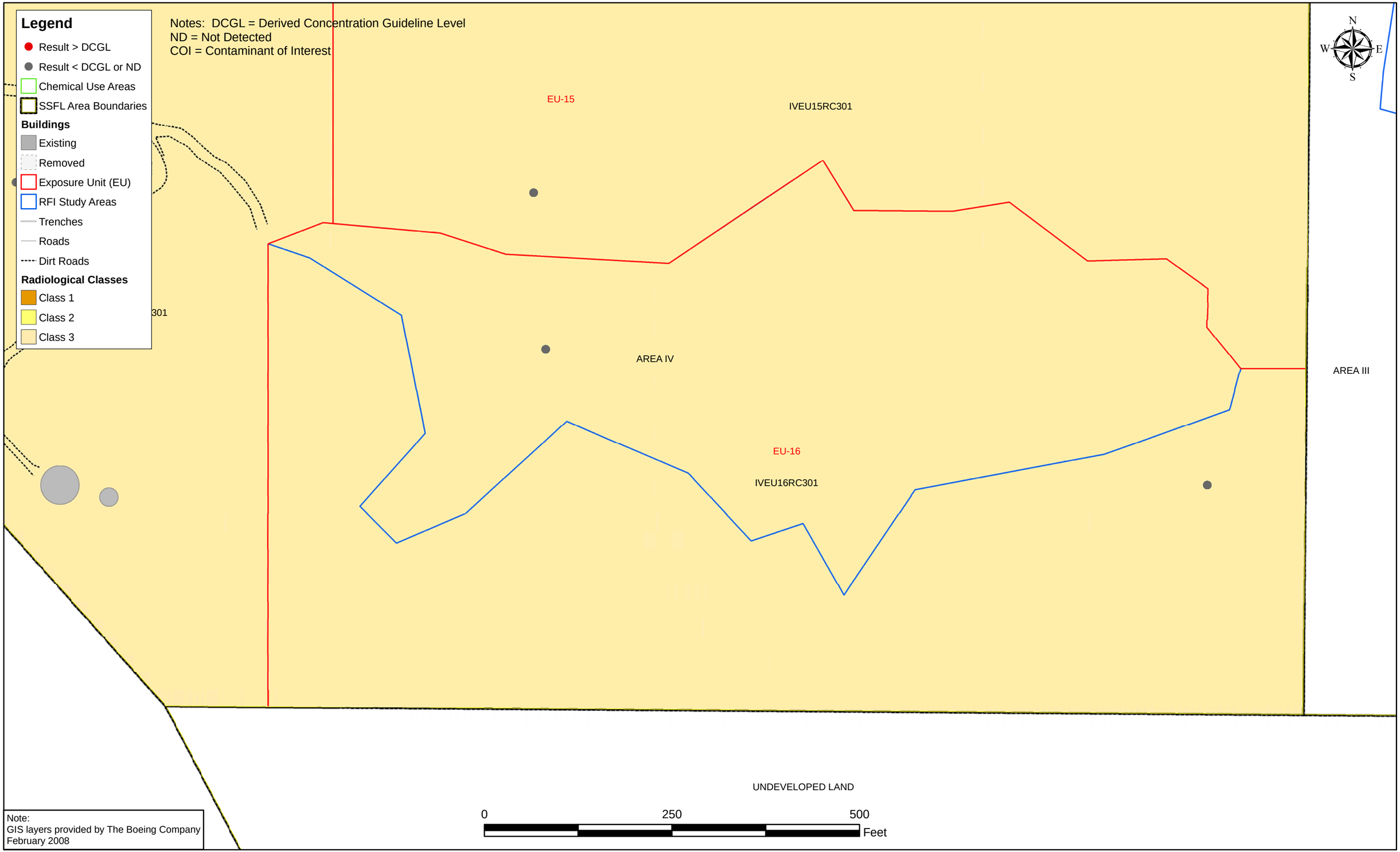
**Figure F16-9**
**Inorganic COIs in Soils - EU-16**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F16-10**
**Dioxin COIs in Soils - EU-16**
**(2-10 ft bgs)**




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Santa Susana Field Laboratory Area IV
Ventura County, California

**Figure F16-11**
**Radiological COIs in Soils - EU-16**
**(0-6 in bgs)**

# Appendix G

# Radionuclide Surface Soil Data Gaps Detail

# Appendix G
# Radionuclide Surface Soil Data Gaps Detail

Details of the calculation of the data gap for surface soils are shown for each radiological COI and each SU in the tables in this appendix. Table G-1 shows the detail for the rural residential scenario and Table G-2 shows the detail for the residential scenario. The total number of valid samples and average, maximum, and standard deviation of the results for each radionuclide are shown for each SU. In addition, the tables show the relative shift, the calculated number of samples to meet the statistical objectives for risk assessment, and the data gap by radionuclide and SU.

Under both the rural residential and residential scenarios, there are 17 Class 1 SUs with average results for at least one constituent with at least eight valid sample results that exceed the DCGL or have a standard deviation greater than one-half the DCGL. Collection of the statistical number of samples required to have confidence that these areas do not exceed the DCGL, will not be required. These SUs are denoted with a 1 in the remediation test column for each analyte that exceeds a DCGL. The number of samples required to further define the nature and extent of contamination in these areas was calculated assuming a relative shift of 1.5 and the SU size.

The analysis was performed on an individual radionuclide basis for each SU. Not every previously-collected sample was analyzed for the same suite of analytes. Therefore the data gap is driven by the largest number for any constituent in the SU. However, radionuclides that are being investigated as COIs but have never been detected above background levels in Area IV were not used to drive the data gap since it is uncertain if they will become COCs until further sampling and analysis is performed.

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC101 | Ac-228 | 3.2 | 20 | 20 | | | 1.53 | 1.224 | 0.158027 | 1.6 | 10.124832 | 3.00 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Am-241 | 1.87 | 20 | 20 | | | 0.07 | -0.016335 | 0.051836 | 0.935 | 18.037516 | 3 | 11 | 3.39 | 1 | 0 | 19 | 0 | |
| EU-01 | IVEU01RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Co-60 | 0.0361 | 20 | 20 | | 2 | 0.063 | 0.0044 | 0.030287 | 0.01805 | 0.5959643 | 0.5959643 | 71 | 3.39 | 1 | 1 | 121 | 101 | |
| EU-01 | IVEU01RC101 | Cs-134 | 0.157 | 22 | 20 | | | 0.05 | 0.0124545 | 0.034323 | 0.0785 | 2.2870952 | 2.2870952 | 12 | 3.39 | 1 | 0 | 21 | 0 | |
| EU-01 | IVEU01RC101 | Cs-137 | 0.48 | 24 | 21 | 1 | | 1.16 | 0.1087833 | 0.326352 | 0.24 | 0.735402 | 0.735402 | 48 | 3.39 | 1 | 1 | 82 | 58 | |
| EU-01 | IVEU01RC101 | Eu-152 | 0.0416 | 20 | 20 | | | 0.12 | -0.00885 | 0.046726 | 0.0208 | 0.4451511 | 0.4451511 | 107 | 3.39 | 1 | 1 | 182 | 162 | |
| EU-01 | IVEU01RC101 | Eu-154 | 0.0499 | 20 | 19 | | | 0.37 | 0.00665 | 0.198921 | 0.02495 | 0.1254268 | 0.1254268 | 1620 | 3.39 | 1 | 1 | 2749 | 2729 | |
| EU-01 | IVEU01RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | K-40 | 60 | 24 | 24 | 4 | | 25.5 | 20.330417 | 2.84717 | 30 | 10.536778 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 24 | |
| EU-01 | IVEU01RC101 | Pu-238 | 2.97 | 22 | 22 | | | 0.012 | -0.000773 | 0.008874 | 1.485 | 167.33479 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 24 | |
| EU-01 | IVEU01RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Pu-241 | 406 | 20 | 20 | | | 1.2 | -0.724 | 0.965573 | 203 | 210.23794 | 3 | 11 | 3.39 | 1 | 0 | 19 | 0 | |
| EU-01 | IVEU01RC101 | Ra-226 | 5 | 2 | 2 | 2 | | 0.95 | 0.9 | 0.070711 | 2.5 | 35.355339 | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 22 | |
| EU-01 | IVEU01RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 24 | |
| EU-01 | IVEU01RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Sr-90 | 0.231 | 20 | 20 | | | 0.45 | 0.08745 | 0.139362 | 0.1155 | 0.8287753 | 0.8287753 | 38 | 3.39 | 1 | 1 | 65 | 45 | |
| EU-01 | IVEU01RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Th-228 | 3.2 | 2 | 2 | | | 1.3 | 0.905 | 0.558614 | 1.6 | 2.86423 | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 22 | |
| EU-01 | IVEU01RC101 | Th-230 | 3.49 | 2 | 2 | | | 1 | 0.715 | 0.403051 | 1.745 | 4.3294784 | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 22 | |
| EU-01 | IVEU01RC101 | Th-232 | 3.1 | 24 | 24 | 2 | | 1.53 | 1.1791667 | 0.211185 | 1.55 | 7.3395223 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Tritium (H-3) | 2.28 | 1 | 1 | | | -0.048 | -0.048 | | 1.14 | | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 23 | |
| EU-01 | IVEU01RC101 | U-234 | 4.01 | 22 | 22 | | | 1.12 | 0.8518182 | 0.139817 | 2.005 | 14.340128 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | U-235 | 0.195 | 24 | 24 | | | 0.053 | 0.0339583 | 0.010861 | 0.0975 | 8.9773255 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | U-238 | 2.6 | 26 | 26 | 2 | | 1.15 | 0.8315385 | 0.176968 | 1.3 | 7.3459766 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | 26 |
| EU-01 | IVEU01RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Cs-137 | 0.48 | 46 | 31 | | | 2.702 | 0.4565741 | 0.641098 | 0.24 | 0.3743579 | 0.3743579 | 243 | 1.14 | 1 | 1 | 139 | 93 | |
| EU-01 | IVEU01RC102 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC102 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | 9 |
| EU-01 | IVEU01RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | 1 |
| EU-01 | IVEU01RC202 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Cs-137 | 0.48 | 1 | 1 | 1 | | 0.12 | 0.12 | | 0.24 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC202 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | K-40 | 60 | 1 | 1 | 1 | | 19 | 19 | | 30 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Pu-238 | 2.97 | 1 | 1 | | | 0.003 | 0.003 | | 1.485 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Ra-226 | 5 | 1 | 1 | 1 | | 0.74 | 0.74 | | 2.5 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Sr-90 | 0.231 | 1 | 1 | | | 0.032 | 0.032 | | 0.1155 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Th-228 | 3.2 | 1 | 1 | | | 0.7 | 0.7 | | 1.6 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Th-230 | 3.49 | 1 | 1 | | | 0.5 | 0.5 | | 1.745 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Th-232 | 3.1 | 1 | 1 | | | 0.71 | 0.71 | | 1.55 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Tritium (H-3) | 2.28 | 1 | 1 | | | -0.036 | -0.036 | | 1.14 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | U-235 | 0.195 | 1 | 1 | | | 0.04 | 0.04 | | 0.0975 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | U-238 | 2.6 | 1 | 1 | | | 0.59 | 0.59 | | 1.3 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | 1 |
| EU-01 | IVEU01RC203 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC203 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | 1 |
| EU-01 | IVEU01RC204 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | 1 |
| EU-01 | IVEU01RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Cs-137 | 0.48 | 7 | 2 | 2 | | 0.17 | 0.0496429 | 0.059488 | 0.24 | 4.0344538 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 4 | |
| EU-01 | IVEU01RC301 | Eu-152 | 0.0416 | | | | 2 | | | | 0.0208 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | K-40 | 60 | 5 | 5 | 5 | | 22 | 20.6 | 1.67332 | 30 | 17.928429 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | Pu-238 | 2.97 | 5 | 5 | | | 0.007 | 0.0028 | 0.00295 | 1.485 | 503.46215 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Ra-226 | 5 | 5 | 5 | 5 | | 1.1 | 0.84 | 0.237592 | 2.5 | 10.522236 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Sr-90 | 0.231 | 5 | 5 | | | 0.041 | 0.0248 | 0.01167 | 0.1155 | 9.8967689 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Th-228 | 3.2 | 5 | 5 | | | 1.5 | 0.938 | 0.384734 | 1.6 | 4.158721 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Th-230 | 3.49 | 5 | 5 | | | 1.8 | 0.946 | 0.560785 | 1.745 | 3.1117086 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Th-232 | 3.1 | 5 | 5 | | | 1.6 | 1 | 0.475973 | 1.55 | 3.2564894 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Tritium (H-3) | 2.28 | 5 | 5 | | | 0.067 | -0.0092 | 0.04651 | 1.14 | 24.510745 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | U-235 | 0.195 | 5 | 5 | | | 0.057 | 0.0406 | 0.014993 | 0.0975 | 6.5028908 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | U-238 | 2.6 | 5 | 5 | | | 1.4 | 0.816 | 0.383184 | 1.3 | 3.3926257 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | 12 |
| EU-02 | IVEU02RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Cs-137 | 0.48 | 8 | 8 | 6 | | 0.45 | 0.3 | 0.159553 | 0.24 | 1.5042029 | 1.5042029 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Eu-152 | 0.0416 | | | | 2 | | | | 0.0208 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | K-40 | 60 | 6 | 6 | 6 | | 22 | 20.5 | 1.378405 | 30 | 21.764288 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | Pu-238 | 2.97 | 6 | 6 | | | 0.006 | 0.0005 | 0.002811 | 1.485 | 528.33929 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Ra-226 | 5 | 6 | 6 | 6 | | 0.84 | 0.7466667 | 0.162193 | 2.5 | 15.413707 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Sr-90 | 0.231 | 6 | 6 | | | 0.099 | 0.0553333 | 0.039993 | 0.1155 | 2.8879814 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Th-228 | 3.2 | 6 | 6 | | | 0.89 | 0.6666667 | 0.127698 | 1.6 | 12.529605 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Th-230 | 3.49 | 6 | 6 | | | 0.69 | 0.5533333 | 0.097297 | 1.745 | 17.934814 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Th-232 | 3.1 | 6 | 6 | | | 0.82 | 0.6916667 | 0.087958 | 1.55 | 17.621982 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Tritium (H-3) | 2.28 | 5 | 5 | | | -0.008 | -0.0208 | 0.014342 | 1.14 | 79.485462 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | U-235 | 0.195 | 6 | 6 | | | 0.038 | 0.0318333 | 0.006432 | 0.0975 | 15.159307 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | U-238 | 2.6 | 6 | 6 | | | 0.71 | 0.595 | 0.110589 | 1.3 | 11.755203 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | 5 |
| EU-02 | IVEU02RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-02 | IVEU02RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Cs-137 | 0.48 | 5 | 4 | 3 | | 0.15 | 0.0775 | 0.068007 | 0.24 | 3.5290302 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 8 | |
| EU-02 | IVEU02RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | K-40 | 60 | 5 | 5 | 5 | | 21 | 18.906 | 4.145984 | 30 | 7.2359186 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 8 | |
| EU-02 | IVEU02RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | Pu-238 | 2.97 | 4 | 4 | | | 0.001 | 0.00025 | 0.0005 | 1.485 | 2970 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Ra-226 | 5 | 4 | 4 | 4 | | 0.97 | 0.8725 | 0.082614 | 2.5 | 30.261377 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Sr-90 | 0.231 | 4 | 4 | | | 0.053 | 0.0345 | 0.021502 | 0.1155 | 5.3716089 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Th-228 | 3.2 | 4 | 4 | | | 1.1 | 0.985 | 0.136748 | 1.6 | 11.700359 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Th-230 | 3.49 | 4 | 4 | | | 1 | 0.875 | 0.117898 | 1.745 | 14.800897 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Th-232 | 3.1 | 4 | 4 | | | 1 | 0.875 | 0.123423 | 1.55 | 12.558398 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Tritium (H-3) | 2.28 | 1 | 1 | | | 0.042 | 0.042 | | 1.14 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 12 | |
| EU-02 | IVEU02RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | U-235 | 0.195 | 4 | 4 | | | 0.053 | 0.0485 | 0.004655 | 0.0975 | 20.94636 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | U-238 | 2.6 | 4 | 4 | | | 1.1 | 0.9275 | 0.122848 | 1.3 | 10.58217 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | 14 |
| EU-03 | IVEU03RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.76 | 1 | 0 | 27 | 27 | |
| EU-03 | IVEU03RC101 | Am-241 | 1.87 | 1 | 1 | | | -0.0149 | -0.0149 | | 0.935 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Co-60 | 0.0361 | 1 | 1 | | | 0.511 | 0.511 | | 0.01805 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Cs-137 | 0.48 | 38 | 15 | 10 | | 0.329 | 0.066777 | 0.077424 | 0.24 | 3.0998135 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Eu-152 | 0.0416 | | | | 8 | | | | 0.0208 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | K-40 | 60 | 11 | 11 | 11 | | 22.9 | 22.363636 | 0.54456 | 30 | 55.090361 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pu-238 | 2.97 | 2 | 2 | | | 0.0304 | 0.0147 | 0.022203 | 1.485 | 66.882393 | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pu-241 | 406 | 1 | 1 | | | 5.87 | 5.87 | | 203 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ra-226 | 5 | 22 | 22 | 22 | | 1.79 | 1.1235455 | 0.326421 | 2.5 | 7.6588288 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Sr-90 | 0.231 | 2 | 2 | | | -0.008 | -0.298 | 0.410122 | 0.1155 | 0.2816236 | 1.5 | 14 | | | 0 | 0 | 0 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-03 | IVEU03RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Th-228 | 3.2 | 17 | 17 | 15 | | 1.54 | 1.2853529 | 0.19613 | 1.6 | 8.1578396 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Th-230 | 3.49 | 12 | 12 | 10 | | 1.72 | 1.048 | 0.342178 | 1.745 | 5.0996921 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Th-232 | 3.1 | 28 | 28 | 26 | | 2.63 | 1.4016786 | 0.437967 | 1.55 | 3.5390765 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | U-234 | 4.01 | 11 | 11 | 10 | | 1.43 | 0.9696364 | 0.244678 | 2.005 | 8.1944344 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | U-235 | 0.195 | 11 | 11 | 9 | | 0.095 | 0.0469091 | 0.019496 | 0.0975 | 5.0010463 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | U-238 | 2.6 | 12 | 12 | 10 | | 1.44 | 0.9631667 | 0.240221 | 1.3 | 5.4116738 | 3 | 8 | 3.76 | 1 | 0 | 16 | 4 | 27 |
| EU-03 | IVEU03RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Co-60 | 0.0361 | 1 | 1 | 1 | | 0.13 | 0.13 | | 0.01805 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 6 | |
| EU-03 | IVEU03RC102 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Cs-137 | 0.48 | 15 | 12 | 4 | | 2.4 | 0.7649786 | 0.870294 | 0.24 | 0.275769 | 1.5 | 14 | 0.83 | 1 | 1 | 6 | 0 | |
| EU-03 | IVEU03RC102 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | K-40 | 60 | 6 | 6 | 6 | | 21 | 18.516667 | 2.08846 | 30 | 14.364649 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 0 | |
| EU-03 | IVEU03RC102 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | Pu-238 | 2.97 | 5 | 5 | | | 0.006 | 0.0014 | 0.00305 | 1.485 | 486.95068 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Ra-226 | 5 | 5 | 5 | 5 | | 1.3 | 1.002 | 0.205475 | 2.5 | 12.166927 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Sr-90 | 0.231 | 5 | 5 | | | 0.21 | 0.0976 | 0.083032 | 0.1155 | 1.3910313 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Th-228 | 3.2 | 5 | 5 | | | 2.5 | 1.188 | 0.799231 | 1.6 | 2.0019246 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Th-230 | 3.49 | 5 | 5 | | | 2.3 | 1.076 | 0.731116 | 1.745 | 2.3867635 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Th-232 | 3.1 | 5 | 5 | | | 2.1 | 1.102 | 0.618078 | 1.55 | 2.5077755 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Tritium (H-3) | 2.28 | 2 | 2 | | | -0.038 | -0.0385 | 0.000707 | 1.14 | 1612.2035 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 4 | |
| EU-03 | IVEU03RC102 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | U-235 | 0.195 | 5 | 5 | | | 0.1 | 0.056 | 0.029095 | 0.0975 | 3.3511289 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | U-238 | 2.6 | 5 | 5 | | | 2 | 1.056 | 0.57622 | 1.3 | 2.256081 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | 7 |
| EU-03 | IVEU03RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Cs-137 | 0.48 | 14 | 14 | 11 | | 0.44 | 0.2045455 | 0.157292 | 0.24 | 1.5258277 | 1.5258277 | 14 | 4.48 | 2 | 0 | 7 | 0 | |
| EU-03 | IVEU03RC201 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | K-40 | 60 | 14 | 14 | 14 | | 25.9 | 23.262857 | 1.704268 | 30 | 17.602865 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-03 | IVEU03RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Pu-238 | 2.97 | 5 | 5 | | | 0.001 | 0.0002 | 0.000447 | 1.485 | 3320.5609 | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 2 | |
| EU-03 | IVEU03RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Ra-226 | 5 | 11 | 11 | 11 | | 0.989 | 0.8558182 | 0.086838 | 2.5 | 28.789382 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Sr-90 | 0.231 | 5 | 5 | | | 0.053 | 0.0356 | 0.009839 | 0.1155 | 11.739357 | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 2 | |
| EU-03 | IVEU03RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Th-228 | 3.2 | 14 | 14 | 9 | | 1.53 | 1.3135714 | 0.139041 | 1.6 | 11.507392 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | Th-230 | 3.49 | 11 | 11 | 6 | | 1.01 | 0.8790909 | 0.117555 | 1.745 | 14.844162 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | Th-232 | 3.1 | 14 | 14 | 9 | | 1.51 | 1.1758571 | 0.189071 | 1.55 | 8.1979807 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | U-234 | 4.01 | 6 | 6 | 6 | | 0.864 | 0.823 | 0.054487 | 2.005 | 36.797974 | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 1 | |
| EU-03 | IVEU03RC201 | U-235 | 0.195 | 11 | 11 | 6 | | 0.061 | 0.0452727 | 0.010743 | 0.0975 | 9.0754361 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | U-238 | 2.6 | 11 | 11 | 6 | | 0.96 | 0.806 | 0.081901 | 1.3 | 15.872791 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | 7 |
| EU-03 | IVEU03RC202 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | 1 |
| EU-03 | IVEU03RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-03 | IVEU03RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Cs-137 | 0.48 | 1 | | | | | 0.0495 | | 0.24 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 7 | |
| EU-03 | IVEU03RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | 8 |
| EU-04 | IVEU04RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | Am-241 | 1.87 | 33 | 21 | | | 0.204 | 0.0591874 | 0.048819 | 0.935 | 19.152383 | 3 | 11 | 2.53 | 1 | 0 | 14 | 0 | |
| EU-04 | IVEU04RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Co-60 | 0.0361 | 99 | 25 | 1 | 13 | 0.095 | 0.0114768 | 0.017986 | 0.01805 | 1.0035507 | 1.0035507 | 23 | 2.53 | 1 | 0 | 30 | 0 | |
| EU-04 | IVEU04RC101 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Cs-137 | 0.48 | 155 | 131 | 85 | | 4.886 | 0.3919071 | 0.734989 | 0.24 | 0.3265355 | 0.3265355 | 243 | 2.53 | 1 | 1 | 308 | 153 | |
| EU-04 | IVEU04RC101 | Eu-152 | 0.0416 | | | | 12 | | | | 0.0208 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | K-40 | 60 | 81 | 81 | 80 | | 22 | 19.68284 | 1.141495 | 30 | 26.281327 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | Pu-238 | 2.97 | 26 | 26 | 3 | | 0.0614 | 0.02055 | 0.020013 | 1.485 | 74.203201 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Pu-241 | 406 | 21 | 21 | | | 6.56 | 2.8249524 | 1.587545 | 203 | 127.87038 | 3 | 11 | 2.53 | 1 | 0 | 14 | 0 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-04 | IVEU04RC101 | Ra-226 | 5 | 94 | 91 | 91 | | 1.63 | 0.7744681 | 0.228305 | 2.5 | 10.950243 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Sr-90 | 0.231 | 23 | 23 | | | 0.947 | 0.2794957 | 0.422943 | 0.1155 | 0.2730862 | 1.5 | 14 | 2.53 | 1 | 1 | 18 | 0 | |
| EU-04 | IVEU04RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Th-228 | 3.2 | 23 | 23 | | | 13.7 | 1.6556957 | 2.632156 | 1.6 | 0.6078666 | 0.6078666 | 64 | 2.53 | 1 | 1 | 81 | 58 | |
| EU-04 | IVEU04RC101 | Th-230 | 3.49 | 23 | 23 | | | 1.77 | 1.0396087 | 0.278322 | 1.745 | 6.2697228 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Th-232 | 3.1 | 35 | 35 | 12 | | 1.94 | 1.0928286 | 0.255768 | 1.55 | 6.0601744 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | U-234 | 4.01 | 21 | 21 | | | 1.26 | 0.8575238 | 0.187675 | 2.005 | 10.683338 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | U-235 | 0.195 | 113 | 105 | 82 | 3 | 0.68 | 0.0628823 | 0.071187 | 0.0975 | 1.3696403 | 1.3696403 | 17 | 2.53 | 1 | 0 | 22 | 0 | |
| EU-04 | IVEU04RC101 | U-238 | 2.6 | 114 | 110 | 87 | | 1.95 | 0.8202982 | 0.291045 | 1.3 | 4.4666597 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | 19 |
| EU-04 | IVEU04RC102 | Ac-228 | 3.2 | 41 | 41 | | | 1.4 | 1.1358537 | 0.123268 | 1.6 | 12.979901 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Am-241 | 1.87 | 41 | 41 | | | 0.105 | -0.002 | 0.044612 | 0.935 | 20.958647 | 3 | 11 | 0.64 | 1 | 0 | 4 | 0 | |
| EU-04 | IVEU04RC102 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Co-60 | 0.0361 | 41 | 41 | | | 0.055 | 0.0010237 | 0.024158 | 0.01805 | 0.7471536 | 0.7471536 | 40 | 0.64 | 1 | 1 | 13 | 0 | |
| EU-04 | IVEU04RC102 | Cs-134 | 0.157 | 41 | 41 | | | 0.066 | 0.0004902 | 0.023172 | 0.0785 | 3.3876862 | 3 | 11 | 0.64 | 1 | 0 | 4 | 0 | |
| EU-04 | IVEU04RC102 | Cs-137 | 0.48 | 47 | 40 | | | 0.068 | 0.0082309 | 0.025306 | 0.24 | 9.4840592 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Eu-152 | 0.0416 | 41 | 41 | | 6 | 0.09 | -0.014244 | 0.047061 | 0.0208 | 0.4419794 | 0.4419794 | 107 | 0.64 | 1 | 1 | 35 | 0 | |
| EU-04 | IVEU04RC102 | Eu-154 | 0.0499 | 40 | 40 | | 1 | 0.31 | 0.026525 | 0.165593 | 0.02495 | 0.1506709 | 0.1506709 | 1620 | 0.64 | 1 | 1 | 516 | 476 | |
| EU-04 | IVEU04RC102 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | K-40 | 60 | 41 | 41 | | | 23.5 | 20.519512 | 1.534148 | 30 | 19.554829 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Pb-210 | 5 | 1 | 1 | | | 1.39 | 1.39 | | 2.5 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 4 | |
| EU-04 | IVEU04RC102 | Pu-238 | 2.97 | 41 | 41 | | | 0.049 | -0.000149 | 0.015319 | 1.485 | 96.938277 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Pu-241 | 406 | 41 | 35 | | | 4 | 1.2934146 | 1.117581 | 203 | 181.64226 | 3 | 11 | 0.64 | 1 | 0 | 4 | 0 | |
| EU-04 | IVEU04RC102 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Sr-90 | 0.231 | 41 | 40 | | | 0.28 | 0.058561 | 0.118019 | 0.1155 | 0.9786571 | 0.9786571 | 31 | 0.64 | 1 | 1 | 10 | 0 | |
| EU-04 | IVEU04RC102 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Th-232 | 3.1 | 41 | 41 | | | 1.4 | 1.1358537 | 0.123268 | 1.55 | 12.574279 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Tritium (H-3) | 2.28 | 41 | 40 | | | 1.4 | 0.2437317 | 0.432301 | 1.14 | 2.6370494 | 2.6370494 | 9 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | U-234 | 4.01 | 47 | 47 | | | 1.22 | 0.9004255 | 0.144146 | 2.005 | 13.909506 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | U-235 | 0.195 | 47 | 47 | | | 0.089 | 0.042 | 0.020632 | 0.0975 | 4.7255788 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | U-238 | 2.6 | 47 | 47 | | | 1.31 | 0.9655319 | 0.162986 | 1.3 | 7.9761529 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | 5 |
| EU-04 | IVEU04RC103 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Cs-137 | 0.48 | 14 | 12 | 9 | | 2.93 | 0.4292857 | 0.746205 | 0.24 | 0.3216273 | 0.3216273 | 243 | 1.15 | 1 | 1 | 140 | 126 | |
| EU-04 | IVEU04RC103 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-04 | IVEU04RC103 | Eu-155 | 3.8 | 1 | 1 | 1 | | 0.06 | 0.06 | | 1.9 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 8 | |
| EU-04 | IVEU04RC103 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | K-40 | 60 | 6 | 6 | 3 | | 22 | 20.381667 | 2.939132 | 30 | 10.207095 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 3 | |
| EU-04 | IVEU04RC103 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Pu-238 | 2.97 | 3 | 2 | | | 0.002 | 0.0013333 | 0.001155 | 1.485 | 1286.0477 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Ra-226 | 5 | 3 | 3 | 3 | | 1.1 | 0.9133333 | 0.176163 | 2.5 | 14.191418 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Sr-90 | 0.231 | 3 | 3 | | | 0.095 | 0.071 | 0.02506 | 0.1155 | 4.6089518 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Th-228 | 3.2 | 3 | 3 | | | 1.3 | 0.9866667 | 0.289194 | 1.6 | 5.5326128 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Th-230 | 3.49 | 3 | 3 | | | 1.2 | 0.8366667 | 0.325935 | 1.745 | 5.3538355 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Th-232 | 3.1 | 3 | 3 | | | 1.4 | 1.0233333 | 0.365559 | 1.55 | 4.2400824 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Tritium (H-3) | 2.28 | 3 | 3 | | | 0.02 | 0.007 | 0.014107 | 1.14 | 80.812457 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | U-235 | 0.195 | 6 | 6 | | | 0.06 | 0.0493333 | 0.010073 | 0.0975 | 9.679277 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 3 | |
| EU-04 | IVEU04RC103 | U-238 | 2.6 | 3 | 3 | | | 0.86 | 0.78 | 0.13 | 1.3 | 10 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | 9 |
| EU-04 | IVEU04RC104 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Cs-137 | 0.48 | 14 | 5 | 2 | | 0.23 | 0.0386821 | 0.060684 | 0.24 | 3.9549077 | 3 | 8 | 1.98 | 1 | 0 | 8 | 0 | |
| EU-04 | IVEU04RC104 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | K-40 | 60 | 4 | 4 | 4 | | 21 | 20.5 | 1 | 30 | 30 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | Pu-238 | 2.97 | 4 | 4 | | | 0.007 | 0 | 0.00483 | 1.485 | 307.42421 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Ra-226 | 5 | 4 | 4 | 4 | | 0.83 | 0.755 | 0.050662 | 2.5 | 49.346377 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Sr-90 | 0.231 | 4 | 4 | | | 0.042 | 0.01275 | 0.023514 | 0.1155 | 4.9119297 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Th-228 | 3.2 | 4 | 4 | | | 1.3 | 1.1 | 0.270801 | 1.6 | 5.9083916 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Th-230 | 3.49 | 4 | 4 | | | 1.3 | 0.96 | 0.313794 | 1.745 | 5.5609733 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Th-232 | 3.1 | 4 | 4 | | | 1.1 | 0.985 | 0.23 | 1.55 | 6.7391304 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Tritium (H-3) | 2.28 | 1 | 1 | | | 0.008 | 0.008 | | 1.14 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 13 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-04 | IVEU04RC104 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | U-235 | 0.195 | 4 | 4 | | | 0.07 | 0.05325 | 0.012366 | 0.0975 | 7.8845553 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | U-238 | 2.6 | 4 | 4 | | | 1.3 | 0.94 | 0.277609 | 1.3 | 4.682848 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | 15 |
| EU-04 | IVEU04RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Cs-137 | 0.48 | 2 | 2 | 2 | | 0.13 | 0.11 | 0.028284 | 0.24 | 8.4852814 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | K-40 | 60 | 2 | 2 | 2 | | 23 | 21.5 | 2.12132 | 30 | 14.142136 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | Pu-238 | 2.97 | 2 | 2 | | | 0.001 | 0 | 0.001414 | 1.485 | 1050.0536 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Ra-226 | 5 | 2 | 2 | 2 | | 0.87 | 0.825 | 0.06364 | 2.5 | 39.28371 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Sr-90 | 0.231 | 2 | 2 | | | 0.049 | 0.036 | 0.018385 | 0.1155 | 6.2823718 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Th-228 | 3.2 | 2 | 2 | | | 0.82 | 0.705 | 0.162635 | 1.6 | 9.8380074 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Th-230 | 3.49 | 2 | 2 | | | 0.65 | 0.64 | 0.014142 | 1.745 | 123.39013 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Th-232 | 3.1 | 2 | 2 | | | 0.9 | 0.805 | 0.13435 | 1.55 | 11.537005 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.027 | 0.0215 | 0.007778 | 1.14 | 146.56395 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | U-235 | 0.195 | 2 | 2 | | | 0.04 | 0.036 | 0.005657 | 0.0975 | 17.235728 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | U-238 | 2.6 | 2 | 2 | | | 0.72 | 0.71 | 0.014142 | 1.3 | 91.923882 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | 11 |
| EU-05 | IVEU05RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Cs-137 | 0.48 | 2 | 2 | | | | | | 0.24 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 0 | |
| EU-05 | IVEU05RC101 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | K-40 | 60 | 2 | 2 | 2 | | 23.6 | 22.9 | 0.989949 | 30 | 30.304576 | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 0 | |
| EU-05 | IVEU05RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-05 | IVEU05RC101 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Ra-226 | 5 | 2 | 2 | 1 | | 0.82 | 0.82 | | 2.5 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 0 | |
| EU-05 | IVEU05RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | 1 |
| EU-05 | IVEU05RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Co-60 | 0.0361 | 1 | 1 | 1 | | 0.04 | 0.04 | | 0.01805 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Cs-137 | 0.48 | 1 | 1 | 1 | | 0.53 | 0.53 | | 0.24 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | K-40 | 60 | 1 | 1 | 1 | | 20 | 20 | | 30 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Pu-238 | 2.97 | 1 | 1 | | | 0 | 0 | | 1.485 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Ra-226 | 5 | 1 | 1 | 1 | | 0.88 | 0.88 | | 2.5 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Sr-90 | 0.231 | 1 | 1 | | | 0.056 | 0.056 | | 0.1155 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Th-228 | 3.2 | 1 | 1 | | | 1.1 | 1.1 | | 1.6 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Th-230 | 3.49 | 1 | 1 | | | 0.79 | 0.79 | | 1.745 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Th-232 | 3.1 | 1 | 1 | | | 1.1 | 1.1 | | 1.55 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | U-235 | 0.195 | 1 | 1 | | | 0.045 | 0.045 | | 0.0975 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | U-238 | 2.6 | 1 | 1 | | | 0.76 | 0.76 | | 1.3 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | 7 |
| EU-05 | IVEU05RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-05 | IVEU05RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | 1 |
| EU-05 | IVEU05RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Cs-137 | 0.48 | 4 | 4 | 4 | | 0.13 | 0.0975 | 0.045735 | 0.24 | 5.2476517 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Eu-155 | 3.8 | 2 | 2 | 2 | | 0.11 | 0.075 | 0.049497 | 1.9 | 38.385797 | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 14 | |
| EU-05 | IVEU05RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | K-40 | 60 | 4 | 4 | 4 | | 23 | 20.5 | 1.732051 | 30 | 17.320508 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | Pu-238 | 2.97 | 4 | 2 | | | -0.001 | 0.00125 | 0.002872 | 1.485 | 517.01064 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Ra-226 | 5 | 4 | 4 | 4 | | 1.4 | 1.0025 | 0.277654 | 2.5 | 9.0040167 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Sr-90 | 0.231 | 4 | 4 | | | 0.059 | 0.0365 | 0.018157 | 0.1155 | 6.3612793 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-05 | IVEU05RC301 | Th-228 | 3.2 | 4 | 4 | | | 1.2 | 0.7775 | 0.332202 | 1.6 | 4.8163431 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Th-230 | 3.49 | 4 | 4 | | | 0.96 | 0.71 | 0.173013 | 1.745 | 10.085975 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Th-232 | 3.1 | 4 | 4 | | | 1.1 | 0.765 | 0.287228 | 1.55 | 5.3964073 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.057 | 0.027 | 0.042426 | 1.14 | 26.870058 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 13 | |
| EU-05 | IVEU05RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | U-235 | 0.195 | 4 | 4 | | | 0.082 | 0.0455 | 0.024906 | 0.0975 | 3.914642 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | U-238 | 2.6 | 4 | 4 | | | 1.4 | 0.94 | 0.332165 | 1.3 | 3.9137221 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | 16 |
| EU-06 | IVEU06RC101 | Ac-228 | 3.2 | 222 | 222 | | | 2.09 | 1.1898649 | 0.226357 | 1.6 | 7.0684771 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Am-241 | 1.87 | 233 | 231 | | | 0.14 | 0.0103588 | 0.032569 | 0.935 | 28.708554 | 3 | 11 | 4.99 | 1 | 0 | 28 | 0 | |
| EU-06 | IVEU06RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Co-60 | 0.0361 | 233 | 233 | | 12 | 0.076 | 0.0011923 | 0.027993 | 0.01805 | 0.6448024 | 0.6448024 | 52 | 4.99 | 1 | 1 | 130 | 0 | |
| EU-06 | IVEU06RC101 | Cs-134 | 0.157 | 245 | 232 | | | 0.11 | 0.0035922 | 0.035645 | 0.0785 | 2.202299 | 2.202299 | 12 | 4.99 | 1 | 0 | 30 | 0 | |
| EU-06 | IVEU06RC101 | Cs-137 | 0.48 | 280 | 267 | 7 | | 5.84 | 0.3643613 | 0.705579 | 0.24 | 0.3401461 | 0.3401461 | 243 | 4.99 | 1 | 1 | 607 | 327 | |
| EU-06 | IVEU06RC101 | Eu-152 | 0.0416 | 230 | 230 | | 3 | 0.62 | -0.02671 | 0.216895 | 0.0208 | 0.0958989 | 0.0958989 | #N/A | 4.99 | 1 | 1 | #N/A | #N/A | |
| EU-06 | IVEU06RC101 | Eu-154 | 0.0499 | 231 | 231 | | 2 | 0.63 | 0.006174 | 0.204947 | 0.02495 | 0.1217385 | 0.1217385 | 1620 | 4.99 | 1 | 1 | 4041 | 3810 | |
| EU-06 | IVEU06RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | K-40 | 60 | 253 | 253 | 20 | | 27.2 | 20.836482 | 2.429071 | 30 | 12.350398 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Na-22 | 0.0865 | 136 | 136 | | | 0.087 | -7.35E-06 | 0.037355 | 0.04325 | 1.1577984 | 1.1577984 | 21 | 4.99 | 1 | 0 | 53 | 0 | |
| EU-06 | IVEU06RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 4.99 | 1 | 0 | 35 | 35 | |
| EU-06 | IVEU06RC101 | Pu-238 | 2.97 | 238 | 238 | 1 | | 0.077 | 0.0030391 | 0.012638 | 1.485 | 117.50371 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 4.99 | 1 | 0 | 35 | 35 | |
| EU-06 | IVEU06RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Pu-241 | 406 | 233 | 232 | | | 4.9 | -0.209206 | 1.329399 | 203 | 152.70054 | 3 | 11 | 4.99 | 1 | 0 | 28 | 0 | |
| EU-06 | IVEU06RC101 | Ra-226 | 5 | 140 | 134 | 4 | | 7.1 | 1.7916429 | 1.195381 | 2.5 | 2.0913842 | 2.0913842 | 10 | 4.99 | 1 | 0 | 25 | 0 | |
| EU-06 | IVEU06RC101 | Ra-228 | 3.2 | 125 | 125 | | | 2.09 | 1.20816 | 0.270237 | 1.6 | 5.9207287 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Sr-90 | 0.231 | 236 | 234 | | 1 | 28.1 | 0.3781949 | 1.84745 | 0.1155 | 0.0625186 | 1.5 | 14 | 4.99 | 1 | 1 | 35 | 0 | |
| EU-06 | IVEU06RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Th-228 | 3.2 | 140 | 140 | | | 2.53 | 1.2400714 | 0.273229 | 1.6 | 5.8558991 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Th-230 | 3.49 | 140 | 140 | | | 1.64 | 0.9690714 | 0.237735 | 1.745 | 7.3401117 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Th-232 | 3.1 | 374 | 374 | 12 | | 2.36 | 1.1851337 | 0.252278 | 1.55 | 6.1440079 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 4.99 | 1 | 0 | 35 | 35 | |
| EU-06 | IVEU06RC101 | U-234 | 4.01 | 233 | 233 | | | 9.6 | 0.9987897 | 0.664471 | 2.005 | 3.017437 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | U-235 | 0.195 | 237 | 236 | | | 0.73 | 0.0546793 | 0.057508 | 0.0975 | 1.6954299 | 1.6954299 | 13 | 4.99 | 1 | 0 | 33 | 0 | |
| EU-06 | IVEU06RC101 | U-238 | 2.6 | 252 | 252 | 12 | | 8.6 | 0.9189603 | 0.60733 | 1.3 | 2.1405184 | 2.1405184 | 10 | 4.99 | 1 | 0 | 25 | 0 | 38 |
| EU-06 | IVEU06RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Cs-134 | 0.157 | 1 | 1 | 1 | | 0.03 | 0.03 | | 0.0785 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 22 | |
| EU-06 | IVEU06RC102 | Cs-137 | 0.48 | 25 | 2 | 2 | | 0.09 | 0.045036 | 0.013549 | 0.24 | 17.713569 | 3 | 8 | 3.00 | 1 | 0 | 13 | 0 | |
| EU-06 | IVEU06RC102 | Eu-152 | 0.0416 | 8 | 8 | | 14 | 2.84 | 1.31375 | 0.645909 | 0.0208 | 0.0322027 | 1.5 | 15 | 3.00 | 1 | 1 | 23 | 15 | |
| EU-06 | IVEU06RC102 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | K-40 | 60 | 3 | 3 | 3 | | 23 | 21 | 2 | 30 | 15 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-06 | IVEU06RC102 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | Pu-238 | 2.97 | 3 | 3 | | | 0 | 0 | 0 | 1.485 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Ra-226 | 5 | 3 | 3 | 3 | | 0.91 | 0.8766667 | 0.057735 | 2.5 | 43.30127 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Sr-90 | 0.231 | 3 | 3 | | | 0.028 | 0.0196667 | 0.009074 | 0.1155 | 12.728996 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Th-228 | 3.2 | 3 | 3 | | | 1.4 | 1.2233333 | 0.225019 | 1.6 | 7.1105259 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Th-230 | 3.49 | 3 | 3 | | | 1.3 | 1.0233333 | 0.24379 | 1.745 | 7.1578136 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Th-232 | 3.1 | 3 | 3 | | | 1.2 | 1.1266667 | 0.127017 | 1.55 | 12.203085 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | U-235 | 0.195 | 3 | 3 | | | 0.052 | 0.0446667 | 0.011846 | 0.0975 | 8.2304616 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | U-238 | 2.6 | 3 | 3 | | | 0.98 | 0.93 | 0.043589 | 1.3 | 29.824045 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | 23 |
| EU-06 | IVEU06RC103 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 25 | |
| EU-06 | IVEU06RC103 | Am-241 | 1.87 | 19 | 19 | | | 0.018 | -0.001263 | 0.007915 | 0.935 | 118.12834 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Cm-243/244 | 0.349 | 19 | 19 | | | 0.026 | 0.0022653 | 0.006958 | 0.1745 | 25.077939 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | Co-60 | 0.0361 | 37 | 37 | | | 0.0071 | 0.0004649 | 0.003572 | 0.01805 | 5.0528961 | 3 | 11 | 3.46 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC103 | Cs-134 | 0.157 | 37 | 37 | | | 0.007 | -0.020032 | 0.021073 | 0.0785 | 3.7251187 | 3 | 11 | 3.46 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC103 | Cs-137 | 0.48 | 40 | 40 | 1 | | 0.746 | 0.04685 | 0.140849 | 0.24 | 1.7039481 | 1.7039481 | 12 | 3.46 | 1 | 0 | 21 | 0 | |
| EU-06 | IVEU06RC103 | Eu-152 | 0.0416 | 37 | 37 | | | 0.024 | -0.004838 | 0.014739 | 0.0208 | 1.4111809 | 1.4111809 | 16 | 3.46 | 1 | 0 | 28 | 0 | |
| EU-06 | IVEU06RC103 | Eu-154 | 0.0499 | 37 | 37 | | | 0.03 | 0.0010541 | 0.017602 | 0.02495 | 1.4174527 | 1.4174527 | 16 | 3.46 | 1 | 0 | 28 | 0 | |
| EU-06 | IVEU06RC103 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Fe-55 | 2690 | 19 | 19 | | | 6 | -2.463158 | 2.640962 | 1345 | 509.28419 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | K-40 | 60 | 39 | 39 | 2 | | 27.72 | 22.066667 | 1.685452 | 30 | 17.799378 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Na-22 | 0.0865 | 37 | 37 | | | 0.014 | 0.0004189 | 0.006723 | 0.04325 | 6.4328583 | 3 | 11 | 3.46 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC103 | Ni-59 | 208 | 19 | 19 | | | 720 | -254.7368 | 480.0274 | 104 | 0.2166543 | 0.2166543 | 410 | 3.46 | 1 | 1 | 711 | 692 | |
| EU-06 | IVEU06RC103 | Ni-63 | 94.8 | 19 | 19 | | | 2.1 | 0.1736842 | 0.910337 | 47.4 | 52.06863 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 25 | |
| EU-06 | IVEU06RC103 | Pu-238 | 2.97 | 20 | 20 | | | 0.012 | -0.000615 | 0.003267 | 1.485 | 454.53088 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 25 | |
| EU-06 | IVEU06RC103 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Pu-241 | 406 | 19 | 19 | | | 3.2 | -1.083684 | 2.534419 | 203 | 80.09725 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | Ra-226 | 5 | 1 | 1 | 1 | | 0.62 | 0.62 | | 2.5 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 24 | |
| EU-06 | IVEU06RC103 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 25 | |
| EU-06 | IVEU06RC103 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Sr-90 | 0.231 | 20 | 20 | | | 0.039 | -0.0012 | 0.026704 | 0.1155 | 4.3251578 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Th-228 | 3.2 | 20 | 19 | | | 0.98 | 0.106 | 0.323458 | 1.6 | 4.946542 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Th-230 | 3.49 | 20 | 20 | | | 0.85 | 0.199 | 0.200604 | 1.745 | 8.6987147 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Th-232 | 3.1 | 20 | 20 | | | 1.08 | 0.2169 | 0.253824 | 1.55 | 6.1066036 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Tritium (H-3) | 2.28 | 19 | 19 | | | 1 | 0.0736842 | 0.409393 | 1.14 | 2.7846128 | 2.7846128 | 9 | 3.46 | 1 | 0 | 16 | 0 | |
| EU-06 | IVEU06RC103 | U-234 | 4.01 | 19 | 19 | | | 0.91 | 0.5684737 | 0.152542 | 2.005 | 13.143896 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | U-235 | 0.195 | 20 | 20 | | | 0.101 | 0.05625 | 0.023697 | 0.0975 | 4.114379 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | U-238 | 2.6 | 20 | 20 | | | 0.87 | 0.5534 | 0.161954 | 1.3 | 8.0269711 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | 26 |
| EU-06 | IVEU06RC104 | Ac-228 | 3.2 | 39 | 39 | | | 1.34 | 1.0411026 | 0.204488 | 1.6 | 7.8244235 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Am-241 | 1.87 | 39 | 39 | | | 0.86 | 0.0195256 | 0.147325 | 0.935 | 6.3465222 | 3 | 11 | 0.77 | 1 | 0 | 5 | 0 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-06 | IVEU06RC104 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Co-60 | 0.0361 | 39 | 39 | | | 0.045 | 0.0028718 | 0.023998 | 0.01805 | 0.7521459 | 0.7521459 | 40 | 0.77 | 1 | 1 | 16 | 0 | |
| EU-06 | IVEU06RC104 | Cs-134 | 0.157 | 39 | 39 | | | 0.027 | 0.0012154 | 0.014679 | 0.0785 | 5.3479341 | 3 | 11 | 0.77 | 1 | 0 | 5 | 0 | |
| EU-06 | IVEU06RC104 | Cs-137 | 0.48 | 39 | 39 | | | 0.05 | -0.000657 | 0.019644 | 0.24 | 12.217762 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Eu-152 | 0.0416 | 39 | 39 | | | 0.091 | -0.016597 | 0.046932 | 0.0208 | 0.4431943 | 0.4431943 | 107 | 0.77 | 1 | 1 | 42 | 3 | |
| EU-06 | IVEU06RC104 | Eu-154 | 0.0499 | 39 | 39 | | | 0.23 | -0.000462 | 0.141473 | 0.02495 | 0.1763589 | 0.1763589 | 1620 | 0.77 | 1 | 1 | 626 | 587 | |
| EU-06 | IVEU06RC104 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | K-40 | 60 | 39 | 39 | | | 23.4 | 20.279487 | 1.423705 | 30 | 21.071778 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Pu-238 | 2.97 | 39 | 39 | | | 0.025 | 0.0018538 | 0.010836 | 1.485 | 137.04474 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Pu-241 | 406 | 39 | 38 | | | 1.2 | 0.3594872 | 0.601533 | 203 | 337.47115 | 3 | 11 | 0.77 | 1 | 0 | 5 | 0 | |
| EU-06 | IVEU06RC104 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Sr-90 | 0.231 | 39 | 39 | | | 0.38 | 0.0688974 | 0.176257 | 0.1155 | 0.6552949 | 0.6552949 | 64 | 0.77 | 1 | 1 | 25 | 0 | |
| EU-06 | IVEU06RC104 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Th-232 | 3.1 | 39 | 39 | | | 1.4 | 1.0766667 | 0.126851 | 1.55 | 12.21904 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | U-234 | 4.01 | 39 | 39 | | | 1.81 | 0.8305128 | 0.222509 | 2.005 | 9.0108713 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | U-235 | 0.195 | 39 | 39 | | | 0.08 | 0.0342564 | 0.020997 | 0.0975 | 4.6434895 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | U-238 | 2.6 | 39 | 39 | | | 1.51 | 0.8361538 | 0.182376 | 1.3 | 7.1281172 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | 6 |
| EU-06 | IVEU06RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-06 | IVEU06RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | 6 |
| EU-07 | IVEU07RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 4.77 | 1 | 0 | 34 | 34 | |
| EU-07 | IVEU07RC101 | Am-241 | 1.87 | 22 | 21 | | | 0.18 | 0.0509545 | 0.124486 | 0.935 | 7.5108974 | 3 | 11 | 4.77 | 1 | 0 | 27 | 5 | |
| EU-07 | IVEU07RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Co-60 | 0.0361 | 1 | 1 | 1 | 12 | 0.04 | 0.04 | | 0.01805 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 35 | |
| EU-07 | IVEU07RC101 | Cs-134 | 0.157 | 13 | 1 | 1 | | 0.04 | 0.0723077 | 0.009707 | 0.0785 | 8.0867364 | 3 | 11 | 4.77 | 1 | 0 | 27 | 14 | |
| EU-07 | IVEU07RC101 | Cs-137 | 0.48 | 58 | 43 | 22 | | 2.93 | 0.4364224 | 0.615021 | 0.24 | 0.3902307 | 0.3902307 | 243 | 4.77 | 1 | 1 | 580 | 522 | |
| EU-07 | IVEU07RC101 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | K-40 | 60 | 34 | 34 | 34 | | 24.27 | 18.385 | 2.864011 | 30 | 10.47482 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 4.77 | 1 | 0 | 34 | 34 | |
| EU-07 | IVEU07RC101 | Pu-238 | 2.97 | 42 | 41 | 8 | | 0.16 | 0.0143483 | 0.032277 | 1.485 | 46.008173 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 4.77 | 1 | 0 | 34 | 34 | |
| EU-07 | IVEU07RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Ra-226 | 5 | 22 | 22 | 22 | | 2.16 | 0.9695 | 0.392234 | 2.5 | 6.3737544 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Ra-228 | 3.2 | 11 | 11 | 11 | | 2.87 | 1.56 | 0.561818 | 1.6 | 2.8478949 | 2.8478949 | 8 | 4.77 | 1 | 0 | 20 | 9 | |
| EU-07 | IVEU07RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Sr-90 | 0.231 | 33 | 33 | | | 3.08 | 0.2340303 | 0.570281 | 0.1155 | 0.2025316 | 1.5 | 14 | 4.77 | 1 | 1 | 34 | 1 | |
| EU-07 | IVEU07RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Th-228 | 3.2 | 44 | 44 | 11 | | 2.69 | 1.3488409 | 0.459015 | 1.6 | 3.4857236 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Th-230 | 3.49 | 33 | 33 | | | 2.7 | 1.1875758 | 0.544025 | 1.745 | 3.207576 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Th-232 | 3.1 | 56 | 56 | 23 | | 2.87 | 1.1242857 | 0.41125 | 1.55 | 3.7689948 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Tritium (H-3) | 2.28 | 4 | 4 | | | -0.031 | -0.049 | 0.02953 | 1.14 | 38.605271 | 1.5 | 14 | 4.77 | 1 | 0 | 34 | 30 | |
| EU-07 | IVEU07RC101 | U-234 | 4.01 | 22 | 22 | | | 1.71 | 1.1054545 | 0.338452 | 2.005 | 5.9240299 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | U-235 | 0.195 | 22 | 22 | 4 | | 0.167 | 0.0646667 | 0.046168 | 0.0975 | 2.1118328 | 2.1118328 | 10 | 4.77 | 1 | 0 | 24 | 2 | |
| EU-07 | IVEU07RC101 | U-238 | 2.6 | 56 | 56 | 21 | | 3.56 | 1.0551852 | 0.618052 | 1.3 | 2.1033845 | 2.1033845 | 10 | 4.77 | 1 | 0 | 24 | 0 | 36 |
| EU-07 | IVEU07RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Cs-137 | 0.48 | 6 | 2 | 2 | | 0.53 | 0.12975 | 0.196714 | 0.24 | 1.2200473 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Eu-152 | 0.0416 | | | | 4 | | | | 0.0208 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-07 | IVEU07RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | K-40 | 60 | 2 | 2 | 2 | | 20 | 19.5 | 0.707107 | 30 | 42.426407 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Pu-238 | 2.97 | 2 | 2 | | | 0 | -0.0005 | 0.000707 | 1.485 | 2100.1071 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Ra-226 | 5 | 2 | 2 | 2 | | 0.86 | 0.84 | 0.028284 | 2.5 | 88.388348 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Sr-90 | 0.231 | 2 | 2 | | | 0.076 | 0.046 | 0.042426 | 0.1155 | 2.7223611 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Th-228 | 3.2 | 2 | 2 | | | 0.71 | 0.69 | 0.028284 | 1.6 | 56.568542 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Th-230 | 3.49 | 2 | 2 | | | 0.59 | 0.59 | 0 | 1.745 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Th-232 | 3.1 | 2 | 2 | | | 0.76 | 0.75 | 0.014142 | 1.55 | 109.60155 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.024 | 0.024 | 0 | 1.14 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | U-235 | 0.195 | 2 | 2 | | | 0.043 | 0.0395 | 0.00495 | 0.0975 | 19.697975 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | U-238 | 2.6 | 2 | 2 | | | 0.78 | 0.7 | 0.113137 | 1.3 | 11.490485 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | 2 |
| EU-07 | IVEU07RC202 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-07 | IVEU07RC202 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | 6 |
| EU-07 | IVEU07RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Cs-137 | 0.48 | 2 | 1 | 1 | | 0.19 | 0.1 | 0.127279 | 0.24 | 1.8856181 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | K-40 | 60 | 2 | 2 | 2 | | 19 | 17.5 | 2.12132 | 30 | 14.142136 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Pu-238 | 2.97 | 2 | 2 | | | 0.005 | 0.002 | 0.004243 | 1.485 | 350.01786 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Ra-226 | 5 | 2 | 2 | 2 | | 0.91 | 0.775 | 0.190919 | 2.5 | 13.09457 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Sr-90 | 0.231 | 2 | 2 | | | 0.088 | 0.072 | 0.022627 | 0.1155 | 5.1044271 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Th-228 | 3.2 | 2 | 2 | | | 1.2 | 1.08 | 0.169706 | 1.6 | 9.4280904 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Th-230 | 3.49 | 2 | 2 | | | 1 | 0.875 | 0.176777 | 1.745 | 9.8712107 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Th-232 | 3.1 | 2 | 2 | | | 1 | 0.96 | 0.056569 | 1.55 | 27.400388 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Tritium (H-3) | 2.28 | 1 | 1 | | | -0.018 | -0.018 | | 1.14 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 5 | |
| EU-07 | IVEU07RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | U-235 | 0.195 | 2 | 2 | | | 0.039 | 0.037 | 0.002828 | 0.0975 | 34.471456 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | U-238 | 2.6 | 2 | 2 | | | 0.92 | 0.795 | 0.176777 | 1.3 | 7.3539105 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | 6 |
| EU-08 | IVEU08RC101 | Ac-228 | 3.2 | 1 | 1 | | | 1.13 | 1.13 | | 1.6 | | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 17 | |
| EU-08 | IVEU08RC101 | Am-241 | 1.87 | 13 | 13 | | | 0.0451 | 0.0192877 | 0.017205 | 0.935 | 54.345105 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Co-60 | 0.0361 | 13 | 13 | | | 0.0497 | -0.002933 | 0.023157 | 0.01805 | 0.7794484 | 0.7794484 | 40 | 2.54 | 1 | 1 | 51 | 38 | |
| EU-08 | IVEU08RC101 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Cs-137 | 0.48 | 49 | 48 | 2 | | 0.18 | 0.0291519 | 0.046143 | 0.24 | 5.2012332 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Eu-152 | 0.0416 | 13 | 13 | | | 0.122 | 0.0395231 | 0.062748 | 0.0208 | 0.3314831 | 0.3314831 | 185 | 2.54 | 1 | 1 | 235 | 222 | |
| EU-08 | IVEU08RC101 | Eu-154 | 0.0499 | 13 | 13 | | | 0.166 | -0.086533 | 0.174489 | 0.02495 | 0.1429893 | 0.1429893 | 1620 | 2.54 | 1 | 1 | 2057 | 2044 | |
| EU-08 | IVEU08RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Fe-55 | 2690 | 13 | 13 | | | 1.72 | 0.0807077 | 0.621047 | 1345 | 2165.698 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | K-40 | 60 | 46 | 46 | 6 | | 30.5 | 18.502276 | 6.414922 | 30 | 4.6765962 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Ni-59 | 208 | 13 | 13 | | | 58.1 | 12.372385 | 20.62087 | 104 | 5.0434336 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | Ni-63 | 94.8 | 13 | 13 | | | 0.626 | -2.415308 | 3.310067 | 47.4 | 14.319951 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 18 | |
| EU-08 | IVEU08RC101 | Pu-238 | 2.97 | 16 | 16 | | | 0.102 | 0.0333276 | 0.032055 | 1.485 | 46.326536 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-08 | IVEU08RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 18 | |
| EU-08 | IVEU08RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Pu-241 | 406 | 13 | 13 | | | 8.61 | 2.3617692 | 2.187107 | 203 | 92.816674 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | Ra-226 | 5 | 3 | 3 | 3 | | 0.81 | 0.7766667 | 0.035119 | 2.5 | 71.18685 | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 15 | |
| EU-08 | IVEU08RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 18 | |
| EU-08 | IVEU08RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Sr-90 | 0.231 | 16 | 16 | | | 0.423 | 0.1582813 | 0.200209 | 0.1155 | 0.5768973 | 0.5768973 | 90 | 2.54 | 1 | 1 | 115 | 99 | |
| EU-08 | IVEU08RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Th-228 | 3.2 | 16 | 16 | | | 1.72 | 1.32875 | 0.242429 | 1.6 | 6.5998791 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Th-230 | 3.49 | 16 | 16 | | | 1.84 | 1.33375 | 0.326657 | 1.745 | 5.3419897 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Th-232 | 3.1 | 16 | 16 | | | 1.71 | 1.39125 | 0.241575 | 1.55 | 6.4162349 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Tritium (H-3) | 2.28 | 13 | 13 | | | 1.79 | -1.503846 | 1.422366 | 1.14 | 0.8014814 | 0.8014814 | 38 | 2.54 | 1 | 1 | 49 | 36 | |
| EU-08 | IVEU08RC101 | U-234 | 4.01 | 13 | 13 | | | 1.1 | 0.9078462 | 0.119634 | 2.005 | 16.759442 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | U-235 | 0.195 | 16 | 16 | | | 0.123 | 0.0634813 | 0.029996 | 0.0975 | 3.2504594 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | U-238 | 2.6 | 16 | 16 | | | 1.08 | 0.848 | 0.170354 | 1.3 | 7.6311793 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | 20 |
| EU-08 | IVEU08RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Am-241 | 1.87 | 58 | 58 | | | 0.118 | 0.0210341 | 0.023519 | 0.935 | 39.754841 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | Ba-133 | 0.175 | 55 | 55 | 12 | | 0.401 | 0.0322502 | 0.084397 | 0.0875 | 1.0367685 | 1.0367685 | 23 | 1.44 | 1 | 0 | 17 | 0 | |
| EU-08 | IVEU08RC102 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Co-60 | 0.0361 | 69 | 69 | 12 | | 0.09558 | 0.0046294 | 0.031462 | 0.01805 | 0.573708 | 0.573708 | 71 | 1.44 | 1 | 1 | 52 | 0 | |
| EU-08 | IVEU08RC102 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Cs-137 | 0.48 | 103 | 86 | 13 | | 0.436 | 0.0150407 | 0.057538 | 0.24 | 4.1711809 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Eu-152 | 0.0416 | 68 | 68 | 12 | | 0.844 | 0.0470391 | 0.252363 | 0.0208 | 0.0824211 | 1.5 | 15 | 1.44 | 1 | 1 | 11 | 0 | |
| EU-08 | IVEU08RC102 | Eu-154 | 0.0499 | 68 | 68 | 12 | | 0.404 | -0.041944 | 0.190007 | 0.02495 | 0.1313107 | 0.1313107 | 1620 | 1.44 | 1 | 1 | 1168 | 1100 | |
| EU-08 | IVEU08RC102 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Fe-55 | 2690 | 58 | 53 | | | 30 | 5.3380183 | 8.072759 | 1345 | 166.60971 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | K-40 | 60 | 31 | 31 | 1 | | 39.34 | 22.93469 | 8.570045 | 30 | 3.5005652 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Ni-63 | 94.8 | 58 | 58 | | | 48.5 | 4.6868858 | 6.85763 | 47.4 | 6.9120087 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Pu-238 | 2.97 | 59 | 59 | | | 0.115 | 0.0160848 | 0.025564 | 1.485 | 58.089016 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Pu-239 | 2.59 | 43 | 43 | | | 0.0302 | 0.0033621 | 0.007488 | 1.295 | 172.9384 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Pu-240 | 2.6 | 43 | 43 | | | 0.0178 | 0.0019763 | 0.004403 | 1.3 | 295.22779 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | Pu-241 | 406 | 58 | 57 | | | 3.34 | -0.528699 | 1.412299 | 203 | 143.73729 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | Ra-226 | 5 | 1 | 1 | 1 | | 0.77 | 0.77 | | 2.5 | | 1.5 | 14 | 1.44 | 1 | 0 | 11 | 10 | |
| EU-08 | IVEU08RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Sr-90 | 0.231 | 60 | 60 | | | 1.25054372 | 0.1007929 | 0.232405 | 0.1155 | 0.4969777 | 0.4969777 | 139 | 1.44 | 1 | 1 | 101 | 41 | |
| EU-08 | IVEU08RC102 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Th-228 | 3.2 | 59 | 59 | | | 1.865 | 1.1458983 | 0.246954 | 1.6 | 6.4789291 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Th-230 | 3.49 | 59 | 59 | | | 2.39 | 1.0059661 | 0.353918 | 1.745 | 4.9305197 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Th-232 | 3.1 | 59 | 59 | | | 1.842 | 1.107339 | 0.273214 | 1.55 | 5.673218 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Tritium (H-3) | 2.28 | 69 | 69 | | 1 | 11.8 | -0.449799 | 3.509829 | 1.14 | 0.3248022 | 0.3248022 | 243 | 1.44 | 1 | 1 | 176 | 107 | |
| EU-08 | IVEU08RC102 | U-234 | 4.01 | 58 | 58 | | | 1.503 | 0.7142207 | 0.287676 | 2.005 | 6.9696391 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | U-235 | 0.195 | 59 | 59 | | | 0.3399 | 0.0568914 | 0.063236 | 0.0975 | 1.5418409 | 1.5418409 | 14 | 1.44 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC102 | U-238 | 2.6 | 59 | 59 | | | 1.297 | 0.6860797 | 0.267405 | 1.3 | 4.8615353 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | 11 |
| EU-08 | IVEU08RC103 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Am-241 | 1.87 | 4 | 4 | | | 0.0302 | 0.0171625 | 0.008825 | 0.935 | 105.94828 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Ba-133 | 0.175 | 4 | 4 | | | 0.35 | 0.20525 | 0.161898 | 0.0875 | 0.5404642 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Co-60 | 0.0361 | 4 | 4 | | | 0.06106 | 0.0033278 | 0.039764 | 0.01805 | 0.4539254 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-08 | IVEU08RC103 | Cs-137 | 0.48 | 4 | 4 | | | 0.1435 | 0.0262678 | 0.079395 | 0.24 | 3.0228507 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Eu-152 | 0.0416 | 4 | 4 | | | 0.231 | 0.1365525 | 0.110647 | 0.0208 | 0.1879855 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Eu-154 | 0.0499 | 4 | 4 | | | 0.1822 | 0.03322 | 0.124283 | 0.02495 | 0.2007515 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Fe-55 | 2690 | 4 | 4 | | | 0.6198 | -0.2126 | 0.669833 | 1345 | 2007.9628 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Ni-63 | 94.8 | 4 | 4 | | | 2.14367812 | 1.6075668 | 0.554202 | 47.4 | 85.528419 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Pu-238 | 2.97 | 4 | 4 | | | 0.05504 | 0.036752 | 0.021637 | 1.485 | 68.63378 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Pu-239 | 2.59 | 4 | 4 | | | 0.0191835 | 0.006449 | 0.01002 | 1.295 | 129.24486 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Pu-240 | 2.6 | 4 | 4 | | | 0.0112665 | 0.0037875 | 0.005885 | 1.3 | 220.91524 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Pu-241 | 406 | 4 | 4 | | | -0.2519858 | -2.386284 | 2.056629 | 203 | 98.705198 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Sr-90 | 0.231 | 4 | 4 | | | 0.25757262 | -0.045164 | 0.244915 | 0.1155 | 0.4715918 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Th-228 | 3.2 | 4 | 4 | | | 1.681 | 1.22595 | 0.380144 | 1.6 | 4.2089337 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Th-230 | 3.49 | 4 | 4 | | | 1.781 | 1.389 | 0.370033 | 1.745 | 4.7157914 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Th-232 | 3.1 | 4 | 4 | | | 1.796 | 1.377075 | 0.369405 | 1.55 | 4.1959423 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Tritium (H-3) | 2.28 | 4 | 4 | | | 0 | -1.066357 | 1.231549 | 1.14 | 0.9256632 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | U-234 | 4.01 | 4 | 4 | | | 1.518 | 1.217675 | 0.26776 | 2.005 | 7.4880627 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | U-235 | 0.195 | 4 | 4 | | | 0.1885 | 0.130945 | 0.067157 | 0.0975 | 1.4518245 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | U-238 | 2.6 | 4 | 4 | | | 1.355 | 1.0269 | 0.24165 | 1.3 | 5.3796806 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | 10 |
| EU-08 | IVEU08RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Co-60 | 0.0361 | | | | 2 | | | | 0.01805 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Cs-134 | 0.157 | 2 | | | | | 0.075 | 0 | 0.0785 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 11 | |
| EU-08 | IVEU08RC301 | Cs-137 | 0.48 | 10 | 8 | 4 | | 0.11 | 0.0614286 | 0.02897 | 0.24 | 8.2843097 | 3 | 8 | 14.64 | 3 | 0 | 7 | 0 | |
| EU-08 | IVEU08RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | K-40 | 60 | 10 | 10 | 6 | | 21.08 | 18.387 | 2.613253 | 30 | 11.479946 | 3 | 8 | 14.64 | 3 | 0 | 7 | 0 | |
| EU-08 | IVEU08RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Pu-238 | 2.97 | 4 | 4 | | | 0.003 | 0.00125 | 0.001258 | 1.485 | 1180.1583 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |
| EU-08 | IVEU08RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Ra-226 | 5 | 4 | 4 | 4 | | 0.85 | 0.7475 | 0.076322 | 2.5 | 32.756089 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |
| EU-08 | IVEU08RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Sr-90 | 0.231 | 4 | 4 | | | 0.022 | 0.0195 | 0.003786 | 0.1155 | 30.507624 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |
| EU-08 | IVEU08RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Th-228 | 3.2 | 4 | 4 | | | 1.3 | 1.175 | 0.15 | 1.6 | 10.666667 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-08 | IVEU08RC301 | Th-230 | 3.49 | 4 | 4 | | | 1.1 | 0.9475 | 0.135984 | 1.745 | 12.832386 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |
| EU-08 | IVEU08RC301 | Th-232 | 3.1 | 6 | 6 | 2 | | 1.2 | 1.1333333 | 0.064083 | 1.55 | 24.187277 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 7 | |
| EU-08 | IVEU08RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | U-235 | 0.195 | 5 | 5 | | | 0.06 | 0.0458 | 0.008729 | 0.0975 | 11.16933 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 8 | |
| EU-08 | IVEU08RC301 | U-238 | 2.6 | 6 | 6 | 2 | | 0.9 | 0.75 | 0.101587 | 1.3 | 12.796863 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 7 | 13 |
| EU-09 | IVEU09RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.36 | 1 | 0 | 38 | 38 | |
| EU-09 | IVEU09RC101 | Am-241 | 1.87 | 812 | 74 | | | 0.19 | 0.0609729 | 0.02512 | 0.935 | 37.221893 | 3 | 11 | 5.36 | 1 | 0 | 30 | 0 | |
| EU-09 | IVEU09RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Co-60 | 0.0361 | | | | 728 | | | | 0.01805 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Cs-134 | 0.157 | 1 | | | | | 0.075 | | 0.0785 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 40 | |
| EU-09 | IVEU09RC101 | Cs-137 | 0.48 | 1056 | 408 | 246 | | 5.864 | 0.1176001 | 0.338692 | 0.24 | 0.7086092 | 0.7086092 | 48 | 5.36 | 1 | 1 | 129 | 0 | |
| EU-09 | IVEU09RC101 | Eu-152 | 0.0416 | | | | 728 | | | | 0.0208 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Eu-155 | 3.8 | 2 | 2 | 2 | | 0.06 | 0.06 | 0 | 1.9 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 39 | |
| EU-09 | IVEU09RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | K-40 | 60 | 15 | 15 | 10 | | 19 | 16.349286 | 2.518743 | 30 | 11.910701 | 3 | 8 | 5.36 | 1 | 0 | 22 | 7 | |
| EU-09 | IVEU09RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 5.36 | 1 | 0 | 38 | 38 | |
| EU-09 | IVEU09RC101 | Pu-238 | 2.97 | 212 | 109 | 45 | | 0.14 | 0.0176533 | 0.02169 | 1.485 | 68.464814 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Pu-239 | 2.59 | 96 | | | | | 0.0125 | 0.002513 | 1.295 | 515.29502 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Ra-226 | 5 | 732 | 708 | 708 | | 1.2 | 0.7481557 | 0.164928 | 2.5 | 15.158168 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.36 | 1 | 0 | 38 | 38 | |
| EU-09 | IVEU09RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Sr-90 | 0.231 | 65 | 65 | | 482 | 1.05 | 0.2216154 | 0.206651 | 0.1155 | 0.5589139 | 0.5589139 | 90 | 5.36 | 1 | 1 | 242 | 177 | |
| EU-09 | IVEU09RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Th-228 | 3.2 | 49 | 49 | | | 2.86 | 1.6204082 | 0.523975 | 1.6 | 3.0535806 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Th-230 | 3.49 | 47 | 47 | | | 2.09 | 1.173617 | 0.38883 | 1.745 | 4.4878219 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Th-232 | 3.1 | 774 | 582 | 536 | | 2.76 | 1.1194186 | 0.541827 | 1.55 | 2.8606891 | 2.8606891 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Tritium (H-3) | 2.28 | 5 | 5 | | | 0.043 | 0.02 | 0.02429 | 1.14 | 46.933057 | 1.5 | 14 | 5.36 | 1 | 0 | 38 | 33 | |
| EU-09 | IVEU09RC101 | U-234 | 4.01 | 43 | 43 | | | 1.3 | 0.6216279 | 0.194139 | 2.005 | 10.327625 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | U-235 | 0.195 | 575 | 58 | 1 | 219 | 0.2 | 0.1187635 | 0.042073 | 0.0975 | 2.3174201 | 2.3174201 | 9 | 5.36 | 1 | 0 | 25 | 0 | |
| EU-09 | IVEU09RC101 | U-238 | 2.6 | 806 | 539 | 471 | | 5.07 | 0.9322829 | 0.381194 | 1.3 | 3.4103397 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | 41 |
| EU-09 | IVEU09RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Cs-137 | 0.48 | 7 | 3 | 1 | | 0.07 | 0.0233333 | 0.026394 | 0.24 | 9.0928228 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 3 | |
| EU-09 | IVEU09RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | K-40 | 60 | 7 | 7 | 6 | | 26.23 | 18.36 | 3.645769 | 30 | 8.2287161 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 3 | |
| EU-09 | IVEU09RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-09 | IVEU09RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | Pu-238 | 2.97 | 5 | 5 | | | 0.001 | 0 | 0.000707 | 1.485 | 2100.1071 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Ra-226 | 5 | 5 | 5 | 5 | | 1 | 0.82 | 0.147648 | 2.5 | 16.932137 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Sr-90 | 0.231 | 5 | 5 | | | 0.12 | 0.0572 | 0.048515 | 0.1155 | 2.3807096 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Th-228 | 3.2 | 5 | 5 | | | 1.4 | 1.2 | 0.234521 | 1.6 | 6.8224229 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Th-230 | 3.49 | 5 | 5 | | | 1.3 | 0.998 | 0.283408 | 1.745 | 6.1572045 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Th-232 | 3.1 | 5 | 5 | | | 1.5 | 1.164 | 0.288929 | 1.55 | 5.3646387 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Tritium (H-3) | 2.28 | 5 | 5 | | | 0.055 | 0.0078 | 0.028261 | 1.14 | 40.337874 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | U-235 | 0.195 | 5 | 5 | | | 0.051 | 0.042 | 0.00755 | 0.0975 | 12.91419 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | U-238 | 2.6 | 5 | 5 | | | 1 | 0.842 | 0.098336 | 1.3 | 13.219959 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | 11 |
| EU-10 | IVEU10RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Cs-137 | 0.48 | 41 | 13 | 2 | | 0.438 | 0.0843732 | 0.091757 | 0.24 | 2.6156185 | 2.6156185 | 9 | 1.30 | 1 | 0 | 6 | 0 | |
| EU-10 | IVEU10RC101 | Eu-152 | 0.0416 | | | | 4 | | | | 0.0208 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | K-40 | 60 | 2 | 2 | 2 | | 19 | 19 | 0 | 30 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Pu-238 | 2.97 | 2 | 2 | | | 0.001 | 0.0005 | 0.000707 | 1.485 | 2100.1071 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Ra-226 | 5 | 2 | 2 | 2 | | 0.77 | 0.725 | 0.06364 | 2.5 | 39.28371 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Sr-90 | 0.231 | 2 | 2 | | | 0.05 | 0.047 | 0.004243 | 0.1155 | 27.223611 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Th-228 | 3.2 | 2 | 2 | | | 0.84 | 0.73 | 0.155563 | 1.6 | 10.28519 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Th-230 | 3.49 | 2 | 2 | | | 0.62 | 0.56 | 0.084853 | 1.745 | 20.565022 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Th-232 | 3.1 | 2 | 2 | | | 0.85 | 0.705 | 0.205061 | 1.55 | 7.5587277 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.055 | 0.0325 | 0.03182 | 1.14 | 35.826744 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | U-235 | 0.195 | 2 | 2 | | | 0.042 | 0.03 | 0.016971 | 0.0975 | 5.7452426 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | U-238 | 2.6 | 2 | 2 | | | 0.62 | 0.56 | 0.084853 | 1.3 | 15.320647 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | 10 |
| EU-10 | IVEU10RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Am-241 | 1.87 | 1 | 1 | | | 0.004 | 0.004 | | 0.935 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Ba-133 | 0.175 | 1 | 1 | | | 0.043 | 0.043 | | 0.0875 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-10 | IVEU10RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Co-60 | 0.0361 | 1 | 1 | | 5 | 0.002 | 0.002 | | 0.01805 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Cs-134 | 0.157 | 5 | | | | | 0.075 | 0 | 0.0785 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 0 | |
| EU-10 | IVEU10RC201 | Cs-137 | 0.48 | 10 | 4 | 1 | | 0.17 | 0.0874444 | 0.048449 | 0.24 | 4.953692 | 3 | 8 | 3.20 | 2 | 0 | 3 | 0 | |
| EU-10 | IVEU10RC201 | Eu-152 | 0.0416 | 1 | 1 | | | -0.25 | -0.25 | | 0.0208 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Eu-154 | 0.0499 | 1 | 1 | | | -0.15 | -0.15 | | 0.02495 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Fe-55 | 2690 | 1 | 1 | | | 9 | 9 | | 1345 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | K-40 | 60 | 7 | 7 | 6 | | 18 | 14.647143 | 2.403565 | 30 | 12.481461 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 0 | |
| EU-10 | IVEU10RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Ni-63 | 94.8 | 1 | 1 | | | 5.9 | 5.9 | | 47.4 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Pu-238 | 2.97 | 2 | 2 | | | 0.003 | 0.0015 | 0.002121 | 1.485 | 700.03571 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | Pu-239 | 2.59 | 1 | 1 | | | 0.00485 | 0.00485 | | 1.295 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Pu-240 | 2.6 | 1 | 1 | | | 0.00285 | 0.00285 | | 1.3 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Pu-241 | 406 | 1 | 1 | | | 0.34 | 0.34 | | 203 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Ra-226 | 5 | 1 | 1 | 1 | | 0.65 | 0.65 | | 2.5 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Sr-90 | 0.231 | 2 | 2 | | | 0.06 | 0.048 | 0.016971 | 0.1155 | 6.8059028 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Th-228 | 3.2 | 2 | 2 | | | 1.3 | 1.09 | 0.296985 | 1.6 | 5.3874802 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | Th-230 | 3.49 | 2 | 2 | | | 0.99 | 0.867 | 0.173948 | 1.745 | 10.031718 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | Th-232 | 3.1 | 7 | 7 | 5 | | 1.3 | 0.8914286 | 0.18452 | 1.55 | 8.4001748 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 0 | |
| EU-10 | IVEU10RC201 | Tritium (H-3) | 2.28 | 1 | 1 | | | 0.03 | 0.03 | | 1.14 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | U-234 | 4.01 | 1 | 1 | | | 0.584 | 0.584 | | 2.005 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | U-235 | 0.195 | 2 | 2 | | | 0.076 | 0.053 | 0.032527 | 0.0975 | 2.9975179 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | U-238 | 2.6 | 7 | 7 | 5 | | 0.82 | 0.6655714 | 0.121589 | 1.3 | 10.691732 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 0 | 5 |
| EU-10 | IVEU10RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |
| EU-10 | IVEU10RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Cs-137 | 0.48 | 32 | 5 | 5 | | 0.2 | 0.0438313 | 0.053011 | 0.24 | 4.5273909 | 3 | 8 | 12.89 | 3 | 0 | 7 | 0 | |
| EU-10 | IVEU10RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | K-40 | 60 | 5 | 5 | 5 | | 21 | 18.8 | 1.788854 | 30 | 16.77051 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |
| EU-10 | IVEU10RC301 | Pu-238 | 2.97 | 5 | 5 | | | 0.003 | 0.0008 | 0.001483 | 1.485 | 1001.1868 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |
| EU-10 | IVEU10RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Ra-226 | 5 | 5 | 5 | 5 | | 0.96 | 0.76 | 0.146116 | 2.5 | 17.109648 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-10 | IVEU10RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Sr-90 | 0.231 | 5 | 5 | | | 0.071 | 0.0296 | 0.027052 | 0.1155 | 4.2695862 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Th-228 | 3.2 | 5 | 5 | | | 1.5 | 1.096 | 0.34217 | 1.6 | 4.6760444 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Th-230 | 3.49 | 5 | 5 | | | 1.1 | 0.86 | 0.228145 | 1.745 | 7.6486549 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Th-232 | 3.1 | 5 | 5 | | | 1.4 | 1.044 | 0.285009 | 1.55 | 5.4384291 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.023 | 0.0095 | 0.019092 | 1.14 | 59.711239 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 9 | |
| EU-10 | IVEU10RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |
| EU-10 | IVEU10RC301 | U-235 | 0.195 | 5 | 5 | | | 0.057 | 0.042 | 0.009823 | 0.0975 | 9.9252387 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | U-238 | 2.6 | 5 | 5 | | | 1.1 | 0.862 | 0.219249 | 1.3 | 5.9293391 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | 12 |
| EU-11 | IVEU11RC101 | Ac-228 | 3.2 | 1 | 1 | | | 1.33 | 1.33 | | 1.6 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 13 | |
| EU-11 | IVEU11RC101 | Am-241 | 1.87 | 3 | 2 | | | 0.011 | 0.0236667 | 0.027301 | 0.935 | 34.248089 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 12 | |
| EU-11 | IVEU11RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Co-60 | 0.0361 | 2 | 2 | | 187 | -0.001 | -0.008 | 0.009899 | 0.01805 | 1.8233253 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Cs-134 | 0.157 | 188 | 2 | | | 0.044 | 0.0743564 | 0.006931 | 0.0785 | 11.326006 | 3 | 11 | 1.97 | 1 | 0 | 11 | 0 | |
| EU-11 | IVEU11RC101 | Cs-137 | 0.48 | 195 | 3 | 1 | | 1.2 | 0.0866333 | 0.106823 | 0.24 | 2.246703 | 2.246703 | 10 | 1.97 | 1 | 0 | 10 | 0 | |
| EU-11 | IVEU11RC101 | Eu-152 | 0.0416 | 2 | 2 | | | -0.009 | -0.0545 | 0.064347 | 0.0208 | 0.3232488 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Eu-154 | 0.0499 | 2 | 2 | | | 0.33 | 0.161 | 0.239002 | 0.02495 | 0.1043924 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | K-40 | 60 | 191 | 191 | 189 | | 21.8 | 14.84356 | 1.846787 | 30 | 16.244429 | 3 | 8 | 1.97 | 1 | 0 | 8 | 0 | |
| EU-11 | IVEU11RC101 | Na-22 | 0.0865 | 2 | 2 | | | 0.023 | -0.0155 | 0.054447 | 0.04325 | 0.7943472 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 14 | |
| EU-11 | IVEU11RC101 | Pu-238 | 2.97 | 5 | 5 | 1 | | 0.01 | 0.0028 | 0.005848 | 1.485 | 253.92964 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 9 | |
| EU-11 | IVEU11RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 14 | |
| EU-11 | IVEU11RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Pu-241 | 406 | 2 | 2 | | | 1.1 | 0.645 | 0.643467 | 203 | 315.47841 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Ra-226 | 5 | 4 | 4 | 2 | | 4 | 2.03 | 1.573997 | 2.5 | 1.588313 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 10 | |
| EU-11 | IVEU11RC101 | Ra-228 | 3.2 | 1 | 1 | | | 1.33 | 1.33 | | 1.6 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 13 | |
| EU-11 | IVEU11RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Sr-90 | 0.231 | 4 | 4 | | | 0.1 | 0.03075 | 0.047675 | 0.1155 | 2.4226475 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 10 | |
| EU-11 | IVEU11RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Th-228 | 3.2 | 4 | 4 | | | 1.1 | 0.855 | 0.29149 | 1.6 | 5.4890311 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 10 | |
| EU-11 | IVEU11RC101 | Th-230 | 3.49 | 4 | 4 | | | 0.92 | 0.615 | 0.228108 | 1.745 | 7.6498797 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 10 | |
| EU-11 | IVEU11RC101 | Th-232 | 3.1 | 192 | 192 | 187 | | 1.36 | 0.8613542 | 0.155308 | 1.55 | 9.9801488 | 3 | 8 | 1.97 | 1 | 0 | 8 | 0 | |
| EU-11 | IVEU11RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 14 | |
| EU-11 | IVEU11RC101 | U-234 | 4.01 | 2 | 2 | | | 1.52 | 1.15 | 0.523259 | 2.005 | 3.8317543 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 12 | |
| EU-11 | IVEU11RC101 | U-235 | 0.195 | 5 | 4 | | | 0.131 | 0.094 | 0.064896 | 0.0975 | 1.5024022 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 9 | |
| EU-11 | IVEU11RC101 | U-238 | 2.6 | 192 | 192 | 188 | | 1.68 | 0.6388542 | 0.133553 | 1.3 | 9.7339707 | 3 | 8 | 1.97 | 1 | 0 | 8 | 0 | 15 |
| EU-11 | IVEU11RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Cs-137 | 0.48 | 12 | 1 | 1 | | 0.06 | 0.02875 | 0.010687 | 0.24 | 22.457921 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-11 | IVEU11RC102 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | K-40 | 60 | 12 | 12 | 12 | | 20 | 16.916667 | 1.378954 | 30 | 21.755615 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Pu-238 | 2.97 | 12 | 12 | | | 0.005 | -0.000167 | 0.004469 | 1.485 | 332.30794 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Ra-226 | 5 | 12 | 12 | 12 | | 0.85 | 0.7525 | 0.077122 | 2.5 | 32.416378 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Sr-90 | 0.231 | 13 | 13 | | | 1.9 | 0.2188462 | 0.508414 | 0.1155 | 0.227177 | 0.227177 | 542 | 0.30 | 1 | 1 | 81 | 68 | |
| EU-11 | IVEU11RC102 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Th-230 | 3.49 | 12 | 12 | | | 1 | 0.8858333 | 0.084149 | 1.745 | 20.737017 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Th-232 | 3.1 | 12 | 12 | 2 | | 1.4 | 1.1991667 | 0.149573 | 1.55 | 10.362859 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Tritium (H-3) | 2.28 | 12 | 12 | | | 0.11 | 0.0139167 | 0.054906 | 1.14 | 20.762896 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | U-235 | 0.195 | 12 | 12 | | | 0.052 | 0.04125 | 0.008572 | 0.0975 | 11.37439 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | U-238 | 2.6 | 12 | 12 | | | 0.94 | 0.8141667 | 0.051779 | 1.3 | 25.106723 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | 3 |
| EU-11 | IVEU11RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-11 | IVEU11RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | 1 |
| EU-11 | IVEU11RC202 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Cs-137 | 0.48 | 4 | 4 | 4 | | 0.12 | 0.089425 | 0.022331 | 0.24 | 10.747583 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | K-40 | 60 | 3 | 3 | 3 | | 26.5 | 22.166667 | 3.883727 | 30 | 7.7245394 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Pb-210 | 5 | 1 | 1 | 1 | | 1.31 | 1.31 | | 2.5 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Pu-238 | 2.97 | 3 | 3 | | | 0.001 | -0.002333 | 0.004933 | 1.485 | 301.041 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Ra-226 | 5 | 4 | 4 | 4 | | 0.97 | 0.87175 | 0.096327 | 2.5 | 25.953227 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Ra-228 | 3.2 | 1 | 1 | 1 | | 0.809 | 0.809 | | 1.6 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Sr-90 | 0.231 | 3 | 3 | | | 0.12 | 0.064 | 0.053254 | 0.1155 | 2.1688468 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Th-228 | 3.2 | 2 | 2 | 1 | | 1.42 | 1.26 | 0.226274 | 1.6 | 7.0710678 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Th-230 | 3.49 | 4 | 4 | 1 | | 1.45 | 1.08 | 0.2502 | 1.745 | 6.9744227 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Th-232 | 3.1 | 4 | 4 | 3 | | 1.4 | 1.25 | 0.129099 | 1.55 | 12.006248 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Tritium (H-3) | 2.28 | 2 | 2 | | | -0.05 | -0.0665 | 0.023335 | 1.14 | 48.85465 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | U-234 | 4.01 | 1 | 1 | 1 | | 1.53 | 1.53 | | 2.005 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | U-235 | 0.195 | 4 | 4 | 1 | | 0.0662 | 0.05055 | 0.011989 | 0.0975 | 8.1322507 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | U-238 | 2.6 | 4 | 4 | 1 | | 1.53 | 0.93 | 0.409634 | 1.3 | 3.1735648 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | 1 |
| EU-11 | IVEU11RC203 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-11 | IVEU11RC203 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | 1 |
| EU-11 | IVEU11RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Co-60 | 0.0361 | | | | 5 | | | | 0.01805 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Cs-134 | 0.157 | 5 | | | | | 0.075 | 0 | 0.0785 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 8 | |
| EU-11 | IVEU11RC301 | Cs-137 | 0.48 | 20 | 12 | 10 | | 0.24 | 0.0810526 | 0.056877 | 0.24 | 4.2196655 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | K-40 | 60 | 20 | 20 | 19 | | 21 | 17.486 | 2.564639 | 30 | 11.697553 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | Pu-238 | 2.97 | 13 | 13 | | | 0.009 | 0.0012308 | 0.003295 | 1.485 | 450.6424 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Ra-226 | 5 | 13 | 13 | 13 | | 0.89 | 0.7576923 | 0.064956 | 2.5 | 38.487825 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Sr-90 | 0.231 | 13 | 13 | | | 0.092 | 0.0236154 | 0.032958 | 0.1155 | 3.5044172 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Th-228 | 3.2 | 13 | 13 | | | 1.6 | 1.25 | 0.247857 | 1.6 | 6.4553225 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Th-230 | 3.49 | 13 | 13 | | | 1.2 | 0.9946154 | 0.205208 | 1.745 | 8.5035739 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Th-232 | 3.1 | 18 | 18 | 5 | | 1.5 | 1.0855556 | 0.300983 | 1.55 | 5.1497901 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Tritium (H-3) | 2.28 | 8 | 8 | | | 0.073 | 0.049875 | 0.021122 | 1.14 | 53.973002 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | U-235 | 0.195 | 14 | 14 | | | 0.069 | 0.0392143 | 0.012565 | 0.0975 | 7.7597874 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | U-238 | 2.6 | 18 | 18 | 5 | | 0.86 | 0.6972222 | 0.103969 | 1.3 | 12.503771 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | 13 |
| EU-12 | IVEU12RC101 | Ac-228 | 3.2 | 40 | 40 | | | 1.69 | 1.31375 | 0.146807 | 1.6 | 10.898676 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Am-241 | 1.87 | 40 | 40 | | | 0.12 | -0.005325 | 0.05005 | 0.935 | 18.681158 | 3 | 11 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Co-60 | 0.0361 | 40 | 40 | | | 0.095 | 0.002925 | 0.028613 | 0.01805 | 0.6308388 | 0.6308388 | 52 | 0.38 | 1 | 1 | 10 | 0 | |
| EU-12 | IVEU12RC101 | Cs-134 | 0.157 | 40 | 40 | | | 0.052 | 0.001 | 0.023668 | 0.0785 | 3.3167749 | 3 | 11 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Cs-137 | 0.48 | 46 | 40 | 2 | | 0.078 | 0.0125652 | 0.030304 | 0.24 | 7.9196655 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-12 | IVEU12RC101 | Eu-152 | 0.0416 | 40 | 40 | | | 0.09 | 0.0051175 | 0.050554 | 0.0208 | 0.4114405 | 0.4114405 | 107 | 0.38 | 1 | 1 | 21 | 0 | |
| EU-12 | IVEU12RC101 | Eu-154 | 0.0499 | 40 | 40 | | | 0.4 | -0.005575 | 0.180312 | 0.02495 | 0.1383716 | 0.1383716 | 1620 | 0.38 | 1 | 1 | 309 | 269 | |
| EU-12 | IVEU12RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | K-40 | 60 | 43 | 43 | 3 | | 23.3 | 20.676744 | 1.380448 | 30 | 21.732075 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Pu-238 | 2.97 | 46 | 46 | | | 0.08 | 0.0062609 | 0.020268 | 1.485 | 73.269717 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Pu-241 | 406 | 42 | 42 | | | 4.4 | -0.022362 | 1.504178 | 203 | 134.95742 | 3 | 11 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Ra-226 | 5 | 3 | 3 | 3 | | 0.87 | 0.7966667 | 0.102144 | 2.5 | 24.475325 | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Sr-90 | 0.231 | 41 | 40 | | | 0.48 | 0.1407073 | 0.112415 | 0.1155 | 1.0274397 | 1.0274397 | 26 | 0.38 | 1 | 0 | 5 | 0 | |
| EU-12 | IVEU12RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Th-228 | 3.2 | 3 | 3 | | | 1 | 0.8733333 | 0.111505 | 1.6 | 14.349151 | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Th-230 | 3.49 | 3 | 3 | | | 0.8 | 0.7066667 | 0.086217 | 1.745 | 20.239679 | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Th-232 | 3.1 | 43 | 43 | | | 1.69 | 1.28 | 0.189297 | 1.55 | 8.1881934 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Tritium (H-3) | 2.28 | 2 | 2 | | | -0.002 | -0.013 | 0.015556 | 1.14 | 73.281976 | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 1 | |
| EU-12 | IVEU12RC101 | U-234 | 4.01 | 44 | 44 | | | 1.15 | 0.8181818 | 0.130085 | 2.005 | 15.412958 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | U-235 | 0.195 | 47 | 45 | | | 0.086 | 0.0385106 | 0.018367 | 0.0975 | 5.3084683 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | U-238 | 2.6 | 47 | 47 | | | 1.06 | 0.8246809 | 0.110922 | 1.3 | 11.719942 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | 3 |
| EU-12 | IVEU12RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Co-60 | 0.0361 | | | | 7 | | | | 0.01805 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Cs-134 | 0.157 | 7 | | | | | 0.075 | 1.15E-09 | 0.0785 | 68281678 | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 0 | |
| EU-12 | IVEU12RC201 | Cs-137 | 0.48 | 11 | 4 | 4 | | 0.13 | 0.0820727 | 0.020051 | 0.24 | 11.969246 | 3 | 8 | 3.64 | 2 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC201 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | K-40 | 60 | 11 | 11 | 11 | | 21.1 | 15.830909 | 3.068161 | 30 | 9.7778456 | 3 | 8 | 3.64 | 2 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Pb-210 | 5 | 1 | 1 | 1 | | 0.818 | 0.818 | | 2.5 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 5 | |
| EU-12 | IVEU12RC201 | Pu-238 | 2.97 | 3 | 3 | | | 0.001 | 0 | 0.001 | 1.485 | 1485 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 3 | |
| EU-12 | IVEU12RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Ra-226 | 5 | 4 | 4 | 4 | | 0.81 | 0.75225 | 0.065271 | 2.5 | 38.302089 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 2 | |
| EU-12 | IVEU12RC201 | Ra-228 | 3.2 | 1 | 1 | 1 | | 1.32 | 1.32 | | 1.6 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 5 | |
| EU-12 | IVEU12RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Sr-90 | 0.231 | 3 | 3 | | | 0.061 | 0.031 | 0.029052 | 0.1155 | 3.975674 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 3 | |
| EU-12 | IVEU12RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Th-228 | 3.2 | 4 | 4 | 1 | | 1.72 | 1.04 | 0.469965 | 1.6 | 3.4045122 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 2 | |
| EU-12 | IVEU12RC201 | Th-230 | 3.49 | 4 | 4 | 1 | | 1.14 | 0.86 | 0.237206 | 1.745 | 7.3564763 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 2 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-12 | IVEU12RC201 | Th-232 | 3.1 | 11 | 11 | 8 | | 1.5 | 0.9636364 | 0.242375 | 1.55 | 6.3950591 | 3 | 8 | 3.64 | 2 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | U-234 | 4.01 | 1 | 1 | 1 | | 0.688 | 0.688 | | 2.005 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 5 | |
| EU-12 | IVEU12RC201 | U-235 | 0.195 | 4 | 4 | 1 | | 0.045 | 0.037725 | 0.006322 | 0.0975 | 15.422049 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 2 | |
| EU-12 | IVEU12RC201 | U-238 | 2.6 | 11 | 11 | 8 | | 0.87 | 0.7119091 | 0.125012 | 1.3 | 10.398971 | 3 | 8 | 3.64 | 2 | 0 | 3 | 0 | 6 |
| EU-12 | IVEU12RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Cs-137 | 0.48 | 9 | 3 | 3 | | 0.17 | 0.0483333 | 0.061745 | 0.24 | 3.8869264 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | K-40 | 60 | 9 | 9 | 9 | | 24 | 19.777778 | 2.279132 | 30 | 13.162904 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | Pu-238 | 2.97 | 9 | 8 | | | 0.003 | 0.0006667 | 0.001936 | 1.485 | 766.8507 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Ra-226 | 5 | 9 | 9 | 9 | | 0.93 | 0.7733333 | 0.119269 | 2.5 | 20.96109 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Sr-90 | 0.231 | 9 | 9 | | | 0.11 | 0.0364444 | 0.046033 | 0.1155 | 2.5090751 | 2.5090751 | 9 | 15.29 | 3 | 0 | 9 | 0 | |
| EU-12 | IVEU12RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Th-228 | 3.2 | 9 | 9 | | | 1.4 | 0.9477778 | 0.32085 | 1.6 | 4.9867607 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Th-230 | 3.49 | 9 | 9 | | | 1.2 | 0.79 | 0.271708 | 1.745 | 6.4223461 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Th-232 | 3.1 | 9 | 9 | | | 1.3 | 0.9233333 | 0.349929 | 1.55 | 4.4294755 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Tritium (H-3) | 2.28 | 8 | 8 | | | 0.053 | 0.004 | 0.030687 | 1.14 | 37.148841 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | U-235 | 0.195 | 9 | 9 | | | 0.051 | 0.0413333 | 0.008322 | 0.0975 | 11.716414 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | U-238 | 2.6 | 9 | 9 | | | 0.96 | 0.7566667 | 0.136198 | 1.3 | 9.5449003 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | 14 |
| EU-13 | IVEU13RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Cs-137 | 0.48 | 6 | 3 | 3 | | 0.16 | 0.0658333 | 0.050241 | 0.24 | 4.7769669 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | K-40 | 60 | 6 | 6 | 6 | | 20 | 18.5 | 1.516575 | 30 | 19.781414 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-13 | IVEU13RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Pu-238 | 2.97 | 6 | 6 | | | 0.003 | -0.000333 | 0.003077 | 1.485 | 482.64511 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Ra-226 | 5 | 6 | 6 | 6 | | 1 | 0.8366667 | 0.102892 | 2.5 | 24.297433 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Sr-90 | 0.231 | 6 | 6 | | | 0.22 | 0.0681667 | 0.080948 | 0.1155 | 1.4268432 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Th-230 | 3.49 | 6 | 6 | | | 0.94 | 0.7883333 | 0.089759 | 1.745 | 19.440961 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Th-232 | 3.1 | 6 | 6 | 6 | | 1.6 | 1.2666667 | 0.196638 | 1.55 | 7.8824882 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Tritium (H-3) | 2.28 | 6 | 6 | | | -0.011 | -0.047167 | 0.032283 | 1.14 | 35.313134 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | U-235 | 0.195 | 6 | 6 | | | 0.052 | 0.0415 | 0.008408 | 0.0975 | 11.595645 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | U-238 | 2.6 | 6 | 6 | | | 0.78 | 0.7383333 | 0.031252 | 1.3 | 41.597782 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | 2 |
| EU-13 | IVEU13RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Cs-137 | 0.48 | 2 | 1 | 1 | | 0.17 | 0.105 | 0.091924 | 0.24 | 2.6108558 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | K-40 | 60 | 2 | 2 | 2 | | 18 | 16.5 | 2.12132 | 30 | 14.142136 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | Pu-238 | 2.97 | 2 | 1 | | | 0 | 0.001 | 0.001414 | 1.485 | 1050.0536 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Ra-226 | 5 | 2 | 2 | 2 | | 0.87 | 0.71 | 0.226274 | 2.5 | 11.048543 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Sr-90 | 0.231 | 2 | 2 | | | 0.13 | 0.087 | 0.060811 | 0.1155 | 1.8993217 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Th-228 | 3.2 | 1 | 1 | | | 0.89 | 0.89 | | 1.6 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 13 | |
| EU-13 | IVEU13RC301 | Th-230 | 3.49 | 2 | 2 | | | 1 | 0.82 | 0.254558 | 1.745 | 6.8550074 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Th-232 | 3.1 | 2 | 2 | 1 | | 1.2 | 1.075 | 0.176777 | 1.55 | 8.7681241 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Tritium (H-3) | 2.28 | 1 | 1 | | | -0.045 | -0.045 | | 1.14 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 13 | |
| EU-13 | IVEU13RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | U-235 | 0.195 | 2 | 2 | | | 0.054 | 0.042 | 0.016971 | 0.0975 | 5.7452426 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | U-238 | 2.6 | 2 | 2 | | | 0.72 | 0.69 | 0.042426 | 1.3 | 30.641294 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | 15 |
| EU-14 | IVEU14RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-14 | IVEU14RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Cs-137 | 0.48 | 3 | 3 | 3 | | 0.29 | 0.1333333 | 0.136504 | 0.24 | 1.7581906 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | K-40 | 60 | 3 | 3 | 3 | | 17 | 12.433333 | 4.045162 | 30 | 7.4162672 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | Pu-238 | 2.97 | 3 | 2 | | | -0.001 | 0 | 0.001732 | 1.485 | 857.36515 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Ra-226 | 5 | 3 | 3 | 3 | | 0.7 | 0.5466667 | 0.150111 | 2.5 | 16.654335 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Sr-90 | 0.231 | 3 | 3 | | | 0.11 | 0.064 | 0.041073 | 0.1155 | 2.8120591 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Th-228 | 3.2 | 3 | 3 | | | 1 | 0.9 | 0.1 | 1.6 | 16 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Th-230 | 3.49 | 3 | 3 | | | 0.61 | 0.57 | 0.060828 | 1.745 | 28.687623 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Th-232 | 3.1 | 3 | 3 | | | 1 | 0.8666667 | 0.119304 | 1.55 | 12.992071 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | U-235 | 0.195 | 3 | 3 | | | 0.032 | 0.027 | 0.004359 | 0.0975 | 22.368034 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | U-238 | 2.6 | 3 | 3 | | | 0.79 | 0.6533333 | 0.140119 | 1.3 | 9.2778283 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | 16 |
| EU-15 | IVEU15RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Cs-137 | 0.48 | 5 | 5 | 5 | | 0.38 | 0.16 | 0.132098 | 0.24 | 1.8168268 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | K-40 | 60 | 5 | 5 | 5 | | 19 | 16.8 | 2.167948 | 30 | 13.837968 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | Pu-238 | 2.97 | 5 | 5 | | | 0.001 | 0 | 0.000707 | 1.485 | 2100.1071 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Ra-226 | 5 | 5 | 5 | 5 | | 1.4 | 0.832 | 0.327063 | 2.5 | 7.6437946 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-15 | IVEU15RC301 | Sr-90 | 0.231 | 5 | 5 | | | 0.12 | 0.0752 | 0.030589 | 0.1155 | 3.7758408 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Th-228 | 3.2 | 5 | 5 | | | 2.1 | 1.252 | 0.528697 | 1.6 | 3.0263109 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Th-230 | 3.49 | 5 | 5 | | | 1.3 | 0.858 | 0.280927 | 1.745 | 6.2115773 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Th-232 | 3.1 | 5 | 5 | | | 1.9 | 1.1 | 0.468668 | 1.55 | 3.3072429 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | U-235 | 0.195 | 5 | 5 | | | 0.069 | 0.0464 | 0.013107 | 0.0975 | 7.4386313 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | U-238 | 2.6 | 5 | 5 | | | 1.2 | 0.868 | 0.201792 | 1.3 | 6.4422781 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | 17 |
| EU-16 | IVEU16RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Cs-137 | 0.48 | 2 | 2 | 2 | | 0.09 | 0.09 | 0 | 0.24 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | K-40 | 60 | 2 | 2 | 2 | | 16 | 15.5 | 0.707107 | 30 | 42.426407 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | Pu-238 | 2.97 | 2 | 2 | | | 0 | -0.0015 | 0.002121 | 1.485 | 700.03571 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Ra-226 | 5 | 2 | 2 | 2 | | 1.6 | 1.15 | 0.636396 | 2.5 | 3.928371 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Sr-90 | 0.231 | 2 | 2 | | | 0.08 | 0.0665 | 0.019092 | 0.1155 | 6.0496914 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Th-228 | 3.2 | 2 | 2 | | | 1.1 | 1.035 | 0.091924 | 1.6 | 17.405705 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Th-230 | 3.49 | 2 | 2 | | | 0.81 | 0.75 | 0.084853 | 1.745 | 20.565022 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Th-232 | 3.1 | 2 | 2 | | | 1 | 0.87 | 0.183848 | 1.55 | 8.4308885 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | U-235 | 0.195 | 2 | 2 | | | 0.072 | 0.0565 | 0.02192 | 0.0975 | 4.4479298 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | U-238 | 2.6 | 2 | 2 | | | 1.3 | 1.01 | 0.410122 | 1.3 | 3.169789 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | 18 |
| NA-01 | NEBNA01RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NA-01 | NEBNA01RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | 1 |
| NA-02 | IIINA02RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Am-241 | 1.87 | | | | | | | | 0.935 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Co-60 | 0.0361 | | | | | | | | 0.01805 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Cs-134 | 0.157 | | | | | | | | 0.0785 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Eu-152 | 0.0416 | | | | | | | | 0.0208 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Eu-154 | 0.0499 | | | | | | | | 0.02495 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Na-22 | 0.0865 | | | | | | | | 0.04325 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Pu-238 | 2.97 | | | | | | | | 1.485 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Pu-241 | 406 | | | | | | | | 203 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Sr-90 | 0.231 | | | | | | | | 0.1155 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Th-230 | 3.49 | | | | | | | | 1.745 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Th-232 | 3.1 | | | | | | | | 1.55 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | U-234 | 4.01 | | | | | | | | 2.005 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | U-235 | 0.195 | | | | | | | | 0.0975 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | 2 |

**Table G-1**
**Radionuclide Data Gaps Calculation Summary**
**(Rural Residential)**

| EU | SU | Analyte | Rural Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Rural Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WBNA-01 | WBNA01RC101 | Ac-228 | 3.2 | 12 | 12 | | | 1.4 | 1.1691667 | 0.138134 | 1.6 | 11.582938 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Am-241 | 1.87 | 13 | 13 | | | 0.032 | 0.0109231 | 0.011679 | 0.935 | 80.054933 | 3 | 11 | 0.21 | 1 | 0 | 2 | 0 | |
| WBNA-01 | WBNA01RC101 | Ba-133 | 0.175 | | | | | | | | 0.0875 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | C-14 | 0.456 | | | | | | | | 0.228 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.1745 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Co-60 | 0.0361 | 13 | 13 | | | 0.061 | 0.0101769 | 0.032131 | 0.01805 | 0.5617567 | 0.5617567 | 71 | 0.21 | 1 | 1 | 8 | 0 | |
| WBNA-01 | WBNA01RC101 | Cs-134 | 0.157 | 13 | 13 | | | 0.041 | -0.002923 | 0.032413 | 0.0785 | 2.4218973 | 2.4218973 | 12 | 0.21 | 1 | 0 | 2 | 0 | |
| WBNA-01 | WBNA01RC101 | Cs-137 | 0.48 | 15 | 14 | | | 0.27 | 0.0673929 | 0.083804 | 0.24 | 2.8638305 | 2.8638305 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Eu-152 | 0.0416 | 13 | 13 | | 1 | 0.47 | 0.0492308 | 0.343207 | 0.0208 | 0.0606048 | 1.5 | 15 | 0.21 | 1 | 1 | 2 | 0 | |
| WBNA-01 | WBNA01RC101 | Eu-154 | 0.0499 | 13 | 13 | | | 0.2 | -0.010769 | 0.195766 | 0.02495 | 0.127448 | 0.127448 | 1620 | 0.21 | 1 | 1 | 173 | 160 | |
| WBNA-01 | WBNA01RC101 | Eu-155 | 3.8 | | | | | | | | 1.9 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Fe-55 | 2690 | | | | | | | | 1345 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | I-129 | 0.596 | | | | | | | | 0.298 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | K-40 | 60 | 13 | 13 | | | 23.9 | 20.853846 | 2.982341 | 30 | 10.059211 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Na-22 | 0.0865 | 13 | 13 | | | 0.062 | -0.000385 | 0.043659 | 0.04325 | 0.9906368 | 0.9906368 | 27 | 0.21 | 1 | 1 | 3 | 0 | |
| WBNA-01 | WBNA01RC101 | Ni-59 | 208 | | | | | | | | 104 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Ni-63 | 94.8 | | | | | | | | 47.4 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Np-237 | 0.13 | | | | | | | | 0.065 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Pu-238 | 2.97 | 13 | 13 | | | 0.103 | 0.0153846 | 0.028111 | 1.485 | 52.825357 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Pu-239 | 2.59 | | | | | | | | 1.295 | | 1.5 | 14 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Pu-240 | 2.6 | | | | | | | | 1.3 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Pu-241 | 406 | 13 | 13 | | | 4.1 | 0.8292308 | 1.579844 | 203 | 128.49368 | 3 | 11 | 0.21 | 1 | 0 | 2 | 0 | |
| WBNA-01 | WBNA01RC101 | Ra-226 | 5 | 13 | 10 | | | 2.5 | 1.3515385 | 0.736205 | 2.5 | 3.3957944 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Ra-228 | 3.2 | 12 | 12 | | | 1.4 | 1.1691667 | 0.138134 | 1.6 | 11.582938 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Sb-125 | 0.462 | | | | | | | | 0.231 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Sr-90 | 0.231 | 13 | 13 | | | 0.63 | 0.2230769 | 0.147048 | 0.1155 | 0.7854585 | 0.7854585 | 48 | 0.21 | 1 | 1 | 6 | 0 | |
| WBNA-01 | WBNA01RC101 | Tc-99 | 0.25 | | | | | | | | 0.125 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Th-228 | 3.2 | 13 | 13 | | | 1.81 | 1.0823077 | 0.360166 | 1.6 | 4.4424014 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Th-230 | 3.49 | 13 | 13 | | | 1.44 | 0.9892308 | 0.222877 | 1.745 | 7.8294147 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Th-232 | 3.1 | 25 | 25 | | | 1.7 | 1.1084 | 0.252003 | 1.55 | 6.1507129 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.14 | | 1.5 | 14 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | U-234 | 4.01 | 13 | 13 | | | 1.72 | 0.8153846 | 0.337284 | 2.005 | 5.9445515 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | U-235 | 0.195 | 13 | 13 | | | 0.083 | 0.0372308 | 0.025378 | 0.0975 | 3.8419617 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | U-238 | 2.6 | 13 | 13 | | | 1.55 | 0.7792308 | 0.292873 | 1.3 | 4.4387901 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | 2 |
| | | | | | | | | | | | | | | | | | | | Total Samples | 616 |

[a] A "1" in this column means the average for this analyte exceeds the DCGL or the standard deviation exceeds the LBGR and it is assumed this SU will require remediation. The number of samples for these SUs is based only on those required for deliniation of nature and extent of contamination.

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC101 | Ac-228 | 3.2 | 20 | 20 | | | 1.53 | 1.224 | 0.158027 | 1.6 | 10.124832 | 3.00 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Am-241 | 1.87 | 20 | 20 | | | 0.07 | -0.016335 | 0.051836 | 0.983259209 | 18.968507 | 3 | 11 | 3.39 | 1 | 0 | 19 | 0 | |
| EU-01 | IVEU01RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Co-60 | 0.0361 | 20 | 20 | | 2 | 0.063 | 0.0044 | 0.030287 | 0.018119848 | 0.5982705 | 0.5982705 | 71 | 3.39 | 1 | 1 | 121 | 101 | |
| EU-01 | IVEU01RC101 | Cs-134 | 0.157 | 22 | 20 | | | 0.05 | 0.0124545 | 0.034323 | 0.07919429 | 2.3073233 | 2.3073233 | 12 | 3.39 | 1 | 0 | 21 | 0 | |
| EU-01 | IVEU01RC101 | Cs-137 | 0.48 | 24 | 21 | | | 1.16 | 0.1087833 | 0.326352 | 0.24 | 0.735402 | 0.735402 | 48 | 3.39 | 1 | 1 | 82 | 58 | |
| EU-01 | IVEU01RC101 | Eu-152 | 0.0416 | 20 | 20 | | | 0.12 | -0.00885 | 0.046726 | 0.020814406 | 0.4454594 | 0.4454594 | 107 | 3.39 | 1 | 1 | 182 | 162 | |
| EU-01 | IVEU01RC101 | Eu-154 | 0.0499 | 19 | 19 | | 0 | 0.37 | 0.0022632 | 0.203375 | 0.024950155 | 0.1226803 | 0.1226803 | 1620 | 3.39 | 1 | 1 | 2749 | 2730 | |
| EU-01 | IVEU01RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | K-40 | 60 | 24 | 24 | | | 25.5 | 20.330417 | 2.84717 | 30 | 10.536778 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 24 | |
| EU-01 | IVEU01RC101 | Pu-238 | 2.97 | 22 | 22 | | | 0.012 | -0.000773 | 0.008874 | 1.635548449 | 184.2991 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 24 | |
| EU-01 | IVEU01RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Pu-241 | 406 | 20 | 20 | | | 1.2 | -0.724 | 0.965573 | 225.8293531 | 233.88127 | 3 | 11 | 3.39 | 1 | 0 | 19 | 0 | |
| EU-01 | IVEU01RC101 | Ra-226 | 5 | 2 | 2 | | | 0.95 | 0.9 | 0.070711 | 2.5 | 35.355339 | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 22 | |
| EU-01 | IVEU01RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 24 | |
| EU-01 | IVEU01RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Sr-90 | 0.231 | 20 | 20 | | | 0.45 | 0.08745 | 0.139362 | 1.960528741 | 14.06786 | 3 | 8 | 3.39 | 1 | 1 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 3.39 | 1 | 0 | 26 | 26 | |
| EU-01 | IVEU01RC101 | Th-228 | 3.2 | 2 | 2 | | | 1.3 | 0.905 | 0.558614 | 1.6 | 2.86423 | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 22 | |
| EU-01 | IVEU01RC101 | Th-230 | 3.49 | 2 | 2 | | | 1 | 0.715 | 0.403051 | 1.909550267 | 4.7377402 | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 22 | |
| EU-01 | IVEU01RC101 | Th-232 | 3.1 | 24 | 24 | | | 1.53 | 1.1791667 | 0.211185 | 1.699812707 | 8.0489118 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | Tritium (H-3) | 2.28 | 1 | 1 | | | -0.048 | -0.048 | | 1.345023403 | | 1.5 | 14 | 3.39 | 1 | 0 | 24 | 23 | |
| EU-01 | IVEU01RC101 | U-234 | 4.01 | 22 | 22 | | | 1.12 | 0.8518182 | 0.139817 | 2.483402446 | 17.76175 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | U-235 | 0.195 | 24 | 24 | | | 0.053 | 0.0339583 | 0.010861 | 0.098571969 | 9.0760272 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | |
| EU-01 | IVEU01RC101 | U-238 | 2.6 | 26 | 26 | | | 1.15 | 0.8315385 | 0.176968 | 1.3 | 7.3459766 | 3 | 8 | 3.39 | 1 | 0 | 14 | 0 | 26 |
| EU-01 | IVEU01RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Cs-137 | 0.48 | 46 | 31 | | | 2.702 | 0.4565741 | 0.641098 | 0.24 | 0.3743579 | 0.3743579 | 243 | 1.14 | 1 | 1 | 139 | 93 | |
| EU-01 | IVEU01RC102 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC102 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.14 | 1 | 0 | 9 | 9 | |
| EU-01 | IVEU01RC102 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | |
| EU-01 | IVEU01RC102 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 1.14 | 1 | 0 | 8 | 8 | 9 |
| EU-01 | IVEU01RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.53 | 2 | 0 | 1 | 1 | 1 |
| EU-01 | IVEU01RC202 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Cs-137 | 0.48 | 1 | 1 | | | 0.12 | 0.12 | | 0.24 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC202 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | K-40 | 60 | 1 | 1 | | | 19 | 19 | | 30 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Pu-238 | 2.97 | 1 | 1 | | | 0.003 | 0.003 | | 1.635548449 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Ra-226 | 5 | 1 | 1 | | | 0.74 | 0.74 | | 2.5 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Sr-90 | 0.231 | 1 | 1 | | | 0.032 | 0.032 | | 1.960528741 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | Th-228 | 3.2 | 1 | 1 | | | 0.7 | 0.7 | | 1.6 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Th-230 | 3.49 | 1 | 1 | | | 0.5 | 0.5 | | 1.909550267 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Th-232 | 3.1 | 1 | 1 | | | 0.71 | 0.71 | | 1.699812707 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | Tritium (H-3) | 2.28 | 1 | 1 | | | -0.036 | -0.036 | | 1.345023403 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC202 | U-235 | 0.195 | 1 | 1 | | | 0.04 | 0.04 | | 0.098571969 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | |
| EU-01 | IVEU01RC202 | U-238 | 2.6 | 1 | 1 | | | 0.59 | 0.59 | | 1.3 | | 1.5 | 14 | 0.37 | 2 | 0 | 1 | 0 | 1 |
| EU-01 | IVEU01RC203 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC203 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC203 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.08 | 2 | 0 | 1 | 1 | 1 |
| EU-01 | IVEU01RC204 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | |
| EU-01 | IVEU01RC204 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.17 | 2 | 0 | 1 | 1 | 1 |
| EU-01 | IVEU01RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Cs-137 | 0.48 | 7 | 2 | | | 0.17 | 0.0496429 | 0.059488 | 0.24 | 4.0344538 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 4 | |
| EU-01 | IVEU01RC301 | Eu-152 | 0.0416 | | | | 2 | | | | 0.020814406 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | K-40 | 60 | 5 | 5 | | | 22 | 20.6 | 1.67332 | 30 | 17.928429 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-01 | IVEU01RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | Pu-238 | 2.97 | 5 | 5 | | | 0.007 | 0.0028 | 0.00295 | 1.635548449 | 554.50286 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Ra-226 | 5 | 5 | 5 | | | 1.1 | 0.84 | 0.237592 | 2.5 | 10.522236 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Sr-90 | 0.231 | 5 | 5 | | | 0.041 | 0.0248 | 0.01167 | 1.960528741 | 167.99048 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 13.13 | 3 | 0 | 12 | 12 | |
| EU-01 | IVEU01RC301 | Th-228 | 3.2 | 5 | 5 | | | 1.5 | 0.938 | 0.384734 | 1.6 | 4.158721 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Th-230 | 3.49 | 5 | 5 | | | 1.8 | 0.946 | 0.560785 | 1.909550267 | 3.4051369 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Th-232 | 3.1 | 5 | 5 | | | 1.6 | 1 | 0.475973 | 1.699812707 | 3.57124 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | Tritium (H-3) | 2.28 | 5 | 5 | | | 0.067 | -0.0092 | 0.04651 | 1.345023403 | 28.918882 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 11 | |
| EU-01 | IVEU01RC301 | U-235 | 0.195 | 5 | 5 | | | 0.057 | 0.0406 | 0.014993 | 0.098571969 | 6.5743872 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | |
| EU-01 | IVEU01RC301 | U-238 | 2.6 | 5 | 5 | | | 1.4 | 0.816 | 0.383184 | 1.3 | 3.3926257 | 1.5 | 14 | 13.13 | 3 | 0 | 11 | 6 | 12 |
| EU-02 | IVEU02RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Cs-137 | 0.48 | 8 | 8 | | | 0.45 | 0.3 | 0.159553 | 0.24 | 1.5042029 | 1.5042029 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Eu-152 | 0.0416 | | | | 2 | | | | 0.020814406 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | K-40 | 60 | 6 | 6 | | | 22 | 20.5 | 1.378405 | 30 | 21.764288 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | Pu-238 | 2.97 | 6 | 6 | | | 0.006 | 0.0005 | 0.002811 | 1.635548449 | 581.90202 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Ra-226 | 5 | 6 | 6 | | | 0.84 | 0.7466667 | 0.162193 | 2.5 | 15.413707 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Sr-90 | 0.231 | 6 | 6 | | | 0.099 | 0.0553333 | 0.039993 | 1.960528741 | 49.021389 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 2.68 | 2 | 0 | 5 | 5 | |
| EU-02 | IVEU02RC201 | Th-228 | 3.2 | 6 | 6 | | | 0.89 | 0.6666667 | 0.127698 | 1.6 | 12.529605 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Th-230 | 3.49 | 6 | 6 | | | 0.69 | 0.5533333 | 0.097297 | 1.909550267 | 19.626034 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Th-232 | 3.1 | 6 | 6 | | | 0.82 | 0.6916667 | 0.087958 | 1.699812707 | 19.325206 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | Tritium (H-3) | 2.28 | 5 | 5 | | | -0.008 | -0.0208 | 0.014342 | 1.345023403 | 93.780533 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 4 | |
| EU-02 | IVEU02RC201 | U-235 | 0.195 | 6 | 6 | | | 0.038 | 0.0318333 | 0.006432 | 0.098571969 | 15.325977 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | |
| EU-02 | IVEU02RC201 | U-238 | 2.6 | 6 | 6 | | | 0.71 | 0.595 | 0.110589 | 1.3 | 11.755203 | 1.5 | 14 | 2.68 | 2 | 0 | 4 | 0 | 5 |
| EU-02 | IVEU02RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-02 | IVEU02RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Cs-137 | 0.48 | 5 | 4 | | | 0.15 | 0.0775 | 0.068007 | 0.24 | 3.5290302 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 8 | |
| EU-02 | IVEU02RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | K-40 | 60 | 5 | 5 | | | 21 | 18.906 | 4.145984 | 30 | 7.2359186 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 8 | |
| EU-02 | IVEU02RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | Pu-238 | 2.97 | 4 | 4 | | | 0.001 | 0.00025 | 0.0005 | 1.635548449 | 3271.0969 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Ra-226 | 5 | 4 | 4 | | | 0.97 | 0.8725 | 0.082614 | 2.5 | 30.261377 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Sr-90 | 0.231 | 4 | 4 | | | 0.053 | 0.0345 | 0.021502 | 1.960528741 | 91.179165 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 14.96 | 3 | 0 | 14 | 14 | |
| EU-02 | IVEU02RC301 | Th-228 | 3.2 | 4 | 4 | | | 1.1 | 0.985 | 0.136748 | 1.6 | 11.700359 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Th-230 | 3.49 | 4 | 4 | | | 1 | 0.875 | 0.117898 | 1.909550267 | 16.196594 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Th-232 | 3.1 | 4 | 4 | | | 1 | 0.875 | 0.123423 | 1.699812707 | 13.772209 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | Tritium (H-3) | 2.28 | 1 | 1 | | | 0.042 | 0.042 | | 1.345023403 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 12 | |
| EU-02 | IVEU02RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 13 | |
| EU-02 | IVEU02RC301 | U-235 | 0.195 | 4 | 4 | | | 0.053 | 0.0485 | 0.004655 | 0.098571969 | 21.176656 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | |
| EU-02 | IVEU02RC301 | U-238 | 2.6 | 4 | 4 | | | 1.1 | 0.9275 | 0.122848 | 1.3 | 10.58217 | 1.5 | 14 | 14.96 | 3 | 0 | 13 | 9 | 14 |
| EU-03 | IVEU03RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.76 | 1 | 0 | 27 | 27 | |
| EU-03 | IVEU03RC101 | Am-241 | 1.87 | 1 | 1 | | | -0.0149 | -0.0149 | | 0.983259209 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Co-60 | 0.0361 | 1 | 1 | | | 0.511 | 0.511 | | 0.018119848 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Cs-137 | 0.48 | 38 | 15 | | | 0.329 | 0.066777 | 0.077424 | 0.24 | 3.0998135 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Eu-152 | 0.0416 | | | | 8 | | | | 0.020814406 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | K-40 | 60 | 11 | 11 | | | 22.9 | 22.363636 | 0.54456 | 30 | 55.090361 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pu-238 | 2.97 | 2 | 2 | | | 0.0304 | 0.0147 | 0.022203 | 1.635548449 | 73.662892 | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Pu-241 | 406 | 1 | 1 | | | 5.87 | 5.87 | | 225.8293531 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ra-226 | 5 | 22 | 22 | | | 1.79 | 1.1235455 | 0.326421 | 2.5 | 7.6588288 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Sr-90 | 0.231 | 2 | 2 | | | -0.008 | -0.298 | 0.410122 | 1.960528741 | 4.7803557 | 1.5 | 14 | | | 0 | 0 | 0 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-03 | IVEU03RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Th-228 | 3.2 | 17 | 17 | | | 1.54 | 1.2853529 | 0.19613 | 1.6 | 8.1578396 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Th-230 | 3.49 | 12 | 12 | | | 1.72 | 1.048 | 0.342178 | 1.909550267 | 5.5805836 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Th-232 | 3.1 | 28 | 28 | | | 2.63 | 1.4016786 | 0.437967 | 1.699812707 | 3.8811401 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | U-234 | 4.01 | 11 | 11 | | | 1.43 | 0.9696364 | 0.244678 | 2.483402446 | 10.149665 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | U-235 | 0.195 | 11 | 11 | | | 0.095 | 0.0469091 | 0.019496 | 0.098571969 | 5.0560306 | 3 | 8 | | | 0 | 0 | 0 | |
| EU-03 | IVEU03RC101 | U-238 | 2.6 | 12 | 12 | | | 1.44 | 0.9631667 | 0.240221 | 1.3 | 5.4116738 | 3 | 8 | 3.76 | 1 | 0 | 16 | 4 | 27 |
| EU-03 | IVEU03RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Co-60 | 0.0361 | 1 | 1 | | | 0.13 | 0.13 | | 0.018119848 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 6 | |
| EU-03 | IVEU03RC102 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Cs-137 | 0.48 | 15 | 12 | | | 2.4 | 0.7649786 | 0.870294 | 0.24 | 0.275769 | 1.5 | 14 | 0.83 | 1 | 1 | 6 | 0 | |
| EU-03 | IVEU03RC102 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | K-40 | 60 | 6 | 6 | | | 21 | 18.516667 | 2.08846 | 30 | 14.364649 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 0 | |
| EU-03 | IVEU03RC102 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | Pu-238 | 2.97 | 5 | 5 | | | 0.006 | 0.0014 | 0.00305 | 1.635548449 | 536.31746 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Ra-226 | 5 | 5 | 5 | | | 1.3 | 1.002 | 0.205475 | 2.5 | 12.166927 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Sr-90 | 0.231 | 5 | 5 | | | 0.21 | 0.0976 | 0.083032 | 1.960528741 | 23.611747 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.83 | 1 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC102 | Th-228 | 3.2 | 5 | 5 | | | 2.5 | 1.188 | 0.799231 | 1.6 | 2.0019246 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Th-230 | 3.49 | 5 | 5 | | | 2.3 | 1.076 | 0.731116 | 1.909550267 | 2.6118309 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Th-232 | 3.1 | 5 | 5 | | | 2.1 | 1.102 | 0.618078 | 1.699812707 | 2.7501604 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | Tritium (H-3) | 2.28 | 2 | 2 | | | -0.038 | -0.0385 | 0.000707 | 1.345023403 | 1902.1503 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 4 | |
| EU-03 | IVEU03RC102 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 6 | |
| EU-03 | IVEU03RC102 | U-235 | 0.195 | 5 | 5 | | | 0.1 | 0.056 | 0.029095 | 0.098571969 | 3.3879731 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | |
| EU-03 | IVEU03RC102 | U-238 | 2.6 | 5 | 5 | | | 2 | 1.056 | 0.57622 | 1.3 | 2.256081 | 1.5 | 14 | 0.83 | 1 | 0 | 6 | 1 | 7 |
| EU-03 | IVEU03RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Cs-137 | 0.48 | 14 | 14 | | | 0.44 | 0.2045455 | 0.157292 | 0.24 | 1.5258277 | 1.5258277 | 14 | 4.48 | 2 | 0 | 7 | 0 | |
| EU-03 | IVEU03RC201 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | K-40 | 60 | 14 | 14 | | | 25.9 | 23.262857 | 1.704268 | 30 | 17.602865 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-03 | IVEU03RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Pu-238 | 2.97 | 5 | 5 | | | 0.001 | 0.0002 | 0.000447 | 1.635548449 | 3657.1975 | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 2 | |
| EU-03 | IVEU03RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Ra-226 | 5 | 11 | 11 | | | 0.989 | 0.8558182 | 0.086838 | 2.5 | 28.789382 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Sr-90 | 0.231 | 5 | 5 | | | 0.053 | 0.0356 | 0.009839 | 1.960528741 | 199.26707 | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 2 | |
| EU-03 | IVEU03RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | Th-228 | 3.2 | 14 | 14 | | | 1.53 | 1.3135714 | 0.139041 | 1.6 | 11.507392 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | Th-230 | 3.49 | 11 | 11 | | | 1.01 | 0.8790909 | 0.117555 | 1.909550267 | 16.243939 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | Th-232 | 3.1 | 14 | 14 | | | 1.51 | 1.1758571 | 0.189071 | 1.699812707 | 8.9903431 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 7 | |
| EU-03 | IVEU03RC201 | U-234 | 4.01 | 6 | 6 | | | 0.864 | 0.823 | 0.054487 | 2.483402446 | 45.578144 | 1.5 | 14 | 4.48 | 2 | 0 | 7 | 1 | |
| EU-03 | IVEU03RC201 | U-235 | 0.195 | 11 | 11 | | | 0.061 | 0.0452727 | 0.010743 | 0.098571969 | 9.1752164 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | |
| EU-03 | IVEU03RC201 | U-238 | 2.6 | 11 | 11 | | | 0.96 | 0.806 | 0.081901 | 1.3 | 15.872791 | 3 | 8 | 4.48 | 2 | 0 | 4 | 0 | 7 |
| EU-03 | IVEU03RC202 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | |
| EU-03 | IVEU03RC202 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.26 | 2 | 0 | 1 | 1 | 1 |
| EU-03 | IVEU03RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-03 | IVEU03RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Cs-137 | 0.48 | 1 | | | | | 0.0495 | | 0.24 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 7 | |
| EU-03 | IVEU03RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | |
| EU-03 | IVEU03RC301 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 8.80 | 3 | 0 | 8 | 8 | 8 |
| EU-04 | IVEU04RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | Am-241 | 1.87 | 33 | 21 | | | 0.204 | 0.0591874 | 0.048819 | 0.983259209 | 20.140917 | 3 | 11 | 2.53 | 1 | 0 | 14 | 0 | |
| EU-04 | IVEU04RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Co-60 | 0.0361 | 99 | 25 | | 13 | 0.095 | 0.0114768 | 0.017986 | 0.018119848 | 1.0074341 | 1.0074341 | 23 | 2.53 | 1 | 0 | 30 | 0 | |
| EU-04 | IVEU04RC101 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Cs-137 | 0.48 | 155 | 131 | | | 4.886 | 0.3919071 | 0.734989 | 0.24 | 0.3265355 | 0.3265355 | 243 | 2.53 | 1 | 1 | 308 | 153 | |
| EU-04 | IVEU04RC101 | Eu-152 | 0.0416 | | | | 12 | | | | 0.020814406 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | K-40 | 60 | 81 | 81 | | | 22 | 19.68284 | 1.141495 | 30 | 26.281327 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | Pu-238 | 2.97 | 26 | 26 | | | 0.0614 | 0.02055 | 0.020013 | 1.635548449 | 81.725879 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Pu-241 | 406 | 21 | 21 | | | 6.56 | 2.8249524 | 1.587545 | 225.8293531 | 142.25067 | 3 | 11 | 2.53 | 1 | 0 | 14 | 0 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-04 | IVEU04RC101 | Ra-226 | 5 | 94 | 91 | | | 1.63 | 0.7744681 | 0.228305 | 2.5 | 10.950243 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Sr-90 | 0.231 | 23 | 23 | | | 0.947 | 0.2794957 | 0.422943 | 1.960528741 | 4.6354409 | 1.5 | 14 | 2.53 | 1 | 1 | 18 | 0 | |
| EU-04 | IVEU04RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 2.53 | 1 | 0 | 19 | 19 | |
| EU-04 | IVEU04RC101 | Th-228 | 3.2 | 23 | 23 | | | 13.7 | 1.6556957 | 2.632156 | 1.6 | 0.6078666 | 0.6078666 | 64 | 2.53 | 1 | 1 | 81 | 58 | |
| EU-04 | IVEU04RC101 | Th-230 | 3.49 | 23 | 23 | | | 1.77 | 1.0396087 | 0.278322 | 1.909550267 | 6.8609461 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Th-232 | 3.1 | 35 | 35 | | | 1.94 | 1.0928286 | 0.255768 | 1.699812707 | 6.6459106 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 2.53 | 1 | 0 | 18 | 18 | |
| EU-04 | IVEU04RC101 | U-234 | 4.01 | 21 | 21 | | | 1.26 | 0.8575238 | 0.187675 | 2.483402446 | 13.232433 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | |
| EU-04 | IVEU04RC101 | U-235 | 0.195 | 113 | 105 | | 3 | 0.68 | 0.0628823 | 0.071187 | 0.098571969 | 1.3846989 | 1.3846989 | 17 | 2.53 | 1 | 0 | 22 | 0 | |
| EU-04 | IVEU04RC101 | U-238 | 2.6 | 114 | 110 | | | 1.95 | 0.8202982 | 0.291045 | 1.3 | 4.4666597 | 3 | 8 | 2.53 | 1 | 0 | 11 | 0 | 19 |
| EU-04 | IVEU04RC102 | Ac-228 | 3.2 | 41 | 41 | | | 1.4 | 1.1358537 | 0.123268 | 1.6 | 12.979901 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Am-241 | 1.87 | 41 | 41 | | | 0.105 | -0.002 | 0.044612 | 0.983259209 | 22.04041 | 3 | 11 | 0.64 | 1 | 0 | 4 | 0 | |
| EU-04 | IVEU04RC102 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Co-60 | 0.0361 | 41 | 41 | | | 0.055 | 0.0010237 | 0.024158 | 0.018119848 | 0.7500449 | 0.7500449 | 40 | 0.64 | 1 | 1 | 13 | 0 | |
| EU-04 | IVEU04RC102 | Cs-134 | 0.157 | 41 | 41 | | | 0.066 | 0.0004902 | 0.023172 | 0.07919429 | 3.4176485 | 3 | 11 | 0.64 | 1 | 0 | 4 | 0 | |
| EU-04 | IVEU04RC102 | Cs-137 | 0.48 | 47 | 40 | | | 0.068 | 0.0082309 | 0.025306 | 0.24 | 9.4840592 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Eu-152 | 0.0416 | 41 | 41 | | 6 | 0.09 | -0.014244 | 0.047061 | 0.020814406 | 0.4422855 | 0.4422855 | 107 | 0.64 | 1 | 1 | 35 | 0 | |
| EU-04 | IVEU04RC102 | Eu-154 | 0.0499 | 40 | 40 | | 1 | 0.31 | 0.026525 | 0.165593 | 0.024950155 | 0.1506719 | 0.1506719 | 1620 | 0.64 | 1 | 1 | 516 | 476 | |
| EU-04 | IVEU04RC102 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | K-40 | 60 | 41 | 41 | | | 23.5 | 20.519512 | 1.534148 | 30 | 19.554829 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Pb-210 | 5 | 1 | 1 | | | 1.39 | 1.39 | | 2.5 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 4 | |
| EU-04 | IVEU04RC102 | Pu-238 | 2.97 | 41 | 41 | | | 0.049 | -0.000149 | 0.015319 | 1.635548449 | 106.76582 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Pu-241 | 406 | 41 | 35 | | | 4 | 1.2934146 | 1.117581 | 225.8293531 | 202.06972 | 3 | 11 | 0.64 | 1 | 0 | 4 | 0 | |
| EU-04 | IVEU04RC102 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Sr-90 | 0.231 | 41 | 40 | | | 0.28 | 0.058561 | 0.118019 | 1.960528741 | 16.611995 | 3 | 8 | 0.64 | 1 | 1 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.64 | 1 | 0 | 5 | 5 | |
| EU-04 | IVEU04RC102 | Th-232 | 3.1 | 41 | 41 | | | 1.4 | 1.1358537 | 0.123268 | 1.699812707 | 13.789625 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | Tritium (H-3) | 2.28 | 41 | 40 | | | 1.4 | 0.2437317 | 0.432301 | 1.345023403 | 3.1113098 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | U-234 | 4.01 | 47 | 47 | | | 1.22 | 0.9004255 | 0.144146 | 2.483402446 | 17.22838 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | U-235 | 0.195 | 47 | 47 | | | 0.089 | 0.042 | 0.020632 | 0.098571969 | 4.7775344 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | |
| EU-04 | IVEU04RC102 | U-238 | 2.6 | 47 | 47 | | | 1.31 | 0.9655319 | 0.162986 | 1.3 | 7.9761529 | 3 | 8 | 0.64 | 1 | 0 | 3 | 0 | 5 |
| EU-04 | IVEU04RC103 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Cs-137 | 0.48 | 14 | 12 | | | 2.93 | 0.4292857 | 0.746205 | 0.24 | 0.3216273 | 0.3216273 | 243 | 1.15 | 1 | 1 | 140 | 126 | |
| EU-04 | IVEU04RC103 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-04 | IVEU04RC103 | Eu-155 | 3.8 | 1 | 1 | | | 0.06 | 0.06 | | 1.903322648 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 8 | |
| EU-04 | IVEU04RC103 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | K-40 | 60 | 6 | 6 | | | 22 | 20.381667 | 2.939132 | 30 | 10.207095 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 3 | |
| EU-04 | IVEU04RC103 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Pu-238 | 2.97 | 3 | 2 | | | 0.002 | 0.0013333 | 0.001155 | 1.635548449 | 1416.4265 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Ra-226 | 5 | 3 | 3 | | | 1.1 | 0.9133333 | 0.176163 | 2.5 | 14.191418 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Sr-90 | 0.231 | 3 | 3 | | | 0.095 | 0.071 | 0.02506 | 1.960528741 | 78.233614 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | Th-228 | 3.2 | 3 | 3 | | | 1.3 | 0.9866667 | 0.289194 | 1.6 | 5.5326128 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Th-230 | 3.49 | 3 | 3 | | | 1.2 | 0.8366667 | 0.325935 | 1.909550267 | 5.8586923 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Th-232 | 3.1 | 3 | 3 | | | 1.4 | 1.0233333 | 0.365559 | 1.699812707 | 4.6499006 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | Tritium (H-3) | 2.28 | 3 | 3 | | | 0.02 | 0.007 | 0.014107 | 1.345023403 | 95.346181 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | |
| EU-04 | IVEU04RC103 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 9 | |
| EU-04 | IVEU04RC103 | U-235 | 0.195 | 6 | 6 | | | 0.06 | 0.0493333 | 0.010073 | 0.098571969 | 9.7856963 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 3 | |
| EU-04 | IVEU04RC103 | U-238 | 2.6 | 3 | 3 | | | 0.86 | 0.78 | 0.13 | 1.3 | 10 | 1.5 | 14 | 1.15 | 1 | 0 | 9 | 6 | 9 |
| EU-04 | IVEU04RC104 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Cs-137 | 0.48 | 14 | 5 | | | 0.23 | 0.0386821 | 0.060684 | 0.24 | 3.9549077 | 3 | 8 | 1.98 | 1 | 0 | 8 | 0 | |
| EU-04 | IVEU04RC104 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | K-40 | 60 | 4 | 4 | | | 21 | 20.5 | 1 | 30 | 30 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | Pu-238 | 2.97 | 4 | 4 | | | 0.007 | 0 | 0.00483 | 1.635548449 | 338.5907 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Ra-226 | 5 | 4 | 4 | | | 0.83 | 0.755 | 0.050662 | 2.5 | 49.346377 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Sr-90 | 0.231 | 4 | 4 | | | 0.042 | 0.01275 | 0.023514 | 1.960528741 | 83.376445 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.98 | 1 | 0 | 15 | 15 | |
| EU-04 | IVEU04RC104 | Th-228 | 3.2 | 4 | 4 | | | 1.3 | 1.1 | 0.270801 | 1.6 | 5.9083916 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Th-230 | 3.49 | 4 | 4 | | | 1.3 | 0.96 | 0.313794 | 1.909550267 | 6.0853628 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Th-232 | 3.1 | 4 | 4 | | | 1.1 | 0.985 | 0.23 | 1.699812707 | 7.39049 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | Tritium (H-3) | 2.28 | 1 | 1 | | | 0.008 | 0.008 | | 1.345023403 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 13 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-04 | IVEU04RC104 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 14 | |
| EU-04 | IVEU04RC104 | U-235 | 0.195 | 4 | 4 | | | 0.07 | 0.05325 | 0.012366 | 0.098571969 | 7.9712425 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | |
| EU-04 | IVEU04RC104 | U-238 | 2.6 | 4 | 4 | | | 1.3 | 0.94 | 0.277609 | 1.3 | 4.682848 | 1.5 | 14 | 1.98 | 1 | 0 | 14 | 10 | 15 |
| EU-04 | IVEU04RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Cs-137 | 0.48 | 2 | 2 | | | 0.13 | 0.11 | 0.028284 | 0.24 | 8.4852814 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | K-40 | 60 | 2 | 2 | | | 23 | 21.5 | 2.12132 | 30 | 14.142136 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | Pu-238 | 2.97 | 2 | 2 | | | 0.001 | 0 | 0.001414 | 1.635548449 | 1156.5074 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Ra-226 | 5 | 2 | 2 | | | 0.87 | 0.825 | 0.06364 | 2.5 | 39.28371 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Sr-90 | 0.231 | 2 | 2 | | | 0.049 | 0.036 | 0.018385 | 1.960528741 | 106.63871 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 11.97 | 3 | 0 | 11 | 11 | |
| EU-04 | IVEU04RC301 | Th-228 | 3.2 | 2 | 2 | | | 0.82 | 0.705 | 0.162635 | 1.6 | 9.8380074 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Th-230 | 3.49 | 2 | 2 | | | 0.65 | 0.64 | 0.014142 | 1.909550267 | 135.02559 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Th-232 | 3.1 | 2 | 2 | | | 0.9 | 0.805 | 0.13435 | 1.699812707 | 12.652096 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.027 | 0.0215 | 0.007778 | 1.345023403 | 172.92276 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 10 | |
| EU-04 | IVEU04RC301 | U-235 | 0.195 | 2 | 2 | | | 0.04 | 0.036 | 0.005657 | 0.098571969 | 17.425227 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | |
| EU-04 | IVEU04RC301 | U-238 | 2.6 | 2 | 2 | | | 0.72 | 0.71 | 0.014142 | 1.3 | 91.923882 | 1.5 | 14 | 11.97 | 3 | 0 | 10 | 8 | 11 |
| EU-05 | IVEU05RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Cs-137 | 0.48 | 2 | 2 | | | | | | 0.24 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 0 | |
| EU-05 | IVEU05RC101 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | K-40 | 60 | 2 | 2 | | | 23.6 | 22.9 | 0.989949 | 30 | 30.304576 | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 0 | |
| EU-05 | IVEU05RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-05 | IVEU05RC101 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Ra-226 | 5 | 2 | 2 | | | 0.82 | 0.82 | | 2.5 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 0 | |
| EU-05 | IVEU05RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC101 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.10 | 1 | 0 | 1 | 1 | 1 |
| EU-05 | IVEU05RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Co-60 | 0.0361 | 1 | 1 | | | 0.04 | 0.04 | | 0.018119848 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Cs-137 | 0.48 | 1 | 1 | | | 0.53 | 0.53 | | 0.24 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | K-40 | 60 | 1 | 1 | | | 20 | 20 | | 30 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Pu-238 | 2.97 | 1 | 1 | | | 0 | 0 | | 1.635548449 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Ra-226 | 5 | 1 | 1 | | | 0.88 | 0.88 | | 2.5 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Sr-90 | 0.231 | 1 | 1 | | | 0.056 | 0.056 | | 1.960528741 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | Th-228 | 3.2 | 1 | 1 | | | 1.1 | 1.1 | | 1.6 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Th-230 | 3.49 | 1 | 1 | | | 0.79 | 0.79 | | 1.909550267 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Th-232 | 3.1 | 1 | 1 | | | 1.1 | 1.1 | | 1.699812707 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 7 | |
| EU-05 | IVEU05RC102 | U-235 | 0.195 | 1 | 1 | | | 0.045 | 0.045 | | 0.098571969 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | |
| EU-05 | IVEU05RC102 | U-238 | 2.6 | 1 | 1 | | | 0.76 | 0.76 | | 1.3 | | 1.5 | 14 | 0.92 | 1 | 0 | 7 | 6 | 7 |
| EU-05 | IVEU05RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-05 | IVEU05RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | |
| EU-05 | IVEU05RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.20 | 2 | 0 | 1 | 1 | 1 |
| EU-05 | IVEU05RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Cs-137 | 0.48 | 4 | 4 | | | 0.13 | 0.0975 | 0.045735 | 0.24 | 5.2476517 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Eu-155 | 3.8 | 2 | 2 | | | 0.11 | 0.075 | 0.049497 | 1.903322648 | 38.452924 | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 14 | |
| EU-05 | IVEU05RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | K-40 | 60 | 4 | 4 | | | 23 | 20.5 | 1.732051 | 30 | 17.320508 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | Pu-238 | 2.97 | 4 | 2 | | | -0.001 | 0.00125 | 0.002872 | 1.635548449 | 569.42488 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Ra-226 | 5 | 4 | 4 | | | 1.4 | 1.0025 | 0.277654 | 2.5 | 9.0040167 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |
| EU-05 | IVEU05RC301 | Sr-90 | 0.231 | 4 | 4 | | | 0.059 | 0.0365 | 0.018157 | 1.960528741 | 107.9781 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 17.66 | 3 | 0 | 16 | 16 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-05 | IVEU05RC301 | Th-228 | 3.2 | 4 | 4 | | | 1.2 | 0.7775 | 0.332202 | 1.6 | 4.8163431 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Th-230 | 3.49 | 4 | 4 | | | 0.96 | 0.71 | 0.173013 | 1.909550267 | 11.037064 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Th-232 | 3.1 | 4 | 4 | | | 1.1 | 0.765 | 0.287228 | 1.699812707 | 5.9179882 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.057 | 0.027 | 0.042426 | 1.345023403 | 31.702506 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 13 | |
| EU-05 | IVEU05RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 15 | |
| EU-05 | IVEU05RC301 | U-235 | 0.195 | 4 | 4 | | | 0.082 | 0.0455 | 0.024906 | 0.098571969 | 3.9576818 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | |
| EU-05 | IVEU05RC301 | U-238 | 2.6 | 4 | 4 | | | 1.4 | 0.94 | 0.332165 | 1.3 | 3.9137221 | 1.5 | 14 | 17.66 | 3 | 0 | 15 | 11 | 16 |
| EU-06 | IVEU06RC101 | Ac-228 | 3.2 | 222 | 222 | | | 2.09 | 1.1898649 | 0.226357 | 1.6 | 7.0684771 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Am-241 | 1.87 | 233 | 231 | | | 0.14 | 0.0103588 | 0.032569 | 0.983259209 | 30.190321 | 3 | 11 | 4.99 | 1 | 0 | 28 | 0 | |
| EU-06 | IVEU06RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Co-60 | 0.0361 | 233 | 233 | | 12 | 0.076 | 0.0011923 | 0.027993 | 0.018119848 | 0.6472976 | 0.6472976 | 52 | 4.99 | 1 | 1 | 130 | 0 | |
| EU-06 | IVEU06RC101 | Cs-134 | 0.157 | 245 | 232 | | | 0.11 | 0.0035922 | 0.035645 | 0.07919429 | 2.2217772 | 2.2217772 | 12 | 4.99 | 1 | 0 | 30 | 0 | |
| EU-06 | IVEU06RC101 | Cs-137 | 0.48 | 280 | 267 | | | 5.84 | 0.3643613 | 0.705579 | 0.24 | 0.3401461 | 0.3401461 | 243 | 4.99 | 1 | 1 | 607 | 327 | |
| EU-06 | IVEU06RC101 | Eu-152 | 0.0416 | 230 | 230 | | 3 | 0.62 | -0.02671 | 0.216895 | 0.020814406 | 0.0959653 | 0.0959653 | #N/A | 4.99 | 1 | 1 | #N/A | #N/A | |
| EU-06 | IVEU06RC101 | Eu-154 | 0.0499 | 231 | 231 | | 2 | 0.63 | 0.006174 | 0.204947 | 0.024950155 | 0.1217393 | 0.1217393 | 1620 | 4.99 | 1 | 1 | 4041 | 3810 | |
| EU-06 | IVEU06RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | K-40 | 60 | 253 | 253 | | | 27.2 | 20.836482 | 2.429071 | 30 | 12.350398 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Na-22 | 0.0865 | 136 | 136 | | | 0.087 | -7.35E-06 | 0.037355 | 0.043308929 | 1.159376 | 1.159376 | 21 | 4.99 | 1 | 0 | 53 | 0 | |
| EU-06 | IVEU06RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 4.99 | 1 | 0 | 35 | 35 | |
| EU-06 | IVEU06RC101 | Pu-238 | 2.97 | 238 | 238 | | | 0.077 | 0.0030391 | 0.012638 | 1.635548449 | 129.41617 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 4.99 | 1 | 0 | 35 | 35 | |
| EU-06 | IVEU06RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Pu-241 | 406 | 233 | 232 | | | 4.9 | -0.209206 | 1.329399 | 225.8293531 | 169.87322 | 3 | 11 | 4.99 | 1 | 0 | 28 | 0 | |
| EU-06 | IVEU06RC101 | Ra-226 | 5 | 139 | 134 | | 0 | 7.1 | 1.7858273 | 1.197715 | 2.5 | 2.0873087 | 2.0873087 | 10 | 4.99 | 1 | 0 | 25 | 0 | |
| EU-06 | IVEU06RC101 | Ra-228 | 3.2 | 125 | 125 | | | 2.09 | 1.20816 | 0.270237 | 1.6 | 5.9207287 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Sr-90 | 0.231 | 237 | 234 | | | 28.1 | 0.3779916 | 1.843535 | 1.960528741 | 1.0634619 | 1.5 | 14 | 4.99 | 1 | 1 | 35 | 0 | |
| EU-06 | IVEU06RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 4.99 | 1 | 0 | 38 | 38 | |
| EU-06 | IVEU06RC101 | Th-228 | 3.2 | 140 | 140 | | | 2.53 | 1.2400714 | 0.273229 | 1.6 | 5.8558991 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Th-230 | 3.49 | 140 | 140 | | | 1.64 | 0.9690714 | 0.237735 | 1.909550267 | 8.0322706 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Th-232 | 3.1 | 374 | 374 | | | 2.36 | 1.1851337 | 0.252278 | 1.699812707 | 6.7378469 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 4.99 | 1 | 0 | 35 | 35 | |
| EU-06 | IVEU06RC101 | U-234 | 4.01 | 233 | 233 | | | 9.6 | 0.9987897 | 0.664471 | 2.483402446 | 3.7374116 | 3 | 8 | 4.99 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC101 | U-235 | 0.195 | 237 | 236 | | | 0.73 | 0.0546793 | 0.057508 | 0.098571969 | 1.7140704 | 1.7140704 | 12 | 4.99 | 1 | 0 | 30 | 0 | |
| EU-06 | IVEU06RC101 | U-238 | 2.6 | 252 | 252 | | | 8.6 | 0.9189603 | 0.60733 | 1.3 | 2.1405184 | 2.1405184 | 10 | 4.99 | 1 | 0 | 25 | 0 | 38 |
| EU-06 | IVEU06RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Cs-134 | 0.157 | 1 | 1 | | | 0.03 | 0.03 | | 0.07919429 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 22 | |
| EU-06 | IVEU06RC102 | Cs-137 | 0.48 | 25 | 2 | | | 0.09 | 0.045036 | 0.013549 | 0.24 | 17.713569 | 3 | 8 | 3.00 | 1 | 0 | 13 | 0 | |
| EU-06 | IVEU06RC102 | Eu-152 | 0.0416 | 8 | 8 | | 14 | 2.84 | 1.31375 | 0.645909 | 0.020814406 | 0.032225 | 1.5 | 15 | 3.00 | 1 | 1 | 23 | 15 | |
| EU-06 | IVEU06RC102 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | K-40 | 60 | 3 | 3 | | | 23 | 21 | 2 | 30 | 15 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-06 | IVEU06RC102 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | Pu-238 | 2.97 | 3 | 3 | | | 0 | 0 | 0 | 1.635548449 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Ra-226 | 5 | 3 | 3 | | | 0.91 | 0.8766667 | 0.057735 | 2.5 | 43.30127 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Sr-90 | 0.231 | 3 | 3 | | | 0.028 | 0.0196667 | 0.009074 | 1.960528741 | 216.06547 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 3.00 | 1 | 0 | 23 | 23 | |
| EU-06 | IVEU06RC102 | Th-228 | 3.2 | 3 | 3 | | | 1.4 | 1.2233333 | 0.225019 | 1.6 | 7.1105259 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Th-230 | 3.49 | 3 | 3 | | | 1.3 | 1.0233333 | 0.24379 | 1.909550267 | 7.8327822 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Th-232 | 3.1 | 3 | 3 | | | 1.2 | 1.1266667 | 0.127017 | 1.699812707 | 13.382554 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 22 | |
| EU-06 | IVEU06RC102 | U-235 | 0.195 | 3 | 3 | | | 0.052 | 0.0446667 | 0.011846 | 0.098571969 | 8.3209519 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | |
| EU-06 | IVEU06RC102 | U-238 | 2.6 | 3 | 3 | | | 0.98 | 0.93 | 0.043589 | 1.3 | 29.824045 | 1.5 | 14 | 3.00 | 1 | 0 | 22 | 19 | 23 |
| EU-06 | IVEU06RC103 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 25 | |
| EU-06 | IVEU06RC103 | Am-241 | 1.87 | 19 | 19 | | | 0.018 | -0.001263 | 0.007915 | 0.983259209 | 124.22543 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Cm-243/244 | 0.349 | 19 | 19 | | | 0.026 | 0.0022653 | 0.006958 | 0.175489416 | 25.220131 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | Co-60 | 0.0361 | 37 | 37 | | | 0.0071 | 0.0004649 | 0.003572 | 0.018119848 | 5.0724493 | 3 | 11 | 3.46 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC103 | Cs-134 | 0.157 | 37 | 37 | | | 0.007 | -0.020032 | 0.021073 | 0.07919429 | 3.7580654 | 3 | 11 | 3.46 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC103 | Cs-137 | 0.48 | 40 | 40 | | | 0.746 | 0.04685 | 0.140849 | 0.24 | 1.7039481 | 1.7039481 | 12 | 3.46 | 1 | 0 | 21 | 0 | |
| EU-06 | IVEU06RC103 | Eu-152 | 0.0416 | 37 | 37 | | | 0.024 | -0.004838 | 0.014739 | 0.020814406 | 1.4121583 | 1.4121583 | 16 | 3.46 | 1 | 0 | 28 | 0 | |
| EU-06 | IVEU06RC103 | Eu-154 | 0.0499 | 37 | 37 | | | 0.03 | 0.0010541 | 0.017602 | 0.024950155 | 1.4174615 | 1.4174615 | 16 | 3.46 | 1 | 0 | 28 | 0 | |
| EU-06 | IVEU06RC103 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Fe-55 | 2690 | 19 | 19 | | | 6 | -2.463158 | 2.640962 | 1461.911262 | 553.55263 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | K-40 | 60 | 39 | 39 | | | 27.72 | 22.066667 | 1.685452 | 30 | 17.799378 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Na-22 | 0.0865 | 37 | 37 | | | 0.014 | 0.0004189 | 0.006723 | 0.043308929 | 6.4416232 | 3 | 11 | 3.46 | 1 | 0 | 20 | 0 | |
| EU-06 | IVEU06RC103 | Ni-59 | 208 | 19 | 19 | | | 720 | -254.7368 | 480.0274 | 541.446433 | 1.127949 | 1.127949 | 21 | 3.46 | 1 | 1 | 37 | 18 | |
| EU-06 | IVEU06RC103 | Ni-63 | 94.8 | 19 | 19 | | | 2.1 | 0.1736842 | 0.910337 | 246.5901147 | 270.87783 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 25 | |
| EU-06 | IVEU06RC103 | Pu-238 | 2.97 | 20 | 20 | | | 0.012 | -0.000615 | 0.003267 | 1.635548449 | 500.61096 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 25 | |
| EU-06 | IVEU06RC103 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Pu-241 | 406 | 19 | 19 | | | 3.2 | -1.083684 | 2.534419 | 225.8293531 | 89.104976 | 3 | 11 | 3.46 | 1 | 0 | 20 | 1 | |
| EU-06 | IVEU06RC103 | Ra-226 | 5 | 1 | 1 | | | 0.62 | 0.62 | | 2.5 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 24 | |
| EU-06 | IVEU06RC103 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.46 | 1 | 0 | 25 | 25 | |
| EU-06 | IVEU06RC103 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Sr-90 | 0.231 | 20 | 20 | | | 0.039 | -0.0012 | 0.026704 | 1.960528741 | 73.416417 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 3.46 | 1 | 0 | 26 | 26 | |
| EU-06 | IVEU06RC103 | Th-228 | 3.2 | 20 | 19 | | | 0.98 | 0.106 | 0.323458 | 1.6 | 4.946542 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Th-230 | 3.49 | 20 | 20 | | | 0.85 | 0.199 | 0.200604 | 1.909550267 | 9.5189873 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Th-232 | 3.1 | 20 | 20 | | | 1.08 | 0.2169 | 0.253824 | 1.699812707 | 6.6968274 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | Tritium (H-3) | 2.28 | 19 | 19 | | | 1 | 0.0736842 | 0.409393 | 1.345023403 | 3.2854117 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | U-234 | 4.01 | 19 | 19 | | | 0.91 | 0.5684737 | 0.152542 | 2.483402446 | 16.280091 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | U-235 | 0.195 | 20 | 20 | | | 0.101 | 0.05625 | 0.023697 | 0.098571969 | 4.1596148 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | |
| EU-06 | IVEU06RC103 | U-238 | 2.6 | 20 | 20 | | | 0.87 | 0.5534 | 0.161954 | 1.3 | 8.0269711 | 3 | 8 | 3.46 | 1 | 0 | 14 | 0 | 26 |
| EU-06 | IVEU06RC104 | Ac-228 | 3.2 | 39 | 39 | | | 1.34 | 1.0411026 | 0.204488 | 1.6 | 7.8244235 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Am-241 | 1.87 | 39 | 39 | | | 0.86 | 0.0195256 | 0.147325 | 0.983259209 | 6.6740924 | 3 | 11 | 0.77 | 1 | 0 | 5 | 0 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-06 | IVEU06RC104 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Co-60 | 0.0361 | 39 | 39 | | | 0.045 | 0.0028718 | 0.023998 | 0.018119848 | 0.7550565 | 0.7550565 | 40 | 0.77 | 1 | 1 | 16 | 0 | |
| EU-06 | IVEU06RC104 | Cs-134 | 0.157 | 39 | 39 | | | 0.027 | 0.0012154 | 0.014679 | 0.07919429 | 5.3952336 | 3 | 11 | 0.77 | 1 | 0 | 5 | 0 | |
| EU-06 | IVEU06RC104 | Cs-137 | 0.48 | 39 | 39 | | | 0.05 | -0.000657 | 0.019644 | 0.24 | 12.217762 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Eu-152 | 0.0416 | 39 | 39 | | | 0.091 | -0.016597 | 0.046932 | 0.020814406 | 0.4435013 | 0.4435013 | 107 | 0.77 | 1 | 1 | 42 | 3 | |
| EU-06 | IVEU06RC104 | Eu-154 | 0.0499 | 39 | 39 | | | 0.23 | -0.000462 | 0.141473 | 0.024950155 | 0.17636 | 0.17636 | 1620 | 0.77 | 1 | 1 | 626 | 587 | |
| EU-06 | IVEU06RC104 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | K-40 | 60 | 39 | 39 | | | 23.4 | 20.279487 | 1.423705 | 30 | 21.071778 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Pu-238 | 2.97 | 39 | 39 | | | 0.025 | 0.0018538 | 0.010836 | 1.635548449 | 150.93826 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Pu-241 | 406 | 39 | 38 | | | 1.2 | 0.3594872 | 0.601533 | 225.8293531 | 375.42311 | 3 | 11 | 0.77 | 1 | 0 | 5 | 0 | |
| EU-06 | IVEU06RC104 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Sr-90 | 0.231 | 39 | 39 | | | 0.38 | 0.0688974 | 0.176257 | 1.960528741 | 11.123156 | 3 | 8 | 0.77 | 1 | 1 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | Th-232 | 3.1 | 39 | 39 | | | 1.4 | 1.0766667 | 0.126851 | 1.699812707 | 13.400052 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.77 | 1 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC104 | U-234 | 4.01 | 39 | 39 | | | 1.81 | 0.8305128 | 0.222509 | 2.483402446 | 11.160908 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | U-235 | 0.195 | 39 | 39 | | | 0.08 | 0.0342564 | 0.020997 | 0.098571969 | 4.6945426 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | |
| EU-06 | IVEU06RC104 | U-238 | 2.6 | 39 | 39 | | | 1.51 | 0.8361538 | 0.182376 | 1.3 | 7.1281172 | 3 | 8 | 0.77 | 1 | 0 | 4 | 0 | 6 |
| EU-06 | IVEU06RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-06 | IVEU06RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 5.86 | 3 | 0 | 6 | 6 | |
| EU-06 | IVEU06RC301 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | |
| EU-06 | IVEU06RC301 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 5.86 | 3 | 0 | 5 | 5 | 6 |
| EU-07 | IVEU07RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 4.77 | 1 | 0 | 34 | 34 | |
| EU-07 | IVEU07RC101 | Am-241 | 1.87 | 22 | 21 | | | 0.18 | 0.0509545 | 0.124486 | 0.983259209 | 7.8985658 | 3 | 11 | 4.77 | 1 | 0 | 27 | 5 | |
| EU-07 | IVEU07RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Co-60 | 0.0361 | 1 | 1 | | 12 | 0.04 | 0.04 | | 0.018119848 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 35 | |
| EU-07 | IVEU07RC101 | Cs-134 | 0.157 | 13 | 1 | | | 0.04 | 0.0723077 | 0.009707 | 0.07919429 | 8.1582592 | 3 | 11 | 4.77 | 1 | 0 | 27 | 14 | |
| EU-07 | IVEU07RC101 | Cs-137 | 0.48 | 58 | 43 | | | 2.93 | 0.4364224 | 0.615021 | 0.24 | 0.3902307 | 0.3902307 | 243 | 4.77 | 1 | 1 | 580 | 522 | |
| EU-07 | IVEU07RC101 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | K-40 | 60 | 34 | 34 | | | 24.27 | 18.385 | 2.864011 | 30 | 10.47482 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 4.77 | 1 | 0 | 34 | 34 | |
| EU-07 | IVEU07RC101 | Pu-238 | 2.97 | 42 | 41 | | | 0.16 | 0.0143483 | 0.032277 | 1.635548449 | 50.672455 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 4.77 | 1 | 0 | 34 | 34 | |
| EU-07 | IVEU07RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Ra-226 | 5 | 22 | 22 | | | 2.16 | 0.9695 | 0.392234 | 2.5 | 6.3737544 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Ra-228 | 3.2 | 11 | 11 | | | 2.87 | 1.56 | 0.561818 | 1.6 | 2.8478949 | 2.8478949 | 8 | 4.77 | 1 | 0 | 20 | 9 | |
| EU-07 | IVEU07RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Sr-90 | 0.231 | 33 | 33 | | | 3.08 | 0.2340303 | 0.570281 | 1.960528741 | 3.4378264 | 1.5 | 14 | 4.77 | 1 | 1 | 34 | 1 | |
| EU-07 | IVEU07RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 4.77 | 1 | 0 | 36 | 36 | |
| EU-07 | IVEU07RC101 | Th-228 | 3.2 | 44 | 44 | | | 2.69 | 1.3488409 | 0.459015 | 1.6 | 3.4857236 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Th-230 | 3.49 | 33 | 33 | | | 2.7 | 1.1875758 | 0.544025 | 1.909550267 | 3.5100444 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Th-232 | 3.1 | 56 | 56 | | | 2.87 | 1.1242857 | 0.41125 | 1.699812707 | 4.1332808 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | Tritium (H-3) | 2.28 | 4 | 4 | | | -0.031 | -0.049 | 0.02953 | 1.345023403 | 45.54824 | 1.5 | 14 | 4.77 | 1 | 0 | 34 | 30 | |
| EU-07 | IVEU07RC101 | U-234 | 4.01 | 22 | 22 | | | 1.71 | 1.1054545 | 0.338452 | 2.483402446 | 7.3375313 | 3 | 8 | 4.77 | 1 | 0 | 20 | 0 | |
| EU-07 | IVEU07RC101 | U-235 | 0.195 | 22 | 22 | | | 0.167 | 0.0646667 | 0.046168 | 0.098571969 | 2.1350514 | 2.1350514 | 10 | 4.77 | 1 | 0 | 24 | 2 | |
| EU-07 | IVEU07RC101 | U-238 | 2.6 | 56 | 56 | | | 3.56 | 1.0551852 | 0.618052 | 1.3 | 2.1033845 | 2.1033845 | 10 | 4.77 | 1 | 0 | 24 | 0 | 36 |
| EU-07 | IVEU07RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Cs-137 | 0.48 | 6 | 2 | | | 0.53 | 0.12975 | 0.196714 | 0.24 | 1.2200473 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Eu-152 | 0.0416 | | | | 4 | | | | 0.020814406 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-07 | IVEU07RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | K-40 | 60 | 2 | 2 | | | 20 | 19.5 | 0.707107 | 30 | 42.426407 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Pu-238 | 2.97 | 2 | 2 | | | 0 | -0.0005 | 0.000707 | 1.635548449 | 2313.0148 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Ra-226 | 5 | 2 | 2 | | | 0.86 | 0.84 | 0.028284 | 2.5 | 88.388348 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Sr-90 | 0.231 | 2 | 2 | | | 0.076 | 0.046 | 0.042426 | 1.960528741 | 46.210106 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | Th-228 | 3.2 | 2 | 2 | | | 0.71 | 0.69 | 0.028284 | 1.6 | 56.568542 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Th-230 | 3.49 | 2 | 2 | | | 0.59 | 0.59 | 0 | 1.909550267 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Th-232 | 3.1 | 2 | 2 | | | 0.76 | 0.75 | 0.014142 | 1.699812707 | 120.19491 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.024 | 0.024 | 0 | 1.345023403 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 2 | |
| EU-07 | IVEU07RC201 | U-235 | 0.195 | 2 | 2 | | | 0.043 | 0.0395 | 0.00495 | 0.098571969 | 19.914545 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | |
| EU-07 | IVEU07RC201 | U-238 | 2.6 | 2 | 2 | | | 0.78 | 0.7 | 0.113137 | 1.3 | 11.490485 | 1.5 | 14 | 1.24 | 2 | 0 | 2 | 0 | 2 |
| EU-07 | IVEU07RC202 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-07 | IVEU07RC202 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC202 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 3.66 | 2 | 0 | 6 | 6 | 6 |
| EU-07 | IVEU07RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Cs-137 | 0.48 | 2 | 1 | | | 0.19 | 0.1 | 0.127279 | 0.24 | 1.8856181 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | K-40 | 60 | 2 | 2 | | | 19 | 17.5 | 2.12132 | 30 | 14.142136 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Pu-238 | 2.97 | 2 | 2 | | | 0.005 | 0.002 | 0.004243 | 1.635548449 | 385.50247 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Ra-226 | 5 | 2 | 2 | | | 0.91 | 0.775 | 0.190919 | 2.5 | 13.09457 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Sr-90 | 0.231 | 2 | 2 | | | 0.088 | 0.072 | 0.022627 | 1.960528741 | 86.643948 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | Th-228 | 3.2 | 2 | 2 | | | 1.2 | 1.08 | 0.169706 | 1.6 | 9.4280904 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Th-230 | 3.49 | 2 | 2 | | | 1 | 0.875 | 0.176777 | 1.909550267 | 10.802048 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Th-232 | 3.1 | 2 | 2 | | | 1 | 0.96 | 0.056569 | 1.699812707 | 30.048727 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | Tritium (H-3) | 2.28 | 1 | 1 | | | -0.018 | -0.018 | | 1.345023403 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 5 | |
| EU-07 | IVEU07RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 6 | |
| EU-07 | IVEU07RC301 | U-235 | 0.195 | 2 | 2 | | | 0.039 | 0.037 | 0.002828 | 0.098571969 | 34.850454 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | |
| EU-07 | IVEU07RC301 | U-238 | 2.6 | 2 | 2 | | | 0.92 | 0.795 | 0.176777 | 1.3 | 7.3539105 | 1.5 | 14 | 6.45 | 3 | 0 | 6 | 4 | 6 |
| EU-08 | IVEU08RC101 | Ac-228 | 3.2 | 1 | 1 | | | 1.13 | 1.13 | | 1.6 | | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 17 | |
| EU-08 | IVEU08RC101 | Am-241 | 1.87 | 13 | 13 | | | 0.0451 | 0.0192877 | 0.017205 | 0.983259209 | 57.150081 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Co-60 | 0.0361 | 13 | 13 | | | 0.0497 | -0.002933 | 0.023157 | 0.018119848 | 0.7824646 | 0.7824646 | 40 | 2.54 | 1 | 1 | 51 | 38 | |
| EU-08 | IVEU08RC101 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Cs-137 | 0.48 | 49 | 48 | | | 0.18 | 0.0291519 | 0.046143 | 0.24 | 5.2012332 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Eu-152 | 0.0416 | 13 | 13 | | | 0.122 | 0.0395231 | 0.062748 | 0.020814406 | 0.3317127 | 0.3317127 | 185 | 2.54 | 1 | 1 | 235 | 222 | |
| EU-08 | IVEU08RC101 | Eu-154 | 0.0499 | 13 | 13 | | | 0.166 | -0.086533 | 0.174489 | 0.024950155 | 0.1429902 | 0.1429902 | 1620 | 2.54 | 1 | 1 | 2057 | 2044 | |
| EU-08 | IVEU08RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Fe-55 | 2690 | 13 | 13 | | | 1.72 | 0.0807077 | 0.621047 | 1461.911262 | 2353.9467 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | K-40 | 60 | 46 | 46 | | | 30.5 | 18.502276 | 6.414922 | 30 | 4.6765962 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Ni-59 | 208 | 13 | 13 | | | 58.1 | 12.372385 | 20.62087 | 541.446433 | 26.257203 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | Ni-63 | 94.8 | 13 | 13 | | | 0.626 | -2.415308 | 3.310067 | 246.5901147 | 74.497012 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 18 | |
| EU-08 | IVEU08RC101 | Pu-238 | 2.97 | 16 | 16 | | | 0.102 | 0.0333276 | 0.032055 | 1.635548449 | 51.023094 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-08 | IVEU08RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 18 | |
| EU-08 | IVEU08RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Pu-241 | 406 | 13 | 13 | | | 8.61 | 2.3617692 | 2.187107 | 225.8293531 | 103.25482 | 3 | 11 | 2.54 | 1 | 0 | 14 | 1 | |
| EU-08 | IVEU08RC101 | Ra-226 | 5 | 3 | 3 | | | 0.81 | 0.7766667 | 0.035119 | 2.5 | 71.18685 | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 15 | |
| EU-08 | IVEU08RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 2.54 | 1 | 0 | 18 | 18 | |
| EU-08 | IVEU08RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Sr-90 | 0.231 | 16 | 16 | | | 0.423 | 0.1582813 | 0.200209 | 1.960528741 | 9.7924125 | 3 | 8 | 2.54 | 1 | 1 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 2.54 | 1 | 0 | 20 | 20 | |
| EU-08 | IVEU08RC101 | Th-228 | 3.2 | 16 | 16 | | | 1.72 | 1.32875 | 0.242429 | 1.6 | 6.5998791 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Th-230 | 3.49 | 16 | 16 | | | 1.84 | 1.33375 | 0.326657 | 1.909550267 | 5.8457294 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Th-232 | 3.1 | 16 | 16 | | | 1.71 | 1.39125 | 0.241575 | 1.699812707 | 7.0363856 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | Tritium (H-3) | 2.28 | 13 | 13 | | | 1.79 | -1.503846 | 1.422366 | 1.345023403 | 0.9456238 | 0.9456238 | 31 | 2.54 | 1 | 1 | 40 | 27 | |
| EU-08 | IVEU08RC101 | U-234 | 4.01 | 13 | 13 | | | 1.1 | 0.9078462 | 0.119634 | 2.483402446 | 20.758323 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | U-235 | 0.195 | 16 | 16 | | | 0.123 | 0.0634813 | 0.029996 | 0.098571969 | 3.2861967 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC101 | U-238 | 2.6 | 16 | 16 | | | 1.08 | 0.848 | 0.170354 | 1.3 | 7.6311793 | 3 | 8 | 2.54 | 1 | 0 | 11 | 0 | 20 |
| EU-08 | IVEU08RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Am-241 | 1.87 | 58 | 58 | | | 0.118 | 0.0210341 | 0.023519 | 0.983259209 | 41.806752 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | Ba-133 | 0.175 | 55 | 55 | | | 0.401 | 0.0322502 | 0.084397 | 0.087668644 | 1.0387667 | 1.0387667 | 23 | 1.44 | 1 | 0 | 17 | 0 | |
| EU-08 | IVEU08RC102 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Co-60 | 0.0361 | 69 | 69 | | | 0.09558 | 0.0046294 | 0.031462 | 0.018119848 | 0.575928 | 0.575928 | 71 | 1.44 | 1 | 1 | 52 | 0 | |
| EU-08 | IVEU08RC102 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Cs-137 | 0.48 | 103 | 86 | | | 0.436 | 0.0150407 | 0.057538 | 0.24 | 4.1711809 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Eu-152 | 0.0416 | 68 | 68 | | | 0.844 | 0.0470391 | 0.252363 | 0.020814406 | 0.0824781 | 1.5 | 15 | 1.44 | 1 | 1 | 11 | 0 | |
| EU-08 | IVEU08RC102 | Eu-154 | 0.0499 | 68 | 68 | | | 0.404 | -0.041944 | 0.190007 | 0.024950155 | 0.1313115 | 0.1313115 | 1620 | 1.44 | 1 | 1 | 1168 | 1100 | |
| EU-08 | IVEU08RC102 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Fe-55 | 2690 | 58 | 53 | | | 30 | 5.3380183 | 8.072759 | 1461.911262 | 181.09191 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | K-40 | 60 | 31 | 31 | | | 39.34 | 22.93469 | 8.570045 | 30 | 3.5005652 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Ni-63 | 94.8 | 58 | 58 | | | 48.5 | 4.6868858 | 6.85763 | 246.5901147 | 35.958502 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Pu-238 | 2.97 | 59 | 59 | | | 0.115 | 0.0160848 | 0.025564 | 1.635548449 | 63.978047 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Pu-239 | 2.59 | 43 | 43 | | | 0.0302 | 0.0033621 | 0.007488 | 1.430938981 | 191.09212 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Pu-240 | 2.6 | 43 | 43 | | | 0.0178 | 0.0019763 | 0.004403 | 1.432213109 | 325.25316 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | Pu-241 | 406 | 58 | 57 | | | 3.34 | -0.528699 | 1.412299 | 225.8293531 | 159.90197 | 3 | 11 | 1.44 | 1 | 0 | 8 | 0 | |
| EU-08 | IVEU08RC102 | Ra-226 | 5 | 1 | 1 | | | 0.77 | 0.77 | | 2.5 | | 1.5 | 14 | 1.44 | 1 | 0 | 11 | 10 | |
| EU-08 | IVEU08RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Sr-90 | 0.231 | 60 | 60 | | | 1.25054372 | 0.1007929 | 0.232405 | 1.960528741 | 8.4358353 | 3 | 8 | 1.44 | 1 | 1 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.44 | 1 | 0 | 11 | 11 | |
| EU-08 | IVEU08RC102 | Th-228 | 3.2 | 59 | 59 | | | 1.865 | 1.1458983 | 0.246954 | 1.6 | 6.4789291 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Th-230 | 3.49 | 59 | 59 | | | 2.39 | 1.0059661 | 0.353918 | 1.909550267 | 5.3954586 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Th-232 | 3.1 | 59 | 59 | | | 1.842 | 1.107339 | 0.273214 | 1.699812707 | 6.2215535 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | Tritium (H-3) | 2.28 | 69 | 69 | | 1 | 11.8 | -0.449799 | 3.509829 | 1.345023403 | 0.3832163 | 0.3832163 | 243 | 1.44 | 1 | 1 | 176 | 107 | |
| EU-08 | IVEU08RC102 | U-234 | 4.01 | 58 | 58 | | | 1.503 | 0.7142207 | 0.287676 | 2.483402446 | 8.6326278 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | |
| EU-08 | IVEU08RC102 | U-235 | 0.195 | 59 | 59 | | | 0.3399 | 0.0568914 | 0.063236 | 0.098571969 | 1.5587928 | 1.5587928 | 14 | 1.44 | 1 | 0 | 11 | 0 | |
| EU-08 | IVEU08RC102 | U-238 | 2.6 | 59 | 59 | | | 1.297 | 0.6860797 | 0.267405 | 1.3 | 4.8615353 | 3 | 8 | 1.44 | 1 | 0 | 6 | 0 | 11 |
| EU-08 | IVEU08RC103 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Am-241 | 1.87 | 4 | 4 | | | 0.0302 | 0.0171625 | 0.008825 | 0.983259209 | 111.41671 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Ba-133 | 0.175 | 4 | 4 | | | 0.35 | 0.20525 | 0.161898 | 0.087668644 | 0.5415059 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Co-60 | 0.0361 | 4 | 4 | | | 0.06106 | 0.0033278 | 0.039764 | 0.018119848 | 0.4556819 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-08 | IVEU08RC103 | Cs-137 | 0.48 | 4 | 4 | | | 0.1435 | 0.0262678 | 0.079395 | 0.24 | 3.0228507 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Eu-152 | 0.0416 | 4 | 4 | | | 0.231 | 0.1365525 | 0.110647 | 0.020814406 | 0.1881157 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Eu-154 | 0.0499 | 4 | 4 | | | 0.1822 | 0.03322 | 0.124283 | 0.024950155 | 0.2007527 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Fe-55 | 2690 | 4 | 4 | | | 0.6198 | -0.2126 | 0.669833 | 1461.911262 | 2182.5007 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Ni-63 | 94.8 | 4 | 4 | | | 2.14367812 | 1.6075668 | 0.554202 | 246.5901147 | 444.94647 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Pu-238 | 2.97 | 4 | 4 | | | 0.05504 | 0.036752 | 0.021637 | 1.635548449 | 75.591834 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Pu-239 | 2.59 | 4 | 4 | | | 0.0191835 | 0.006449 | 0.01002 | 1.430938981 | 142.81197 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Pu-240 | 2.6 | 4 | 4 | | | 0.0112665 | 0.0037875 | 0.005885 | 1.432213109 | 243.38285 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Pu-241 | 406 | 4 | 4 | | | -0.2519858 | -2.386284 | 2.056629 | 225.8293531 | 109.80557 | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 6 | |
| EU-08 | IVEU08RC103 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 9 | |
| EU-08 | IVEU08RC103 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Sr-90 | 0.231 | 4 | 4 | | | 0.25757262 | -0.045164 | 0.244915 | 1.960528741 | 8.0049291 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.23 | 1 | 0 | 10 | 10 | |
| EU-08 | IVEU08RC103 | Th-228 | 3.2 | 4 | 4 | | | 1.681 | 1.22595 | 0.380144 | 1.6 | 4.2089337 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Th-230 | 3.49 | 4 | 4 | | | 1.781 | 1.389 | 0.370033 | 1.909550267 | 5.1604818 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Th-232 | 3.1 | 4 | 4 | | | 1.796 | 1.377075 | 0.369405 | 1.699812707 | 4.6014942 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | Tritium (H-3) | 2.28 | 4 | 4 | | | 0 | -1.066357 | 1.231549 | 1.345023403 | 1.0921392 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | U-234 | 4.01 | 4 | 4 | | | 1.518 | 1.217675 | 0.26776 | 2.483402446 | 9.2747497 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | U-235 | 0.195 | 4 | 4 | | | 0.1885 | 0.130945 | 0.067157 | 0.098571969 | 1.4677867 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | |
| EU-08 | IVEU08RC103 | U-238 | 2.6 | 4 | 4 | | | 1.355 | 1.0269 | 0.24165 | 1.3 | 5.3796806 | 1.5 | 14 | 1.23 | 1 | 0 | 9 | 5 | 10 |
| EU-08 | IVEU08RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Co-60 | 0.0361 | | | | 2 | | | | 0.018119848 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Cs-134 | 0.157 | 2 | | | | | 0.075 | 0 | 0.07919429 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 11 | |
| EU-08 | IVEU08RC301 | Cs-137 | 0.48 | 10 | 8 | | | 0.11 | 0.0614286 | 0.02897 | 0.24 | 8.2843097 | 3 | 8 | 14.64 | 3 | 0 | 7 | 0 | |
| EU-08 | IVEU08RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | K-40 | 60 | 10 | 10 | | | 21.08 | 18.387 | 2.613253 | 30 | 11.479946 | 3 | 8 | 14.64 | 3 | 0 | 7 | 0 | |
| EU-08 | IVEU08RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Pu-238 | 2.97 | 4 | 4 | | | 0.003 | 0.00125 | 0.001258 | 1.635548449 | 1299.8021 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |
| EU-08 | IVEU08RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Ra-226 | 5 | 4 | 4 | | | 0.85 | 0.7475 | 0.076322 | 2.5 | 32.756089 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |
| EU-08 | IVEU08RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Sr-90 | 0.231 | 4 | 4 | | | 0.022 | 0.0195 | 0.003786 | 1.960528741 | 517.84479 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |
| EU-08 | IVEU08RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | Th-228 | 3.2 | 4 | 4 | | | 1.3 | 1.175 | 0.15 | 1.6 | 10.666667 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-08 | IVEU08RC301 | Th-230 | 3.49 | 4 | 4 | | | 1.1 | 0.9475 | 0.135984 | 1.909550267 | 14.042456 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 9 | |
| EU-08 | IVEU08RC301 | Th-232 | 3.1 | 6 | 6 | | | 1.2 | 1.1333333 | 0.064083 | 1.699812707 | 26.525058 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 7 | |
| EU-08 | IVEU08RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 13 | |
| EU-08 | IVEU08RC301 | U-235 | 0.195 | 5 | 5 | | | 0.06 | 0.0458 | 0.008729 | 0.098571969 | 11.292132 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 8 | |
| EU-08 | IVEU08RC301 | U-238 | 2.6 | 6 | 6 | | | 0.9 | 0.75 | 0.101587 | 1.3 | 12.796863 | 1.5 | 14 | 14.64 | 3 | 0 | 13 | 7 | 13 |
| EU-09 | IVEU09RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.36 | 1 | 0 | 38 | 38 | |
| EU-09 | IVEU09RC101 | Am-241 | 1.87 | 812 | 74 | | | 0.19 | 0.0609729 | 0.02512 | 0.983259209 | 39.143069 | 3 | 11 | 5.36 | 1 | 0 | 30 | 0 | |
| EU-09 | IVEU09RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Co-60 | 0.0361 | | | | 728 | | | | 0.018119848 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Cs-134 | 0.157 | 1 | | | | | 0.075 | | 0.07919429 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 40 | |
| EU-09 | IVEU09RC101 | Cs-137 | 0.48 | 1056 | 408 | | | 5.864 | 0.1176001 | 0.338692 | 0.24 | 0.7086092 | 0.7086092 | 48 | 5.36 | 1 | 1 | 129 | 0 | |
| EU-09 | IVEU09RC101 | Eu-152 | 0.0416 | | | | 728 | | | | 0.020814406 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Eu-155 | 3.8 | 2 | 2 | | | 0.06 | 0.06 | 0 | 1.903322648 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 39 | |
| EU-09 | IVEU09RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | K-40 | 60 | 15 | 15 | | | 19 | 16.349286 | 2.518743 | 30 | 11.910701 | 3 | 8 | 5.36 | 1 | 0 | 22 | 7 | |
| EU-09 | IVEU09RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 5.36 | 1 | 0 | 38 | 38 | |
| EU-09 | IVEU09RC101 | Pu-238 | 2.97 | 212 | 109 | | | 0.14 | 0.0176533 | 0.02169 | 1.635548449 | 75.405737 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Pu-239 | 2.59 | 96 | | | | | 0.0125 | 0.002513 | 1.430938981 | 569.38667 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Ra-226 | 5 | 732 | 708 | | | 1.2 | 0.7481557 | 0.164928 | 2.5 | 15.158168 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 5.36 | 1 | 0 | 38 | 38 | |
| EU-09 | IVEU09RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Sr-90 | 0.231 | 547 | 65 | | | 1.05 | 0.334415 | 0.085071 | 1.960528741 | 23.045923 | 1.5 | 14 | 5.36 | 1 | 1 | 38 | 0 | |
| EU-09 | IVEU09RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 5.36 | 1 | 0 | 41 | 41 | |
| EU-09 | IVEU09RC101 | Th-228 | 3.2 | 49 | 49 | | | 2.86 | 1.6204082 | 0.523975 | 1.6 | 3.0535806 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Th-230 | 3.49 | 47 | 47 | | | 2.09 | 1.173617 | 0.38883 | 1.909550267 | 4.9110152 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Th-232 | 3.1 | 774 | 582 | | | 2.76 | 1.1194186 | 0.541827 | 1.699812707 | 3.1371844 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | Tritium (H-3) | 2.28 | 5 | 5 | | | 0.043 | 0.02 | 0.02429 | 1.345023403 | 55.373737 | 1.5 | 14 | 5.36 | 1 | 0 | 38 | 33 | |
| EU-09 | IVEU09RC101 | U-234 | 4.01 | 43 | 43 | | | 1.3 | 0.6216279 | 0.194139 | 2.483402446 | 12.791846 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | |
| EU-09 | IVEU09RC101 | U-235 | 0.195 | 575 | 58 | | 219 | 0.2 | 0.1187635 | 0.042073 | 0.098571969 | 2.3428991 | 2.3428991 | 9 | 5.36 | 1 | 0 | 25 | 0 | |
| EU-09 | IVEU09RC101 | U-238 | 2.6 | 806 | 539 | | | 5.07 | 0.9322829 | 0.381194 | 1.3 | 3.4103397 | 3 | 8 | 5.36 | 1 | 0 | 22 | 0 | 41 |
| EU-09 | IVEU09RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Cs-137 | 0.48 | 7 | 3 | | | 0.07 | 0.0233333 | 0.026394 | 0.24 | 9.0928228 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 3 | |
| EU-09 | IVEU09RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | K-40 | 60 | 7 | 7 | | | 26.23 | 18.36 | 3.645769 | 30 | 8.2287161 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 3 | |
| EU-09 | IVEU09RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-09 | IVEU09RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | Pu-238 | 2.97 | 5 | 5 | | | 0.001 | 0 | 0.000707 | 1.635548449 | 2313.0148 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Ra-226 | 5 | 5 | 5 | | | 1 | 0.82 | 0.147648 | 2.5 | 16.932137 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Sr-90 | 0.231 | 5 | 5 | | | 0.12 | 0.0572 | 0.048515 | 1.960528741 | 40.41082 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 11.82 | 3 | 0 | 11 | 11 | |
| EU-09 | IVEU09RC301 | Th-228 | 3.2 | 5 | 5 | | | 1.4 | 1.2 | 0.234521 | 1.6 | 6.8224229 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Th-230 | 3.49 | 5 | 5 | | | 1.3 | 0.998 | 0.283408 | 1.909550267 | 6.7378175 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Th-232 | 3.1 | 5 | 5 | | | 1.5 | 1.164 | 0.288929 | 1.699812707 | 5.883149 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | Tritium (H-3) | 2.28 | 5 | 5 | | | 0.055 | 0.0078 | 0.028261 | 1.345023403 | 47.592443 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 10 | |
| EU-09 | IVEU09RC301 | U-235 | 0.195 | 5 | 5 | | | 0.051 | 0.042 | 0.00755 | 0.098571969 | 13.056176 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | |
| EU-09 | IVEU09RC301 | U-238 | 2.6 | 5 | 5 | | | 1 | 0.842 | 0.098336 | 1.3 | 13.219959 | 1.5 | 14 | 11.82 | 3 | 0 | 10 | 5 | 11 |
| EU-10 | IVEU10RC101 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Cs-137 | 0.48 | 41 | 13 | | | 0.438 | 0.0843732 | 0.091757 | 0.24 | 2.6156185 | 2.6156185 | 9 | 1.30 | 1 | 0 | 6 | 0 | |
| EU-10 | IVEU10RC101 | Eu-152 | 0.0416 | | | | 4 | | | | 0.020814406 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | K-40 | 60 | 2 | 2 | | | 19 | 19 | 0 | 30 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Pu-238 | 2.97 | 2 | 2 | | | 0.001 | 0.0005 | 0.000707 | 1.635548449 | 2313.0148 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Ra-226 | 5 | 2 | 2 | | | 0.77 | 0.725 | 0.06364 | 2.5 | 39.28371 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Sr-90 | 0.231 | 2 | 2 | | | 0.05 | 0.047 | 0.004243 | 1.960528741 | 462.10106 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | Th-228 | 3.2 | 2 | 2 | | | 0.84 | 0.73 | 0.155563 | 1.6 | 10.28519 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Th-230 | 3.49 | 2 | 2 | | | 0.62 | 0.56 | 0.084853 | 1.909550267 | 22.504266 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Th-232 | 3.1 | 2 | 2 | | | 0.85 | 0.705 | 0.205061 | 1.699812707 | 8.2893041 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.055 | 0.0325 | 0.03182 | 1.345023403 | 42.270008 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 10 | |
| EU-10 | IVEU10RC101 | U-235 | 0.195 | 2 | 2 | | | 0.042 | 0.03 | 0.016971 | 0.098571969 | 5.808409 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | |
| EU-10 | IVEU10RC101 | U-238 | 2.6 | 2 | 2 | | | 0.62 | 0.56 | 0.084853 | 1.3 | 15.320647 | 1.5 | 14 | 1.30 | 1 | 0 | 10 | 8 | 10 |
| EU-10 | IVEU10RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Am-241 | 1.87 | 1 | 1 | | | 0.004 | 0.004 | | 0.983259209 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Ba-133 | 0.175 | 1 | 1 | | | 0.043 | 0.043 | | 0.087668644 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-10 | IVEU10RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Co-60 | 0.0361 | 1 | 1 | | 5 | 0.002 | 0.002 | | 0.018119848 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Cs-134 | 0.157 | 5 | | | | | 0.075 | 0 | 0.07919429 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 0 | |
| EU-10 | IVEU10RC201 | Cs-137 | 0.48 | 10 | 4 | | | 0.17 | 0.0874444 | 0.048449 | 0.24 | 4.953692 | 3 | 8 | 3.20 | 2 | 0 | 3 | 0 | |
| EU-10 | IVEU10RC201 | Eu-152 | 0.0416 | 1 | 1 | | | -0.25 | -0.25 | | 0.020814406 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Eu-154 | 0.0499 | 1 | 1 | | | -0.15 | -0.15 | | 0.024950155 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Fe-55 | 2690 | 1 | 1 | | | 9 | 9 | | 1461.911262 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | K-40 | 60 | 7 | 7 | | | 18 | 14.647143 | 2.403565 | 30 | 12.481461 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 0 | |
| EU-10 | IVEU10RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Ni-63 | 94.8 | 1 | 1 | | | 5.9 | 5.9 | | 246.5901147 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Pu-238 | 2.97 | 2 | 2 | | | 0.003 | 0.0015 | 0.002121 | 1.635548449 | 771.00493 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | Pu-239 | 2.59 | 1 | 1 | | | 0.00485 | 0.00485 | | 1.430938981 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Pu-240 | 2.6 | 1 | 1 | | | 0.00285 | 0.00285 | | 1.432213109 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Pu-241 | 406 | 1 | 1 | | | 0.34 | 0.34 | | 225.8293531 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Ra-226 | 5 | 1 | 1 | | | 0.65 | 0.65 | | 2.5 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Sr-90 | 0.231 | 2 | 2 | | | 0.06 | 0.048 | 0.016971 | 1.960528741 | 115.52526 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 3.20 | 2 | 0 | 5 | 5 | |
| EU-10 | IVEU10RC201 | Th-228 | 3.2 | 2 | 2 | | | 1.3 | 1.09 | 0.296985 | 1.6 | 5.3874802 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | Th-230 | 3.49 | 2 | 2 | | | 0.99 | 0.867 | 0.173948 | 1.909550267 | 10.977691 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | Th-232 | 3.1 | 7 | 7 | | | 1.3 | 0.8914286 | 0.18452 | 1.699812707 | 9.2120799 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 0 | |
| EU-10 | IVEU10RC201 | Tritium (H-3) | 2.28 | 1 | 1 | | | 0.03 | 0.03 | | 1.345023403 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | U-234 | 4.01 | 1 | 1 | | | 0.584 | 0.584 | | 2.483402446 | | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 4 | |
| EU-10 | IVEU10RC201 | U-235 | 0.195 | 2 | 2 | | | 0.076 | 0.053 | 0.032527 | 0.098571969 | 3.0304742 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 3 | |
| EU-10 | IVEU10RC201 | U-238 | 2.6 | 7 | 7 | | | 0.82 | 0.6655714 | 0.121589 | 1.3 | 10.691732 | 1.5 | 14 | 3.20 | 2 | 0 | 5 | 0 | 5 |
| EU-10 | IVEU10RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |
| EU-10 | IVEU10RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Cs-137 | 0.48 | 32 | 5 | | | 0.2 | 0.0438313 | 0.053011 | 0.24 | 4.5273909 | 3 | 8 | 12.89 | 3 | 0 | 7 | 0 | |
| EU-10 | IVEU10RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | K-40 | 60 | 5 | 5 | | | 21 | 18.8 | 1.788854 | 30 | 16.77051 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |
| EU-10 | IVEU10RC301 | Pu-238 | 2.97 | 5 | 5 | | | 0.003 | 0.0008 | 0.001483 | 1.635548449 | 1102.6865 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |
| EU-10 | IVEU10RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Ra-226 | 5 | 5 | 5 | | | 0.96 | 0.76 | 0.146116 | 2.5 | 17.109648 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-10 | IVEU10RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Sr-90 | 0.231 | 5 | 5 | | | 0.071 | 0.0296 | 0.027052 | 1.960528741 | 72.473129 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 12.89 | 3 | 0 | 12 | 12 | |
| EU-10 | IVEU10RC301 | Th-228 | 3.2 | 5 | 5 | | | 1.5 | 1.096 | 0.34217 | 1.6 | 4.6760444 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Th-230 | 3.49 | 5 | 5 | | | 1.1 | 0.86 | 0.228145 | 1.909550267 | 8.3699088 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Th-232 | 3.1 | 5 | 5 | | | 1.4 | 1.044 | 0.285009 | 1.699812707 | 5.9640715 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | Tritium (H-3) | 2.28 | 2 | 2 | | | 0.023 | 0.0095 | 0.019092 | 1.345023403 | 70.450013 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 9 | |
| EU-10 | IVEU10RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 11 | |
| EU-10 | IVEU10RC301 | U-235 | 0.195 | 5 | 5 | | | 0.057 | 0.042 | 0.009823 | 0.098571969 | 10.034362 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | |
| EU-10 | IVEU10RC301 | U-238 | 2.6 | 5 | 5 | | | 1.1 | 0.862 | 0.219249 | 1.3 | 5.9293391 | 1.5 | 14 | 12.89 | 3 | 0 | 11 | 6 | 12 |
| EU-11 | IVEU11RC101 | Ac-228 | 3.2 | 1 | 1 | | | 1.33 | 1.33 | | 1.6 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 13 | |
| EU-11 | IVEU11RC101 | Am-241 | 1.87 | 3 | 2 | | | 0.011 | 0.0236667 | 0.027301 | 0.983259209 | 36.015774 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 12 | |
| EU-11 | IVEU11RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Co-60 | 0.0361 | 2 | 2 | | 187 | -0.001 | -0.008 | 0.009899 | 0.018119848 | 1.8303811 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Cs-134 | 0.157 | 188 | 2 | | | 0.044 | 0.0743564 | 0.006931 | 0.07919429 | 11.426179 | 3 | 11 | 1.97 | 1 | 0 | 11 | 0 | |
| EU-11 | IVEU11RC101 | Cs-137 | 0.48 | 195 | 3 | | | 1.2 | 0.0866333 | 0.106823 | 0.24 | 2.246703 | 2.246703 | 10 | 1.97 | 1 | 0 | 10 | 0 | |
| EU-11 | IVEU11RC101 | Eu-152 | 0.0416 | 2 | 2 | | | -0.009 | -0.0545 | 0.064347 | 0.020814406 | 0.3234727 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Eu-154 | 0.0499 | 2 | 2 | | | 0.33 | 0.161 | 0.239002 | 0.024950155 | 0.104393 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | K-40 | 60 | 191 | 191 | | | 21.8 | 14.84356 | 1.846787 | 30 | 16.244429 | 3 | 8 | 1.97 | 1 | 0 | 8 | 0 | |
| EU-11 | IVEU11RC101 | Na-22 | 0.0865 | 2 | 2 | | | 0.023 | -0.0155 | 0.054447 | 0.043308929 | 0.7954295 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 14 | |
| EU-11 | IVEU11RC101 | Pu-238 | 2.97 | 5 | 5 | | | 0.01 | 0.0028 | 0.005848 | 1.635548449 | 279.67288 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 9 | |
| EU-11 | IVEU11RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 14 | |
| EU-11 | IVEU11RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Pu-241 | 406 | 2 | 2 | | | 1.1 | 0.645 | 0.643467 | 225.8293531 | 350.95707 | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 13 | |
| EU-11 | IVEU11RC101 | Ra-226 | 5 | 4 | 4 | | | 4 | 2.03 | 1.573997 | 2.5 | 1.588313 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 10 | |
| EU-11 | IVEU11RC101 | Ra-228 | 3.2 | 1 | 1 | | | 1.33 | 1.33 | | 1.6 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 13 | |
| EU-11 | IVEU11RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Sr-90 | 0.231 | 4 | 4 | | | 0.1 | 0.03075 | 0.047675 | 1.960528741 | 41.122684 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 10 | |
| EU-11 | IVEU11RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.97 | 1 | 0 | 15 | 15 | |
| EU-11 | IVEU11RC101 | Th-228 | 3.2 | 4 | 4 | | | 1.1 | 0.855 | 0.29149 | 1.6 | 5.4890311 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 10 | |
| EU-11 | IVEU11RC101 | Th-230 | 3.49 | 4 | 4 | | | 0.92 | 0.615 | 0.228108 | 1.909550267 | 8.3712492 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 10 | |
| EU-11 | IVEU11RC101 | Th-232 | 3.1 | 192 | 192 | | | 1.36 | 0.8613542 | 0.155308 | 1.699812707 | 10.944764 | 3 | 8 | 1.97 | 1 | 0 | 8 | 0 | |
| EU-11 | IVEU11RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 14 | |
| EU-11 | IVEU11RC101 | U-234 | 4.01 | 2 | 2 | | | 1.52 | 1.15 | 0.523259 | 2.483402446 | 4.7460289 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 12 | |
| EU-11 | IVEU11RC101 | U-235 | 0.195 | 5 | 4 | | | 0.131 | 0.094 | 0.064896 | 0.098571969 | 1.5189204 | 1.5 | 14 | 1.97 | 1 | 0 | 14 | 9 | |
| EU-11 | IVEU11RC101 | U-238 | 2.6 | 192 | 192 | | | 1.68 | 0.6388542 | 0.133553 | 1.3 | 9.7339707 | 3 | 8 | 1.97 | 1 | 0 | 8 | 0 | 15 |
| EU-11 | IVEU11RC102 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Cs-137 | 0.48 | 12 | 1 | | | 0.06 | 0.02875 | 0.010687 | 0.24 | 22.457921 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-11 | IVEU11RC102 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | K-40 | 60 | 12 | 12 | | | 20 | 16.916667 | 1.378954 | 30 | 21.755615 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Pu-238 | 2.97 | 12 | 12 | | | 0.005 | -0.000167 | 0.004469 | 1.635548449 | 365.99713 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Ra-226 | 5 | 12 | 12 | | | 0.85 | 0.7525 | 0.077122 | 2.5 | 32.416378 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Sr-90 | 0.231 | 13 | 13 | | | 1.9 | 0.2188462 | 0.508414 | 1.960528741 | 3.8561646 | 3 | 8 | 0.30 | 1 | 1 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | Th-230 | 3.49 | 12 | 12 | | | 1 | 0.8858333 | 0.084149 | 1.909550267 | 22.692479 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Th-232 | 3.1 | 12 | 12 | | | 1.4 | 1.1991667 | 0.149573 | 1.699812707 | 11.364464 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | Tritium (H-3) | 2.28 | 12 | 12 | | | 0.11 | 0.0139167 | 0.054906 | 1.345023403 | 24.497001 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.30 | 1 | 0 | 3 | 3 | |
| EU-11 | IVEU11RC102 | U-235 | 0.195 | 12 | 12 | | | 0.052 | 0.04125 | 0.008572 | 0.098571969 | 11.499446 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | |
| EU-11 | IVEU11RC102 | U-238 | 2.6 | 12 | 12 | | | 0.94 | 0.8141667 | 0.051779 | 1.3 | 25.106723 | 3 | 8 | 0.30 | 1 | 0 | 2 | 0 | 3 |
| EU-11 | IVEU11RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC201 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-11 | IVEU11RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.46 | 2 | 0 | 1 | 1 | 1 |
| EU-11 | IVEU11RC202 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Cs-137 | 0.48 | 4 | 4 | | | 0.12 | 0.089425 | 0.022331 | 0.24 | 10.747583 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | K-40 | 60 | 3 | 3 | | | 26.5 | 22.166667 | 3.883727 | 30 | 7.7245394 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Pb-210 | 5 | 1 | 1 | | | 1.31 | 1.31 | | 2.5 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Pu-238 | 2.97 | 3 | 3 | | | 0.001 | -0.002333 | 0.004933 | 1.635548449 | 331.56037 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Ra-226 | 5 | 4 | 4 | | | 0.97 | 0.87175 | 0.096327 | 2.5 | 25.953227 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Ra-228 | 3.2 | 1 | 1 | | | 0.809 | 0.809 | | 1.6 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Sr-90 | 0.231 | 3 | 3 | | | 0.12 | 0.064 | 0.053254 | 1.960528741 | 36.814601 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.51 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC202 | Th-228 | 3.2 | 2 | 2 | | | 1.42 | 1.26 | 0.226274 | 1.6 | 7.0710678 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Th-230 | 3.49 | 4 | 4 | | | 1.45 | 1.08 | 0.2502 | 1.909550267 | 7.6320978 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Th-232 | 3.1 | 4 | 4 | | | 1.4 | 1.25 | 0.129099 | 1.699812707 | 13.166693 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | Tritium (H-3) | 2.28 | 2 | 2 | | | -0.05 | -0.0665 | 0.023335 | 1.345023403 | 57.640919 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | U-234 | 4.01 | 1 | 1 | | | 1.53 | 1.53 | | 2.483402446 | | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | U-235 | 0.195 | 4 | 4 | | | 0.0662 | 0.05055 | 0.011989 | 0.098571969 | 8.2216612 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | |
| EU-11 | IVEU11RC202 | U-238 | 2.6 | 4 | 4 | | | 1.53 | 0.93 | 0.409634 | 1.3 | 3.1735648 | 1.5 | 14 | 0.51 | 2 | 0 | 1 | 0 | 1 |
| EU-11 | IVEU11RC203 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-11 | IVEU11RC203 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | |
| EU-11 | IVEU11RC203 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.45 | 2 | 0 | 1 | 1 | 1 |
| EU-11 | IVEU11RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Co-60 | 0.0361 | | | | 5 | | | | 0.018119848 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Cs-134 | 0.157 | 5 | | | | | 0.075 | 0 | 0.07919429 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 8 | |
| EU-11 | IVEU11RC301 | Cs-137 | 0.48 | 20 | 12 | | | 0.24 | 0.0810526 | 0.056877 | 0.24 | 4.2196655 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | K-40 | 60 | 20 | 20 | | | 21 | 17.486 | 2.564639 | 30 | 11.697553 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | Pu-238 | 2.97 | 13 | 13 | | | 0.009 | 0.0012308 | 0.003295 | 1.635548449 | 496.32827 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Ra-226 | 5 | 13 | 13 | | | 0.89 | 0.7576923 | 0.064956 | 2.5 | 38.487825 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Sr-90 | 0.231 | 13 | 13 | | | 0.092 | 0.0236154 | 0.032958 | 1.960528741 | 59.484941 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 14.05 | 3 | 0 | 13 | 13 | |
| EU-11 | IVEU11RC301 | Th-228 | 3.2 | 13 | 13 | | | 1.6 | 1.25 | 0.247857 | 1.6 | 6.4553225 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Th-230 | 3.49 | 13 | 13 | | | 1.2 | 0.9946154 | 0.205208 | 1.909550267 | 9.3054451 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Th-232 | 3.1 | 18 | 18 | | | 1.5 | 1.0855556 | 0.300983 | 1.699812707 | 5.6475347 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | Tritium (H-3) | 2.28 | 8 | 8 | | | 0.073 | 0.049875 | 0.021122 | 1.345023403 | 63.679781 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 14.05 | 3 | 0 | 12 | 12 | |
| EU-11 | IVEU11RC301 | U-235 | 0.195 | 14 | 14 | | | 0.069 | 0.0392143 | 0.012565 | 0.098571969 | 7.8451028 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | |
| EU-11 | IVEU11RC301 | U-238 | 2.6 | 18 | 18 | | | 0.86 | 0.6972222 | 0.103969 | 1.3 | 12.503771 | 3 | 8 | 14.05 | 3 | 0 | 7 | 0 | 13 |
| EU-12 | IVEU12RC101 | Ac-228 | 3.2 | 40 | 40 | | | 1.69 | 1.31375 | 0.146807 | 1.6 | 10.898676 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Am-241 | 1.87 | 40 | 40 | | | 0.12 | -0.005325 | 0.05005 | 0.983259209 | 19.64537 | 3 | 11 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Co-60 | 0.0361 | 40 | 40 | | | 0.095 | 0.002925 | 0.028613 | 0.018119848 | 0.6332799 | 0.6332799 | 52 | 0.38 | 1 | 1 | 10 | 0 | |
| EU-12 | IVEU12RC101 | Cs-134 | 0.157 | 40 | 40 | | | 0.052 | 0.001 | 0.023668 | 0.07919429 | 3.34611 | 3 | 11 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Cs-137 | 0.48 | 46 | 40 | | | 0.078 | 0.0125652 | 0.030304 | 0.24 | 7.9196655 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-12 | IVEU12RC101 | Eu-152 | 0.0416 | 40 | 40 | | | 0.09 | 0.0051175 | 0.050554 | 0.020814406 | 0.4117254 | 0.4117254 | 107 | 0.38 | 1 | 1 | 21 | 0 | |
| EU-12 | IVEU12RC101 | Eu-154 | 0.0499 | 40 | 40 | | | 0.4 | -0.005575 | 0.180312 | 0.024950155 | 0.1383725 | 0.1383725 | 1620 | 0.38 | 1 | 1 | 309 | 269 | |
| EU-12 | IVEU12RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | K-40 | 60 | 43 | 43 | | | 23.3 | 20.676744 | 1.380448 | 30 | 21.732075 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Pu-238 | 2.97 | 46 | 46 | | | 0.08 | 0.0062609 | 0.020268 | 1.635548449 | 80.697759 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Pu-241 | 406 | 42 | 42 | | | 4.4 | -0.022362 | 1.504178 | 225.8293531 | 150.13471 | 3 | 11 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Ra-226 | 5 | 3 | 3 | | | 0.87 | 0.7966667 | 0.102144 | 2.5 | 24.475325 | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Sr-90 | 0.231 | 41 | 40 | | | 0.48 | 0.1407073 | 0.112415 | 1.960528741 | 17.440044 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.38 | 1 | 0 | 3 | 3 | |
| EU-12 | IVEU12RC101 | Th-228 | 3.2 | 3 | 3 | | | 1 | 0.8733333 | 0.111505 | 1.6 | 14.349151 | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Th-230 | 3.49 | 3 | 3 | | | 0.8 | 0.7066667 | 0.086217 | 1.909550267 | 22.148244 | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC101 | Th-232 | 3.1 | 43 | 43 | | | 1.69 | 1.28 | 0.189297 | 1.699812707 | 8.9796098 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | Tritium (H-3) | 2.28 | 2 | 2 | | | -0.002 | -0.013 | 0.015556 | 1.345023403 | 86.461379 | 1.5 | 14 | 0.38 | 1 | 0 | 3 | 1 | |
| EU-12 | IVEU12RC101 | U-234 | 4.01 | 44 | 44 | | | 1.15 | 0.8181818 | 0.130085 | 2.483402446 | 19.090562 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | U-235 | 0.195 | 47 | 45 | | | 0.086 | 0.0385106 | 0.018367 | 0.098571969 | 5.3668326 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | |
| EU-12 | IVEU12RC101 | U-238 | 2.6 | 47 | 47 | | | 1.06 | 0.8246809 | 0.110922 | 1.3 | 11.719942 | 3 | 8 | 0.38 | 1 | 0 | 2 | 0 | 3 |
| EU-12 | IVEU12RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Co-60 | 0.0361 | | | | 7 | | | | 0.018119848 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Cs-134 | 0.157 | 7 | | | | | 0.075 | 1.15E-09 | 0.07919429 | 68885592 | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 0 | |
| EU-12 | IVEU12RC201 | Cs-137 | 0.48 | 11 | 4 | | | 0.13 | 0.0820727 | 0.020051 | 0.24 | 11.969246 | 3 | 8 | 3.64 | 2 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC201 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | K-40 | 60 | 11 | 11 | | | 21.1 | 15.830909 | 3.068161 | 30 | 9.7778456 | 3 | 8 | 3.64 | 2 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Pb-210 | 5 | 1 | 1 | | | 0.818 | 0.818 | | 2.5 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 5 | |
| EU-12 | IVEU12RC201 | Pu-238 | 2.97 | 3 | 3 | | | 0.001 | 0 | 0.001 | 1.635548449 | 1635.5484 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 3 | |
| EU-12 | IVEU12RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Ra-226 | 5 | 4 | 4 | | | 0.81 | 0.75225 | 0.065271 | 2.5 | 38.302089 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 2 | |
| EU-12 | IVEU12RC201 | Ra-228 | 3.2 | 1 | 1 | | | 1.32 | 1.32 | | 1.6 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 5 | |
| EU-12 | IVEU12RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Sr-90 | 0.231 | 3 | 3 | | | 0.061 | 0.031 | 0.029052 | 1.960528741 | 67.484182 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 3 | |
| EU-12 | IVEU12RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | Th-228 | 3.2 | 4 | 4 | | | 1.72 | 1.04 | 0.469965 | 1.6 | 3.4045122 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 2 | |
| EU-12 | IVEU12RC201 | Th-230 | 3.49 | 4 | 4 | | | 1.14 | 0.86 | 0.237206 | 1.909550267 | 8.0501783 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 2 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-12 | IVEU12RC201 | Th-232 | 3.1 | 11 | 11 | | | 1.5 | 0.9636364 | 0.242375 | 1.699812707 | 7.0131631 | 3 | 8 | 3.64 | 2 | 0 | 3 | 0 | |
| EU-12 | IVEU12RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 6 | |
| EU-12 | IVEU12RC201 | U-234 | 4.01 | 1 | 1 | | | 0.688 | 0.688 | | 2.483402446 | | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 5 | |
| EU-12 | IVEU12RC201 | U-235 | 0.195 | 4 | 4 | | | 0.045 | 0.037725 | 0.006322 | 0.098571969 | 15.591607 | 1.5 | 14 | 3.64 | 2 | 0 | 6 | 2 | |
| EU-12 | IVEU12RC201 | U-238 | 2.6 | 11 | 11 | | | 0.87 | 0.7119091 | 0.125012 | 1.3 | 10.398971 | 3 | 8 | 3.64 | 2 | 0 | 3 | 0 | 6 |
| EU-12 | IVEU12RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Cs-137 | 0.48 | 9 | 3 | | | 0.17 | 0.0483333 | 0.061745 | 0.24 | 3.8869264 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | K-40 | 60 | 9 | 9 | | | 24 | 19.777778 | 2.279132 | 30 | 13.162904 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | Pu-238 | 2.97 | 9 | 8 | | | 0.003 | 0.0006667 | 0.001936 | 1.635548449 | 844.59359 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Ra-226 | 5 | 9 | 9 | | | 0.93 | 0.7733333 | 0.119269 | 2.5 | 20.96109 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Sr-90 | 0.231 | 9 | 9 | | | 0.11 | 0.0364444 | 0.046033 | 1.960528741 | 42.58973 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 15.29 | 3 | 0 | 14 | 14 | |
| EU-12 | IVEU12RC301 | Th-228 | 3.2 | 9 | 9 | | | 1.4 | 0.9477778 | 0.32085 | 1.6 | 4.9867607 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Th-230 | 3.49 | 9 | 9 | | | 1.2 | 0.79 | 0.271708 | 1.909550267 | 7.0279614 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Th-232 | 3.1 | 9 | 9 | | | 1.3 | 0.9233333 | 0.349929 | 1.699812707 | 4.8575992 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | Tritium (H-3) | 2.28 | 8 | 8 | | | 0.053 | 0.004 | 0.030687 | 1.345023403 | 43.829878 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 15.29 | 3 | 0 | 13 | 13 | |
| EU-12 | IVEU12RC301 | U-235 | 0.195 | 9 | 9 | | | 0.051 | 0.0413333 | 0.008322 | 0.098571969 | 11.845231 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | |
| EU-12 | IVEU12RC301 | U-238 | 2.6 | 9 | 9 | | | 0.96 | 0.7566667 | 0.136198 | 1.3 | 9.5449003 | 3 | 8 | 15.29 | 3 | 0 | 8 | 0 | 14 |
| EU-13 | IVEU13RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Cs-137 | 0.48 | 6 | 3 | | | 0.16 | 0.0658333 | 0.050241 | 0.24 | 4.7769669 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | K-40 | 60 | 6 | 6 | | | 20 | 18.5 | 1.516575 | 30 | 19.781414 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-13 | IVEU13RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Pu-238 | 2.97 | 6 | 6 | | | 0.003 | -0.000333 | 0.003077 | 1.635548449 | 531.5754 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Ra-226 | 5 | 6 | 6 | | | 1 | 0.8366667 | 0.102892 | 2.5 | 24.297433 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Sr-90 | 0.231 | 6 | 6 | | | 0.22 | 0.0681667 | 0.080948 | 1.960528741 | 24.219629 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | Th-230 | 3.49 | 6 | 6 | | | 0.94 | 0.7883333 | 0.089759 | 1.909550267 | 21.274208 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Th-232 | 3.1 | 6 | 6 | | | 1.6 | 1.2666667 | 0.196638 | 1.699812707 | 8.6443572 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | Tritium (H-3) | 2.28 | 6 | 6 | | | -0.011 | -0.047167 | 0.032283 | 1.345023403 | 41.664028 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 2 | |
| EU-13 | IVEU13RC201 | U-235 | 0.195 | 6 | 6 | | | 0.052 | 0.0415 | 0.008408 | 0.098571969 | 11.723134 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | |
| EU-13 | IVEU13RC201 | U-238 | 2.6 | 6 | 6 | | | 0.78 | 0.7383333 | 0.031252 | 1.3 | 41.597782 | 1.5 | 14 | 1.09 | 2 | 0 | 2 | 0 | 2 |
| EU-13 | IVEU13RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Cs-137 | 0.48 | 2 | 1 | | | 0.17 | 0.105 | 0.091924 | 0.24 | 2.6108558 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | K-40 | 60 | 2 | 2 | | | 18 | 16.5 | 2.12132 | 30 | 14.142136 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | Pu-238 | 2.97 | 2 | 1 | | | 0 | 0.001 | 0.001414 | 1.635548449 | 1156.5074 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Ra-226 | 5 | 2 | 2 | | | 0.87 | 0.71 | 0.226274 | 2.5 | 11.048543 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Sr-90 | 0.231 | 2 | 2 | | | 0.13 | 0.087 | 0.060811 | 1.960528741 | 32.239609 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 16.03 | 3 | 0 | 15 | 15 | |
| EU-13 | IVEU13RC301 | Th-228 | 3.2 | 1 | 1 | | | 0.89 | 0.89 | | 1.6 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 13 | |
| EU-13 | IVEU13RC301 | Th-230 | 3.49 | 2 | 2 | | | 1 | 0.82 | 0.254558 | 1.909550267 | 7.5014219 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Th-232 | 3.1 | 2 | 2 | | | 1.2 | 1.075 | 0.176777 | 1.699812707 | 9.6155927 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | Tritium (H-3) | 2.28 | 1 | 1 | | | -0.045 | -0.045 | | 1.345023403 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 13 | |
| EU-13 | IVEU13RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 14 | |
| EU-13 | IVEU13RC301 | U-235 | 0.195 | 2 | 2 | | | 0.054 | 0.042 | 0.016971 | 0.098571969 | 5.808409 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | |
| EU-13 | IVEU13RC301 | U-238 | 2.6 | 2 | 2 | | | 0.72 | 0.69 | 0.042426 | 1.3 | 30.641294 | 1.5 | 14 | 16.03 | 3 | 0 | 14 | 12 | 15 |
| EU-14 | IVEU14RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-14 | IVEU14RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Cs-137 | 0.48 | 3 | 3 | | | 0.29 | 0.1333333 | 0.136504 | 0.24 | 1.7581906 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | K-40 | 60 | 3 | 3 | | | 17 | 12.433333 | 4.045162 | 30 | 7.4162672 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | Pu-238 | 2.97 | 3 | 2 | | | -0.001 | 0 | 0.001732 | 1.635548449 | 944.28434 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Ra-226 | 5 | 3 | 3 | | | 0.7 | 0.5466667 | 0.150111 | 2.5 | 16.654335 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Sr-90 | 0.231 | 3 | 3 | | | 0.11 | 0.064 | 0.041073 | 1.960528741 | 47.732664 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 17.08 | 3 | 0 | 16 | 16 | |
| EU-14 | IVEU14RC301 | Th-228 | 3.2 | 3 | 3 | | | 1 | 0.9 | 0.1 | 1.6 | 16 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Th-230 | 3.49 | 3 | 3 | | | 0.61 | 0.57 | 0.060828 | 1.909550267 | 31.392813 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Th-232 | 3.1 | 3 | 3 | | | 1 | 0.8666667 | 0.119304 | 1.699812707 | 14.247798 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 15 | |
| EU-14 | IVEU14RC301 | U-235 | 0.195 | 3 | 3 | | | 0.032 | 0.027 | 0.004359 | 0.098571969 | 22.613961 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | |
| EU-14 | IVEU14RC301 | U-238 | 2.6 | 3 | 3 | | | 0.79 | 0.6533333 | 0.140119 | 1.3 | 9.2778283 | 1.5 | 14 | 17.08 | 3 | 0 | 15 | 12 | 16 |
| EU-15 | IVEU15RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Cs-137 | 0.48 | 5 | 5 | | | 0.38 | 0.16 | 0.132098 | 0.24 | 1.8168268 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | K-40 | 60 | 5 | 5 | | | 19 | 16.8 | 2.167948 | 30 | 13.837968 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | Pu-238 | 2.97 | 5 | 5 | | | 0.001 | 0 | 0.000707 | 1.635548449 | 2313.0148 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Ra-226 | 5 | 5 | 5 | | | 1.4 | 0.832 | 0.327063 | 2.5 | 7.6437946 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU-15 | IVEU15RC301 | Sr-90 | 0.231 | 5 | 5 | | | 0.12 | 0.0752 | 0.030589 | 1.960528741 | 64.092159 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 18.68 | 3 | 0 | 17 | 17 | |
| EU-15 | IVEU15RC301 | Th-228 | 3.2 | 5 | 5 | | | 2.1 | 1.252 | 0.528697 | 1.6 | 3.0263109 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Th-230 | 3.49 | 5 | 5 | | | 1.3 | 0.858 | 0.280927 | 1.909550267 | 6.7973175 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Th-232 | 3.1 | 5 | 5 | | | 1.9 | 1.1 | 0.468668 | 1.699812707 | 3.626899 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 16 | |
| EU-15 | IVEU15RC301 | U-235 | 0.195 | 5 | 5 | | | 0.069 | 0.0464 | 0.013107 | 0.098571969 | 7.5204158 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | |
| EU-15 | IVEU15RC301 | U-238 | 2.6 | 5 | 5 | | | 1.2 | 0.868 | 0.201792 | 1.3 | 6.4422781 | 1.5 | 14 | 18.68 | 3 | 0 | 16 | 11 | 17 |
| EU-16 | IVEU16RC301 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Cs-137 | 0.48 | 2 | 2 | | | 0.09 | 0.09 | 0 | 0.24 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | K-40 | 60 | 2 | 2 | | | 16 | 15.5 | 0.707107 | 30 | 42.426407 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | Pu-238 | 2.97 | 2 | 2 | | | 0 | -0.0015 | 0.002121 | 1.635548449 | 771.00493 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Ra-226 | 5 | 2 | 2 | | | 1.6 | 1.15 | 0.636396 | 2.5 | 3.928371 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Sr-90 | 0.231 | 2 | 2 | | | 0.08 | 0.0665 | 0.019092 | 1.960528741 | 102.68912 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 19.65 | 3 | 0 | 18 | 18 | |
| EU-16 | IVEU16RC301 | Th-228 | 3.2 | 2 | 2 | | | 1.1 | 1.035 | 0.091924 | 1.6 | 17.405705 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Th-230 | 3.49 | 2 | 2 | | | 0.81 | 0.75 | 0.084853 | 1.909550267 | 22.504266 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Th-232 | 3.1 | 2 | 2 | | | 1 | 0.87 | 0.183848 | 1.699812707 | 9.2457622 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 17 | |
| EU-16 | IVEU16RC301 | U-235 | 0.195 | 2 | 2 | | | 0.072 | 0.0565 | 0.02192 | 0.098571969 | 4.4968328 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | |
| EU-16 | IVEU16RC301 | U-238 | 2.6 | 2 | 2 | | | 1.3 | 1.01 | 0.410122 | 1.3 | 3.169789 | 1.5 | 14 | 19.65 | 3 | 0 | 17 | 15 | 18 |
| NA-01 | NEBNA01RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NA-01 | NEBNA01RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | |
| NA-01 | NEBNA01RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.10 | 2 | 0 | 1 | 1 | 1 |
| NA-02 | IIINA02RC201 | Ac-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Am-241 | 1.87 | | | | | | | | 0.983259209 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Co-60 | 0.0361 | | | | | | | | 0.018119848 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Cs-134 | 0.157 | | | | | | | | 0.07919429 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Cs-137 | 0.48 | | | | | | | | 0.24 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Eu-152 | 0.0416 | | | | | | | | 0.020814406 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Eu-154 | 0.0499 | | | | | | | | 0.024950155 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | K-40 | 60 | | | | | | | | 30 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Na-22 | 0.0865 | | | | | | | | 0.043308929 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Pu-238 | 2.97 | | | | | | | | 1.635548449 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Pu-241 | 406 | | | | | | | | 225.8293531 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Ra-226 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Ra-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Sr-90 | 0.231 | | | | | | | | 1.960528741 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.68 | 2 | 0 | 2 | 2 | |
| NA-02 | IIINA02RC201 | Th-228 | 3.2 | | | | | | | | 1.6 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Th-230 | 3.49 | | | | | | | | 1.909550267 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Th-232 | 3.1 | | | | | | | | 1.699812707 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | U-234 | 4.01 | | | | | | | | 2.483402446 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | U-235 | 0.195 | | | | | | | | 0.098571969 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | |
| NA-02 | IIINA02RC201 | U-238 | 2.6 | | | | | | | | 1.3 | | 1.5 | 14 | 0.68 | 2 | 0 | 1 | 1 | 2 |

**Table G-2**
**Radionuclide Data Gaps Calculation Summary**
**(Residential)**

| EU | SU | Analyte | Residential DCGL (piC/g) | Number of Valid Samples | Number of Detects | Number of Detection Uncertain | Number of Rejected Samples | Max Detected Result (piC/g) | Average (piC/g) | Std. Dev. (piC/g) | Delta Residential | Relative Shift | Test Shift | Statistically Required Number of Samples per Area Size | SU Acreage | SU Class | Remediation Test[a] | Risk Assessment Required Samples per SU | Risk Assessment Data Gap Rural Residential | Risk Assessment Radiological Samples per SU required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WBNA-01 | WBNA01RC101 | Ac-228 | 3.2 | 12 | 12 | | | 1.4 | 1.1691667 | 0.138134 | 1.6 | 11.582938 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Am-241 | 1.87 | 13 | 13 | | | 0.032 | 0.0109231 | 0.011679 | 0.983259209 | 84.186898 | 3 | 11 | 0.21 | 1 | 0 | 2 | 0 | |
| WBNA-01 | WBNA01RC101 | Ba-133 | 0.175 | | | | | | | | 0.087668644 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | C-14 | 0.456 | | | | | | | | 139.7005115 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Cm-243/244 | 0.349 | | | | | | | | 0.175489416 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Co-60 | 0.0361 | 13 | 13 | | | 0.061 | 0.0101769 | 0.032131 | 0.018119848 | 0.5639305 | 0.5639305 | 71 | 0.21 | 1 | 1 | 8 | 0 | |
| WBNA-01 | WBNA01RC101 | Cs-134 | 0.157 | 13 | 13 | | | 0.041 | -0.002923 | 0.032413 | 0.07919429 | 2.4433177 | 2.4433177 | 12 | 0.21 | 1 | 0 | 2 | 0 | |
| WBNA-01 | WBNA01RC101 | Cs-137 | 0.48 | 15 | 14 | | | 0.27 | 0.0673929 | 0.083804 | 0.24 | 2.8638305 | 2.8638305 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Eu-152 | 0.0416 | 13 | 13 | | 1 | 0.47 | 0.0492308 | 0.343207 | 0.020814406 | 0.0606468 | 1.5 | 15 | 0.21 | 1 | 1 | 2 | 0 | |
| WBNA-01 | WBNA01RC101 | Eu-154 | 0.0499 | 13 | 13 | | | 0.2 | -0.010769 | 0.195766 | 0.024950155 | 0.1274488 | 0.1274488 | 1620 | 0.21 | 1 | 1 | 173 | 160 | |
| WBNA-01 | WBNA01RC101 | Eu-155 | 3.8 | | | | | | | | 1.903322648 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Fe-55 | 2690 | | | | | | | | 1461.911262 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | I-129 | 0.596 | | | | | | | | 1.262193866 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | K-40 | 60 | 13 | 13 | | | 23.9 | 20.853846 | 2.982341 | 30 | 10.059211 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Na-22 | 0.0865 | 13 | 13 | | | 0.062 | -0.000385 | 0.043659 | 0.043308929 | 0.9919865 | 0.9919865 | 27 | 0.21 | 1 | 1 | 3 | 0 | |
| WBNA-01 | WBNA01RC101 | Ni-59 | 208 | | | | | | | | 541.446433 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Ni-63 | 94.8 | | | | | | | | 246.5901147 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Np-237 | 0.13 | | | | | | | | 0.068047461 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Pb-210 | 5 | | | | | | | | 2.5 | | 1.5 | 14 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Pu-238 | 2.97 | 13 | 13 | | | 0.103 | 0.0153846 | 0.028111 | 1.635548449 | 58.180761 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Pu-239 | 2.59 | | | | | | | | 1.430938981 | | 1.5 | 14 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Pu-240 | 2.6 | | | | | | | | 1.432213109 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Pu-241 | 406 | 13 | 13 | | | 4.1 | 0.8292308 | 1.579844 | 225.8293531 | 142.94407 | 3 | 11 | 0.21 | 1 | 0 | 2 | 0 | |
| WBNA-01 | WBNA01RC101 | Ra-226 | 5 | 13 | 10 | | | 2.5 | 1.3515385 | 0.736205 | 2.5 | 3.3957944 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Ra-228 | 3.2 | 12 | 12 | | | 1.4 | 1.1691667 | 0.138134 | 1.6 | 11.582938 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Sb-125 | 0.462 | | | | | | | | 0.231442714 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Sr-90 | 0.231 | 13 | 13 | | | 0.63 | 0.2230769 | 0.147048 | 1.960528741 | 13.332588 | 3 | 8 | 0.21 | 1 | 1 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Tc-99 | 0.25 | | | | | | | | 48.16625994 | | 1.5 | 15 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | Th-228 | 3.2 | 13 | 13 | | | 1.81 | 1.0823077 | 0.360166 | 1.6 | 4.4424014 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Th-230 | 3.49 | 13 | 13 | | | 1.44 | 0.9892308 | 0.222877 | 1.909550267 | 8.567714 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Th-232 | 3.1 | 25 | 25 | | | 1.7 | 1.1084 | 0.252003 | 1.699812707 | 6.7452 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | Tritium (H-3) | 2.28 | | | | | | | | 1.345023403 | | 1.5 | 14 | 0.21 | 1 | 0 | 2 | 2 | |
| WBNA-01 | WBNA01RC101 | U-234 | 4.01 | 13 | 13 | | | 1.72 | 0.8153846 | 0.337284 | 2.483402446 | 7.3629495 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | U-235 | 0.195 | 13 | 13 | | | 0.083 | 0.0372308 | 0.025378 | 0.098571969 | 3.8842024 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | |
| WBNA-01 | WBNA01RC101 | U-238 | 2.6 | 13 | 13 | | | 1.55 | 0.7792308 | 0.292873 | 1.3 | 4.4387901 | 3 | 8 | 0.21 | 1 | 0 | 1 | 0 | 2 |
| | | | | | | | | | | | | | | | | | | | Total Samples | 616 |

[a] A "1" in this column means the average for this analyte exceeds the DCGL or the standard deviation exceeds the LBGR and it is assumed this SU will require remediation. The number of samples for these SUs is based only on those required for deliniation of nature and extent of contamination.

# Appendix H

# Update of Chemical PRGs

# Appendix H

# Update of Chemical PRGs

The purpose of Appendix H is to describe the calculations used to update EPA Region 9 preliminary remediation goals (PRGs). As discussed in Section 3.2.2.1, EPA Region 9 has established generic risk-based preliminary remediation goals (PRGs) for several media (soil, tap water, and ambient air). These PRGs are screening values intended to be used as guidelines for determining whether additional investigation is necessary and can be used as initial cleanup goals, if applicable. Although PRGs are not enforceable standards, they are used in the Data Gaps Analysis to screen analytical data in Area IV to aid in the determination of data gaps. Tap water PRGs are used in the Area IV screening for comparison to groundwater concentrations. Residential soil PRGs are used for comparison to Area IV soil concentrations.

However, as noted in Section 3.2.2.1, the EPA Region 9 PRGs have not been updated since October 2004. In addition, the PRGs do not include the exposure pathway of ingestion of fruits and vegetables, which is considered a completed exposure pathway for the rural resident. To be appropriate for screening Area IV data, EPA Region 9 generic risk-based PRGs need to be updated to account for CalEPA toxicity values, which have been updated as recently as 2008. In addition, residential PRGs need to be revised to incorporate the exposure pathway of ingestion of fruits and vegetables, which was identified as complete for future Area IV residents in the site conceptual model. Appendix H describes the calculations used to update the PRGs for use in the Area IV screening.

## H.1 CalEPA Toxicity Values

Although the EPA Region 9 PRG list includes Cal-modified PRGs, which would be applicable to Area IV, these EPA Region 9 PRGs were last updated in October 2004. To account for updates in toxicity values, PRGs were recalculated using the formulas in the PRG user's guidance for chemicals with updated CalEPA cancer potency values dated January 25, 2008 (Table H-1) and CalEPA's most recent list of reference exposure levels (RELs) accessed on March 7, 2008 (Table H-2). All other toxicity values that were not updated by these two sources were obtained from the Region 9 PRG table.

EPA Region 9 PRGs are calculated for cancer risk levels of $10^{-6}$ and hazard levels of 1. To calculate PRGs, target cancer risks or HIs are input to the equations for back calculation to a media concentration. Thus, development of PRGs is basically the reverse of risk calculation. These calculations use a selected acceptable risk (i.e., a cancer risk of one in one million, $10^{-6}$, and a hazard index of 1), exposure variables, and chemical toxicity factors to determine medium-specific chemical concentration instead of starting with measured concentrations and estimating risks. Exposure variables used in the calculations are the same as those presented in the footer of the EPA Region 9 PRG Table and toxicity values are those presented in Tables H-1 and H-2. PRG equations from USEPA Region 9 PRG Guidance (USEPA 2004) are provided below.

**Equation for Exposure to Carcinogenic Contaminants in Industrial Soil through Ingestion, Dermal Contact, and Inhalation of Fugitive Dust**

$$C_s\ (mg/kg) = \frac{TR\ x\ BW\ x\ AT_c}{EF\ x\ ED\left[\left(\frac{IR\ x\ CSF}{10^6\ mg/kg}\right)+\left(\frac{SA\ x\ AF\ x\ ABS\ x\ CSF}{10^6\ mg/kg}\right)+\left(\frac{ET\ x\ IhR\ x\ CSF}{PEF}\right)\right]}$$

**Equation for Exposure to Noncarcinogenic Contaminants in Industrial Soil through Ingestion, Dermal Contact, and Inhalation of Fugitive Dust**

$$C_s\ (mg/kg) = \frac{THQ\ x\ BW\ x\ AT_n}{EF\ x\ ED\left[\left(\frac{1}{RfD}\ x\ \frac{IR}{10^6\ mg/kg}\right)+\left(\frac{1}{RfD}\ x\ \frac{SA\ x\ AF\ x\ ABS}{10^6\ mg/kg}\right)+\left(\frac{1}{RfD}\ x\ \frac{ET\ x\ IhR}{PEF}\right)\right]}$$

**Equation for Inhalation Exposure to Carcinogenic Contaminants in Indoor or Ambient Air**

$$C_a\ (ug/m^3) = \frac{TR\ x\ BW\ x\ AT_c\ x1000 ug/mg}{EF\ x\ ED\ x\ IhR\ x\ ET\ x\ CSF}$$

**Equation for Inhalation Exposure to Noncarcinogenic Contaminants in Indoor or Ambient Air**

$$C_a\ (ug/m^3) = \frac{THQ\ x\ RfD\ x\ BW\ x\ AT_n\ x1000\ ug/mg}{EF\ x\ ED\ x\ IhR\ x\ ET}$$

Where

TR = Target Risk (a cancer risk of one in one million, $10^{-6}$)

THQ = Target Hazard Quotient (a hazard index of 1)

CSF = Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$

RfD = Reference Dose (mg/kg-day)

$C_S$ = Chemical Concentration in Soil or Dust (mg/kg)

$C_a$ = Chemical Concentration in Air ($mg/m^3$)

IR = Ingestion Rate (mg/day)

IhR = Inhalation Rate ($m^3$/hour)

PEF = Particulate Emission Factor ($m^3$/kg)

SA = Skin surface area exposed ($cm^2$)

AF = Soil to skin adherence factor (mg/$cm^2$)

ABS = Absorption fraction of chemical from soil

ET = Exposure Time (hrs/day)

EF = Exposure Frequency (days/year)

ED = Exposure Duration (years)

BW = Body Weight (kg)

$AT_c$ = Averaging Time – carcinogenic (days)

$AT_n$ = Averaging Time – noncarcinogenic (days)

For the adult+child scenario, the ingestion rate, skin contact and inhalation rates are time-weighted averages to account for different exposure assumptions used for adult and child receptors using the following equations:

**Adjusted Ingestion Rate for Adult+Child**

$$IR_{adj}(mg-yr/kg-d) = \frac{ED_c \; x \; IR_c}{BW_c} + \frac{ED_a \; x \; IR_a}{BW_a}$$

**Adjusted Skin Contact Rate for Adult+Child**

$$SA_{adj}(mg-yr/kg-d) = \frac{ED_c \; x \; AF \; x \; SA_c}{BW_c} + \frac{ED_a \; x \; AF \; x \; SA_a}{BW_a}$$

**Adjusted Inhalation Rate for Adult+Child**

$$IhR_{adj}(mg-yr/kg-d) = \frac{ED_c \; x \; ET \; x \; IhR_c}{BW_c} + \frac{ED_a \; x \; ET \; x \; IhR_a}{BW_a}$$

These equations were used to calculate exposure concentrations in primary exposure media. A target cancer risk of one in one million ($10^{-6}$) and target hazard index of 1 were used for the calculation of PRGs as these threshold values were identified as the point of departure in the risk calculations. PRGs for soil do not include inhalation of volatile

compounds measured in soil which then partition to soil gas and are subsequently released to air. Inhalation of VOCs is captured primarily through exposure to soil gas, which is discussed in Section 3.12 of the Data Gaps Analysis.

The updated PRG intercalculation tables for soil and groundwater are provided in Tables H-3 and H-4, respectively. Table H-3 calculates soil PRGs for the resident and industrial worker receptors via soil ingestion, inhalation, and dermal contact exposure pathways using the formulas listed above. The column titled "combined" lists the soil PRG based on combining all three exposure pathways. Table H-4 calculates groundwater PRGs for the resident receptor via groundwater ingestion and inhalation using the formulas listed above. The column titled "combined" lists the groundwater PRG based on combining the two exposure pathways. Ambient air PRGs are provided in this table as well.

# H.2 PRGs for the Rural Resident

EPA Region 9 PRGs include exposure via incidental ingestion, dermal contact and inhalation. However, for Area IV, the residential scenario is a rural resident scenario which would include ingestion of fruits and vegetables ; therefore, PRGs needed to be updated to incorporate this exposure pathway. As noted in Section 3.3.2.2, to address this pathway, agricultural land use PRGs for the ingestion of fruits and vegetables from the Risk Assessment Information System (RAIS), which were last updated in May 2007, were included in the screening process. These soil PRGs include the ingestion of fruits and vegetables exposure pathway and are calculated for a cancer risk levels of 1.0E-6 and hazard levels of 1 using equations developed for assessment of sites on the Oak Ridge Reservation in Oak Ridge, Tennessee and approved by EPA Region 4 (Table H-5).

To combine the Region 4 agricultural PRGs for the ingestion of fruits and vegetables with the Region 9 PRGs, the soil PRG formula in Section H.1 was modified as follows:

**Equation for Exposure to Carcinogenic Contaminants in Industrial Soil through Ingestion, Dermal Contact, and Inhalation of Fugitive Dust**

$$C_s\ (mg/kg) = \frac{TR \times BW \times AT_c}{EF \times ED\left[\left(\frac{IR \times CSF}{10^6\ mg/kg}\right)+\left(\frac{SA \times AF \times ABS \times CSF}{10^6\ mg/kg}\right)+\left(\frac{ET \times IhR \times CSF}{PEF}\right)+\left(\frac{1}{AgPRG_c}\right)\right]}$$

**Equation for Exposure to Noncarcinogenic Contaminants in Industrial Soil through Ingestion, Dermal Contact, and Inhalation of Fugitive Dust**

$$C_s\ (mg/kg) = \frac{THQ \times BW \times AT_n}{EF \times ED\left[\left(\frac{1}{RfD} \times \frac{IR}{10^6\ mg/kg}\right)+\left(\frac{1}{RfD} \times \frac{SA \times AF \times ABS}{10^6\ mg/kg}\right)+\left(\frac{1}{RfD} \times \frac{ET \times IhR}{PEF}\right)+\left(\frac{1}{AgPRG_n}\right)\right]}$$

Where

$Ag\ PRG_c$ = Agricultural PRG for the ingestion of fruits and vegetables based on Cancer Risk of $10^{-6}$ (Table H-5)

$Ag\ PRG_n$ = Agricultural PRG for the ingestion of fruits and vegetables based on Hazard Quotient of 1 for Child (Table H-5)

Note that the agricultural PRG for the ingestion of fruits and vegetables for the non-carcinogens was based on the PRG for the child to be more conservative. Although this does not conform with the adult plus child receptor that was used for the calculation of the Region 9 PRGs, the difference is minimal and the resulting PRG is adequate for screening purposes.

The updated list of PRGs incorporating the updated toxicity values and the ingestion of fruits and vegetables pathways is provided in Table H-6. Table H-6 summarizes the soil and groundwater PRGs calculated in this appendix. The column titled "Rural residential soil" provides the soil PRGs calculated in Table H-3 modified to incorporate the ingestion of fruits and vegetables. The most stringent PRG based on either carcinogenic or non-carcinogenic exposure was selected as the PRG.

For a few chemicals, the Region 9 2004 PRG referred to the soil saturation concentration ("sat"). As noted in the PRG guidance, this value "corresponds to the contaminant concentration in soil at which the absorptive limits of the soil particles, the solubility limits of the soil pore water, and the saturation of soil pore have been reached." For chemicals with a "sat" value in the 2004 PRG table, the "sat" value was retained as the PRG, with the exception of ethylbenzene. CalEPA OEHHA considers ethylbenzene to be carcinogenic, whereas Region 9 2004 PRG Table did not. Thus, the calculated soil PRG using the CalEPA OEHHA cancer slope factor toxicity value was used as the updated PRG instead of the "sat" value.

The column titled "Industrial soil" provides the soil PRGs calculated in Table H-3, listing the most stringent PRG based on either carcinogenic or non-carcinogenic exposure. The column titled "Ambient air" and "Tap Water" provides the ambient air and tap water PRGs, respectively, as calculated in Table H-4, listing the most stringent PRG based on either carcinogenic or non-carcinogenic exposure.

# References

USEPA 2004. Users' Guide and Background Technical Document for USEPA Region 9's Preliminary Remediation Goals (PRGs) Table.

**Table H-1**
**CalEPA OEHHA Cancer Potenticy Values from the Toxicity Criteria Database dated January 25, 2008**

| Chemical | CAS | Inhalation Slope Factor (mg/kg-day) | Inhalation Unit Risk (μg/cubic meter) | Oral Slope Factor (mg/kg-day) |
|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 2.00E-01 | 5.80E-05 | 2.70E-01 |
| 1,1,2-Trichloroethane | 79-00-5 | 5.70E-02 | 1.60E-05 | 7.20E-02 |
| 1,1-Dichloroethane | 75-34-3 | 5.70E-03 | 1.60E-06 | 5.70E-03 |
| 1,2,3,4,6,7,8,9-Octachlorodibenzofuran | 39001-02-0 | 1.30E+01 | 3.80E-03 | 1.30E+01 |
| 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin | 3268-87-9 | 1.30E+01 | 3.80E-03 | 1.30E+01 |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | 1.30E+03 | 3.80E-01 | 1.30E+03 |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 37871-00-4 | 1.30E+03 | 3.80E-01 | 1.30E+03 |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | 1.30E+03 | 3.80E-01 | 1.30E+03 |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 39227-28-6 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 57653-85-7 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 19408-74-3 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | 6.50E+03 | 1.90E+00 | 6.50E+03 |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 40321-76-4 | 1.30E+05 | 3.80E+01 | 1.30E+05 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | | 3.60E-03 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | 7.00E+00 | 1.90E-03 | 7.00E+00 |
| 1,2-Dibromoethane | 106-93-4 | 2.50E-01 | 7.10E-05 | 3.60E+00 |
| 1,2-Dichloroethane | 107-06-2 | 7.20E-02 | 2.10E-05 | 4.70E-02 |
| 1,2-Dichloropropane | 78-87-5 | 3.60E-02 | 1.00E-05 | 3.60E-02 |
| 1,2-Dimethylhydrazine | 540-73-8 | 5.50E+02 | 1.60E-01 | 5.50E+02 |
| 1,3-Butadiene | 106-99-0 | 6.00E-01 | 1.70E-04 | 3.40E+00 |
| 1,3-Dichloropropene | 542-75-6 | 5.50E-02 | 1.60E-05 | 9.10E-02 |
| 1,3-Propane sultone | 1120-71-4 | 2.40E+00 | 6.90E-04 | 2.40E+00 |
| 1,4-Dichlorobenzene | 106-46-7 | 4.00E-02 | 1.10E-05 | 5.40E-03 |
| 1,4-Dioxane | 123-91-1 | 2.70E-02 | 7.70E-06 | 2.70E-02 |
| 1,6-Dinitropyrene | 42397-64-8 | 3.90E+01 | 1.10E-02 | 1.20E+02 |
| 1,8-Dinitropyrene | 42397-65-9 | 3.90E+00 | 1.10E-03 | 1.20E+01 |
| 1-[(5-Nitrofurfurylidene)-amino]-2-imidazolidinone | 555-84-0 | 1.80E+00 | 5.10E-04 | 1.80E+00 |
| 1-Amino-2-methylanthraquinone | 82-28-0 | 1.50E-01 | 4.30E-05 | 1.50E-01 |
| 1-Nitropyrene | 5522-43-0 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| 2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thiazole | 3570-75-0 | 2.30E+00 | 6.60E-04 | 2.30E+00 |
| 2,3,3',4,4',5,5'-HpCB | 39635-31-9 | 1.30E+01 | 3.80E-03 | 1.30E+01 |
| 2,3,3',4,4',5'-HxCB | 69782-90-7 | 6.50E+01 | 1.90E-02 | 6.50E+01 |
| 2,3,3',4,4',5-HxCB | 38380-08-4 | 6.50E+01 | 1.90E-02 | 6.50E+01 |
| 2,3,3',4,4'-PeCB | 32598-14-4 | 1.30E+01 | 3.80E-03 | 1.30E+01 |
| 2,3',4,4',5,5'-HxCB | 52663-72-6 | 1.30E+00 | 3.80E-04 | 1.30E+00 |
| 2',3,4,4',5-PeCB | 65510-44-3 | 1.30E+01 | 3.80E-03 | 1.30E+01 |
| 2,3',4,4',5-PeCB | 31508-00-6 | 1.30E+01 | 3.80E-03 | 1.30E+01 |
| 2,3,4,4',5-PeCB | 74472-37-0 | 6.50E+01 | 1.90E-02 | 6.50E+01 |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 2,3,4,7,8,9-Hexachlorodibenzofuran | 57117-44-9 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | 6.50E+04 | 1.90E+01 | 6.50E+04 |
| 2,3,7,8-Hexachlorodibenzo-p-dioxin (mixture) | HCDBPmix | 1.30E+04 | 3.80E+00 | 3.30E+03 |

**Table H-1**
**CalEPA OEHHA Cancer Potenticy Values from the Toxicity Criteria Database dated January 25, 2008**

| Chemical | CAS | Inhalation Slope Factor (mg/kg-day) | Inhalation Unit Risk (μg/cubic meter) | Oral Slope Factor (mg/kg-day) |
|---|---|---|---|---|
| 2,3,7,8-Tetrachlorodibenzofuran | 51207-31-9 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin and related compounds (TCDD) | 1746-01-6 | 1.30E+05 | 3.80E+01 | 1.30E+05 |
| 2,4,6-Trichlorophenol | 88-06-2 | 7.00E-02 | 2.00E-05 | 7.00E-02 |
| 2,4-Diaminoanisole | 615-05-4 | 2.30E-02 | 6.60E-06 | 2.30E-02 |
| 2,4-Diaminoanisole sulfate | 39156-41-7 | 1.30E-02 | 3.70E-06 | 1.30E-02 |
| 2,4-Diaminotoluene | 95-80-7 | 4.00E+00 | 1.10E-03 | 3.80E+00 |
| 2,4-Dinitrotoluene | 121-14-2 | 3.10E-01 | 8.90E-05 | 3.10E-01 |
| 2-Acetylaminofluorene | 53-96-3 | 3.80E+00 | 1.30E-03 | 3.80E+00 |
| 2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazol | 712-68-5 | 1.60E+01 | 4.60E-03 | 1.60E+01 |
| 2-Aminoanthraquinone | 117-79-3 | 3.30E-02 | 9.40E-06 | 3.30E-02 |
| 2-Methyl-1-nitroanthraquinone (of uncertain purity) | 129-15-7 | 4.30E+00 | 1.20E-03 | 4.30E+00 |
| 2-Naphthylamine | 91-59-8 | 1.80E+00 | 0.00E+00 | 1.80E+00 |
| 2-Nitrofluorene | 607-57-8 | 3.90E-02 | 1.10E-05 | 1.20E-01 |
| 3,3',4,4',5,5'-HxCB | 32774-16-6 | 1.30E+03 | 3.80E-01 | 1.30E+03 |
| 3,3',4,4',5-PeCB | 57465-28-8 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| 3,3',4,4'-TCB | 32598-13-3 | 1.30E+01 | 3.80E-03 | 1.30E+01 |
| 3,3-Dichlorobenzidine | 91-94-1 | 1.20E+00 | 3.40E-04 | 1.20E+00 |
| 3,4,4'5-TCB | 70362-50-4 | 1.30E+01 | 3.80E-03 | 1.30E+01 |
| 3-Amino-9-ethylcarbazolehydrochloride | 6109-97-3 | 7.80E-02 | 2.20E-05 | 7.80E-02 |
| 3-Chloro-2-methylpropene | 563-47-3 | 1.40E-01 | 4.00E-05 | 1.40E-01 |
| 3-Methylcholanthrene | 56-49-5 | 2.20E+01 | 6.30E-03 | 2.20E+01 |
| 4,4-Diaminodiphenyl ether | 101-80-4 | 1.40E-01 | 4.00E-05 | 1.40E-01 |
| 4,4-Methylene bis(2-chloroaniline) | 101-14-4 | 1.50E+00 | 4.30E-04 | 1.50E+00 |
| 4,4-Methylene bis(2-methylaniline) | 838-88-0 | 9.20E-01 | 2.60E-04 | 9.20E-01 |
| 4,4-Methylene bis(N,N'-dimethyl)aniline | 101-61-1 | 4.60E-02 | 1.30E-05 | 4.60E-02 |
| 4,4-Methylenedianiline | 101-77-9 | 1.60E+00 | 4.60E-04 | 1.60E+00 |
| 4,4-Methylenedianiline dihydrochloride | 13552-44-8 | 1.20E+00 | 3.40E-04 | 1.20E+00 |
| 4,4-Thiodianiline | 139-65-1 | 1.50E+01 | 4.30E-03 | 1.50E+01 |
| 4-Aminobiphenyl (4-aminodiphenyl) | 92-67-1 | 2.10E+01 | 6.00E-03 | 2.10E+01 |
| 4-Chloro-ortho-phenylenediamine | 95-83-0 | 1.60E-02 | 4.60E-06 | 1.60E-02 |
| 4-Dimethylaminoazobenzene | 60-11-7 | 4.60E+00 | 1.30E-03 | 4.60E+00 |
| 4-Nitropyrene | 57835-92-4 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| 5-Methylchrysene | 3697-24-3 | 3.90E+00 | 1.10E-03 | 1.20E+01 |
| 5-Nitroacenaphthene | 602-87-9 | 1.30E-01 | 3.70E-05 | 1.30E-01 |
| 5-Nitro-o-anisidine | 99-59-2 | 4.90E-02 | 1.40E-05 | 4.90E-02 |
| 6-Nitrochrysene | 7496-02-8 | 3.90E+01 | 1.10E-02 | 1.20E+02 |
| 7,12-Dimethylbenz(a)anthracene | 57-97-6 | 2.50E+02 | 7.10E-02 | 2.50E+02 |
| 7H-dibenzo(c,g)carbazole | 194-59-2 | 3.90E+00 | 1.10E-03 | 1.20E+01 |
| A-alpha-C(2-Amino-9H-pyrido[2,3-b]indole) | 26148-68-5 | 4.00E-01 | 1.14E-04 | 4.00E-01 |
| Acetaldehyde | 75-07-0 | 1.00E-02 | 2.70E-06 | |
| Acetamide | 60-35-5 | 7.00E-02 | 2.00E-05 | 7.00E-02 |
| Acrylamide | 79-06-1 | 4.50E+00 | 1.30E-03 | 4.50E+00 |
| Acrylonitrile | 107-13-1 | 1.00E+00 | 2.90E-04 | 1.00E+00 |
| Actinomycin D | 50-76-0 | 8.70E+03 | 2.50E+00 | 8.70E+03 |

**Table H-1**
**CalEPA OEHHA Cancer Potenticy Values from the Toxicity Criteria Database dated January 25, 2008**

| Chemical | CAS | Inhalation Slope Factor (mg/kg-day) | Inhalation Unit Risk (μg/cubic meter) | Oral Slope Factor (mg/kg-day) |
|---|---|---|---|---|
| AF-2;[2-(2-furyl)-3(5-nitro-2-furyl)]acrylamide | 3688-53-7 | 2.40E-01 | 6.90E-05 | 2.40E-01 |
| Alachlor | 15972-60-8 | | | 5.60E-02 |
| Aldrin | 309-00-2 | 1.70E+01 | 4.90E-03 | 1.70E+01 |
| Allyl chloride | 107-05-1 | 2.10E-02 | 6.00E-06 | 2.10E-02 |
| Amitrole | 61-82-5 | 9.40E-01 | 2.70E-04 | 9.40E-01 |
| Aniline | 62-53-3 | 5.70E-03 | 1.60E-06 | 5.70E-03 |
| Aramite | 140-57-8 | 3.00E-02 | 8.60E-06 | 3.00E-02 |
| Arsenic | 7440-38-2 | 1.20E+01 | 3.30E-03 | 9.45E+00 |
| Asbestos [1/(100 PCM fibers/m^3)]^-1 | 1332-21-4 | 2.20E+02 | 6.30E-02 | |
| Atrazine | 1912-24-9 | | | 2.30E-01 |
| Auramine | 492-80-8 | 8.80E-01 | 2.50E-04 | 8.80E-01 |
| Azaserine | 115-02-6 | 1.10E+01 | 3.10E-03 | 1.10E+01 |
| Azathioprine | 446-86-6 | 1.80E+00 | 5.10E-04 | 1.80E+00 |
| Azobenzene | 103-33-3 | 1.10E-01 | 3.10E-05 | 1.10E-01 |
| Benz(a)anthracene | 56-55-3 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| Benzene | 71-43-2 | 1.00E-01 | 2.90E-05 | 1.00E-01 |
| Benzidine | 92-87-5 | 5.00E+02 | 1.40E-01 | 5.00E+02 |
| Benzo(a)pyrene | 50-32-8 | 3.90E+00 | 1.10E-03 | 1.20E+01 |
| Benzo(b)fluoranthene | 205-99-2 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| Benzo(j)fluoranthene | 205-82-3 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| Benzo(k)fluoranthene | 207-08-9 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| Benzyl chloride | 100-44-7 | 1.70E-01 | 4.90E-05 | 1.70E-01 |
| Benzyl violet 4B | 1694-09-3 | 2.00E-02 | 5.70E-06 | 2.00E-02 |
| Beryllium | 7440-41-7 | 8.40E+00 | 2.40E-03 | |
| Beryllium oxide | 1304-56-9 | 8.40E+00 | 2.40E-03 | 7.00E+00 |
| Beryllium sulfate | 13510-49-1 | 3.00E+03 | 8.60E-01 | 3.00E+03 |
| beta-Butyrolactone | 3068-88-0 | 1.00E+00 | 2.90E-04 | 1.00E+00 |
| beta-Propiolactone | 57-57-8 | 1.40E+01 | 4.00E-03 | 1.40E+01 |
| Bis(2-chloroethyl) ether | 111-44-4 | 2.50E+00 | 7.10E-04 | 2.50E+00 |
| Bis(2-chloromethyl) ether | 542-88-1 | 4.60E+01 | 1.30E-02 | 4.60E+01 |
| Bromodichloromethane | 75-27-4 | 1.30E-01 | 3.70E-05 | 1.30E-01 |
| Butylated hydroxyanisole | 25013-16-5 | 2.00E-04 | 5.70E-08 | 2.00E-04 |
| C.I. Basic Red 9 monohydrochloride | 569-61-9 | 2.50E-01 | 7.10E-05 | 2.40E+02 |
| Cadmium | 7440-43-9 | 1.50E+01 | 4.20E-03 | |
| Captafol | 2425-06-1 | 1.50E-01 | 4.30E-05 | 1.50E-01 |
| Captan | 133-06-2 | 2.30E-03 | 6.60E-07 | 2.30E-03 |
| Carbon tetrachloride | 56-23-5 | 1.50E-01 | 4.20E-05 | 1.50E-01 |
| Chlorambucil | 305-03-3 | 4.40E+02 | 1.30E-01 | 2.30E-03 |
| Chlordane | 57-74-9 | 1.20E+00 | 3.40E-04 | 1.30E+00 |
| Chlordecone (Kepone) | 143-50-0 | 1.60E+01 | 4.60E-03 | 1.60E+01 |
| Chlorendic acid | 115-28-6 | 9.10E-02 | 2.60E-05 | 9.10E-02 |
| Chlorinated paraffins (Avg. chain length,C12:approx.60 percent chlorine by weight) | 108171-26-2 | 8.90E-02 | 2.50E-05 | 8.90E-02 |
| Chlorodibromomethane | 124-48-1 | 9.40E-02 | 2.70E-05 | 9.40E-02 |
| Chloroform | 67-66-3 | 1.90E-02 | 5.30E-06 | 3.10E-02 |

**Table H-1**
**CalEPA OEHHA Cancer Potenticy Values from the Toxicity Criteria Database dated January 25, 2008**

| Chemical | CAS | Inhalation Slope Factor (mg/kg-day) | Inhalation Unit Risk (μg/cubic meter) | Oral Slope Factor (mg/kg-day) |
|---|---|---|---|---|
| Chloromethyl methyl ether (technical grade) | 107-30-2 | 2.40E+00 | 6.90E-04 | 2.40E+00 |
| Chlorothalonil | 1897-45-6 | 3.10E-03 | 8.90E-07 | 3.10E-03 |
| Chlorozotocin | 54749-90-5 | 2.40E+02 | 6.90E-02 | 2.40E+02 |
| Chromium, hexavalent (Chromium VI) | 18540-29-9 | 5.10E+02 | 1.50E-01 | |
| Chrysene | 218-01-9 | 3.90E-02 | 1.10E-05 | 1.20E-01 |
| Cinnamyl anthranilate | 87-29-6 | 4.60E-03 | 1.30E-06 | 4.60E-03 |
| Coke oven emissions | Coke | 2.20E+00 | 6.20E-04 | |
| Cupferron | 135-20-6 | 2.20E-01 | 6.30E-05 | 2.20E-01 |
| Cyclophosphamide (anhydrous) | 50-18-0 | 6.10E-01 | 1.70E-04 | 6.10E-01 |
| Cyclophosphamide (hydrated) | 6055-19-2 | 5.70E-01 | 1.60E-04 | 5.70E-01 |
| D & C Red No. 9 | 5160-02-1 | 5.30E-03 | 1.50E-06 | 5.30E-03 |
| Dacarbazine | 4342-03-4 | 4.90E+01 | 1.40E-02 | 4.90E+01 |
| Daminozide | 1596-84-5 | 1.80E-02 | 5.10E-06 | 1.80E-02 |
| Dantron | 117-10-2 | 7.60E-02 | 2.20E-05 | 7.60E-02 |
| Di(2-ethylhexyl)phthalate | 117-81-7 | 8.40E-03 | 2.40E-06 | 3.00E-03 |
| Dibenz(a,h)acridine | 226-36-8 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| Dibenz(a,h)anthracene | 53-70-3 | 4.10E+00 | 1.20E-03 | 4.10E+00 |
| Dibenz(a,j)acridine | 224-42-0 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| Dibenzo(a,e)pyrene | 192-65-4 | 3.90E+00 | 1.10E-03 | 1.20E+01 |
| Dibenzo(a,h)pyrene | 189-64-0 | 3.90E+01 | 1.10E-02 | 1.20E+02 |
| Dibenzo(a,i)pyrene | 189-55-9 | 3.90E+01 | 1.10E-02 | 1.20E+02 |
| Dibenzo(a,l)pyrene | 191-30-0 | 3.90E+01 | 1.10E-02 | 1.20E+02 |
| Dichlorodiphenyldichloroethane | 72-54-8 | 2.40E-01 | 6.90E-05 | 2.40E-01 |
| Dichlorodiphenyldichloroethylene | 72-55-9 | 3.40E-01 | 9.70E-05 | 3.40E-01 |
| Dichlorodiphenyltrichloroethane | 50-29-3 | 3.40E-01 | 9.70E-05 | 3.40E-01 |
| Dichlorvos | 62-73-7 | 2.90E-01 | 8.30E-05 | 4.10E-01 |
| Dieldrin | 60-57-1 | 1.60E+01 | 4.60E-03 | 1.60E+01 |
| Diesel exhaust particulate | DEP | 1.10E+00 | 3.00E-04 | |
| Diethylstilbestrol | 56-53-1 | 3.50E+02 | 1.00E-01 | 3.50E+02 |
| Diglycidyl resorcinol ether (DGRE) | 101-90-6 | 1.70E+00 | 4.90E-04 | 1.70E+00 |
| Dihydrosafrole | 94-58-6 | 4.40E-02 | 1.30E-05 | 4.40E-02 |
| Dimethylcarbamyl chloride | 79-44-7 | 1.30E+01 | 3.70E-03 | 1.30E+01 |
| Dimethylvinylchloride | 513-37-1 | 4.50E-02 | 1.30E-05 | 4.50E-02 |
| Direct Black 38 (technical grade) | 1937-37-7 | 7.40E+00 | 2.10E-03 | 7.40E+00 |
| Direct Blue 6 (technical grade) | 2602-46-2 | 7.40E+00 | 2.10E-03 | 7.40E+00 |
| Direct Brown 95 (technical grade) | 16071-86-6 | 6.70E+00 | 1.90E-03 | 6.70E+00 |
| Disperse Blue 1 (technical grade) | 2475-45-8 | 4.50E-03 | 1.30E-06 | 4.50E-03 |
| Epichlorohydrin | 106-89-8 | 8.00E-02 | 2.30E-05 | 8.00E-02 |
| Estradiol 17B | 50-28-2 | 3.90E+01 | 1.10E-02 | 3.90E+01 |
| Ethyl-4,4'-dichlorobenzilate | 510-15-6 | 1.10E-01 | 3.10E-05 | 1.10E-01 |
| Ethylbenzene | 100-41-4 | 8.70E-03 | 2.50E-06 | 1.10E-02 |
| Ethylene oxide | 75-21-8 | 3.10E-01 | 8.80E-05 | 3.10E-01 |
| Ethylene thiourea | 96-45-7 | 4.50E-02 | 1.30E-05 | 4.50E-02 |
| Ethyleneimine | 151-56-4 | 6.50E+01 | 1.90E-02 | 6.50E+01 |
| Formaldehyde | 50-00-0 | 2.10E-02 | 6.00E-06 | |
| Furmecyclox | 60568-05-0 | 3.00E-02 | 8.60E-06 | 3.00E-02 |

**Table H-1**
**CalEPA OEHHA Cancer Potenticy Values from the Toxicity Criteria Database dated January 25, 2008**

| Chemical | CAS | Inhalation Slope Factor (mg/kg-day) | Inhalation Unit Risk (μg/cubic meter) | Oral Slope Factor (mg/kg-day) |
|---|---|---|---|---|
| d]imidazole) | 67730-11-4 | 4.80E+00 | 1.40E-03 | 4.80E+00 |
| Glu-P-2 (2-Aminodipyrido[1,2-a:3',2'-d]indole) | 67730-10-3 | 1.40E+00 | 4.00E-04 | 1.40E+00 |
| Gyromitrin | 16568-02-8 | 1.00E+01 | 2.90E-03 | 1.00E+01 |
| HC Blue 1 | 2784-94-3 | 5.10E-02 | 1.50E-05 | 5.10E-02 |
| Heptachlor | 76-44-8 | 4.10E+00 | | 4.10E+00 |
| Heptachlor epoxide | 1024-57-3 | 5.50E+00 | | 5.50E+00 |
| Hexachlorobenzene | 118-74-1 | 1.80E+00 | 5.10E-04 | 1.80E+00 |
| Hexachlorocyclohexane (technical grade) | 608-73-1 | 4.00E+00 | 1.10E-03 | 4.00E+00 |
| Hexachlorocyclohexane, alpha isomer | 319-84-6 | 2.70E+00 | 7.70E-04 | 2.70E+00 |
| Hexachlorocyclohexane, beta isomer | 319-85-7 | 1.50E+00 | 4.30E-04 | 1.50E+00 |
| Hexachlorocyclohexane, gamma isomer | 58-89-9 | 1.10E+00 | 3.10E-04 | 1.10E+00 |
| Hexachlorodibenzo-p-dioxin | 34465-46-8 | 1.30E+04 | 3.80E+00 | 1.30E+04 |
| Hexachloroethane | 67-72-1 | 3.90E-02 | 1.10E-05 | 3.90E-02 |
| Hydrazine | 302-01-2 | 1.70E+01 | 4.90E-03 | 3.00E+00 |
| Hydrazine Sulfate | 10034-93-2 | 3.00E+00 | 8.60E-04 | 3.00E+00 |
| Hydrazobenzene | 122-66-7 | 8.70E-01 | 2.50E-04 | 8.70E-01 |
| Indeno(1,2,3-c,d)pyrene | 193-39-5 | 3.90E-01 | 1.10E-04 | 1.20E+00 |
| IQ (2-Amino-3-methylimidazo-[4,5-f]quinoline) | 76180-96-6 | 1.40E+00 | 4.00E-04 | 1.40E+00 |
| Lasiocarpine | 303-34-4 | 7.80E+00 | 2.20E-03 | 7.80E+00 |
| Lead acetate | 301-04-2 | 2.80E-01 | 8.00E-05 | 2.80E-01 |
| Lead and lead compounds | 7439-92-1 | 4.20E-02 | 1.20E-05 | 8.50E-03 |
| Lead subacetate | 1335-32-6 | 3.80E-02 | 1.10E-05 | 3.80E-02 |
| Me-A-alpha-C (2-Amino-3-methyl-9H-pyrido[2,3-b]indole) | 68006-83-7 | 1.20E+00 | 3.40E-04 | 1.20E+00 |
| Melphalan | 3223-07-2 | 1.30E+02 | 3.70E-02 | 1.30E+02 |
| Methyl methanesulfonate | 66-27-3 | 9.90E-02 | 2.80E-05 | 9.90E-02 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 9.10E-04 | 2.60E-07 | 1.80E-03 |
| Methylene chloride | 75-09-2 | 3.50E-03 | 1.00E-06 | 1.40E-02 |
| Methylthiouracil | 56-04-2 | 4.00E-01 | 1.10E-04 | 4.00E-01 |
| Michler's ketone | 90-94-8 | 8.60E-01 | 2.50E-04 | 8.60E-01 |
| Mirex | 2385-85-5 | 1.80E+01 | 5.10E-03 | 1.80E+01 |
| Mitomycin C | 50-07-7 | 8.20E+03 | 2.30E+00 | 8.20E+03 |
| Monocrotaline | 315-22-0 | 1.00E+01 | 2.90E-03 | 1.00E+01 |
| N-[4-(5-Nitro-2-furyl)-2-thiazolyl]-acetamide | 531-82-8 | 1.50E+00 | 4.30E-04 | 1.50E+00 |
| naphthalene | 91-20-3 | 1.20E-01 | 3.40E-05 | |
| Nickel and Nickel compounds | 7440-02-0 | 9.10E-01 | 2.60E-04 | |
| Nickel subsulfide | 12035-72-2 | 1.70E+00 | 4.90E-04 | 1.70E+00 |
| Nitrilotriacetic acid | 139-13-9 | 5.30E-03 | 1.50E-06 | 5.30E-03 |
| Nitrilotriacetic acid, trisodium salt monohydrate | 18662-53-8 | 1.00E-02 | 2.90E-06 | 1.00E-02 |
| Nitrofen (technical grade) | 1836-75-5 | 8.20E-02 | 2.30E-05 | 8.20E-02 |
| Nitrofurazone | 59-87-0 | 1.30E+00 | 3.70E-04 | 1.30E+00 |
| N-Methyl-N-nitro-N-nitrosoguanidine | 70-25-7 | 8.30E+00 | 2.40E-03 | 8.30E+00 |
| N-Nitrosodiethanolamine | 1116-54-7 | 2.80E+00 | 8.00E-04 | 2.80E+00 |
| N-Nitrosodiethylamine | 55-18-5 | 3.60E+01 | 1.00E-02 | 3.60E+01 |

**Table H-1**
**CalEPA OEHHA Cancer Potenticy Values from the Toxicity Criteria Database dated January 25, 2008**

| Chemical | CAS | Inhalation Slope Factor (mg/kg-day) | Inhalation Unit Risk (μg/cubic meter) | Oral Slope Factor (mg/kg-day) |
|---|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | 1.60E+01 | 4.60E-03 | 1.60E+01 |
| N-Nitrosodi-n-butylamine | 924-16-3 | 1.10E+01 | 3.10E-03 | 1.10E+01 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 7.00E+00 | 2.00E-03 | 7.00E+00 |
| N-Nitrosodiphenylamine | 86-30-6 | 9.00E-03 | 2.60E-06 | 9.00E-03 |
| N-Nitrosomorpholine | 59-89-2 | 6.70E+00 | 1.90E-03 | 6.70E+00 |
| N-Nitroso-N-ethylurea | 759-73-9 | 2.70E+01 | 7.70E-03 | 2.70E+01 |
| N-Nitroso-N-methylethylamine | 10595-95-6 | 2.20E+01 | 6.30E-03 | 2.20E+01 |
| N-Nitroso-N-methylurea | 684-93-5 | 1.20E+02 | 3.40E-02 | 1.20E+02 |
| N-Nitroso-N-methylurethane | 615-53-2 | 1.10E+02 | 3.10E-02 | 1.10E+02 |
| N-Nitrosonornicotine | 16543-55-8 | 1.40E+00 | 4.00E-04 | 1.40E+00 |
| N-Nitrosopiperidine | 100-75-4 | 9.40E+00 | 2.70E-03 | 9.40E+00 |
| N-Nitrosopyrrolidine | 930-55-2 | 2.10E+00 | 6.00E-04 | 2.10E+00 |
| O-Phenylphenate, sodium | 132-27-4 | 3.00E-03 | 8.60E-07 | 3.00E-03 |
| ortho-Aminoazotoluene | 97-56-3 | 3.80E+00 | 1.10E-03 | 3.80E+00 |
| ortho-Anisidine | 90-04-0 | 1.40E-01 | 4.00E-05 | 1.40E-01 |
| ortho-Anisidine hydrochloride | 134-29-2 | 1.10E-01 | 3.10E-05 | 1.10E-01 |
| ortho-Toluidine | 95-53-4 | 1.80E-01 | 5.10E-05 | 1.80E-01 |
| ortho-Toluidine hydrochloride | 636-21-5 | 1.30E-01 | 3.70E-05 | 1.30E-01 |
| para-Cresidine | 120-71-8 | 1.50E-01 | 4.30E-05 | 1.50E-01 |
| p-Chloro-o-toluidine | 95-69-2 | 2.70E-01 | 7.70E-05 | 2.70E-01 |
| Pentachlorophenol | 87-86-5 | 1.80E-02 | 4.60E-06 | 8.10E-02 |
| Phenacetin | 62-44-2 | 2.20E-03 | 6.30E-07 | 2.20E-03 |
| Phenazopyridine | 94-78-0 | 1.70E-01 | 4.90E-05 | 1.70E-01 |
| Phenazopyridine hydrochloride | 136-40-3 | 1.50E-01 | 4.30E-05 | 1.50E-01 |
| Phenesterin | 3546-10-9 | 1.50E+02 | 4.30E-02 | 1.50E+02 |
| Phenobarbital | 50-06-6 | 4.60E-01 | 1.30E-04 | 4.60E-01 |
| Phenoxybenzamine | 59-96-1 | 3.10E+00 | 8.90E-04 | 3.10E+00 |
| Phenoxybenzamine hydrochloride | 63-92-3 | 2.70E+00 | 7.70E-04 | 2.70E+00 |
| p-Nitrosodiphenylamine | 156-10-5 | 2.20E-02 | 6.30E-06 | 2.20E-02 |
| Polybrominated biphenyls (PBB) | PBB | 3.00E+01 | 8.60E-03 | 3.00E+01 |
| Polychlorinated biphenyls | 133-63-63 | 2.00E+00 | 5.70E-04 | 5.00E+00 |
| Ponceau 3R | 3564-09-8 | 1.60E-02 | 4.60E-06 | 1.60E-02 |
| Ponceau MX (D&C Red No.5) | 3761-53-3 | 4.50E-03 | 1.30E-06 | 4.50E-03 |
| Potassium bromate | 7758-01-2 | 4.90E-01 | 1.40E-04 | 4.90E-01 |
| Procarbazine | 671-16-9 | 1.40E+01 | 4.00E-03 | 1.40E+01 |
| Procarbazine hydrochloride | 366-70-1 | 1.20E+01 | 3.40E-03 | 1.20E+01 |
| Propylene oxide | 75-56-9 | 1.30E-02 | 3.70E-06 | 2.40E-01 |
| Propylthiouracil | 51-52-5 | 1.00E+00 | 2.90E-04 | 1.00E+00 |
| Reserpine | 50-55-5 | 1.10E+01 | 3.10E-03 | 1.10E+01 |
| Safrole | 94-59-7 | 2.20E-01 | 6.30E-05 | 2.20E-01 |
| Sterigmatocystin | 10048-13-2 | 3.50E+01 | 1.00E-02 | 2.20E-01 |
| Streptozotocin | 18883-66-4 | 1.10E+02 | 3.10E-02 | 1.10E+02 |
| Styrene oxide | 96-09-3 | 1.60E-01 | 4.60E-05 | 1.60E-01 |
| Sulfallate | 95-06-7 | 1.90E-01 | 5.40E-05 | 1.90E-01 |
| Tetrachloroethylene | 127-18-4 | 2.10E-02 | 5.90E-06 | 5.40E-01 |
| Thioacetamide | 62-55-5 | 6.10E+00 | 1.70E-03 | 6.10E+00 |

**Table H-1**
**CalEPA OEHHA Cancer Potenticy Values from the Toxicity Criteria Database dated January 25, 2008**

| Chemical | CAS | Inhalation Slope Factor (mg/kg-day) | Inhalation Unit Risk (μg/cubic meter) | Oral Slope Factor (mg/kg-day) |
|---|---|---|---|---|
| Thiourea | 62-56-6 | 7.20E-02 | 2.10E-05 | 7.20E-02 |
| Toluene diisocyanate | 26471-62-5 | 3.90E-02 | 1.10E-05 | 3.90E-02 |
| Toxaphene | 8001-35-2 | 1.20E+00 | 3.40E-04 | 1.20E+00 |
| trans-2[(Dimethylamino)-methylimino]-5-[2-(5-nitro-2-furyl)-vinyl]-1,3,4-oxadiazole | 55738-54-0 | 4.40E-01 | 1.30E-04 | 4.40E-01 |
| Trichloroethylene | 79-01-6 | 7.00E-03 | 2.00E-06 | 1.30E-02 |
| Tris-(1-aziridinyl)phosphine sulfide | 52-24-4 | 1.20E+01 | 3.40E-03 | 1.20E+01 |
| Tris(2,3-dibromopropyl)phosphate | 126-72-7 | 2.30E+00 | 6.60E-04 | 2.30E+00 |
| Trp-P-1 (Tryptophan-P-1) | 62450-06-0 | 2.60E+01 | 7.40E-03 | 2.60E+01 |
| Trp-P-2 (Tryptophan-P-2) | 62450-07-1 | 3.20E+00 | 9.10E-04 | 3.20E+00 |
| Urethane | 51-79-6 | 1.00E+00 | 2.90E-04 | 1.00E+00 |
| Vinyl chloride | 75-01-4 | 2.70E-01 | 7.80E-05 | 2.70E-01 |

mg/kg-day = milligrams per kilogram per day

μg/cubic meter = microgram per cubic meter

CalEPA = California Environmental Protection Agency

OEHHA = Office of Environmental Human Hazard Assessment

**Table H-2**
**CalEPA OEHHA Chronic Reference Exposure Levels dated March 7, 2008**

| Chemical | CAS | Chronic Inhalation REL ($\mu g/m^3$) | Chronic Inhalation RfDi (mg/kg-day) | Hazard Index Target(s) | Human Data |
|---|---|---|---|---|---|
| Acetaldehyde* | 75-07-0 | 9 | 2.57E-03 | Respiratory system | |
| Acrolein | 107-02-8 | 0.06 | 1.71E-05 | Respiratory system; eyes | |
| Acrylonitrile | 107-13-1 | 5 | 1.43E-03 | Respiratory system | |
| Ammonia | 7664-41-7 | 200 | 5.71E-02 | Respiratory system | yes |
| Arsenic & arsenic compounds | 7440-38-2 | 0.03 | 8.57E-06 | Development; Cardiovascular system; Nervous system | |
| Benzene | 71-43-2 | 60 | 1.71E-02 | Hematopoietic system; development; nervous system | yes |
| Beryllium and beryllium compounds | 7440-41-7 | 0.007 | 2.00E-06 | Respiratory system; immune system | yes |
| Butadiene | 106-99-0 | 20 | 5.71E-03 | Reproductive system | |
| Cadmium & cadmium compounds | 7440-43-9 | 0.02 | 5.71E-06 | Kidney; respiratory system | yes |
| Carbon tetrachloride | 56-23-5 | 40 | 1.14E-02 | Alimentary system; development; nervous system | |
| Carbon disulfide | 75-15-0 | 800 | 2.29E-01 | Nervous system; reproductive system | yes |
| Chlorinated dioxins | 1746-01-6 | 0.00004 | 1.14E-08 | Alimentary system (liver); reproductive system; development; endocrine system; respiratory system; hematopoietic system | |
| (1746-01-6) & dibenzofurans | 5120-73-19 | 0.00004 | 1.14E-08 | Alimentary system (liver); reproductive system; development; endocrine system; respiratory system; hematopoietic system | |
| Chlorine | 7782-50-5 | 0.2 | 5.71E-05 | Respiratory system | |
| Chlorine dioxide | 10049-04-4 | 0.6 | 1.71E-04 | Respiratory system | |
| Chlorobenzene | 108-90-7 | 1000 | 2.86E-01 | Alimentary system; kidney; reproductive system | |
| Chloroform | 67-66-3 | 300 | 8.57E-02 | Alimentary system; kidney; development | |
| Chloropicrin | 76-06-2 | 0.4 | 1.14E-04 | Respiratory system | |
| Chromium hexavalent: soluble except chromic trioxide | 18540-29-9 | 0.2 | 5.71E-05 | Respiratory system | |
| Chromic trioxide (as chromic acid mist) | | 0.002 | 5.71E-07 | Respiratory system | yes |
| Cresol mixtures | 1319-77-3 | 600 | 1.71E-01 | Nervous system | |
| Dichlorobenzene (1,4-) | 106-46-7 | 800 | 2.29E-01 | Nervous system; respiratory system; alimentary system; kidney | |
| Dichloroethylene (1,1) | 75-35-4 | 70 | 2.00E-02 | Alimentary system | |
| Diesel Exhaust* | | 5 | 1.43E-03 | Respiratory system | |
| Diethanolamine | 111-42-2 | 3 | 8.57E-04 | Cardiovascular system; nervous system | |
| Dimethylformamide (N,N-) | 68-12-2 | 80 | 2.29E-02 | Alimentary system ; respiratory system | yes |
| Dioxane (1,4-) | 123-91-1 | 3,000 | 8.57E-01 | Alimentary system; kidney; cardiovascular system | |
| Epichlorohydrin | 106-89-8 | 3 | 8.57E-04 | Respiratory system; eyes | |

**Table H-2**
**CalEPA OEHHA Chronic Reference Exposure Levels dated March 7, 2008**

| Chemical | CAS | Chronic Inhalation REL ($\mu g/m^3$) | Chronic Inhalation RfDi (mg/kg-day) | Hazard Index Target(s) | Human Data |
|---|---|---|---|---|---|
| Epoxybutane (1,2-) | 106-88-7 | 20 | 5.71E-03 | Respiratory system; cardiovascular system | |
| Ethylbenzene | 100-41-4 | 2,000 | 5.71E-01 | Development; alimentary system (liver); kidney; endocrine system | |
| Ethyl chloride | 75-00-3 | 30,000 | 8.57E+00 | Development; alimentary system | |
| Ethylene dibromide | 106-93-4 | 0.8 | 2.29E-04 | Reproductive system | yes |
| Ethylene dichloride | 107-06-2 | 400 | 1.14E-01 | Alimentary system (liver) | |
| Ethylene glycol | 107-21-1 | 400 | 1.14E-01 | Respiratory system; kidney; development | yes |
| Ethylene glycol monoethyl ether | 110-80-5 | 70 | 2.00E-02 | Reproductive system; hematopoietic system | |
| Ethylene glycol monoethyl ether acetate | 111-15-9 | 300 | 8.57E-02 | Development | |
| Ethylene glycol monomethyl ether | 109-86-4 | 60 | 1.71E-02 | Reproductive system | |
| Ethylene glycol monomethyl ether acetate | 110-49-6 | 90 | 2.57E-02 | Reproductive system | |
| Ethylene oxide | 75-21-8 | 30 | 8.57E-03 | Nervous system | |
| Fluoride including Hydrogen Fluoride | 16984-48-8 | 13 | 3.71E-03 | Bone and teeth; respiratory system | yes |
| Formaldehyde | 50-00-0 | 3 | 8.57E-04 | Respiratory system; eyes | yes |
| Glutaraldehyde | 111-30-8 | 0.08 | 2.29E-05 | Respiratory system | |
| Hexane (n-) | 110-54-3 | 7000 | 2.00E+00 | Nervous system | |
| Hydrazine | 302-01-2 | 0.2 | 5.71E-05 | Alimentary system; endocrine system | |
| Hydrogen chloride | 7647-01-0 | 9 | 2.57E-03 | Respiratory system | |
| Hydrogen cyanide | 74-90-8 | 9 | 2.57E-03 | Nervous system; endocrine system; cardiovascular system | yes |
| Hydrogen sulfide | 7783-06-4 | 10 | 2.86E-03 | Respiratory system | |
| Isophorone | 78-59-1 | 2000 | 5.71E-01 | Development; liver | |
| Isopropanol | 67-63-0 | 7,000 | 2.00E+00 | Kidney; development | |
| Maleic anhydride | 108-31-6 | 0.7 | 2.00E-04 | Respiratory system | |
| Manganese & manganese compounds | 7439-96-5 | 0.2 | 5.71E-05 | Nervous system | yes |
| Mercury & mercury compounds (inorganic) | 7487-94-7 | 0.09 | 2.57E-05 | Nervous system | yes |
| Methanol | 67-56-1 | 4,000 | 1.14E+00 | Development | |
| Methyl bromide | 74-83-9 | 5 | 1.43E-03 | Respiratory system; nervous system; development | |
| Methyl chloroform | 71-55-6 | 1,000 | 2.86E-01 | Nervous system | |
| Methyl isocyanate | 624-83-9 | 1 | 2.86E-04 | Respiratory system; reproductive system | |
| Methyl t-butyl ether | 1634-04-4 | 8,000 | 2.29E+00 | Kidney; eyes; alimentary system (liver) | |
| Methylene chloride | 75-09-2 | 400 | 1.14E-01 | Cardiovascular system; nervous system | yes |
| Methylene dianiline (4,4'-) | 101-77-9 | 20 | 5.71E-03 | Eyes; alimentary system (hepatotoxicity) | |

## Table H-2
## CalEPA OEHHA Chronic Reference Exposure Levels dated March 7, 2008

| Chemical | CAS | Chronic Inhalation REL ($\mu g/m^3$) | Chronic Inhalation RfDi (mg/kg-day) | Hazard Index Target(s) | Human Data |
|---|---|---|---|---|---|
| Methylene Diphenyl Isocyanate | 101-68-8 | 0.7 | 2.00E-04 | Respiratory system | |
| Naphthalene | 91-20-3 | 9 | 2.57E-03 | Respiratory system | |
| Nickel & compounds (except nickel oxide) | 7440-02-0 | 0.05 | 1.43E-05 | Respiratory system; hematopoietic system | |
| Nickel oxide | 1313-99-1 | 0.1 | 2.86E-05 | Respiratory system; hematopoietic system | |
| Phenol | 108-95-2 | 200 | 5.71E-02 | Alimentary system; cardiovascular system; kidney; nervous system | |
| Phosphine | 7803-51-2 | 0.8 | 2.29E-04 | Respiratory system; alimentary system; nervous system; kidney; hematopoietic system | |
| Phosphoric acid | 7664-38-2 | 7 | 2.00E-03 | Respiratory system | |
| Phthalic anhydride | 85-44-9 | 20 | 5.71E-03 | Respiratory system | yes |
| Propylene | 115-07-1 | 3,000 | 8.57E-01 | Respiratory system | |
| Propylene glycol monomethyl ether | 107-98-2 | 7,000 | 2.00E+00 | Alimentary system (liver) | |
| Propylene oxide | 75-56-9 | 30 | 8.57E-03 | Respiratory system | |
| Selenium and selenium compounds (other than hydrogen selenide) | 7782-49-2 | 20 | 5.71E-03 | Alimentary system; cardiovascular system; nervous system | yes |
| Silica (crystalline, respirable) | | 3 | 8.57E-04 | Respiratory system | yes |
| Styrene | 100-42-5 | 900 | 2.57E-01 | Nervous system | yes |
| Sulfuric acid | 7664-93-9 | 1 | 2.86E-04 | Respiratory system | |
| Tetrachloroethylene*(perchloroethylene) | 127-18-4 | 35 | 1.00E-02 | Kidney; alimentary system (liver) | |
| Toluene | 108-88-3 | 300 | 8.57E-02 | Nervous system; respiratory system; development | |
| Toluene diisocyanates (2,4-&2,6-) | | 0.07 | 2.00E-05 | Respiratory system | yes |
| Trichloroethylene | 79-01-6 | 600 | 1.71E-01 | Nervous system; eyes | yes |
| Triethylamine | 121-44-8 | 200 | 5.71E-02 | Eyes | |
| Vinyl acetate | 108-05-4 | 200 | 5.71E-02 | Respiratory system | |
| Xylenes (m-, o-, p-) | 1330-20-7 | 700 | 2.00E-01 | Nervous system; respiratory system | yes |

mg/kg-day = milligrams per kilogram per day

μg/cubic meter = microgram per cubic meter

CalEPA = California Environmental Protection Agency

OEHHA = Office of Environmental Human Hazard Assessment

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Acephate | 1.0E+06 | 2.3E+02 | 7.4E+01 | 5.6E+01 | 8.2E+06 | 1.1E+03 | 3.1E+02 | 2.4E+02 | 2.2E+06 | 5.0E+02 | 3.3E+02 | 2.0E+02 | 2.7E+07 | 6.2E+03 | 4.1E+03 | 2.5E+03 |
| Acetaldehyde | 8.3E+00 | | | 8.3E+00 | 5.0E+01 | | | 5.0E+01 | 1.8E+01 | | | 1.8E+01 | 1.6E+02 | | | 1.6E+02 |
| Acetochlor | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Acetone | | | | | 1.8E+04 | | 7.0E+04 | 1.4E+04 | | | | | 5.8E+04 | | 9.2E+05 | 5.4E+04 |
| Acetone cyanohydrin | | | | | 1.6E+06 | 2.2E+02 | 6.3E+01 | 4.9E+01 | | | | | 5.4E+06 | 1.2E+03 | 8.2E+02 | 4.9E+02 |
| Acetonitrile | | | | | 6.2E+02 | | 1.3E+03 | 4.2E+02 | | | | | 2.0E+03 | | 1.7E+04 | 1.8E+03 |
| Acrolein | | | | | 3.1E-01 | | 3.9E+01 | 3.1E-01 | | | | | 1.0E+00 | | 5.1E+02 | 1.0E+00 |
| Acrylamide | 1.9E+03 | 4.5E-01 | 1.4E-01 | 1.1E-01 | 4.1E+05 | 5.6E+01 | 1.6E+01 | 1.2E+01 | 4.2E+03 | 9.6E-01 | 6.4E-01 | 3.8E-01 | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 |
| Acrylic acid | | | | | 5.9E+05 | 1.4E+05 | 3.9E+04 | 2.9E+04 | | | | | 1.9E+06 | 7.7E+05 | 5.1E+05 | 2.7E+05 |
| Acrylonitrile | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 6.0E-02 | | 6.4E-01 | 5.5E-02 | 2.0E+01 | | 7.8E+01 | 1.6E+01 | 1.3E-01 | | 2.9E+00 | 1.2E-01 | 6.6E+01 | | 1.0E+03 | 6.2E+01 |
| Alachlor | 1.1E+05 | 3.6E+01 | 1.1E+01 | 8.7E+00 | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | 2.4E+05 | 7.7E+01 | 5.1E+01 | 3.1E+01 | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Alar | 4.9E+05 | 1.1E+02 | 3.6E+01 | 2.7E+01 | 3.1E+08 | 4.2E+04 | 1.2E+04 | 9.2E+03 | 1.0E+06 | 2.4E+02 | 1.6E+02 | 9.6E+01 | 1.0E+09 | 2.3E+05 | 1.5E+05 | 9.2E+04 |
| Aldicarb | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Aldicarb sulfone | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Aldrin | 5.1E+02 | 1.2E-01 | 3.8E-02 | 2.9E-02 | 6.2E+04 | 8.4E+00 | 2.3E+00 | 1.8E+00 | 1.1E+03 | 2.6E-01 | 1.7E-01 | 1.0E-01 | 2.0E+05 | 4.6E+01 | 3.1E+01 | 1.8E+01 |
| Ally | | | | | 5.1E+08 | 7.0E+04 | 2.0E+04 | 1.5E+04 | | | | | 1.7E+09 | 3.9E+05 | 2.6E+05 | 1.5E+05 |
| Allyl alcohol | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Allyl chloride | 4.2E+05 | 9.6E+01 | 3.0E+01 | 2.3E+01 | 5.9E+05 | 8.0E+01 | 2.2E+01 | 1.7E+01 | 9.0E+05 | 2.1E+02 | 1.4E+02 | 8.2E+01 | 1.9E+06 | 4.4E+02 | 2.9E+02 | 1.8E+02 |
| Aluminum | | | | | 2.9E+06 | | 7.8E+04 | 7.6E+04 | | | | | 9.4E+06 | | 1.0E+06 | 9.2E+05 |
| Aluminum phosphide | | | | | | | 3.1E+01 | 3.1E+01 | | | | | | | 4.1E+02 | 4.1E+02 |
| Amdro | | | | | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| Ametryn | | | | | 1.9E+07 | 2.5E+03 | 7.0E+02 | 5.5E+02 | | | | | 6.1E+07 | 1.4E+04 | 9.2E+03 | 5.5E+03 |
| Aminodinitrotoluene | | | | | 4.1E+05 | 5.6E+01 | 1.6E+01 | 1.2E+01 | | | | | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 |
| m-Aminophenol | | | | | 1.4E+08 | 2.0E+04 | 5.5E+03 | 4.3E+03 | | | | | 4.7E+08 | 1.1E+05 | 7.2E+04 | 4.3E+04 |
| 4-Aminopyridine | | | | | 4.1E+04 | 5.6E+00 | 1.6E+00 | 1.2E+00 | | | | | 1.3E+05 | 3.1E+01 | 2.0E+01 | 1.2E+01 |
| Amitraz | | | | | 5.1E+06 | 7.0E+02 | 2.0E+02 | 1.5E+02 | | | | | 1.7E+07 | 3.9E+03 | 2.6E+03 | 1.5E+03 |
| Ammonia | | | | | 1.2E+08 | | | 1.2E+08 | | | | | 3.8E+08 | | | 3.8E+08 |
| Ammonium sulfamate | | | | | | 5.6E+04 | 1.6E+04 | 1.2E+04 | | | | | | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| Aniline | 1.5E+06 | 3.5E+02 | 1.1E+02 | 8.5E+01 | 5.9E+05 | 2.0E+03 | 5.5E+02 | 4.3E+02 | 3.3E+06 | 7.6E+02 | 5.0E+02 | 3.0E+02 | 1.9E+06 | 1.1E+04 | 7.2E+03 | 4.3E+03 |
| Antimony and compounds | | | | | | | 3.1E+01 | 3.1E+01 | | | | | | | 4.1E+02 | 4.1E+02 |
| Apollo | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Aramite | 2.9E+05 | 6.7E+01 | 2.1E+01 | 1.6E+01 | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | 6.3E+05 | 1.4E+02 | 9.5E+01 | 5.7E+01 | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Arsenic | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 7.3E+02 | 7.1E-01 | 6.8E-02 | 6.2E-02 | 1.8E+04 | 2.8E+02 | 2.3E+01 | 2.2E+01 | 1.6E+03 | 1.5E+00 | 3.0E-01 | 2.5E-01 | 5.8E+04 | 1.5E+03 | 3.1E+02 | 2.5E+02 |
| Arsine | | | | | 2.9E+04 | | | 2.9E+04 | | | | | 9.6E+04 | | | 9.6E+04 |
| Assure | | | | | 1.9E+07 | 2.5E+03 | 7.0E+02 | 5.5E+02 | | | | | 6.1E+07 | 1.4E+04 | 9.2E+03 | 5.5E+03 |
| Asulam | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Atrazine | 4.0E+04 | 8.8E+00 | 2.8E+00 | 2.1E+00 | 7.2E+07 | 9.8E+03 | 2.7E+03 | 2.1E+03 | 8.6E+04 | 1.9E+01 | 1.2E+01 | 7.5E+00 | 2.4E+08 | 5.4E+04 | 3.6E+04 | 2.2E+04 |
| Avermectin B1 | | | | | 8.2E+05 | 1.1E+02 | 3.1E+01 | 2.4E+01 | | | | | 2.7E+06 | 6.2E+02 | 4.1E+02 | 2.5E+02 |
| Azobenzene | 7.9E+04 | 1.8E+01 | 5.8E+00 | 4.4E+00 | | | | | 1.7E+05 | 3.9E+01 | 2.6E+01 | 1.6E+01 | | | | |
| Barium and compounds | | | | | 2.9E+05 | | 5.5E+03 | 5.4E+03 | | | | | 9.6E+05 | | 7.2E+04 | 6.7E+04 |
| Baygon | | | | | 8.2E+06 | 1.1E+03 | 3.1E+02 | 2.4E+02 | | | | | 2.7E+07 | 6.2E+03 | 4.1E+03 | 2.5E+03 |
| Bayleton | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Baythroid | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| Benefin | | | | | 6.2E+08 | 8.4E+04 | 2.3E+04 | 1.8E+04 | | | | | 2.0E+09 | 4.6E+05 | 3.1E+05 | 1.8E+05 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Benomyl | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Bentazon | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Benzaldehyde | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Benzene | 1.8E-01 | | 6.4E+00 | 1.8E-01 | 7.3E+01 | | 3.1E+02 | 5.9E+01 | 3.9E-01 | | 2.9E+01 | 3.9E-01 | 2.4E+02 | | 4.1E+03 | 2.3E+02 |
| Benzidine | 1.7E+01 | 4.0E-03 | 1.3E-03 | 9.7E-04 | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | 3.8E+01 | 8.7E-03 | 5.7E-03 | 3.4E-03 | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Benzoic acid | | | | | 8.2E+09 | 1.1E+06 | 3.1E+05 | 2.4E+05 | | | | | 2.7E+10 | 6.2E+06 | 4.1E+06 | 2.5E+06 |
| Benzotrichloride | 6.7E+02 | 1.6E-01 | 4.9E-02 | 3.7E-02 | | | | | 1.4E+03 | 3.3E-01 | 2.2E-01 | 1.3E-01 | | | | |
| Benzyl alcohol | | | | | 6.2E+08 | 8.4E+04 | 2.3E+04 | 1.8E+04 | | | | | 2.0E+09 | 4.6E+05 | 3.1E+05 | 1.8E+05 |
| Benzyl chloride | 1.2E+00 | | 3.8E+00 | 8.8E-01 | 1.3E+02 | | 2.3E+02 | 8.4E+01 | 2.5E+00 | | 1.7E+01 | 2.2E+00 | 4.4E+02 | | 3.0E+03 | 3.8E+02 |
| Beryllium and compounds | 1.0E+03 | | | 1.0E+03 | 4.1E+03 | | 1.6E+02 | 1.5E+02 | 2.2E+03 | | | 2.2E+03 | 1.3E+04 | | 2.0E+03 | 1.8E+03 |
| Bidrin | | | | | 2.1E+05 | 2.8E+01 | 7.8E+00 | 6.1E+00 | | | | | 6.7E+05 | 1.5E+02 | 1.0E+02 | 6.2E+01 |
| Biphenthrin (Talstar) | | | | | 3.1E+07 | 4.2E+03 | 1.2E+03 | 9.2E+02 | | | | | 1.0E+08 | 2.3E+04 | 1.5E+04 | 9.2E+03 |
| 1,1-Biphenyl | | | | | 1.3E+04 | | 3.9E+03 | 3.0E+03 | | | | | 4.3E+04 | | 5.1E+04 | 2.3E+04 |
| Bis(2-chloroethyl)ether | 1.5E-01 | | 2.6E-01 | 9.5E-02 | | | | | 3.3E-01 | | 1.1E+00 | 2.5E-01 | | | | |
| Bis(2-chloroisopropyl)ether | 4.2E+00 | | 9.1E+00 | 2.9E+00 | 1.4E+03 | | 3.1E+03 | 9.5E+02 | 9.0E+00 | | 4.1E+01 | 7.4E+00 | 4.5E+03 | | 4.1E+04 | 4.0E+03 |
| Bis(chloromethyl)ether | 9.7E-04 | | 1.4E-02 | 9.1E-04 | | | | | 2.1E-03 | | 6.2E-02 | 2.0E-03 | | | | |
| Bis(2-chloro-1-methylethyl)ether | 4.2E+00 | | 9.1E+00 | 2.9E+00 | 1.4E+03 | | 3.1E+03 | 9.5E+02 | 9.0E+00 | | 4.1E+01 | 7.4E+00 | 4.5E+03 | | 4.1E+04 | 4.0E+03 |
| Bis(2-ethylhexyl)phthalate (DEHP) | 1.0E+06 | 6.7E+02 | 2.1E+02 | 1.6E+02 | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | 2.2E+06 | 1.4E+03 | 9.5E+02 | 5.7E+02 | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Bisphenol A | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Boron | | | | | 1.2E+07 | | 1.6E+04 | 1.6E+04 | | | | | 3.8E+07 | | 2.0E+05 | 2.0E+05 |
| Boron trifluoride | | | | | 4.1E+05 | | | 4.1E+05 | | | | | 1.3E+06 | | | 1.3E+06 |
| Bromate | 1.2E+04 | 2.9E+00 | 9.1E-01 | 6.9E-01 | 8.2E+06 | 1.1E+03 | 3.1E+02 | 2.4E+02 | 2.7E+04 | 6.2E+00 | 4.1E+00 | 2.5E+00 | 2.7E+07 | 6.2E+03 | 4.1E+03 | 2.5E+03 |
| Bromobenzene | | | | | 2.8E+01 | | 1.6E+03 | 2.8E+01 | | | | | 9.3E+01 | | 2.0E+04 | 9.2E+01 |
| Bromodichloromethane | 4.2E-01 | | 4.9E+00 | 3.9E-01 | 2.6E+02 | | 1.6E+03 | 2.2E+02 | 9.1E-01 | | 2.2E+01 | 8.7E-01 | 8.4E+02 | | 2.0E+04 | 8.1E+02 |
| Bromoform (tribromomethane) | 2.3E+06 | 2.6E+02 | 8.1E+01 | 6.2E+01 | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | 4.9E+06 | 5.5E+02 | 3.6E+02 | 2.2E+02 | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Bromomethane | | | | | 4.0E+00 | | 1.1E+02 | 3.9E+00 | | | | | 1.3E+01 | | 1.4E+03 | 1.3E+01 |
| Bromophos | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Bromoxynil | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Bromoxynil octanoate | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| 1,3-Butadiene | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 1.1E-02 | | 1.9E-01 | 1.0E-02 | 8.6E+00 | | 4.5E+02 | 8.4E+00 | 2.3E-02 | | 8.4E-01 | 2.2E-02 | 2.8E+01 | | 5.8E+03 | 2.8E+01 |
| 1-Butanol | | | | | 5.4E+06 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 1.7E+07 | 1.5E+05 | 1.0E+05 | 6.1E+04 |
| Butylate | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| n-Butylbenzene | | | | | 7.1E+02 | | 3.1E+03 | 5.8E+02 | | | | | 2.3E+03 | | 4.1E+04 | 2.2E+03 |
| sec-Butylbenzene | | | | | 5.2E+02 | | 3.1E+03 | 4.5E+02 | | | | | 1.7E+03 | | 4.1E+04 | 1.6E+03 |
| tert-Butylbenzene | | | | | 6.3E+02 | | 3.1E+03 | 5.3E+02 | | | | | 2.1E+03 | | 4.1E+04 | 2.0E+03 |
| Butyl benzyl phthalate | | | | | 4.1E+08 | 5.6E+04 | 1.6E+04 | 1.2E+04 | | | | | 1.3E+09 | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| Butylphthalyl butylglycolate | | | | | 2.1E+09 | 2.8E+05 | 7.8E+04 | 6.1E+04 | | | | | 6.7E+09 | 1.5E+06 | 1.0E+06 | 6.2E+05 |
| Cadmium and compounds | 5.8E+02 | | | 5.8E+02 | 1.2E+04 | 1.4E+04 | 3.9E+01 | 3.9E+01 | 1.3E+03 | | | 1.3E+03 | 3.8E+04 | 7.7E+04 | 5.1E+02 | 5.0E+02 |
| Caprolactam | | | | | 1.0E+09 | 1.4E+05 | 3.9E+04 | 3.1E+04 | | | | | 3.4E+09 | 7.7E+05 | 5.1E+05 | 3.1E+05 |
| Captafol | 5.8E+04 | 1.3E+01 | 4.3E+00 | 3.2E+00 | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | 1.3E+05 | 2.9E+01 | 1.9E+01 | 1.1E+01 | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Captan | 3.8E+06 | 8.8E+02 | 2.8E+02 | 2.1E+02 | 2.7E+08 | 3.6E+04 | 1.0E+04 | 7.9E+03 | 8.2E+06 | 1.9E+03 | 1.2E+03 | 7.5E+02 | 8.7E+08 | 2.0E+05 | 1.3E+05 | 8.0E+04 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Carbaryl | | | | | 2.3E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 7.4E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Carbazole | 4.4E+05 | 1.0E+02 | 3.2E+01 | 2.4E+01 | | | | | 9.4E+05 | 2.2E+02 | 1.4E+02 | 8.6E+01 | | | | |
| Carbofuran | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Carbon disulfide | | | | | 4.3E+02 | | 7.8E+03 | 4.0E+02 | | | | | 1.4E+03 | | 1.0E+05 | 1.4E+03 |
| Carbon tetrachloride | 9.1E-02 | | 4.3E+00 | 9.0E-02 | 3.7E+01 | | 5.5E+01 | 2.2E+01 | 2.0E-01 | | 1.9E+01 | 2.0E-01 | 1.2E+02 | | 7.2E+02 | 1.0E+02 |
| Carbosulfan | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Carboxin | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Chloramben | | | | | 3.1E+07 | 4.2E+03 | 1.2E+03 | 9.2E+02 | | | | | 1.0E+08 | 2.3E+04 | 1.5E+04 | 9.2E+03 |
| Chloranil | 2.2E+04 | 5.0E+00 | 1.6E+00 | 1.2E+00 | | | | | 4.7E+04 | 1.1E+01 | 7.1E+00 | 4.3E+00 | | | | |
| Chlordane | 7.3E+03 | | 4.9E-01 | 4.9E-01 | | | | | 1.6E+04 | | 2.2E+00 | 2.2E+00 | | | | |
| Chlorimuron-ethyl | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Chlorine | | | | | 1.2E+05 | | 7.8E+03 | 7.3E+03 | | | | | 3.8E+05 | | 1.0E+05 | 8.1E+04 |
| Chlorine dioxide | | | | | 3.5E+05 | | 2.3E+03 | 2.3E+03 | | | | | 1.2E+06 | | 3.1E+04 | 3.0E+04 |
| Chloroacetic acid | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| 2-Chloroacetophenone | | | | | 3.4E-02 | | 6.7E-01 | 3.3E-02 | | | | | 1.1E-01 | | 8.8E+00 | 1.1E-01 |
| 4-Chloroaniline | | | | | 8.2E+06 | 1.1E+03 | 3.1E+02 | 2.4E+02 | | | | | 2.7E+07 | 6.2E+03 | 4.1E+03 | 2.5E+03 |
| Chlorobenzene | | | | | 2.8E+03 | | 1.6E+03 | 1.0E+03 | | | | | 9.2E+03 | | 2.0E+04 | 6.3E+03 |
| Chlorobenzilate | 7.9E+04 | 1.8E+01 | 5.8E+00 | 4.4E+00 | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | 1.7E+05 | 3.9E+01 | 2.6E+01 | 1.6E+01 | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| p-Chlorobenzoic acid | | | | | 4.1E+08 | 5.6E+04 | 1.6E+04 | 1.2E+04 | | | | | 1.3E+09 | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| 4-Chlorobenzotrifluoride | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| 2-Chloro-1,3-butadiene | | | | | 3.6E+00 | | 1.6E+03 | 3.6E+00 | | | | | 1.2E+01 | | 2.0E+04 | 1.2E+01 |
| 1-Chlorobutane | | | | | 7.3E+02 | | 3.1E+04 | 7.1E+02 | | | | | 2.4E+03 | | 4.1E+05 | 2.4E+03 |
| 1-Chloro-1,1-difluoroethane | | | | | 2.4E+04 | | 1.1E+06 | 2.3E+04 | | | | | 7.7E+04 | | 1.5E+07 | 7.7E+04 |
| Chlorodifluoromethane | | | | | 2.3E+04 | | 1.1E+06 | 2.3E+04 | | | | | 7.6E+04 | | 1.4E+07 | 7.5E+04 |
| Chloroethane | 3.0E+00 | | 2.2E+02 | 3.0E+00 | 1.8E+04 | | 3.1E+04 | 1.1E+04 | 6.5E+00 | | 9.9E+02 | 6.5E+00 | 5.8E+04 | | 4.1E+05 | 5.1E+04 |
| Chloroform | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 9.3E-01 | | 2.1E+01 | 8.9E-01 | 3.6E+02 | | 7.8E+02 | 2.4E+02 | 2.0E+00 | | 9.2E+01 | 2.0E+00 | 1.2E+03 | | 1.0E+04 | 1.0E+03 |
| Chloromethane | | | | | 4.8E+01 | | 2.0E+03 | 4.7E+01 | | | | | 1.6E+02 | | 2.7E+04 | 1.6E+02 |
| 4-Chloro-2-methylaniline | 3.2E+04 | 7.5E+00 | 2.4E+00 | 1.8E+00 | | | | | 7.0E+04 | 1.6E+01 | 1.1E+01 | 6.4E+00 | | | | |
| 4-Chloro-2-methylaniline hydrochloride | 1.9E+04 | 4.4E+00 | 1.4E+00 | 1.1E+00 | | | | | 4.1E+04 | 9.4E+00 | 6.2E+00 | 3.7E+00 | | | | |
| beta-Chloronaphthalene | | | | | 1.0E+04 | | 6.3E+03 | 3.9E+03 | | | | | 3.3E+04 | | 8.2E+04 | 2.3E+04 |
| o-Chloronitrobenzene | 3.0E+01 | | 6.6E+01 | 2.1E+01 | 1.4E+00 | | 7.8E+01 | 1.4E+00 | 6.5E+01 | | 3.0E+02 | 5.3E+01 | 4.5E+00 | | 1.0E+03 | 4.5E+00 |
| p-Chloronitrobenzene | 4.4E+01 | | 9.6E+01 | 3.0E+01 | 1.2E+01 | | 7.8E+01 | 1.0E+01 | 9.4E+01 | | 4.3E+02 | 7.7E+01 | 3.8E+01 | | 1.0E+03 | 3.7E+01 |
| 2-Chlorophenol | | | | | 7.6E+01 | | 3.9E+02 | 6.3E+01 | | | | | 2.5E+02 | | 5.1E+03 | 2.4E+02 |
| 2-Chloropropane | | | | | 1.8E+02 | | 2.3E+03 | 1.7E+02 | | | | | 6.0E+02 | | 3.0E+04 | 5.9E+02 |
| Chlorothalonil | 2.8E+06 | 6.5E+02 | 2.1E+02 | 1.6E+02 | 3.1E+07 | 4.2E+03 | 1.2E+03 | 9.2E+02 | 6.1E+06 | 1.4E+03 | 9.2E+02 | 5.6E+02 | 1.0E+08 | 2.3E+04 | 1.5E+04 | 9.2E+03 |
| o-Chlorotoluene | | | | | 1.8E+02 | | 1.6E+03 | 1.6E+02 | | | | | 5.8E+02 | | 2.0E+04 | 5.6E+02 |
| Chlorpropham | | | | | 4.1E+08 | 5.6E+04 | 1.6E+04 | 1.2E+04 | | | | | 1.3E+09 | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| Chlorpyrifos | | | | | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Chlorpyrifos-methyl | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Chlorsulfuron | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Chlorthiophos | | | | | 1.6E+06 | 2.2E+02 | 6.3E+01 | 4.9E+01 | | | | | 5.4E+06 | 1.2E+03 | 8.2E+02 | 4.9E+02 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Total Chromium (1:6 ratio Cr VI:Cr III)+++ | 2.1E+02 | | | 2.1E+02 | | | | | 4.5E+02 | | | 4.5E+02 | | | | |
| Chromium III | | | | | | | 1.2E+05 | 1.2E+05 | | | | | | | 1.5E+06 | 1.5E+06 |
| Chromium VI+++ | 1.7E+01 | | | 1.7E+01 | 1.2E+05 | | 2.3E+02 | 2.3E+02 | 3.7E+01 | | | 3.7E+01 | 3.8E+05 | | 3.1E+03 | 3.0E+03 |
| Cobalt | 8.9E+02 | | | 8.9E+02 | 1.2E+04 | | 1.6E+03 | 1.4E+03 | 1.9E+03 | | | 1.9E+03 | 3.8E+04 | | 2.0E+04 | 1.3E+04 |
| Coke Oven Emissions | 4.0E+03 | | | 4.0E+03 | | | | | 8.7E+03 | | | 8.7E+03 | | | | |
| Copper and compounds | | | | | | | 3.1E+03 | 3.1E+03 | | | | | | | 4.1E+04 | 4.1E+04 |
| Crotonaldehyde | 5.3E-03 | | 3.4E-01 | 5.2E-03 | | | | | 1.1E-02 | | 1.5E+00 | 1.1E-02 | | | | |
| Cumene (isopropylbenzene) | | | | | 6.2E+02 | | 7.8E+03 | 5.7E+02 | | | | | 2.0E+03 | | 1.0E+05 | 2.0E+03 |
| Cyanazine | 1.0E+04 | 2.4E+00 | 7.6E-01 | 5.8E-01 | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | 2.2E+04 | 5.2E+00 | 3.4E+00 | 2.1E+00 | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Cyanide (free) | | | | | | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Cyanide (hydrogen) | | | | | 3.3E+01 | | 1.6E+03 | 3.2E+01 | | | | | 1.1E+02 | | 2.0E+04 | 1.1E+02 |
| Cyanogen | | | | | 1.3E+02 | | 3.1E+03 | 1.3E+02 | | | | | 4.3E+02 | | 4.1E+04 | 4.3E+02 |
| Cyanogen bromide | | | | | 3.0E+02 | | 7.0E+03 | 2.9E+02 | | | | | 9.8E+02 | | 9.2E+04 | 9.7E+02 |
| Cyanogen chloride | | | | | 1.7E+02 | | 3.9E+03 | 1.6E+02 | | | | | 5.4E+02 | | 5.1E+04 | 5.4E+02 |
| Cyclohexane | | | | | 2.9E+03 | | 1.3E+05 | 2.8E+03 | | | | | 9.5E+03 | | 1.7E+06 | 9.4E+03 |
| Cyclohexanone | | | | | 1.0E+10 | 1.4E+06 | 3.9E+05 | 3.1E+05 | | | | | 3.4E+10 | 7.7E+06 | 5.1E+06 | 3.1E+06 |
| Cyclohexylamine | | | | | 4.1E+08 | 5.6E+04 | 1.6E+04 | 1.2E+04 | | | | | 1.3E+09 | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| Cyhalothrin/Karate | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Cypermethrin | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Cyromazine | | | | | 1.5E+07 | 2.1E+03 | 5.9E+02 | 4.6E+02 | | | | | 5.0E+07 | 1.2E+04 | 7.7E+03 | 4.6E+03 |
| Dacthal | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Dalapon | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Danitol | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| DDD | 3.6E+04 | 2.8E+01 | 2.7E+00 | 2.4E+00 | | | | | 7.8E+04 | 6.0E+01 | 1.2E+01 | 1.0E+01 | | | | |
| DDE | 2.6E+04 | 2.0E+01 | 1.9E+00 | 1.7E+00 | | | | | 5.5E+04 | 4.3E+01 | 8.4E+00 | 7.0E+00 | | | | |
| DDT | 2.6E+04 | 2.0E+01 | 1.9E+00 | 1.7E+00 | 1.0E+06 | 4.7E+02 | 3.9E+01 | 3.6E+01 | 5.5E+04 | 4.3E+01 | 8.4E+00 | 7.0E+00 | 3.4E+06 | 2.6E+03 | 5.1E+02 | 4.3E+02 |
| Decabromodiphenyl ether | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Demeton | | | | | 8.2E+04 | 1.1E+01 | 3.1E+00 | 2.4E+00 | | | | | 2.7E+05 | 6.2E+01 | 4.1E+01 | 2.5E+01 |
| Diallate | 1.4E+05 | 3.3E+01 | 1.0E+01 | 8.0E+00 | | | | | 3.1E+05 | 7.1E+01 | 4.7E+01 | 2.8E+01 | | | | |
| Diazinon | | | | | 1.9E+06 | 2.5E+02 | 7.0E+01 | 5.5E+01 | | | | | 6.1E+06 | 1.4E+03 | 9.2E+02 | 5.5E+02 |
| Dibenzofuran | | | | | 2.0E+03 | | 1.6E+02 | 1.5E+02 | | | | | 6.6E+03 | | 2.0E+03 | 1.6E+03 |
| 1,4-Dibromobenzene | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Dibromochloromethane | 1.1E+00 | | 6.8E+00 | 9.8E-01 | 5.1E+02 | | 1.6E+03 | 3.8E+02 | 2.5E+00 | | 3.0E+01 | 2.3E+00 | 1.7E+03 | | 2.0E+04 | 1.5E+03 |
| 1,2-Dibromo-3-chloropropane "CAL-Modified PRG" | 4.4E-02 | | 9.1E-02 | 3.0E-02 | 4.1E+00 | | 4.5E+00 | 2.1E+00 | 9.4E-02 | | 4.1E-01 | 7.6E-02 | 1.3E+01 | | 5.8E+01 | 1.1E+01 |
| 1,2-Dibromoethane | 2.9E-01 | | 1.8E-01 | 1.1E-01 | 3.9E+00 | | 7.0E+02 | 3.9E+00 | 6.3E-01 | | 7.9E-01 | 3.5E-01 | 1.3E+01 | | 9.2E+03 | 1.3E+01 |
| Dibutyl phthalate | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Dicamba | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| 1,2-Dichlorobenzene | | | | | 1.3E+03 | | 7.0E+03 | 1.1E+03 | | | | | 4.3E+03 | | 9.2E+04 | 4.1E+03 |
| 1,3-Dichlorobenzene | | | | | 6.9E+02 | | 2.3E+03 | 5.3E+02 | | | | | 2.2E+03 | | 3.1E+04 | 2.1E+03 |
| 1,4-Dichlorobenzene | 2.1E+00 | | 1.2E+02 | 2.1E+00 | 4.6E+03 | | 2.3E+03 | 1.6E+03 | 4.6E+00 | | 5.3E+02 | 4.6E+00 | 1.5E+04 | | 3.1E+04 | 1.0E+04 |
| 3,3-Dichlorobenzidine | 7.3E+03 | 1.7E+00 | 5.3E-01 | 4.1E-01 | | | | | 1.6E+04 | 3.6E+00 | 2.4E+00 | 1.4E+00 | | | | |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| 4,4'-Dichlorobenzophenone | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| 1,4-Dichloro-2-butene | 8.8E-03 | | 6.9E-02 | 7.8E-03 | | | | | 1.9E-02 | | 3.1E-01 | 1.8E-02 | | | | |
| Dichlorodifluoromethane | | | | | 9.4E+01 | | 1.6E+04 | 9.4E+01 | | | | | 3.1E+02 | | 2.0E+05 | 3.1E+02 |
| 1,1-Dichloroethane | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 2.8E+00 | | 1.1E+02 | 2.8E+00 | 5.4E+02 | | 7.8E+03 | 5.1E+02 | 6.1E+00 | | 5.0E+02 | 6.0E+00 | 1.8E+03 | | 1.0E+05 | 1.7E+03 |
| 1,2-Dichloroethane | 3.6E-01 | | 1.4E+01 | 3.5E-01 | 7.0E+02 | | 1.6E+03 | 4.8E+02 | 7.8E-01 | | 6.1E+01 | 7.7E-01 | 2.3E+03 | | 2.0E+04 | 2.1E+03 |
| 1,1-Dichloroethylene | | | | | 4.5E+01 | | 3.9E+03 | 4.4E+01 | | | | | 1.5E+02 | | 5.1E+04 | 1.5E+02 |
| 1,2-Dichloroethylene (cis) | | | | | 4.5E+01 | | 7.8E+02 | 4.3E+01 | | | | | 1.5E+02 | | 1.0E+04 | 1.5E+02 |
| 1,2-Dichloroethylene (trans) | | | | | 7.3E+01 | | 1.6E+03 | 6.9E+01 | | | | | 2.4E+02 | | 2.0E+04 | 2.3E+02 |
| 2,4-Dichlorophenol | | | | | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| 4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB) | | | | | 1.6E+07 | 2.2E+03 | 6.3E+02 | 4.9E+02 | | | | | 5.4E+07 | 1.2E+04 | 8.2E+03 | 4.9E+03 |
| 2,4-Dichlorophenoxyacetic Acid (2,4-D) | | | | | 2.1E+07 | 5.6E+03 | 7.8E+02 | 6.9E+02 | | | | | 6.7E+07 | 3.1E+04 | 1.0E+04 | 7.7E+03 |
| 1,2-Dichloropropane | 6.6E-01 | | 1.8E+01 | 6.4E-01 | 6.4E+00 | | 8.6E+01 | 6.0E+00 | 1.4E+00 | | 7.9E+01 | 1.4E+00 | 2.1E+01 | | 1.1E+03 | 2.1E+01 |
| 1,3-Dichloropropane | | | | | 1.1E+02 | | 1.6E+03 | 1.0E+02 | | | | | 3.7E+02 | | 2.0E+04 | 3.6E+02 |
| 1,3-Dichloropropene | 2.2E-01 | | 7.0E+00 | 2.2E-01 | 1.6E+01 | | 2.3E+03 | 1.6E+01 | 4.8E-01 | | 3.1E+01 | 4.7E-01 | 5.4E+01 | | 3.1E+04 | 5.4E+01 |
| 2,3-Dichloropropanol | | | | | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Dichlorvos | 3.0E+04 | 4.9E+00 | 1.6E+00 | 1.2E+00 | 2.9E+05 | 1.4E+02 | 3.9E+01 | 3.1E+01 | 6.5E+04 | 1.1E+01 | 7.0E+00 | 4.2E+00 | 9.6E+05 | 7.7E+02 | 5.1E+02 | 3.1E+02 |
| Dicofol | 2.0E+04 | 4.6E+00 | 1.5E+00 | 1.1E+00 | | | | | 4.3E+04 | 9.9E+00 | 6.5E+00 | 3.9E+00 | | | | |
| Dicyclopentadiene | | | | | 5.4E-01 | | 2.3E+03 | 5.4E-01 | | | | | 1.8E+00 | | 3.1E+04 | 1.8E+00 |
| Dieldrin | 5.5E+02 | 1.3E-01 | 4.0E-02 | 3.0E-02 | 1.0E+05 | 1.4E+01 | 3.9E+00 | 3.1E+00 | 1.2E+03 | 2.7E-01 | 1.8E-01 | 1.1E-01 | 3.4E+05 | 7.7E+01 | 5.1E+01 | 3.1E+01 |
| Diethylene glycol, monobutyl ether | | | | | 1.2E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 3.8E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Diethylene glycol, monoethyl ether | | | | | 1.8E+06 | 1.7E+04 | 4.7E+03 | 3.7E+03 | | | | | 5.8E+06 | 9.3E+04 | 6.1E+04 | 3.7E+04 |
| Diethylformamide | | | | | 8.2E+05 | 1.1E+02 | 3.1E+01 | 2.4E+01 | | | | | 2.7E+06 | 6.2E+02 | 4.1E+02 | 2.5E+02 |
| Di(2-ethylhexyl)adipate | 7.3E+06 | 1.7E+03 | 5.3E+02 | 4.1E+02 | 1.2E+09 | 1.7E+05 | 4.7E+04 | 3.7E+04 | 1.6E+07 | 3.6E+03 | 2.4E+03 | 1.4E+03 | 4.0E+09 | 9.3E+05 | 6.1E+05 | 3.7E+05 |
| Diethyl phthalate | | | | | 1.6E+09 | 2.2E+05 | 6.3E+04 | 4.9E+04 | | | | | 5.4E+09 | 1.2E+06 | 8.2E+05 | 4.9E+05 |
| Diethylstilbestrol | 2.5E+01 | 5.8E-03 | 1.8E-03 | 1.4E-03 | | | | | 5.4E+01 | 1.2E-02 | 8.2E-03 | 4.9E-03 | | | | |
| Difenzoquat (Avenge) | | | | | 1.6E+08 | 2.2E+04 | 6.3E+03 | 4.9E+03 | | | | | 5.4E+08 | 1.2E+05 | 8.2E+04 | 4.9E+04 |
| Diflubenzuron | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| 1,1-Difluoroethane | | | | | 2.3E+10 | | 8.9E+05 | 8.9E+05 | | | | | 7.7E+10 | | 1.2E+07 | 1.2E+07 |
| Diisononyl phthalate | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Diisopropyl ether | | | | | 2.3E+08 | | | 2.3E+08 | | | | | 7.4E+08 | | | 7.4E+08 |
| Diisopropyl methylphosphonate | | | | | 1.6E+08 | 2.2E+04 | 6.3E+03 | 4.9E+03 | | | | | 5.4E+08 | 1.2E+05 | 8.2E+04 | 4.9E+04 |
| Dimethipin | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Dimethoate | | | | | 4.1E+05 | 5.6E+01 | 1.6E+01 | 1.2E+01 | | | | | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 |
| 3,3'-Dimethoxybenzidine | 6.2E+05 | 1.4E+02 | 4.6E+01 | 3.5E+01 | | | | | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 | | | | |
| Dimethylamine | | | | | 7.9E-02 | | 4.5E-01 | 6.7E-02 | | | | | 2.6E-01 | | 5.8E+00 | 2.5E-01 |
| N-N-Dimethylaniline | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| 2,4-Dimethylaniline | 1.2E+04 | 2.7E+00 | 8.5E-01 | 6.5E-01 | | | | | 2.5E+04 | 5.8E+00 | 3.8E+00 | 2.3E+00 | | | | |
| 2,4-Dimethylaniline hydrochloride | 1.5E+04 | 3.5E+00 | 1.1E+00 | 8.4E-01 | | | | | 3.2E+04 | 7.5E+00 | 4.9E+00 | 3.0E+00 | | | | |
| 3,3'-Dimethylbenzidine | 3.8E+03 | 8.8E-01 | 2.8E-01 | 2.1E-01 | | | | | 8.2E+03 | 1.9E+00 | 1.2E+00 | 7.5E-01 | | | | |
| N,N-Dimethylformamide | | | | | 4.7E+07 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 1.5E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Dimethylphenethylamine | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| 2,4-Dimethylphenol | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| 2,6-Dimethylphenol | | | | | 1.2E+06 | 1.7E+02 | 4.7E+01 | 3.7E+01 | | | | | 4.0E+06 | 9.3E+02 | 6.1E+02 | 3.7E+02 |
| 3,4-Dimethylphenol | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Dimethyl phthalate | | | | | 2.1E+10 | 2.8E+06 | 7.8E+05 | 6.1E+05 | | | | | 6.7E+10 | 1.5E+07 | 1.0E+07 | 6.2E+06 |
| Dimethyl terephthalate | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| 4,6-Dinitro-o-cresol | | | | | 2.1E+05 | 2.8E+01 | 7.8E+00 | 6.1E+00 | | | | | 6.7E+05 | 1.5E+02 | 1.0E+02 | 6.2E+01 |
| 4,6-Dinitro-o-cyclohexyl phenol | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| 1,2-Dinitrobenzene | | | | | 2.1E+05 | 2.8E+01 | 7.8E+00 | 6.1E+00 | | | | | 6.7E+05 | 1.5E+02 | 1.0E+02 | 6.2E+01 |
| 1,3-Dinitrobenzene | | | | | 2.1E+05 | 2.8E+01 | 7.8E+00 | 6.1E+00 | | | | | 6.7E+05 | 1.5E+02 | 1.0E+02 | 6.2E+01 |
| 1,4-Dinitrobenzene | | | | | 2.1E+05 | 2.8E+01 | 7.8E+00 | 6.1E+00 | | | | | 6.7E+05 | 1.5E+02 | 1.0E+02 | 6.2E+01 |
| 2,4-Dinitrophenol | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Dinitrotoluene mixture | 1.3E+04 | 3.0E+00 | 9.4E-01 | 7.2E-01 | | | | | 2.8E+04 | 6.4E+00 | 4.2E+00 | 2.5E+00 | | | | |
| 2,4-Dinitrotoluene | 2.8E+04 | 6.5E+00 | 2.1E+00 | 1.6E+00 | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | 6.1E+04 | 1.4E+01 | 9.2E+00 | 5.6E+00 | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| 2,6-Dinitrotoluene | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Dinoseb | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| di-n-Octyl phthalate | | | | | 8.2E+07 | 1.1E+04 | 3.1E+03 | 2.4E+03 | | | | | 2.7E+08 | 6.2E+04 | 4.1E+04 | 2.5E+04 |
| 1,4-Dioxane | 3.2E+05 | 7.5E+01 | 2.4E+01 | 1.8E+01 | 1.8E+09 | | | 1.8E+09 | 7.0E+05 | 1.6E+02 | 1.1E+02 | 6.4E+01 | 5.8E+09 | | | 5.8E+09 |
| Dioxin (2,3,7,8-TCDD) | 6.7E-02 | 5.2E-05 | 4.9E-06 | 4.5E-06 | 2.4E+01 | | | 2.4E+01 | 1.4E-01 | 1.1E-04 | 2.2E-05 | 1.8E-05 | 7.7E+01 | | | 7.7E+01 |
| Diphenamid | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Diphenylamine | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| N,N-Diphenyl-1,4 benzenediamine (DPPD) | | | | | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| 1,2-Diphenylhydrazine | 1.0E+04 | 2.3E+00 | 7.4E-01 | 5.6E-01 | | | | | 2.2E+04 | 5.0E+00 | 3.3E+00 | 2.0E+00 | | | | |
| Diphenyl sulfone | | | | | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Diquat | | | | | 4.5E+06 | 6.1E+02 | 1.7E+02 | 1.3E+02 | | | | | 1.5E+07 | 3.4E+03 | 2.2E+03 | 1.4E+03 |
| Direct black 38 | 1.2E+03 | 2.7E-01 | 8.7E-02 | 6.6E-02 | | | | | 2.5E+03 | 5.9E-01 | 3.9E-01 | 2.3E-01 | | | | |
| Direct blue 6 | 1.2E+03 | 2.7E-01 | 8.7E-02 | 6.6E-02 | | | | | 2.5E+03 | 5.9E-01 | 3.9E-01 | 2.3E-01 | | | | |
| Direct brown 95 | 1.3E+03 | 3.0E-01 | 9.6E-02 | 7.3E-02 | | | | | 2.8E+03 | 6.5E-01 | 4.3E-01 | 2.6E-01 | | | | |
| Disulfoton | | | | | 8.2E+04 | 1.1E+01 | 3.1E+00 | 2.4E+00 | | | | | 2.7E+05 | 6.2E+01 | 4.1E+01 | 2.5E+01 |
| 1,4-Dithiane | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Diuron | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Dodine | | | | | 8.2E+06 | 1.1E+03 | 3.1E+02 | 2.4E+02 | | | | | 2.7E+07 | 6.2E+03 | 4.1E+03 | 2.5E+03 |
| Dysprosium | | | | | | | 7.8E+03 | 7.8E+03 | | | | | | | 1.0E+05 | 1.0E+05 |
| Endosulfan | | | | | 1.2E+07 | 1.7E+03 | 4.7E+02 | 3.7E+02 | | | | | 4.0E+07 | 9.3E+03 | 6.1E+03 | 3.7E+03 |
| Endothall | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Endrin | | | | | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| Epichlorohydrin | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 1.5E+00 | | 8.0E+00 | 1.2E+00 | 2.4E+01 | | 1.6E+02 | 2.1E+01 | 3.2E+00 | | 3.6E+01 | 2.9E+00 | 7.8E+01 | | 2.0E+03 | 7.5E+01 |
| 1,2-Epoxybutane | | | | | 1.2E+07 | 1.6E+03 | 4.5E+02 | 3.5E+02 | | | | | 3.8E+07 | 8.8E+03 | 5.8E+03 | 3.5E+03 |
| EPTC (S-Ethyl dipropylthiocarbamate) | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| Ethephon (2-chloroethyl phosphonic acid) | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Ethion | | | | | 1.0E+06 | 1.4E+02 | 3.9E+01 | 3.1E+01 | | | | | 3.4E+06 | 7.7E+02 | 5.1E+02 | 3.1E+02 |
| 2-Ethoxyethanol | | | | | 4.1E+07 | 1.1E+05 | 3.1E+04 | 2.4E+04 | | | | | 1.3E+08 | 6.2E+05 | 4.1E+05 | 2.5E+05 |
| 2-Ethoxyethanol acetate | | | | | 1.8E+08 | 8.4E+04 | 2.3E+04 | 1.8E+04 | | | | | 5.8E+08 | 4.6E+05 | 3.1E+05 | 1.8E+05 |
| Ethyl acetate | | | | | 2.5E+04 | | 7.0E+04 | 1.9E+04 | | | | | 8.3E+04 | | 9.2E+05 | 7.6E+04 |
| Ethyl acrylate | 2.1E-01 | | 1.3E+01 | 2.1E-01 | | | | | 4.6E-01 | | 6.0E+01 | 4.5E-01 | | | | |
| Ethylbenzene | 4.1E+00 | | 5.8E+01 | 3.8E+00 | 4.8E+03 | | 7.8E+03 | 3.0E+03 | 8.9E+00 | | 2.6E+02 | 8.6E+00 | 1.6E+04 | | 1.0E+05 | 1.4E+04 |
| Ethyl chloride | 3.0E+00 | | 2.2E+02 | 3.0E+00 | 1.8E+04 | | 3.1E+04 | 1.1E+04 | 6.5E+00 | | 9.9E+02 | 6.5E+00 | 5.8E+04 | | 4.1E+05 | 5.1E+04 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Ethylene cyanohydrin | | | | | 6.2E+08 | 8.4E+04 | 2.3E+04 | 1.8E+04 | | | | | 2.0E+09 | 4.6E+05 | 3.1E+05 | 1.8E+05 |
| Ethylene diamine | | | | | 1.9E+08 | 2.5E+04 | 7.0E+03 | 5.5E+03 | | | | | 6.1E+08 | 1.4E+05 | 9.2E+04 | 5.5E+04 |
| Ethylene glycol | | | | | 2.4E+08 | 5.6E+05 | 1.6E+05 | 1.2E+05 | | | | | 7.7E+08 | 3.1E+06 | 2.0E+06 | 1.2E+06 |
| Ethylene glycol, monobutyl ether | | | | | 7.6E+09 | 1.4E+05 | 3.9E+04 | 3.1E+04 | | | | | 2.5E+10 | 7.7E+05 | 5.1E+05 | 3.1E+05 |
| Ethylene oxide | 2.0E-01 | | 2.1E+00 | 1.8E-01 | 1.3E+02 | | | 1.3E+02 | 4.3E-01 | | 9.2E+00 | 4.1E-01 | 4.1E+02 | | | 4.1E+02 |
| Ethylene thiourea (ETU) | 1.9E+05 | 4.5E+01 | 1.4E+01 | 1.1E+01 | 1.6E+05 | 2.2E+01 | 6.3E+00 | 4.9E+00 | 4.2E+05 | 9.6E+01 | 6.4E+01 | 3.8E+01 | 5.4E+05 | 1.2E+02 | 8.2E+01 | 4.9E+01 |
| Ethyl ether | | | | | 1.2E+04 | | 1.6E+04 | 6.8E+03 | | | | | 3.9E+04 | | 2.0E+05 | 3.3E+04 |
| Ethyl methacrylate | | | | | 2.1E+02 | | 7.0E+03 | 2.1E+02 | | | | | 7.0E+02 | | 9.2E+04 | 7.0E+02 |
| Ethyl p-nitrophenyl phenylphosphorothioate | | | | | 2.1E+04 | 2.8E+00 | 7.8E-01 | 6.1E-01 | | | | | 6.7E+04 | 1.5E+01 | 1.0E+01 | 6.2E+00 |
| Ethylphthalyl ethyl glycolate | | | | | 6.2E+09 | 8.4E+05 | 2.3E+05 | 1.8E+05 | | | | | 2.0E+10 | 4.6E+06 | 3.1E+06 | 1.8E+06 |
| Express | | | | | 1.6E+07 | 2.2E+03 | 6.3E+02 | 4.9E+02 | | | | | 5.4E+07 | 1.2E+04 | 8.2E+03 | 4.9E+03 |
| Fenamiphos | | | | | 5.1E+05 | 7.0E+01 | 2.0E+01 | 1.5E+01 | | | | | 1.7E+06 | 3.9E+02 | 2.6E+02 | 1.5E+02 |
| Fluometuron | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Fluoride | | | | | | | | | | | | | | | | |
| Fluoridone | | | | | 1.6E+08 | 2.2E+04 | 6.3E+03 | 4.9E+03 | | | | | 5.4E+08 | 1.2E+05 | 8.2E+04 | 4.9E+04 |
| Flurprimidol | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Flutolanil | | | | | 1.2E+08 | 1.7E+04 | 4.7E+03 | 3.7E+03 | | | | | 4.0E+08 | 9.3E+04 | 6.1E+04 | 3.7E+04 |
| Fluvalinate | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Folpet | 2.5E+06 | 5.8E+02 | 1.8E+02 | 1.4E+02 | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | 5.4E+06 | 1.2E+03 | 8.2E+02 | 4.9E+02 | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Fomesafen | 4.6E+04 | 1.1E+01 | 3.4E+00 | 2.6E+00 | | | | | 9.9E+04 | 2.3E+01 | 1.5E+01 | 9.1E+00 | | | | |
| Fonofos | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Formaldehyde | 4.2E+05 | | | 4.2E+05 | 1.8E+06 | 4.2E+04 | 1.2E+04 | 9.1E+03 | 9.0E+05 | | | 9.0E+05 | 5.8E+06 | 2.3E+05 | 1.5E+05 | 9.1E+04 |
| Formic Acid | | | | | 1.8E+06 | 5.6E+05 | 1.6E+05 | 1.1E+05 | | | | | 5.8E+06 | 3.1E+06 | 2.0E+06 | 1.0E+06 |
| Fosetyl-al | | | | | 6.2E+09 | 8.4E+05 | 2.3E+05 | 1.8E+05 | | | | | 2.0E+10 | 4.6E+06 | 3.1E+06 | 1.8E+06 |
| Freon 113 | | | | | 2.1E+04 | | 2.3E+06 | 2.1E+04 | | | | | 6.9E+04 | | 3.1E+07 | 6.9E+04 |
| Furan | | | | | 2.6E+00 | | 7.8E+01 | 2.5E+00 | | | | | 8.6E+00 | | 1.0E+03 | 8.5E+00 |
| Furazolidone | 2.3E+03 | 5.3E-01 | 1.7E-01 | 1.3E-01 | | | | | 5.0E+03 | 1.1E+00 | 7.5E-01 | 4.5E-01 | | | | |
| Furfural | | | | | 2.9E+07 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 9.6E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Furium | 5.8E+03 | 1.3E+00 | 4.3E-01 | 3.2E-01 | | | | | 1.3E+04 | 2.9E+00 | 1.9E+00 | 1.1E+00 | | | | |
| Furmecyclox | 2.9E+05 | 6.7E+01 | 2.1E+01 | 1.6E+01 | | | | | 6.3E+05 | 1.4E+02 | 9.5E+01 | 5.7E+01 | | | | |
| Glufosinate-ammonium | | | | | 8.2E+05 | 1.1E+02 | 3.1E+01 | 2.4E+01 | | | | | 2.7E+06 | 6.2E+02 | 4.1E+02 | 2.5E+02 |
| Glycidaldehyde | | | | | 5.9E+05 | 1.1E+02 | 3.1E+01 | 2.4E+01 | | | | | 1.9E+06 | 6.2E+02 | 4.1E+02 | 2.5E+02 |
| Glyphosate | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Haloxyfop-methyl | | | | | 1.0E+05 | 1.4E+01 | 3.9E+00 | 3.1E+00 | | | | | 3.4E+05 | 7.7E+01 | 5.1E+01 | 3.1E+01 |
| Harmony | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Heptachlor | 2.1E+03 | 4.9E-01 | 1.6E-01 | 1.2E-01 | 1.0E+06 | 1.4E+02 | 3.9E+01 | 3.1E+01 | 4.6E+03 | 1.1E+00 | 7.0E-01 | 4.2E-01 | 3.4E+06 | 7.7E+02 | 5.1E+02 | 3.1E+02 |
| Heptachlor epoxide | 1.6E+03 | 3.7E-01 | 1.2E-01 | 8.8E-02 | 2.7E+04 | 3.6E+00 | 1.0E+00 | 7.9E-01 | 3.4E+03 | 7.9E-01 | 5.2E-01 | 3.1E-01 | 8.7E+04 | 2.0E+01 | 1.3E+01 | 8.0E+00 |
| Hexabromobenzene | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Hexachlorobenzene | 4.9E+03 | 1.1E+00 | 3.6E-01 | 2.7E-01 | 1.6E+06 | 2.2E+02 | 6.3E+01 | 4.9E+01 | 1.0E+04 | 2.4E+00 | 1.6E+00 | 9.6E-01 | 5.4E+06 | 1.2E+03 | 8.2E+02 | 4.9E+02 |
| Hexachlorobutadiene | 1.1E+05 | 2.6E+01 | 8.2E+00 | 6.2E+00 | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | 2.4E+05 | 5.6E+01 | 3.7E+01 | 2.2E+01 | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| HCH (alpha) | 3.2E+03 | 1.9E+00 | 2.4E-01 | 2.1E-01 | 1.0E+06 | 3.5E+02 | 3.9E+01 | 3.5E+01 | 7.0E+03 | 4.0E+00 | 1.1E+00 | 8.4E-01 | 3.4E+06 | 1.9E+03 | 5.1E+02 | 4.0E+02 |
| HCH (beta) | 5.8E+03 | 3.4E+00 | 4.3E-01 | 3.8E-01 | 4.1E+05 | 1.4E+02 | 1.6E+01 | 1.4E+01 | 1.3E+04 | 7.2E+00 | 1.9E+00 | 1.5E+00 | 1.3E+06 | 7.7E+02 | 2.0E+02 | 1.6E+02 |
| HCH (gamma) Lindane | 7.9E+03 | 4.6E+00 | 5.8E-01 | 5.2E-01 | 6.2E+05 | 2.1E+02 | 2.3E+01 | 2.1E+01 | 1.7E+04 | 9.9E+00 | 2.6E+00 | 2.1E+00 | 2.0E+06 | 1.2E+03 | 3.1E+02 | 2.4E+02 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| HCH-technical | 2.2E+03 | 1.3E+00 | 1.6E-01 | 1.4E-01 | | | | | 4.7E+03 | 2.7E+00 | 7.2E-01 | 5.7E-01 | | | | |
| Hexachlorocyclopentadiene | | | | | 1.2E+05 | 1.7E+03 | 4.7E+02 | 3.7E+02 | | | | | 3.8E+05 | 9.3E+03 | 6.1E+03 | 3.7E+03 |
| Hexachloroethane | 2.2E+05 | 5.2E+01 | 1.6E+01 | 1.2E+01 | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | 4.8E+05 | 1.1E+02 | 7.3E+01 | 4.4E+01 | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Hexachlorophene | | | | | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine | 7.9E+04 | 1.8E+01 | 5.8E+00 | 4.4E+00 | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | 1.7E+05 | 3.9E+01 | 2.6E+01 | 1.6E+01 | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| 1,6-Hexamethylene diisocyanate | | | | | 5.9E+03 | 8.0E-01 | 2.2E-01 | 1.7E-01 | | | | | 1.9E+04 | 4.4E+00 | 2.9E+00 | 1.8E+00 |
| n-Hexane | | | | | 4.3E+03 | | 8.6E+05 | 4.3E+03 | | | | | 1.4E+04 | | 1.1E+07 | 1.4E+04 |
| Hexazinone | | | | | 6.8E+07 | 9.2E+03 | 2.6E+03 | 2.0E+03 | | | | | 2.2E+08 | 5.1E+04 | 3.4E+04 | 2.0E+04 |
| HMX (Octahydro-1357-tetranitro-1357- tetrazocine) | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Hydrazine, hydrazine sulfate | 5.1E+02 | 6.7E-01 | 2.1E-01 | 1.6E-01 | 1.2E+05 | | | 1.2E+05 | 1.1E+03 | 1.4E+00 | 9.5E-01 | 5.7E-01 | 3.8E+05 | | | 3.8E+05 |
| Hydrazine, monomethyl | 5.1E+02 | 6.7E-01 | 2.1E-01 | 1.6E-01 | | | | | 1.1E+03 | 1.4E+00 | 9.5E-01 | 5.7E-01 | | | | |
| Hydrazine, dimethyl | 5.1E+02 | 6.7E-01 | 2.1E-01 | 1.6E-01 | | | | | 1.1E+03 | 1.4E+00 | 9.5E-01 | 5.7E-01 | | | | |
| Hydrogen chloride | | | | | 5.3E+06 | | | 5.3E+06 | | | | | 1.7E+07 | | | 1.7E+07 |
| Hydrogen cyanide | | | | | 3.3E+01 | | 1.6E+03 | 3.2E+01 | | | | | 1.1E+02 | | 2.0E+04 | 1.1E+02 |
| Hydrogen sulfide | | | | | 5.9E+06 | | 2.3E+02 | 2.3E+02 | | | | | 1.9E+07 | | 3.1E+03 | 3.1E+03 |
| p-Hydroquinone | 1.6E+05 | 3.6E+01 | 1.1E+01 | 8.7E+00 | 8.2E+07 | 1.1E+04 | 3.1E+03 | 2.4E+03 | 3.4E+05 | 7.7E+01 | 5.1E+01 | 3.1E+01 | 2.7E+08 | 6.2E+04 | 4.1E+04 | 2.5E+04 |
| Imazalil | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Imazaquin | | | | | 5.1E+08 | 7.0E+04 | 2.0E+04 | 1.5E+04 | | | | | 1.7E+09 | 3.9E+05 | 2.6E+05 | 1.5E+05 |
| Iprodione | | | | | 8.2E+07 | 1.1E+04 | 3.1E+03 | 2.4E+03 | | | | | 2.7E+08 | 6.2E+04 | 4.1E+04 | 2.5E+04 |
| Iron | | | | | | | 2.3E+04 | 2.3E+04 | | | | | | | 3.1E+05 | 3.1E+05 |
| Isobutanol | | | | | 2.7E+04 | | 2.3E+04 | 1.3E+04 | | | | | 8.8E+04 | | 3.1E+05 | 6.8E+04 |
| Isophorone | 9.2E+06 | 2.1E+03 | 6.7E+02 | 5.1E+02 | 1.2E+09 | 5.6E+04 | 1.6E+04 | 1.2E+04 | 2.0E+07 | 4.6E+03 | 3.0E+03 | 1.8E+03 | 3.8E+09 | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| Isopropalin | | | | | 3.1E+07 | 4.2E+03 | 1.2E+03 | 9.2E+02 | | | | | 1.0E+08 | 2.3E+04 | 1.5E+04 | 9.2E+03 |
| Isopropyl methyl phosphonic acid | | | | | 2.3E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 7.4E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Isoxaben | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Kepone (chlordecone) | 5.5E+02 | 1.3E-01 | 4.0E-02 | 3.0E-02 | 4.1E+05 | 5.6E+01 | 1.6E+01 | 1.2E+01 | 1.2E+03 | 2.7E-01 | 1.8E-01 | 1.1E-01 | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 |
| Lactofen | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Lead+++ "CAL-Modified PRG"+++ Lead (tetraethyl) | | | | | | 2.8E-02 | 7.8E-03 | 6.1E-03 | | | | | | 1.5E-01 | 1.0E-01 | 6.2E-02 |
| Linuron | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Lithium | | | | | | | 1.6E+03 | 1.6E+03 | | | | | | | 2.0E+04 | 2.0E+04 |
| Londax | | | | | 4.1E+08 | 5.6E+04 | 1.6E+04 | 1.2E+04 | | | | | 1.3E+09 | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| Malathion | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Maleic anhydride | | | | | 4.1E+05 | 2.8E+04 | 7.8E+03 | 6.0E+03 | | | | | 1.3E+06 | 1.5E+05 | 1.0E+05 | 5.9E+04 |
| Maleic hydrazide | | | | | 1.7E+03 | | 3.9E+04 | 1.7E+03 | | | | | 5.7E+03 | | 5.1E+05 | 5.6E+03 |
| Malononitrile | | | | | 2.1E+05 | 2.8E+01 | 7.8E+00 | 6.1E+00 | | | | | 6.7E+05 | 1.5E+02 | 1.0E+02 | 6.2E+01 |
| Mancozeb | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Maneb | 1.5E+05 | 3.4E+01 | 1.1E+01 | 8.1E+00 | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | 3.1E+05 | 7.2E+01 | 4.8E+01 | 2.9E+01 | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Manganese (non-food)+++ | | | | | 1.2E+05 | | 1.9E+03 | 1.8E+03 | | | | | 3.8E+05 | | 2.5E+04 | 2.3E+04 |
| Mephosfolan | | | | | 1.9E+05 | 2.5E+01 | 7.0E+00 | 5.5E+00 | | | | | 6.1E+05 | 1.4E+02 | 9.2E+01 | 5.5E+01 |
| Mepiquat chloride | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| 2-Mercaptobenzothiazole | 3.0E+05 | 7.0E+01 | 2.2E+01 | 1.7E+01 | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | 6.5E+05 | 1.5E+02 | 9.9E+01 | 5.9E+01 | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Mercury and compounds | | | | | 5.3E+04 | | 2.3E+01 | 2.3E+01 | | | | | 1.7E+05 | | 3.1E+02 | 3.1E+02 |
| Mercury (elemental) | | | | | 1.8E+05 | | | 1.8E+05 | | | | | 5.8E+05 | | | 5.8E+05 |
| Mercury (methyl) | | | | | | 2.8E+01 | 7.8E+00 | 6.1E+00 | | | | | | 1.5E+02 | 1.0E+02 | 6.2E+01 |
| Merphos | | | | | 6.2E+04 | 8.4E+00 | 2.3E+00 | 1.8E+00 | | | | | 2.0E+05 | 4.6E+01 | 3.1E+01 | 1.8E+01 |
| Merphos oxide | | | | | 6.2E+04 | 8.4E+00 | 2.3E+00 | 1.8E+00 | | | | | 2.0E+05 | 4.6E+01 | 3.1E+01 | 1.8E+01 |
| Metalaxyl | | | | | 1.2E+08 | 1.7E+04 | 4.7E+03 | 3.7E+03 | | | | | 4.0E+08 | 9.3E+04 | 6.1E+04 | 3.7E+04 |
| Methacrylonitrile | | | | | 2.8E+00 | | 7.8E+00 | 2.1E+00 | | | | | 9.1E+00 | | 1.0E+02 | 8.4E+00 |
| Methamidophos | | | | | 1.0E+05 | 1.4E+01 | 3.9E+00 | 3.1E+00 | | | | | 3.4E+05 | 7.7E+01 | 5.1E+01 | 3.1E+01 |
| Methanol | | | | | 2.4E+09 | 1.4E+05 | 3.9E+04 | 3.1E+04 | | | | | 7.7E+09 | 7.7E+05 | 5.1E+05 | 3.1E+05 |
| Methidathion | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Methomyl | | | | | 4.5E+01 | | 2.0E+03 | 4.4E+01 | | | | | 1.5E+02 | | 2.6E+04 | 1.5E+02 |
| Methoxychlor | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| 2-Methoxyethanol | | | | | 3.5E+07 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 1.2E+08 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| 2-Methoxyethanol acetate | | | | | 5.3E+07 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.7E+08 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| 2-Methoxy-5-nitroaniline | 1.8E+05 | 4.1E+01 | 1.3E+01 | 9.9E+00 | | | | | 3.8E+05 | 8.8E+01 | 5.8E+01 | 3.5E+01 | | | | |
| Methyl acetate | | | | | 3.1E+04 | | 7.8E+04 | 2.2E+04 | | | | | 1.0E+05 | | 1.0E+06 | 9.2E+04 |
| Methyl acrylate | | | | | 7.2E+01 | | 2.3E+03 | 7.0E+01 | | | | | 2.3E+02 | | 3.1E+04 | 2.3E+02 |
| 2-Methylaniline (o-toluidine) | 4.9E+04 | 1.1E+01 | 3.6E+00 | 2.7E+00 | | | | | 1.0E+05 | 2.4E+01 | 1.6E+01 | 9.6E+00 | | | | |
| 2-Methylaniline hydrochloride | 6.7E+04 | 1.6E+01 | 4.9E+00 | 3.7E+00 | | | | | 1.4E+05 | 3.3E+01 | 2.2E+01 | 1.3E+01 | | | | |
| 2-Methyl-4-chlorophenoxyacetic acid | | | | | 1.0E+06 | 1.4E+02 | 3.9E+01 | 3.1E+01 | | | | | 3.4E+06 | 7.7E+02 | 5.1E+02 | 3.1E+02 |
| 4-(2-Methyl-4-chlorophenoxy) butyric acid | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| 2-(2-Methyl-4-chlorophenoxy) propionic acid | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Methylcyclohexane | | | | | 2.7E+03 | | 6.7E+04 | 2.6E+03 | | | | | 8.8E+03 | | 8.8E+05 | 8.7E+03 |
| 4,4'-Methylenebisbenzeneamine | 5.5E+03 | 1.3E+00 | 4.0E-01 | 3.0E-01 | 1.2E+07 | | | 1.2E+07 | 1.2E+04 | 2.7E+00 | 1.8E+00 | 1.1E+00 | 3.8E+07 | | | 3.8E+07 |
| 4,4'-Methylene bis(2-chloroaniline) | 5.8E+03 | 1.3E+00 | 4.3E-01 | 3.2E-01 | 1.4E+06 | 2.0E+02 | 5.5E+01 | 4.3E+01 | 1.3E+04 | 2.9E+00 | 1.9E+00 | 1.1E+00 | 4.7E+06 | 1.1E+03 | 7.2E+02 | 4.3E+02 |
| 4,4'-Methylene bis(N,N'-dimethyl)aniline | 1.9E+05 | 4.4E+01 | 1.4E+01 | 1.1E+01 | | | | | 4.1E+05 | 9.4E+01 | 6.2E+01 | 3.7E+01 | | | | |
| Methylene bromide | | | | | 7.3E+01 | | 7.8E+02 | 6.7E+01 | | | | | 2.4E+02 | | 1.0E+04 | 2.3E+02 |
| Methylene chloride | 4.7E+00 | | 4.6E+01 | 4.3E+00 | 4.5E+02 | | 4.7E+03 | 4.1E+02 | 1.0E+01 | | 2.0E+02 | 9.7E+00 | 1.5E+03 | | 6.1E+04 | 1.4E+03 |
| 4,4'-Methylene diphenyl diisocyanate | | | | | 4.1E+05 | 4.7E+01 | 1.3E+01 | 1.0E+01 | | | | | 1.3E+06 | 2.6E+02 | 1.7E+02 | 1.0E+02 |
| 2-Methylnapthalene | | | | | | 1.1E+03 | 3.1E+02 | 2.4E+02 | | | | | | 6.2E+03 | 4.1E+03 | 2.5E+03 |
| Methyl ethyl ketone (2-Butanone) | | | | | 4.3E+04 | | 4.7E+04 | 2.2E+04 | | | | | 1.4E+05 | | 6.1E+05 | 1.1E+05 |
| Methyl isobutyl ketone | | | | | 3.4E+04 | | 6.3E+03 | 5.3E+03 | | | | | 1.1E+05 | | 8.2E+04 | 4.7E+04 |
| Methyl mercaptan | | | | | 1.2E+06 | 1.6E+02 | 4.5E+01 | 3.5E+01 | | | | | 3.8E+06 | 8.8E+02 | 5.8E+02 | 3.5E+02 |
| Methyl methacrylate | | | | | 2.2E+03 | | 1.1E+05 | 2.2E+03 | | | | | 7.3E+03 | | 1.4E+06 | 7.3E+03 |
| 2-Methyl-5-nitroaniline | 2.6E+05 | 6.1E+01 | 1.9E+01 | 1.5E+01 | | | | | 5.7E+05 | 1.3E+02 | 8.7E+01 | 5.2E+01 | | | | |
| Methyl parathion | | | | | 5.1E+05 | 7.0E+01 | 2.0E+01 | 1.5E+01 | | | | | 1.7E+06 | 3.9E+02 | 2.6E+02 | 1.5E+02 |
| 2-Methylphenol | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| 3-Methylphenol | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| 4-Methylphenol | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Methyl phosphonic acid | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Methyl styrene (mixture) | | | | | 1.8E+02 | | 4.7E+02 | 1.3E+02 | | | | | 5.9E+02 | | 6.1E+03 | 5.4E+02 |
| Methyl styrene (alpha) | | | | | 1.1E+03 | | 5.5E+03 | 9.2E+02 | | | | | 3.6E+03 | | 7.2E+04 | 3.4E+03 |
| Methyl tertbutyl ether (MTBE) | 3.4E+01 | | 3.6E+02 | 3.1E+01 | 1.7E+04 | | 6.7E+04 | 1.3E+04 | 7.4E+01 | | 1.6E+03 | 7.0E+01 | 5.5E+04 | | 8.8E+05 | 5.2E+04 |
| Metolaclor (Dual) | | | | | 3.1E+08 | 4.2E+04 | 1.2E+04 | 9.2E+03 | | | | | 1.0E+09 | 2.3E+05 | 1.5E+05 | 9.2E+04 |
| Metribuzin | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Mirex | 4.9E+02 | 1.1E-01 | 3.6E-02 | 2.7E-02 | 4.1E+05 | 5.6E+01 | 1.6E+01 | 1.2E+01 | 1.0E+03 | 2.4E-01 | 1.6E-01 | 9.6E-02 | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 |
| Molinate | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Molybdenum | | | | | | | 3.9E+02 | 3.9E+02 | | | | | | | 5.1E+03 | 5.1E+03 |
| Monochloramine | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Naled | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Napropamide | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Nickel (soluble salts) | 9.6E+03 | | | 9.6E+03 | 2.9E+04 | | 1.6E+03 | 1.5E+03 | 2.1E+04 | | | 2.1E+04 | 9.6E+04 | | 2.0E+04 | 1.7E+04 |
| Nickel refinery dust | | | | | | | | | | | | | | | | |
| Nickel subsulfide | 5.1E+03 | | 3.8E-01 | 3.8E-01 | | | | | 1.1E+04 | | 1.7E+00 | 1.7E+00 | | | | |
| Nitrate+++ | | | #VALUE! | #VALUE! | | | | | | | #VALUE! | #VALUE! | | | | |
| Nitrite+++ | | | #VALUE! | #VALUE! | | | | | | | #VALUE! | #VALUE! | | | | |
| 2-Nitroaniline | | | | | 6.2E+04 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 2.0E+05 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| 3-Nitroaniline | 4.2E+05 | 9.6E+01 | 3.0E+01 | 2.3E+01 | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | 9.0E+05 | 2.1E+02 | 1.4E+02 | 8.2E+01 | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| 4-Nitroaniline | 4.2E+05 | 9.6E+01 | 3.0E+01 | 2.3E+01 | 2.1E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | 9.0E+05 | 2.1E+02 | 1.4E+02 | 8.2E+01 | 6.7E+06 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Nitrobenzene | | | | | 3.9E+01 | | 3.9E+01 | 2.0E+01 | | | | | 1.3E+02 | | 5.1E+02 | 1.0E+02 |
| Nitrofurantoin | | | | | 1.4E+08 | 2.0E+04 | 5.5E+03 | 4.3E+03 | | | | | 4.7E+08 | 1.1E+05 | 7.2E+04 | 4.3E+04 |
| Nitrofurazone | 6.7E+03 | 1.6E+00 | 4.9E-01 | 3.7E-01 | | | | | 1.4E+04 | 3.3E+00 | 2.2E+00 | 1.3E+00 | | | | |
| Nitroglycerin | 6.2E+05 | 1.4E+02 | 4.6E+01 | 3.5E+01 | | | | | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 | | | | |
| Nitroguanidine | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| 2-Nitropropane | 9.3E+02 | | 6.8E-02 | 6.8E-02 | 1.2E+07 | | 4.5E+02 | 4.5E+02 | 2.0E+03 | | 3.0E-01 | 3.0E-01 | 3.8E+07 | | 5.8E+03 | 5.8E+03 |
| N-Nitrosodi-n-butylamine | 1.5E-02 | | 5.8E-02 | 1.2E-02 | | | | | 3.3E-02 | | 2.6E-01 | 2.9E-02 | | | | |
| N-Nitrosodiethanolamine | 3.1E+03 | 7.2E-01 | 2.3E-01 | 1.7E-01 | | | | | 6.7E+03 | 1.5E+00 | 1.0E+00 | 6.2E-01 | | | | |
| N-Nitrosodiethylamine | 2.4E+02 | 5.6E-02 | 1.8E-02 | 1.4E-02 | | | | | 5.2E+02 | 1.2E-01 | 7.9E-02 | 4.8E-02 | | | | |
| N-Nitrosodimethylamine | 5.5E+02 | 1.3E-01 | 4.0E-02 | 3.0E-02 | 1.6E+04 | 2.2E+00 | 6.3E-01 | 4.9E-01 | 1.2E+03 | 2.7E-01 | 1.8E-01 | 1.1E-01 | 5.4E+04 | 1.2E+01 | 8.2E+00 | 4.9E+00 |
| N-Nitrosodiphenylamine | 9.7E+05 | 2.2E+02 | 7.1E+01 | 5.4E+01 | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | 2.1E+06 | 4.8E+02 | 3.2E+02 | 1.9E+02 | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| N-Nitroso di-n-propylamine | 1.2E+03 | 2.9E-01 | 9.1E-02 | 6.9E-02 | | | | | 2.7E+03 | 6.2E-01 | 4.1E-01 | 2.5E-01 | | | | |
| N-Nitroso-N-methylethylamine | 4.0E+02 | 9.2E-02 | 2.9E-02 | 2.2E-02 | | | | | 8.6E+02 | 2.0E-01 | 1.3E-01 | 7.8E-02 | | | | |
| N-Nitrosopyrrolidine | 4.2E+03 | 9.6E-01 | 3.0E-01 | 2.3E-01 | | | | | 9.0E+03 | 2.1E+00 | 1.4E+00 | 8.2E-01 | | | | |
| m-Nitrotoluene | | | | | 1.4E+03 | | 1.6E+03 | 7.3E+02 | | | | | 4.5E+03 | | 2.0E+04 | 3.7E+03 |
| o-Nitrotoluene | 1.3E+00 | | 2.8E+00 | 8.7E-01 | 6.9E+02 | | 7.8E+02 | 3.7E+02 | 2.7E+00 | | 1.2E+01 | 2.2E+00 | 2.3E+03 | | 1.0E+04 | 1.8E+03 |
| p-Nitrotoluene | 1.7E+01 | | 3.8E+01 | 1.2E+01 | 6.9E+02 | | 7.8E+02 | 3.7E+02 | 3.7E+01 | | 1.7E+02 | 3.0E+01 | 2.3E+03 | | 1.0E+04 | 1.8E+03 |
| Norflurazon | | | | | 8.2E+07 | 1.1E+04 | 3.1E+03 | 2.4E+03 | | | | | 2.7E+08 | 6.2E+04 | 4.1E+04 | 2.5E+04 |
| NuStar | | | | | 1.4E+06 | 2.0E+02 | 5.5E+01 | 4.3E+01 | | | | | 4.7E+06 | 1.1E+03 | 7.2E+02 | 4.3E+02 |
| Octabromodiphenyl ether | | | | | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Octamethylpyrophosphoramide | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Oryzalin | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Oxadiazon | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Oxamyl | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| Oxyfluorfen | | | | | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Paclobutrazol | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Paraquat | | | | | 9.3E+06 | 1.3E+03 | 3.5E+02 | 2.7E+02 | | | | | 3.0E+07 | 7.0E+03 | 4.6E+03 | 2.8E+03 |
| Parathion | | | | | 1.2E+07 | 1.7E+03 | 4.7E+02 | 3.7E+02 | | | | | 4.0E+07 | 9.3E+03 | 6.1E+03 | 3.7E+03 |
| Pebulate | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Pendimethalin | | | | | 8.2E+07 | 1.1E+04 | 3.1E+03 | 2.4E+03 | | | | | 2.7E+08 | 6.2E+04 | 4.1E+04 | 2.5E+04 |
| Pentabromo-6-chloro cyclohexane | 3.8E+05 | 8.8E+01 | 2.8E+01 | 2.1E+01 | | | | | 8.2E+05 | 1.9E+02 | 1.2E+02 | 7.5E+01 | | | | |
| Pentabromodiphenyl ether | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Pentachlorobenzene | | | | | 1.6E+06 | 2.2E+02 | 6.3E+01 | 4.9E+01 | | | | | 5.4E+06 | 1.2E+03 | 8.2E+02 | 4.9E+02 |
| Pentachloronitrobenzene | 3.4E+04 | 7.8E+00 | 2.5E+00 | 1.9E+00 | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | 7.2E+04 | 1.7E+01 | 1.1E+01 | 6.6E+00 | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Pentachlorophenol | 4.9E+05 | 1.0E+01 | 7.9E+00 | 4.4E+00 | 6.2E+07 | 3.4E+03 | 2.3E+03 | 1.4E+03 | 1.0E+06 | 2.1E+01 | 3.5E+01 | 1.3E+01 | 2.0E+08 | 1.9E+04 | 3.1E+04 | 1.2E+04 |
| Perchlorate | | | | | | | 7.8E+00 | 7.8E+00 | | | | | | | 1.0E+02 | 1.0E+02 |
| Permethrin | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Phenmedipham | | | | | 5.1E+08 | 7.0E+04 | 2.0E+04 | 1.5E+04 | | | | | 1.7E+09 | 3.9E+05 | 2.6E+05 | 1.5E+05 |
| Phenol | | | | | 1.2E+08 | 8.4E+04 | 2.3E+04 | 1.8E+04 | | | | | 3.8E+08 | 4.6E+05 | 3.1E+05 | 1.8E+05 |
| Phenothiazine | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| m-Phenylenediamine | | | | | 1.2E+07 | 1.7E+03 | 4.7E+02 | 3.7E+02 | | | | | 4.0E+07 | 9.3E+03 | 6.1E+03 | 3.7E+03 |
| o-Phenylenediamine | 1.9E+05 | 4.3E+01 | 1.4E+01 | 1.0E+01 | | | | | 4.0E+05 | 9.2E+01 | 6.1E+01 | 3.7E+01 | | | | |
| p-Phenylenediamine | | | | | 3.9E+08 | 5.3E+04 | 1.5E+04 | 1.2E+04 | | | | | 1.3E+09 | 2.9E+05 | 1.9E+05 | 1.2E+05 |
| Phenylmercuric acetate | | | | | 1.6E+05 | 2.2E+01 | 6.3E+00 | 4.9E+00 | | | | | 5.4E+05 | 1.2E+02 | 8.2E+01 | 4.9E+01 |
| 2-Phenylphenol | 4.6E+06 | 1.0E+03 | 3.3E+02 | 2.5E+02 | | | | | 9.9E+06 | 2.2E+03 | 1.5E+03 | 8.9E+02 | | | | |
| Phorate | | | | | 4.1E+05 | 5.6E+01 | 1.6E+01 | 1.2E+01 | | | | | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 |
| Phosmet | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Phosphine | | | | | 4.7E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 1.5E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| Phosphoric acid | | | | | 4.1E+06 | | | 4.1E+06 | | | | | 1.3E+07 | | | 1.3E+07 |
| Phosphorus (white) | | | | | | | 1.6E+00 | 1.6E+00 | | | | | | | 2.0E+01 | 2.0E+01 |
| p-Phthalic acid | | | | | 2.1E+09 | 2.8E+05 | 7.8E+04 | 6.1E+04 | | | | | 6.7E+09 | 1.5E+06 | 1.0E+06 | 6.2E+05 |
| Phthalic anhydride | | | | | 1.2E+07 | 5.6E+05 | 1.6E+05 | 1.2E+05 | | | | | 3.8E+07 | 3.1E+06 | 2.0E+06 | 1.2E+06 |
| Picloram | | | | | 1.4E+08 | 2.0E+04 | 5.5E+03 | 4.3E+03 | | | | | 4.7E+08 | 1.1E+05 | 7.2E+04 | 4.3E+04 |
| Pirimiphos-methyl | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Polybrominated biphenyls | | | | | | | | | | | | | | | | |
| Polychlorinated biphenyls (PCBs) | | | | | | | | | | | | | | | | |
| PCBs (unspeciated mixture, low risk, e.g. Aroclor 1016) | 1.2E+05 | 2.1E+01 | 9.1E+00 | 6.3E+00 | 1.4E+05 | 1.4E+01 | 5.5E+00 | 3.9E+00 | 2.7E+05 | 4.4E+01 | 4.1E+01 | 2.1E+01 | 4.7E+05 | 7.7E+01 | 7.2E+01 | 3.7E+01 |
| PCBs (unspeciated mixture, high risk, e.g. Aroclor 1254) | 4.4E+03 | 7.2E-01 | 3.2E-01 | 2.2E-01 | 4.1E+04 | 4.0E+00 | 1.6E+00 | 1.1E+00 | 9.4E+03 | 1.5E+00 | 1.4E+00 | 7.4E-01 | 1.3E+05 | 2.2E+01 | 2.0E+01 | 1.1E+01 |
| Polychlorinated terphenyls | 1.9E+03 | 4.5E-01 | 1.4E-01 | 1.1E-01 | | | | | 4.2E+03 | 9.6E-01 | 6.4E-01 | 3.8E-01 | | | | |
| Polynuclear aromatic hydrocarbons | | | | | | | | | | | | | | | | |
| Acenaphthene | | | | | 1.7E+04 | | 4.7E+03 | 3.7E+03 | | | | | 5.6E+04 | | 6.1E+04 | 2.9E+04 |
| Anthracene | | | | | 3.3E+05 | | 2.3E+04 | 2.2E+04 | | | | | 1.1E+06 | | 3.1E+05 | 2.4E+05 |
| Benz[a]anthracene | 2.2E+04 | 1.3E+00 | 5.3E-01 | 3.8E-01 | | | | | 4.8E+04 | 2.8E+00 | 2.4E+00 | 1.3E+00 | | | | |
| Benzo[b]fluoranthene | 2.2E+04 | 1.3E+00 | 5.3E-01 | 3.8E-01 | | | | | 4.8E+04 | 2.8E+00 | 2.4E+00 | 1.3E+00 | | | | |
| Benzo[k]fluoranthene | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 2.2E+04 | 1.3E+00 | 5.3E-01 | 3.8E-01 | | | | | 4.8E+04 | 2.8E+00 | 2.4E+00 | 1.3E+00 | | | | |
| Benzo[a]pyrene | 2.2E+03 | 1.3E-01 | 5.3E-02 | 3.8E-02 | | | | | 4.8E+03 | 2.8E-01 | 2.4E-01 | 1.3E-01 | | | | |
| Chrysene | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 4.6E+02 | 1.3E+01 | 5.3E+00 | 3.8E+00 | | | | | 1.0E+03 | 2.8E+01 | 2.4E+01 | 1.3E+01 | | | | |
| Dibenz[ah]anthracene | 2.1E+03 | 3.8E-01 | 1.6E-01 | 1.1E-01 | | | | | 4.6E+03 | 8.1E-01 | 7.0E-01 | 3.8E-01 | | | | |
| Fluoranthene | | | | | 8.2E+07 | 8.6E+03 | 3.1E+03 | 2.3E+03 | | | | | 2.7E+08 | 4.8E+04 | 4.1E+04 | 2.2E+04 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Fluorene | | | | | 2.3E+04 | | 3.1E+03 | 2.7E+03 | | | | | 7.4E+04 | | 4.1E+04 | 2.6E+04 |
| Indeno[1,2,3-cd]pyrene | 2.2E+04 | 1.3E+00 | 5.3E-01 | 3.8E-01 | | | | | 4.8E+04 | 2.8E+00 | 2.4E+00 | 1.3E+00 | | | | |
| Naphthalene | | | | | | | | | | | | | | | | |
| "CAL-Modified PRG" | 2.4E+00 | | 5.3E+00 | 1.7E+00 | 1.7E+02 | | 1.6E+03 | 1.6E+02 | 5.2E+00 | | 2.4E+01 | 4.2E+00 | 5.7E+02 | | 2.0E+04 | 5.5E+02 |
| Pyrene | | | | | 1.8E+05 | | 2.3E+03 | 2.3E+03 | | | | | 5.8E+05 | | 3.1E+04 | 2.9E+04 |
| Prochloraz | 5.8E+04 | 1.3E+01 | 4.3E+00 | 3.2E+00 | 1.9E+07 | 2.5E+03 | 7.0E+02 | 5.5E+02 | 1.3E+05 | 2.9E+01 | 1.9E+01 | 1.1E+01 | 6.1E+07 | 1.4E+04 | 9.2E+03 | 5.5E+03 |
| Profluralin | | | | | 1.2E+07 | 1.7E+03 | 4.7E+02 | 3.7E+02 | | | | | 4.0E+07 | 9.3E+03 | 6.1E+03 | 3.7E+03 |
| Prometon | | | | | 3.1E+07 | 4.2E+03 | 1.2E+03 | 9.2E+02 | | | | | 1.0E+08 | 2.3E+04 | 1.5E+04 | 9.2E+03 |
| Prometryn | | | | | 8.2E+06 | 1.1E+03 | 3.1E+02 | 2.4E+02 | | | | | 2.7E+07 | 6.2E+03 | 4.1E+03 | 2.5E+03 |
| Pronamide | | | | | 1.5E+08 | 2.1E+04 | 5.9E+03 | 4.6E+03 | | | | | 5.0E+08 | 1.2E+05 | 7.7E+04 | 4.6E+04 |
| Propachlor | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Propanil | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Propargite | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Propargyl alcohol | | | | | 4.1E+06 | 5.6E+02 | 1.6E+02 | 1.2E+02 | | | | | 1.3E+07 | 3.1E+03 | 2.0E+03 | 1.2E+03 |
| Propazine | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Propham | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Propiconazole | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Isopropylbenzene (see cumene) | | | | | 6.2E+02 | | 7.8E+03 | 5.7E+02 | | | | | 2.0E+03 | | 1.0E+05 | 2.0E+03 |
| n-Propylbenzene | | | | | 7.1E+02 | | 3.1E+03 | 5.8E+02 | | | | | 2.3E+03 | | 4.1E+04 | 2.2E+03 |
| Propylene glycol | | | | | 1.8E+06 | 1.4E+05 | 3.9E+04 | 3.0E+04 | | | | | 5.8E+06 | 7.7E+05 | 5.1E+05 | 2.9E+05 |
| Propylene glycol, monoethyl ether | | | | | 1.4E+09 | 2.0E+05 | 5.5E+04 | 4.3E+04 | | | | | 4.7E+09 | 1.1E+06 | 7.2E+05 | 4.3E+05 |
| Propylene glycol, monomethyl ether | | | | | 4.1E+09 | 2.0E+05 | 5.5E+04 | 4.3E+04 | | | | | 1.3E+10 | 1.1E+06 | 7.2E+05 | 4.3E+05 |
| Propylene oxide | 6.8E+00 | | 2.7E+00 | 1.9E+00 | 1.8E+02 | | 6.7E+02 | 1.4E+02 | 1.5E+01 | | 1.2E+01 | 6.6E+00 | 5.9E+02 | | 8.8E+03 | 5.5E+02 |
| Pursuit | | | | | 5.1E+08 | 7.0E+04 | 2.0E+04 | 1.5E+04 | | | | | 1.7E+09 | 3.9E+05 | 2.6E+05 | 1.5E+05 |
| Pydrin | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| Pyridine | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Quinalphos | | | | | 1.0E+06 | 1.4E+02 | 3.9E+01 | 3.1E+01 | | | | | 3.4E+06 | 7.7E+02 | 5.1E+02 | 3.1E+02 |
| Quinoline | 2.9E+03 | 6.7E-01 | 2.1E-01 | 1.6E-01 | | | | | 6.3E+03 | 1.4E+00 | 9.5E-01 | 5.7E-01 | | | | |
| RDX (Cyclonite) | 7.9E+04 | 1.8E+01 | 5.8E+00 | 4.4E+00 | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | 1.7E+05 | 3.9E+01 | 2.6E+01 | 1.6E+01 | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Resmethrin | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Ronnel | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Rotenone | | | | | 8.2E+06 | 1.1E+03 | 3.1E+02 | 2.4E+02 | | | | | 2.7E+07 | 6.2E+03 | 4.1E+03 | 2.5E+03 |
| Savey | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| Selenious Acid | | | | | | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Selenium | | | | | 1.2E+07 | | 3.9E+02 | 3.9E+02 | | | | | 3.8E+07 | | 5.1E+03 | 5.1E+03 |
| Selenourea | | | | | | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Sethoxydim | | | | | 1.9E+08 | 2.5E+04 | 7.0E+03 | 5.5E+03 | | | | | 6.1E+08 | 1.4E+05 | 9.2E+04 | 5.5E+04 |
| Silver and compounds | | | | | | | 3.9E+02 | 3.9E+02 | | | | | | | 5.1E+03 | 5.1E+03 |
| Simazine | 7.3E+04 | 1.7E+01 | 5.3E+00 | 4.1E+00 | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | 1.6E+05 | 3.6E+01 | 2.4E+01 | 1.4E+01 | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Sodium azide | | | | | | | 3.1E+02 | 3.1E+02 | | | | | | | 4.1E+03 | 4.1E+03 |
| Sodium diethyldithiocarbamate | 3.2E+04 | 7.5E+00 | 2.4E+00 | 1.8E+00 | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | 7.0E+04 | 1.6E+01 | 1.1E+01 | 6.4E+00 | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Sodium fluoroacetate | | | | | 4.1E+04 | 5.6E+00 | 1.6E+00 | 1.2E+00 | | | | | 1.3E+05 | 3.1E+01 | 2.0E+01 | 1.2E+01 |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Sodium metavanadate | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Strontium, stable | | | | | | | 4.7E+04 | 4.7E+04 | | | | | | | 6.1E+05 | 6.1E+05 |
| Strychnine | | | | | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| Styrene | | | | | 5.4E+03 | | 1.6E+04 | 4.0E+03 | | | | | 1.8E+04 | | 2.0E+05 | 1.6E+04 |
| 1,1'-Sulfonylbis (4-chlorobenzene) | | | | | 1.0E+07 | | 3.9E+02 | 3.9E+02 | | | | | 3.4E+07 | | 5.1E+03 | 5.1E+03 |
| Systhane | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| 2,3,7,8-TCDD (dioxin) | 6.7E-02 | 5.2E-05 | 4.9E-06 | 4.5E-06 | 2.4E+01 | | | 2.4E+01 | 1.4E-01 | 1.1E-04 | 2.2E-05 | 1.8E-05 | 7.7E+01 | | | 7.7E+01 |
| Tebuthiuron | | | | | 1.4E+08 | 2.0E+04 | 5.5E+03 | 4.3E+03 | | | | | 4.7E+08 | 1.1E+05 | 7.2E+04 | 4.3E+04 |
| Temephos | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Terbacil | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Terbufos | | | | | 5.1E+04 | 7.0E+00 | 2.0E+00 | 1.5E+00 | | | | | 1.7E+05 | 3.9E+01 | 2.6E+01 | 1.5E+01 |
| Terbutryn | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| 1,2,4,5-Tetrachlorobenzene | | | | | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| 1,1,1,2-Tetrachloroethane | 3.6E+00 | | 2.5E+01 | 3.2E+00 | 6.6E+02 | | 2.3E+03 | 5.2E+02 | 7.8E+00 | | 1.1E+02 | 7.3E+00 | 2.2E+03 | | 3.1E+04 | 2.0E+03 |
| 1,1,2,2-Tetrachloroethane | 4.7E-01 | | 2.4E+00 | 3.9E-01 | 1.3E+03 | | 4.7E+03 | 1.0E+03 | 1.0E+00 | | 1.1E+01 | 9.2E-01 | 4.3E+03 | | 6.1E+04 | 4.0E+03 |
| Tetrachloroethylene (PCE) | 8.1E-01 | | 1.2E+00 | 4.8E-01 | 4.0E+01 | | 7.8E+02 | 3.8E+01 | 1.7E+00 | | 5.3E+00 | 1.3E+00 | 1.3E+02 | | 1.0E+04 | 1.3E+02 |
| 2,3,4,6-Tetrachlorophenol | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| p,a,a,a-Tetrachlorotoluene | 4.4E+02 | 1.0E-01 | 3.2E-02 | 2.4E-02 | | | | | 9.4E+02 | 2.2E-01 | 1.4E-01 | 8.6E-02 | | | | |
| Tetrachlorovinphos | 3.6E+05 | 8.4E+01 | 2.7E+01 | 2.0E+01 | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | 7.8E+05 | 1.8E+02 | 1.2E+02 | 7.2E+01 | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Tetraethyldithiopyrophosphate | | | | | 1.0E+06 | 1.4E+02 | 3.9E+01 | 3.1E+01 | | | | | 3.4E+06 | 7.7E+02 | 5.1E+02 | 3.1E+02 |
| Tetrahydrofuran | 1.0E+01 | | 8.4E+01 | 9.3E+00 | 1.4E+03 | | 1.6E+04 | 1.3E+03 | 2.2E+01 | | 3.8E+02 | 2.1E+01 | 4.7E+03 | | 2.1E+05 | 4.6E+03 |
| Thallium and compounds+++ | | | | | | | 5.2E+00 | 5.2E+00 | | | | | | | 6.7E+01 | 6.7E+01 |
| Thiobencarb | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| Thiocyanate | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| Thiofanox | | | | | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| Thiophanate-methyl | | | | | 1.6E+08 | 2.2E+04 | 6.3E+03 | 4.9E+03 | | | | | 5.4E+08 | 1.2E+05 | 8.2E+04 | 4.9E+04 |
| Thiram | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Tin and compounds | | | | | | | 4.7E+04 | 4.7E+04 | | | | | | | 6.1E+05 | 6.1E+05 |
| Titanium | | | | | 1.8E+07 | | 3.1E+05 | 3.1E+05 | | | | | 5.8E+07 | | 4.1E+06 | 3.8E+06 |
| Toluene | | | | | 5.3E+02 | | 1.6E+04 | 5.2E+02 | | | | | 1.7E+03 | | 2.0E+05 | 1.7E+03 |
| Toluene-2,4-diamine | 2.2E+03 | 5.3E-01 | 1.7E-01 | 1.3E-01 | | | | | 4.7E+03 | 1.1E+00 | 7.5E-01 | 4.5E-01 | | | | |
| Toluene-2,5-diamine | | | | | 1.2E+09 | 1.7E+05 | 4.7E+04 | 3.7E+04 | | | | | 4.0E+09 | 9.3E+05 | 6.1E+05 | 3.7E+05 |
| Toluene-2,6-diamine | | | | | 4.1E+08 | 5.6E+04 | 1.6E+04 | 1.2E+04 | | | | | 1.3E+09 | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| p-Toluidine | 4.6E+04 | 1.1E+01 | 3.4E+00 | 2.6E+00 | | | | | 9.9E+04 | 2.3E+01 | 1.5E+01 | 9.1E+00 | | | | |
| Toxaphene | 7.3E+03 | 1.7E+00 | 5.3E-01 | 4.1E-01 | | | | | 1.6E+04 | 3.6E+00 | 2.4E+00 | 1.4E+00 | | | | |
| Tralomethrin | | | | | 1.5E+07 | 2.1E+03 | 5.9E+02 | 4.6E+02 | | | | | 5.0E+07 | 1.2E+04 | 7.7E+03 | 4.6E+03 |
| Triallate | | | | | 2.7E+07 | 3.6E+03 | 1.0E+03 | 7.9E+02 | | | | | 8.7E+07 | 2.0E+04 | 1.3E+04 | 8.0E+03 |
| Triasulfuron | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| 1,2,4-Tribromobenzene | | | | | 1.0E+07 | 1.4E+03 | 3.9E+02 | 3.1E+02 | | | | | 3.4E+07 | 7.7E+03 | 5.1E+03 | 3.1E+03 |
| Tributyl phosphate | 9.5E+05 | 2.2E+02 | 7.0E+01 | 5.3E+01 | 4.1E+08 | 5.6E+04 | 1.6E+04 | 1.2E+04 | 2.0E+06 | 4.7E+02 | 3.1E+02 | 1.9E+02 | 1.3E+09 | 3.1E+05 | 2.0E+05 | 1.2E+05 |
| Tributyltin oxide (TBTO) | | | | | | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| 2,4,6-Trichloroaniline | 2.6E+05 | 6.0E+01 | 1.9E+01 | 1.4E+01 | | | | | 5.5E+05 | 1.3E+02 | 8.4E+01 | 5.1E+01 | | | | |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| 2,4,6-Trichloroaniline hydrochloride | 3.0E+05 | 7.0E+01 | 2.2E+01 | 1.7E+01 | | | | | 6.5E+05 | 1.5E+02 | 9.9E+01 | 5.9E+01 | | | | |
| 1,2,4-Trichlorobenzene | | | 1.8E+02 | 1.8E+02 | 6.8E+01 | | 7.8E+02 | 6.2E+01 | | | 7.9E+02 | 7.9E+02 | 2.2E+02 | | 1.0E+04 | 2.2E+02 |
| 1,1,1-Trichloroethane | | | | | 9.9E+02 | | 2.2E+04 | 9.5E+02 | | | | | 3.2E+03 | | 2.9E+05 | 3.2E+03 |
| 1,1,2-Trichloroethane | 7.6E-01 | | 8.9E+00 | 7.0E-01 | 4.1E+01 | | 3.1E+02 | 3.6E+01 | 1.6E+00 | | 4.0E+01 | 1.6E+00 | 1.3E+02 | | 4.1E+03 | 1.3E+02 |
| Trichloroethylene (TCE) "CAL-Modified PRG" | 3.1E+00 | | 4.9E+01 | 2.9E+00 | 8.7E+02 | | 2.3E+01 | 2.3E+01 | 6.7E+00 | | 2.2E+02 | 6.5E+00 | 2.9E+03 | | 3.1E+02 | 2.8E+02 |
| Trichlorofluoromethane | | | | | 3.9E+02 | | 2.3E+04 | 3.9E+02 | | | | | 1.3E+03 | | 3.1E+05 | 1.3E+03 |
| 2,4,5-Trichlorophenol | | | | | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | | | | | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| 2,4,6-Trichlorophenol "CAL-Modified PRG" | 1.2E+05 | 2.9E+01 | 9.1E+00 | 6.9E+00 | 2.1E+05 | 2.8E+01 | 7.8E+00 | 6.1E+00 | 2.7E+05 | 6.2E+01 | 4.1E+01 | 2.5E+01 | 6.7E+05 | 1.5E+02 | 1.0E+02 | 6.2E+01 |
| 2,4,5-Trichlorophenoxyacetic Acid | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| 2-(2,4,5-Trichlorophenoxy) propionic acid | | | | | 1.6E+07 | 2.2E+03 | 6.3E+02 | 4.9E+02 | | | | | 5.4E+07 | 1.2E+04 | 8.2E+03 | 4.9E+03 |
| 1,1,2-Trichloropropane | | | | | 8.6E+01 | | 3.9E+02 | 7.1E+01 | | | | | 2.8E+02 | | 5.1E+03 | 2.7E+02 |
| 1,2,3-Trichloropropane | 3.7E-02 | | 3.2E-01 | 3.3E-02 | 2.4E+01 | | 4.7E+02 | 2.3E+01 | 7.9E-02 | | 1.4E+00 | 7.5E-02 | 7.9E+01 | | 6.1E+03 | 7.8E+01 |
| 1,2,3-Trichloropropene | | | | | 5.2E+00 | | 7.8E+02 | 5.1E+00 | | | | | 1.7E+01 | | 1.0E+04 | 1.7E+01 |
| Tridiphane | | | | | 6.2E+06 | 8.4E+02 | 2.3E+02 | 1.8E+02 | | | | | 2.0E+07 | 4.6E+03 | 3.1E+03 | 1.8E+03 |
| Triethylamine | | | | | 7.9E+02 | | 1.6E+02 | 1.3E+02 | | | | | 2.6E+03 | | 2.0E+03 | 1.1E+03 |
| Trifluralin | 1.1E+06 | 2.6E+02 | 8.3E+01 | 6.3E+01 | 1.5E+07 | 2.1E+03 | 5.9E+02 | 4.6E+02 | 2.4E+06 | 5.6E+02 | 3.7E+02 | 2.2E+02 | 5.0E+07 | 1.2E+04 | 7.7E+03 | 4.6E+03 |
| Trimellitic Anhydride (TMAN) | | | | | 2.9E+05 | 3.9E+01 | 1.1E+01 | 8.6E+00 | | | | | 9.4E+05 | 2.2E+02 | 1.4E+02 | 8.6E+01 |
| 1,2,4-Trimethylbenzene | | | | | 5.2E+01 | | 3.9E+03 | 5.2E+01 | | | | | 1.7E+02 | | 5.1E+04 | 1.7E+02 |
| 1,3,5-Trimethylbenzene | | | | | 2.1E+01 | | 3.9E+03 | 2.1E+01 | | | | | 7.0E+01 | | 5.1E+04 | 7.0E+01 |
| Trimethyl phosphate | 2.4E+05 | 5.5E+01 | 1.7E+01 | 1.3E+01 | | | | | 5.1E+05 | 1.2E+02 | 7.7E+01 | 4.7E+01 | | | | |
| 1,3,5-Trinitrobenzene | | | | | 6.2E+07 | 8.4E+03 | 2.3E+03 | 1.8E+03 | | | | | 2.0E+08 | 4.6E+04 | 3.1E+04 | 1.8E+04 |
| Trinitrophenylmethylnitramine | | | | | 2.1E+07 | 2.8E+03 | 7.8E+02 | 6.1E+02 | | | | | 6.7E+07 | 1.5E+04 | 1.0E+04 | 6.2E+03 |
| 2,4,6-Trinitrotoluene | 2.9E+05 | 6.7E+01 | 2.1E+01 | 1.6E+01 | 1.0E+06 | 1.4E+02 | 3.9E+01 | 3.1E+01 | 6.3E+05 | 1.4E+02 | 9.5E+01 | 5.7E+01 | 3.4E+06 | 7.7E+02 | 5.1E+02 | 3.1E+02 |
| Triphenylphosphine oxide | | | | | 4.1E+07 | 5.6E+03 | 1.6E+03 | 1.2E+03 | | | | | 1.3E+08 | 3.1E+04 | 2.0E+04 | 1.2E+04 |
| Tris(2-chloroethyl) phosphate | 6.2E+05 | 1.4E+02 | 4.6E+01 | 3.5E+01 | 6.4E+08 | 8.7E+04 | 2.4E+04 | 1.9E+04 | 1.3E+06 | 3.1E+02 | 2.0E+02 | 1.2E+02 | 2.1E+09 | 4.8E+05 | 3.2E+05 | 1.9E+05 |
| Tris(2-ethylhexyl) phosphate | 2.7E+06 | 6.3E+02 | 2.0E+02 | 1.5E+02 | 2.1E+08 | 2.8E+04 | 7.8E+03 | 6.1E+03 | 5.9E+06 | 1.4E+03 | 8.9E+02 | 5.4E+02 | 6.7E+08 | 1.5E+05 | 1.0E+05 | 6.2E+04 |
| Uranium (chemical toxicity only) | | | | | | | 1.6E+01 | 1.6E+01 | | | | | | | 2.0E+02 | 2.0E+02 |
| Vanadium and compounds | | | | | | | 7.8E+01 | 7.8E+01 | | | | | | | 1.0E+03 | 1.0E+03 |
| Vernam | | | | | 2.1E+06 | 2.8E+02 | 7.8E+01 | 6.1E+01 | | | | | 6.7E+06 | 1.5E+03 | 1.0E+03 | 6.2E+02 |
| Vinclozolin | | | | | 5.1E+07 | 7.0E+03 | 2.0E+03 | 1.5E+03 | | | | | 1.7E+08 | 3.9E+04 | 2.6E+04 | 1.5E+04 |
| Vinyl acetate | | | | | 4.3E+02 | | 7.8E+04 | 4.3E+02 | | | | | 1.4E+03 | | 1.0E+06 | 1.4E+03 |
| Vinyl bromide (bromoethene) | 2.0E-01 | | 5.8E+00 | 1.9E-01 | 4.4E+00 | | 6.7E+01 | 4.1E+00 | 4.3E-01 | | 2.6E+01 | 4.2E-01 | 1.4E+01 | | 8.8E+02 | 1.4E+01 |
| Vinyl chloride (child/adult)+++ | 2.5E-02 | | 2.4E+00 | 2.5E-02 | 4.6E+01 | | 2.3E+02 | 3.9E+01 | 5.5E-02 | | 1.1E+01 | 5.5E-02 | 1.5E+02 | | 3.1E+03 | 1.4E+02 |
| Vinyl chloride (adult) | 2.5E-02 | | 2.4E+00 | 2.5E-02 | 4.6E+01 | | 2.3E+02 | 3.9E+01 | 5.5E-02 | | 1.1E+01 | 5.5E-02 | 1.5E+02 | | 3.1E+03 | 1.4E+02 |
| Warfarin | | | | | 6.2E+05 | 8.4E+01 | 2.3E+01 | 1.8E+01 | | | | | 2.0E+06 | 4.6E+02 | 3.1E+02 | 1.8E+02 |
| Xylenes | | | | | 1.9E+03 | 5.6E+04 | 1.6E+04 | 1.7E+03 | | | | | 6.2E+03 | 3.1E+05 | 2.0E+05 | 5.9E+03 |
| Zinc | | | | | | | 2.3E+04 | 2.3E+04 | | | | | | | 3.1E+05 | 3.1E+05 |
| Zinc phosphide | | | | | | | 2.3E+01 | 2.3E+01 | | | | | | | 3.1E+02 | 3.1E+02 |
| Zineb | | | | | 1.0E+08 | 1.4E+04 | 3.9E+03 | 3.1E+03 | | | | | 3.4E+08 | 7.7E+04 | 5.1E+04 | 3.1E+04 |
| 1,2,3,4,6,7,8,9-Octachlorodibenzofuran | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 6.7E+00 | | 4.9E-04 | 4.9E-04 | | | | | 1.4E+01 | | 2.2E-03 | 2.2E-03 | | | | |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 6.7E+00 | | 4.9E-04 | 4.9E-04 | | | | | 1.4E+01 | | 2.2E-03 | 2.2E-03 | | | | |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 6.7E+00 | | 4.9E-04 | 4.9E-04 | | | | | 1.4E+01 | | 2.2E-03 | 2.2E-03 | | | | |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| 1,2,3,7,8-Pentachlorodibenzofuran | 1.3E+00 | | 9.9E-05 | 9.9E-05 | | | | | 2.9E+00 | | 4.4E-04 | 4.4E-04 | | | | |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 6.7E-02 | | 4.9E-06 | 4.9E-06 | | | | | 1.4E-01 | | 2.2E-05 | 2.2E-05 | | | | |
| 1,2-Dimethylhydrazine | 1.6E+01 | | 1.2E-03 | 1.2E-03 | | | | | 3.4E+01 | | 5.2E-03 | 5.2E-03 | | | | |
| 1,3-Propane sultone | 3.6E+03 | | 2.7E-01 | 2.7E-01 | | | | | 7.8E+03 | | 1.2E+00 | 1.2E+00 | | | | |
| 1,6-Dinitropyrene | 2.2E+02 | | 5.3E-03 | 5.3E-03 | | | | | 4.8E+02 | | 2.4E-02 | 2.4E-02 | | | | |
| 1,8-Dinitropyrene | 2.2E+03 | | 5.3E-02 | 5.3E-02 | | | | | 4.8E+03 | | 2.4E-01 | 2.4E-01 | | | | |
| 1-[(5-Nitrofurfurylidene)-amino]-2-imidazolidi | 4.9E+03 | | 3.6E-01 | 3.6E-01 | | | | | 1.0E+04 | | 1.6E+00 | 1.6E+00 | | | | |
| 1-Amino-2-methylanthraquinone | 5.8E+04 | | 4.3E+00 | 4.3E+00 | | | | | 1.3E+05 | | 1.9E+01 | 1.9E+01 | | | | |
| 1-Nitropyrene | 2.2E+04 | | 5.3E-01 | 5.3E-01 | | | | | 4.8E+04 | | 2.4E+00 | 2.4E+00 | | | | |
| 2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thiaz | 3.8E+03 | | 2.8E-01 | 2.8E-01 | | | | | 8.2E+03 | | 1.2E+00 | 1.2E+00 | | | | |
| 2,3,3',4,4',5,5'-HpCB | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |
| 2,3,3',4,4',5'-HxCB | 1.3E+02 | | 9.9E-03 | 9.9E-03 | | | | | 2.9E+02 | | 4.4E-02 | 4.4E-02 | | | | |
| 2,3,3',4,4',5-HxCB | 1.3E+02 | | 9.9E-03 | 9.9E-03 | | | | | 2.9E+02 | | 4.4E-02 | 4.4E-02 | | | | |
| 2,3,3',4,4'-PeCB | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |
| 2,3',4,4',5,5'-HxCB | 6.7E+03 | | 4.9E-01 | 4.9E-01 | | | | | 1.4E+04 | | 2.2E+00 | 2.2E+00 | | | | |
| 2',3,4,4',5-PeCB | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |
| 2,3',4,4',5-PeCB | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |
| 2,3,4,4',5-PeCB | 1.3E+02 | | 9.9E-03 | 9.9E-03 | | | | | 2.9E+02 | | 4.4E-02 | 4.4E-02 | | | | |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| 2,3,4,7,8,9-Hexachlorodibenzofuran | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| 2,3,4,7,8-Pentachlorodibenzofuran | 1.3E-01 | | 9.9E-06 | 9.9E-06 | | | | | 2.9E-01 | | 4.4E-05 | 4.4E-05 | | | | |
| 2,3,7,8-Hexachlorodibenzo-p-dioxin (mixture | 6.7E-01 | | 1.9E-04 | 1.9E-04 | | | | | 1.4E+00 | | 8.7E-04 | 8.7E-04 | | | | |
| 2,3,7,8-Tetrachlorodibenzofuran | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| 2,4-Diaminoanisole | 3.8E+05 | | 2.8E+01 | 2.8E+01 | | | | | 8.2E+05 | | 1.2E+02 | 1.2E+02 | | | | |
| 2,4-Diaminoanisole sulfate | 6.7E+05 | | 4.9E+01 | 4.9E+01 | | | | | 1.4E+06 | | 2.2E+02 | 2.2E+02 | | | | |
| 2-Acetylaminofluorene | 2.3E+03 | | 1.7E-01 | 1.7E-01 | | | | | 5.0E+03 | | 7.5E-01 | 7.5E-01 | | | | |
| 2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazol | 5.5E+02 | | 4.0E-02 | 4.0E-02 | | | | | 1.2E+03 | | 1.8E-01 | 1.8E-01 | | | | |
| 2-Aminoanthraquinone | 2.6E+05 | | 1.9E+01 | 1.9E+01 | | | | | 5.7E+05 | | 8.7E+01 | 8.7E+01 | | | | |
| 2-Methyl-1-nitroanthraquinone (of uncertain p | 2.0E+03 | | 1.5E-01 | 1.5E-01 | | | | | 4.4E+03 | | 6.7E-01 | 6.7E-01 | | | | |
| 2-Naphthylamine | 4.9E+03 | | 3.6E-01 | 3.6E-01 | | | | | 1.0E+04 | | 1.6E+00 | 1.6E+00 | | | | |
| 2-Nitrofluorene | 2.2E+05 | | 5.3E+00 | 5.3E+00 | | | | | 4.8E+05 | | 2.4E+01 | 2.4E+01 | | | | |
| 3,3',4,4',5,5'-HxCB | 6.7E+00 | | 4.9E-04 | 4.9E-04 | | | | | 1.4E+01 | | 2.2E-03 | 2.2E-03 | | | | |
| 3,3',4,4',5-PeCB | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| 3,3',4,4'-TCB | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |
| 3,4,4'5-TCB | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |
| 3-Amino-9-ethylcarbazolehydrochloride | 1.1E+05 | | 8.2E+00 | 8.2E+00 | | | | | 2.4E+05 | | 3.7E+01 | 3.7E+01 | | | | |
| 3-Chloro-2-methylpropene | 6.2E+04 | | 4.6E+00 | 4.6E+00 | | | | | 1.3E+05 | | 2.0E+01 | 2.0E+01 | | | | |
| 3-Methylcholanthrene | 4.0E+02 | | 2.9E-02 | 2.9E-02 | | | | | 8.6E+02 | | 1.3E-01 | 1.3E-01 | | | | |
| 4,4-Diaminodiphenyl ether | 6.2E+04 | | 4.6E+00 | 4.6E+00 | | | | | 1.3E+05 | | 2.0E+01 | 2.0E+01 | | | | |
| 4,4-Methylene bis(2-methylaniline) | 9.5E+03 | | 7.0E-01 | 7.0E-01 | | | | | 2.0E+04 | | 3.1E+00 | 3.1E+00 | | | | |
| 4,4-Methylenedianiline dihydrochloride | 7.3E+03 | | 5.3E-01 | 5.3E-01 | | | | | 1.6E+04 | | 2.4E+00 | 2.4E+00 | | | | |
| 4,4-Thiodianiline | 5.8E+02 | | 4.3E-02 | 4.3E-02 | | | | | 1.3E+03 | | 1.9E-01 | 1.9E-01 | | | | |
| 4-Aminobiphenyl (4-aminodiphenyl) | 4.2E+02 | | 3.0E-02 | 3.0E-02 | | | | | 9.0E+02 | | 1.4E-01 | 1.4E-01 | | | | |
| 4-Chloro-ortho-phenylenediamine | 5.5E+05 | | 4.0E+01 | 4.0E+01 | | | | | 1.2E+06 | | 1.8E+02 | 1.8E+02 | | | | |
| 4-Dimethylaminoazobenzene | 1.9E+03 | | 1.4E-01 | 1.4E-01 | | | | | 4.1E+03 | | 6.2E-01 | 6.2E-01 | | | | |
| 4-Nitropyrene | 2.2E+04 | | 5.3E-01 | 5.3E-01 | | | | | 4.8E+04 | | 2.4E+00 | 2.4E+00 | | | | |
| 5-Methylchrysene | 2.2E+03 | | 5.3E-02 | 5.3E-02 | | | | | 4.8E+03 | | 2.4E-01 | 2.4E-01 | | | | |
| 5-Nitroacenaphthene | 6.7E+04 | | 4.9E+00 | 4.9E+00 | | | | | 1.4E+05 | | 2.2E+01 | 2.2E+01 | | | | |
| 6-Nitrochrysene | 2.2E+02 | | 5.3E-03 | 5.3E-03 | | | | | 4.8E+02 | | 2.4E-02 | 2.4E-02 | | | | |
| 7,12-Dimethylbenz(a)anthracene | 3.5E+01 | | 2.6E-03 | 2.6E-03 | | | | | 7.5E+01 | | 1.1E-02 | 1.1E-02 | | | | |
| 7H-dibenzo(c,g)carbazole | 2.2E+03 | | 5.3E-02 | 5.3E-02 | | | | | 4.8E+03 | | 2.4E-01 | 2.4E-01 | | | | |
| A-alpha-C(2-Amino-9H-pyrido[2,3-b]indole) | 2.2E+04 | | 1.6E+00 | 1.6E+00 | | | | | 4.7E+04 | | 7.2E+00 | 7.2E+00 | | | | |
| Acetamide | 1.2E+05 | | 9.1E+00 | 9.1E+00 | | | | | 2.7E+05 | | 4.1E+01 | 4.1E+01 | | | | |
| Actinomycin D | 1.0E+00 | | 7.4E-05 | 7.4E-05 | | | | | 2.2E+00 | | 3.3E-04 | 3.3E-04 | | | | |
| AF-2;[2-(2-furyl)-3(5-nitro-2-furyl)]acrylamide | 3.6E+04 | | 2.7E+00 | 2.7E+00 | | | | | 7.8E+04 | | 1.2E+01 | 1.2E+01 | | | | |
| Amitrole | 9.3E+03 | | 6.8E-01 | 6.8E-01 | | | | | 2.0E+04 | | 3.0E+00 | 3.0E+00 | | | | |
| Asbestos [1/(100 PCM fibers/m^3)]^-1 | 4.0E+01 | | | 4.0E+01 | | | | | 8.6E+01 | | | 8.6E+01 | | | | |
| Auramine | 9.9E+03 | | 7.3E-01 | 7.3E-01 | | | | | 2.1E+04 | | 3.3E+00 | 3.3E+00 | | | | |
| Azaserine | 7.9E+02 | | 5.8E-02 | 5.8E-02 | | | | | 1.7E+03 | | 2.6E-01 | 2.6E-01 | | | | |
| Azathioprine | 4.9E+03 | | 3.6E-01 | 3.6E-01 | | | | | 1.0E+04 | | 1.6E+00 | 1.6E+00 | | | | |
| Benzo(j)fluoranthene | 2.2E+04 | | 5.3E-01 | 5.3E-01 | | | | | 4.8E+04 | | 2.4E+00 | 2.4E+00 | | | | |
| Benzyl violet 4B | 4.4E+05 | | 3.2E+01 | 3.2E+01 | | | | | 9.4E+05 | | 1.4E+02 | 1.4E+02 | | | | |
| Beryllium oxide | 1.0E+03 | | 9.1E-02 | 9.1E-02 | | | | | 2.2E+03 | | 4.1E-01 | 4.1E-01 | | | | |
| Beryllium sulfate | 2.9E+00 | | 2.1E-04 | 2.1E-04 | | | | | 6.3E+00 | | 9.5E-04 | 9.5E-04 | | | | |
| beta-Butyrolactone | 8.7E+03 | | 6.4E-01 | 6.4E-01 | | | | | 1.9E+04 | | 2.9E+00 | 2.9E+00 | | | | |
| beta-Propiolactone | 6.2E+02 | | 4.6E-02 | 4.6E-02 | | | | | 1.3E+03 | | 2.0E-01 | 2.0E-01 | | | | |
| Butylated hydroxyanisole | 4.4E+07 | | 3.2E+03 | 3.2E+03 | | | | | 9.4E+07 | | 1.4E+04 | 1.4E+04 | | | | |
| C.I. Basic Red 9 monohydrochloride | 3.5E+04 | | 2.7E-03 | 2.7E-03 | | | | | 7.5E+04 | | 1.2E-02 | 1.2E-02 | | | | |
| Chlorambucil | 2.0E+01 | | 2.8E+02 | 1.9E+01 | | | | | 4.3E+01 | | 1.2E+03 | 4.1E+01 | | | | |
| Chlordane | 7.3E+03 | | 4.9E-01 | 4.9E-01 | | | | | 1.6E+04 | | 2.2E+00 | 2.2E+00 | | | | |
| Chlorendic acid | 9.6E+04 | | 7.0E+00 | 7.0E+00 | | | | | 2.1E+05 | | 3.1E+01 | 3.1E+01 | | | | |
| Chlorinated paraffins (Avg. chain length,C12 | 9.8E+04 | | 7.2E+00 | 7.2E+00 | | | | | 2.1E+05 | | 3.2E+01 | 3.2E+01 | | | | |
| Chloromethyl methyl ether (technical grade) | 3.6E+03 | | 2.7E-01 | 2.7E-01 | | | | | 7.8E+03 | | 1.2E+00 | 1.2E+00 | | | | |
| Chlorozotocin | 3.6E+01 | | 2.7E-03 | 2.7E-03 | | | | | 7.8E+01 | | 1.2E-02 | 1.2E-02 | | | | |
| Cinnamyl anthranilate | 1.9E+06 | | 1.4E+02 | 1.4E+02 | | | | | 4.1E+06 | | 6.2E+02 | 6.2E+02 | | | | |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| Coke oven emissions | 4.0E+03 | | | 4.0E+03 | | | | | 8.7E+03 | | | 8.7E+03 | | | | |
| Cupferron | 4.0E+04 | | 2.9E+00 | 2.9E+00 | | | | | 8.6E+04 | | 1.3E+01 | 1.3E+01 | | | | |
| Cyclophosphamide (anhydrous) | 1.4E+04 | | 1.0E+00 | 1.0E+00 | | | | | 3.1E+04 | | 4.7E+00 | 4.7E+00 | | | | |
| Cyclophosphamide (hydrated) | 1.5E+04 | | 1.1E+00 | 1.1E+00 | | | | | 3.3E+04 | | 5.0E+00 | 5.0E+00 | | | | |
| D & C Red No. 9 | 1.6E+06 | | 1.2E+02 | 1.2E+02 | | | | | 3.6E+06 | | 5.4E+02 | 5.4E+02 | | | | |
| Dacarbazine | 1.8E+02 | | 1.3E-02 | 1.3E-02 | | | | | 3.8E+02 | | 5.8E-02 | 5.8E-02 | | | | |
| Dantron | 1.1E+05 | | 8.4E+00 | 8.4E+00 | | | | | 2.5E+05 | | 3.8E+01 | 3.8E+01 | | | | |
| Dibenz(a,h)acridine | 2.2E+04 | | 5.3E-01 | 5.3E-01 | | | | | 4.8E+04 | | 2.4E+00 | 2.4E+00 | | | | |
| Dibenz(a,j)acridine | 2.2E+04 | | 5.3E-01 | 5.3E-01 | | | | | 4.8E+04 | | 2.4E+00 | 2.4E+00 | | | | |
| Dibenzo(a,e)pyrene | 2.2E+03 | | 5.3E-02 | 5.3E-02 | | | | | 4.8E+03 | | 2.4E-01 | 2.4E-01 | | | | |
| Dibenzo(a,h)pyrene | 2.2E+02 | | 5.3E-03 | 5.3E-03 | | | | | 4.8E+02 | | 2.4E-02 | 2.4E-02 | | | | |
| Dibenzo(a,i)pyrene | 2.2E+02 | | 5.3E-03 | 5.3E-03 | | | | | 4.8E+02 | | 2.4E-02 | 2.4E-02 | | | | |
| Dibenzo(a,l)pyrene | 2.2E+02 | | 5.3E-03 | 5.3E-03 | | | | | 4.8E+02 | | 2.4E-02 | 2.4E-02 | | | | |
| Diesel exhaust particulate | 7.9E+03 | | | 7.9E+03 | | | | | 1.7E+04 | | | 1.7E+04 | | | | |
| Diglycidyl resorcinol ether (DGRE) | 5.1E+03 | | 3.8E-01 | 3.8E-01 | | | | | 1.1E+04 | | 1.7E+00 | 1.7E+00 | | | | |
| Dihydrosafrole | 2.0E+05 | | 1.5E+01 | 1.5E+01 | | | | | 4.3E+05 | | 6.5E+01 | 6.5E+01 | | | | |
| Dimethylcarbamyl chloride | 6.7E+02 | | 4.9E-02 | 4.9E-02 | | | | | 1.4E+03 | | 2.2E-01 | 2.2E-01 | | | | |
| Dimethylvinylchloride | 1.9E+05 | | 1.4E+01 | 1.4E+01 | | | | | 4.2E+05 | | 6.4E+01 | 6.4E+01 | | | | |
| Disperse Blue 1 (technical grade) | 1.9E+06 | | 1.4E+02 | 1.4E+02 | | | | | 4.2E+06 | | 6.4E+02 | 6.4E+02 | | | | |
| Estradiol 17B | 2.2E+02 | | 1.6E-02 | 1.6E-02 | | | | | 4.8E+02 | | 7.3E-02 | 7.3E-02 | | | | |
| Ethyleneimine | 1.3E+02 | | 9.9E-03 | 9.9E-03 | | | | | 2.9E+02 | | 4.4E-02 | 4.4E-02 | | | | |
| d]imidazole) | 1.8E+03 | | 1.3E-01 | 1.3E-01 | | | | | 3.9E+03 | | 6.0E-01 | 6.0E-01 | | | | |
| Glu-P-2 (2-Aminodipyrido[1,2-a:3',2'-d]indole | 6.2E+03 | | 4.6E-01 | 4.6E-01 | | | | | 1.3E+04 | | 2.0E+00 | 2.0E+00 | | | | |
| Gyromitrin | 8.7E+02 | | 6.4E-02 | 6.4E-02 | | | | | 1.9E+03 | | 2.9E-01 | 2.9E-01 | | | | |
| HC Blue 1 | 1.7E+05 | | 1.3E+01 | 1.3E+01 | | | | | 3.7E+05 | | 5.6E+01 | 5.6E+01 | | | | |
| Hexachlorodibenzo-p-dioxin | 6.7E-01 | | 4.9E-05 | 4.9E-05 | | | | | 1.4E+00 | | 2.2E-04 | 2.2E-04 | | | | |
| Hydrazine Sulfate | 2.9E+03 | | 2.1E-01 | 2.1E-01 | | | | | 6.3E+03 | | 9.5E-01 | 9.5E-01 | | | | |
| IQ (2-Amino-3-methylimidazo-[4,5-f]quinoline | 6.2E+03 | | 4.6E-01 | 4.6E-01 | | | | | 1.3E+04 | | 2.0E+00 | 2.0E+00 | | | | |
| Lasiocarpine | 1.1E+03 | | 8.2E-02 | 8.2E-02 | | | | | 2.4E+03 | | 3.7E-01 | 3.7E-01 | | | | |
| Lead acetate | 3.1E+04 | | 2.3E+00 | 2.3E+00 | | | | | 6.7E+04 | | 1.0E+01 | 1.0E+01 | | | | |
| Lead subacetate | 2.3E+05 | | 1.7E+01 | 1.7E+01 | | | | | 5.0E+05 | | 7.5E+01 | 7.5E+01 | | | | |
| Me-A-alpha-C (2-Amino-3-methyl-9H-pyrido[ | 7.3E+03 | | 5.3E-01 | 5.3E-01 | | | | | 1.6E+04 | | 2.4E+00 | 2.4E+00 | | | | |
| Melphalan | 6.7E+01 | | 4.9E-03 | 4.9E-03 | | | | | 1.4E+02 | | 2.2E-02 | 2.2E-02 | | | | |
| Methyl methanesulfonate | 8.8E+04 | | 6.5E+00 | 6.5E+00 | | | | | 1.9E+05 | | 2.9E+01 | 2.9E+01 | | | | |
| Methylthiouracil | 2.2E+04 | | 1.6E+00 | 1.6E+00 | | | | | 4.7E+04 | | 7.2E+00 | 7.2E+00 | | | | |
| Michler's ketone | 1.0E+04 | | 7.4E-01 | 7.4E-01 | | | | | 2.2E+04 | | 3.3E+00 | 3.3E+00 | | | | |
| Mitomycin C | 1.1E+00 | | 7.8E-05 | 7.8E-05 | | | | | 2.3E+00 | | 3.5E-04 | 3.5E-04 | | | | |
| Monocrotaline | 8.7E+02 | | 6.4E-02 | 6.4E-02 | | | | | 1.9E+03 | | 2.9E-01 | 2.9E-01 | | | | |
| Nitrilotriacetic acid | 1.6E+06 | | 1.2E+02 | 1.2E+02 | | | | | 3.6E+06 | | 5.4E+02 | 5.4E+02 | | | | |
| Nitrilotriacetic acid, trisodium salt monohydra | 8.7E+05 | | 6.4E+01 | 6.4E+01 | | | | | 1.9E+06 | | 2.9E+02 | 2.9E+02 | | | | |
| Nitrofen (technical grade) | 1.1E+05 | | 7.8E+00 | 7.8E+00 | | | | | 2.3E+05 | | 3.5E+01 | 3.5E+01 | | | | |
| N-Methyl-N-nitro-N-nitrosoguanidine | 1.1E+03 | | 7.7E-02 | 7.7E-02 | | | | | 2.3E+03 | | 3.4E-01 | 3.4E-01 | | | | |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| N-Nitrosomorpholine | 1.3E+03 | | 9.6E-02 | 9.6E-02 | | | | | 2.8E+03 | | 4.3E-01 | 4.3E-01 | | | | |
| N-Nitroso-N-ethylurea | 3.2E+02 | | 2.4E-02 | 2.4E-02 | | | | | 7.0E+02 | | 1.1E-01 | 1.1E-01 | | | | |
| N-Nitroso-N-methylurea | 7.3E+01 | | 5.3E-03 | 5.3E-03 | | | | | 1.6E+02 | | 2.4E-02 | 2.4E-02 | | | | |
| N-Nitroso-N-methylurethane | 7.9E+01 | | 5.8E-03 | 5.8E-03 | | | | | 1.7E+02 | | 2.6E-02 | 2.6E-02 | | | | |
| N-Nitrosonornicotine | 6.2E+03 | | 4.6E-01 | 4.6E-01 | | | | | 1.3E+04 | | 2.0E+00 | 2.0E+00 | | | | |
| N-Nitrosopiperidine | 9.3E+02 | | 6.8E-02 | 6.8E-02 | | | | | 2.0E+03 | | 3.0E-01 | 3.0E-01 | | | | |
| O-Phenylphenate, sodium | 2.9E+06 | | 2.1E+02 | 2.1E+02 | | | | | 6.3E+06 | | 9.5E+02 | 9.5E+02 | | | | |
| ortho-Aminoazotoluene | 2.3E+03 | | 1.7E-01 | 1.7E-01 | | | | | 5.0E+03 | | 7.5E-01 | 7.5E-01 | | | | |
| ortho-Anisidine | 6.2E+04 | | 4.6E+00 | 4.6E+00 | | | | | 1.3E+05 | | 2.0E+01 | 2.0E+01 | | | | |
| ortho-Anisidine hydrochloride | 7.9E+04 | | 5.8E+00 | 5.8E+00 | | | | | 1.7E+05 | | 2.6E+01 | 2.6E+01 | | | | |
| para-Cresidine | 5.8E+04 | | 4.3E+00 | 4.3E+00 | | | | | 1.3E+05 | | 1.9E+01 | 1.9E+01 | | | | |
| Phenacetin | 4.0E+06 | | 2.9E+02 | 2.9E+02 | | | | | 8.6E+06 | | 1.3E+03 | 1.3E+03 | | | | |
| Phenazopyridine | 5.1E+04 | | 3.8E+00 | 3.8E+00 | | | | | 1.1E+05 | | 1.7E+01 | 1.7E+01 | | | | |
| Phenazopyridine hydrochloride | 5.8E+04 | | 4.3E+00 | 4.3E+00 | | | | | 1.3E+05 | | 1.9E+01 | 1.9E+01 | | | | |
| Phenesterin | 5.8E+01 | | 4.3E-03 | 4.3E-03 | | | | | 1.3E+02 | | 1.9E-02 | 1.9E-02 | | | | |
| Phenobarbital | 1.9E+04 | | 1.4E+00 | 1.4E+00 | | | | | 4.1E+04 | | 6.2E+00 | 6.2E+00 | | | | |
| Phenoxybenzamine | 2.8E+03 | | 2.1E-01 | 2.1E-01 | | | | | 6.1E+03 | | 9.2E-01 | 9.2E-01 | | | | |
| Phenoxybenzamine hydrochloride | 3.2E+03 | | 2.4E-01 | 2.4E-01 | | | | | 7.0E+03 | | 1.1E+00 | 1.1E+00 | | | | |
| p-Nitrosodiphenylamine | 4.0E+05 | | 2.9E+01 | 2.9E+01 | | | | | 8.6E+05 | | 1.3E+02 | 1.3E+02 | | | | |
| Polybrominated biphenyls (PBB) | | | | | | | | | | | | | | | | |
| Polychlorinated biphenyls | 4.4E+03 | 2.9E-01 | 1.3E-01 | 8.9E-02 | #N/A | #N/A | #N/A | #N/A | 9.4E+03 | 6.2E-01 | 5.7E-01 | 3.0E-01 | #N/A | #N/A | #N/A | #N/A |
| Ponceau 3R | 5.5E+05 | | 4.0E+01 | 4.0E+01 | | | | | 1.2E+06 | | 1.8E+02 | 1.8E+02 | | | | |
| Ponceau MX (D&C Red No.5) | 1.9E+06 | | 1.4E+02 | 1.4E+02 | | | | | 4.2E+06 | | 6.4E+02 | 6.4E+02 | | | | |
| Potassium bromate | 1.8E+04 | | 1.3E+00 | 1.3E+00 | | | | | 3.8E+04 | | 5.8E+00 | 5.8E+00 | | | | |
| Procarbazine | 6.2E+02 | | 4.6E-02 | 4.6E-02 | | | | | 1.3E+03 | | 2.0E-01 | 2.0E-01 | | | | |
| Procarbazine hydrochloride | 7.3E+02 | | 5.3E-02 | 5.3E-02 | | | | | 1.6E+03 | | 2.4E-01 | 2.4E-01 | | | | |
| Propylthiouracil | 8.7E+03 | | 6.4E-01 | 6.4E-01 | | | | | 1.9E+04 | | 2.9E+00 | 2.9E+00 | | | | |
| Reserpine | 7.9E+02 | | 5.8E-02 | 5.8E-02 | | | | | 1.7E+03 | | 2.6E-01 | 2.6E-01 | | | | |
| Safrole | 4.0E+04 | | 2.9E+00 | 2.9E+00 | | | | | 8.6E+04 | | 1.3E+01 | 1.3E+01 | | | | |
| Sterigmatocystin | 2.5E+02 | | 2.9E+00 | 2.9E+00 | | | | | 5.4E+02 | | 1.3E+01 | 1.3E+01 | | | | |
| Streptozotocin | 7.9E+01 | | 5.8E-03 | 5.8E-03 | | | | | 1.7E+02 | | 2.6E-02 | 2.6E-02 | | | | |
| Styrene oxide | 5.5E+04 | | 4.0E+00 | 4.0E+00 | | | | | 1.2E+05 | | 1.8E+01 | 1.8E+01 | | | | |
| Sulfallate | 4.6E+04 | | 3.4E+00 | 3.4E+00 | | | | | 9.9E+04 | | 1.5E+01 | 1.5E+01 | | | | |
| Thioacetamide | 1.4E+03 | | 1.0E-01 | 1.0E-01 | | | | | 3.1E+03 | | 4.7E-01 | 4.7E-01 | | | | |
| Thiourea | 1.2E+05 | | 8.9E+00 | 8.9E+00 | | | | | 2.6E+05 | | 4.0E+01 | 4.0E+01 | | | | |
| Toluene diisocyanate | 2.2E+05 | | 1.6E+01 | 1.6E+01 | | | | | 4.8E+05 | | 7.3E+01 | 7.3E+01 | | | | |

**Table H-3**
**PRG Intercalculation Tables for Soil with Updated OEHHA Toxicity Values**

| CONTAMINANT | RESIDENTIAL SOIL | | | | | | | | INDUSTRIAL SOIL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | | Cancer Risk = 1E-06 | | | | Chronic HQ = 1 | | | |
| | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) | soil-inhale (mg/kg) | soil-dermal (mg/kg) | soil-ingest (mg/kg) | combined (mg/kg) |
| trans-2[(Dimethylamino)-methylimino]-5-[2-(5 | 2.0E+04 | | 1.5E+00 | 1.5E+00 | | | | | 4.3E+04 | | 6.5E+00 | 6.5E+00 | | | | |
| Tris-(1-aziridinyl)phosphine sulfide | 7.3E+02 | | 5.3E-02 | 5.3E-02 | | | | | 1.6E+03 | | 2.4E-01 | 2.4E-01 | | | | |
| Tris(2,3-dibromopropyl)phosphate | 3.8E+03 | | 2.8E-01 | 2.8E-01 | | | | | 8.2E+03 | | 1.2E+00 | 1.2E+00 | | | | |
| Trp-P-1 (Tryptophan-P-1) | 3.4E+02 | | 2.5E-02 | 2.5E-02 | | | | | 7.2E+02 | | 1.1E-01 | 1.1E-01 | | | | |
| Trp-P-2 (Tryptophan-P-2) | 2.7E+03 | | 2.0E-01 | 2.0E-01 | | | | | 5.9E+03 | | 8.9E-01 | 8.9E-01 | | | | |
| Urethane | 8.7E+03 | | 6.4E-01 | 6.4E-01 | | | | | 1.9E+04 | | 2.9E+00 | 2.9E+00 | | | | |

mg/kg-d = milligrams per kilogram per day
$\mu g/m^3$ = microgram per cubic meter
µg/L = microgram per liter
mg/kg = milligrams per kilogram

**Equation for Exposure to Carcinogenic Contaminants in Industrial Soil through Ingestion, Dermal Contact, and Inhalation of Fugitive Dust**

$$PRG_s\ (mg/kg) = \frac{TR \times BW \times AT_c}{EF \times ED\left[\left(\frac{IR \times CSF}{10^6\ mg/kg}\right) + \left(\frac{SA \times AF \times ABS \times CSF}{10^6\ mg/kg}\right) + \left(\frac{ET \times IhR \times CSF}{PEF}\right)\right]}$$

**Equation for Exposure to Noncarcinogenic Contaminants in Industrial Soil through Ingestion, Dermal Contact, and Inhalation of Fugitive Dust**

$$PRG_s\ (mg/kg) = \frac{THQ \times BW \times AT_n}{EF \times ED\left[\left(\frac{1}{RfD} \times \frac{IR}{10^6\ mg/kg}\right) + \left(\frac{1}{RfD} \times \frac{SA \times AF \times ABS}{10^6\ mg/kg}\right) + \left(\frac{1}{RfD} \times \frac{ET \times IhR}{PEF}\right)\right]}$$

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR: Cancer Risk = 1E-06 (ug/m3) | AMBIENT AIR: Chronic HQ = 1 (ug/m3) | TAP WATER: Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER: Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER: Cancer Risk = 1E-06 combined (ug/l) | TAP WATER: Chronic HQ = 1 water-inhale (ug/l) | TAP WATER: Chronic HQ = 1 water-ingest (ug/l) | TAP WATER: Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acephate | 30560-19-1 | 8.7E-03 | 4.0E-03 | 8.7E-03 | 4.0E-03 | 7.6E-01 | 1.5E+01 | | 7.7E+00 | 7.7E+00 | | 1.5E+02 | 1.5E+02 |
| Acetaldehyde | 75-07-0 | | | 1.0E-02 | 2.6E-03 | 6.6E-01 | 9.4E+00 | 1.3E+00 | | 1.3E+00 | 1.9E+01 | | 1.9E+01 |
| Acetochlor | 34256-82-1 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Acetone | 67-64-1 | | 9.0E-01 | | 9.0E-01 | | 3.3E+03 | | | | 6.6E+03 | 3.3E+04 | 5.5E+03 |
| Acetone cyanohydrin | 75-86-5 | | 8.0E-04 | | 8.0E-04 | | 2.9E+00 | | | | | 2.9E+01 | 2.9E+01 |
| Acetonitrile | 75-05-8 | | 1.7E-02 | | 1.7E-02 | | 6.2E+01 | | | | 1.2E+02 | 6.2E+02 | 1.0E+02 |
| Acrolein | 107-02-8 | | 5.0E-04 | | 1.7E-05 | | 6.3E-02 | | | | 1.3E-01 | 1.8E+01 | 1.2E-01 |
| Acrylamide | 79-06-1 | 4.5E+00 | 2.0E-04 | 4.5E+00 | 2.0E-04 | 1.5E-03 | 7.3E-01 | | 1.5E-02 | 1.5E-02 | | 7.3E+00 | 7.3E+00 |
| Acrylic acid | 79-10-7 | | 5.0E-01 | | 2.9E-04 | | 1.0E+00 | | | | | 1.8E+04 | 1.8E+04 |
| Acrylonitrile | 107-13-1 | 1.0E+00 | 1.0E-03 | 1.0E+00 | 1.4E-03 | 6.6E-03 | 5.2E+00 | 1.3E-02 | 6.7E-02 | 1.1E-02 | 1.0E+01 | 3.7E+01 | 8.1E+00 |
| Alachlor | 15972-60-8 | 5.6E-02 | 1.0E-02 | 8.0E-02 | 1.0E-02 | 8.3E-02 | 3.7E+01 | | 1.2E+00 | 1.2E+00 | | 3.7E+02 | 3.7E+02 |
| Alar | 1596-84-5 | 1.8E-02 | 1.5E-01 | 1.8E-02 | 1.5E-01 | 3.7E-01 | 5.5E+02 | | 3.7E+00 | 3.7E+00 | | 5.5E+03 | 5.5E+03 |
| Aldicarb | 116-06-3 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| Aldicarb sulfone | 1646-88-4 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| Aldrin | 309-00-2 | 1.7E+01 | 3.0E-05 | 1.7E+01 | 3.0E-05 | 3.9E-04 | 1.1E-01 | | 4.0E-03 | 4.0E-03 | | 1.1E+00 | 1.1E+00 |
| Ally | 74223-64-6 | | 2.5E-01 | | 2.5E-01 | | 9.1E+02 | | | | | 9.1E+03 | 9.1E+03 |
| Allyl alcohol | 107-18-6 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Allyl chloride | 107-05-1 | 2.1E-02 | 2.9E-04 | 2.1E-02 | 2.9E-04 | 3.2E-01 | 1.0E+00 | | 3.2E+00 | 3.2E+00 | | 1.0E+01 | 1.0E+01 |
| Aluminum | 7429-90-5 | | 1.0E+00 | | 1.4E-03 | | 5.1E+00 | | | | | 3.7E+04 | 3.7E+04 |
| Aluminum phosphide | 20859-73-8 | | 4.0E-04 | | | | | | | | | 1.5E+01 | 1.5E+01 |
| Amdro | 67485-29-4 | | 3.0E-04 | | 3.0E-04 | | 1.1E+00 | | | | | 1.1E+01 | 1.1E+01 |
| Ametryn | 834-12-8 | | 9.0E-03 | | 9.0E-03 | | 3.3E+01 | | | | | 3.3E+02 | 3.3E+02 |
| m-Aminophenol | 591-27-5 | | 7.0E-02 | | 7.0E-02 | | 2.6E+02 | | | | | 2.6E+03 | 2.6E+03 |
| 4-Aminopyridine | 504-24-5 | | 2.0E-05 | | 2.0E-05 | | 7.3E-02 | | | | | 7.3E-01 | 7.3E-01 |
| Amitraz | 33089-61-1 | | 2.5E-03 | | 2.5E-03 | | 9.1E+00 | | | | | 9.1E+01 | 9.1E+01 |
| Ammonia | 7664-41-7 | | | | 5.7E-02 | | 2.1E+02 | | | | | | |
| Ammonium sulfamate | 7773-06-0 | | 2.0E-01 | | | | | | | | | 7.3E+03 | 7.3E+03 |
| Aniline | 62-53-3 | 5.7E-03 | 7.0E-03 | 5.7E-03 | 2.9E-04 | 1.2E+00 | 1.0E+00 | | 1.2E+01 | 1.2E+01 | | 2.6E+02 | 2.6E+02 |
| Antimony and compounds | 7440-36-0 | | 4.0E-04 | | | | | | | | | 1.5E+01 | 1.5E+01 |
| Apollo | 74115-24-5 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |
| Aramite | 140-57-8 | 3.0E-02 | 5.0E-02 | 3.0E-02 | 5.0E-02 | 2.2E-01 | 1.8E+02 | | 2.2E+00 | 2.2E+00 | | 1.8E+03 | 1.8E+03 |
| Arsenic | 7440-38-2 | 9.5E+00 | 3.0E-04 | 1.2E+01 | 8.6E-06 | 5.5E-04 | 3.1E-02 | | 7.1E-03 | 7.1E-03 | | 1.1E+01 | 1.1E+01 |
| Arsine | 7784-42-1 | | | | 1.4E-05 | | 5.2E-02 | | | | | | |
| Assure | 76578-14-8 | | 9.0E-03 | | 9.0E-03 | | 3.3E+01 | | | | | 3.3E+02 | 3.3E+02 |
| Asulam | 3337-71-1 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Atrazine | 1912-24-9 | 2.3E-01 | 3.5E-02 | 2.2E-01 | 3.5E-02 | 3.0E-02 | 1.3E+02 | | 2.9E-01 | 2.9E-01 | | 1.3E+03 | 1.3E+03 |
| Avermectin B1 | 71751-41-2 | | 4.0E-04 | | 4.0E-04 | | 1.5E+00 | | | | | 1.5E+01 | 1.5E+01 |
| Azobenzene | 103-33-3 | 1.1E-01 | | 1.1E-01 | | 6.0E-02 | | | 6.1E-01 | 6.1E-01 | | | |
| Barium and compounds | 7440-39-3 | | 7.0E-02 | | 1.4E-04 | | 5.2E-01 | | | | | 2.6E+03 | 2.6E+03 |
| Baygon | 114-26-1 | | 4.0E-03 | | 4.0E-03 | | 1.5E+01 | | | | | 1.5E+02 | 1.5E+02 |
| Bayleton | 43121-43-3 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| Baythroid | 68359-37-5 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| Benefin | 1861-40-1 | | 3.0E-01 | | 3.0E-01 | | 1.1E+03 | | | | | 1.1E+04 | 1.1E+04 |
| Benomyl | 17804-35-2 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Bentazon | 25057-89-0 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| Benzaldehyde | 100-52-7 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| Benzene | 71-43-2 | 1.0E-01 | 4.0E-03 | 1.0E-01 | 1.7E-02 | 6.6E-02 | 6.3E+01 | 1.3E-01 | 6.7E-01 | 1.1E-01 | 1.3E+02 | 1.5E+02 | 6.7E+01 |
| Benzidine | 92-87-5 | 5.0E+02 | 3.0E-03 | 5.0E+02 | 3.0E-03 | 1.3E-05 | 1.1E+01 | | 1.3E-04 | 1.3E-04 | | 1.1E+02 | 1.1E+02 |
| Benzoic acid | 65-85-0 | | 4.0E+00 | | 4.0E+00 | | 1.5E+04 | | | | | 1.5E+05 | 1.5E+05 |
| Benzotrichloride | 98-07-7 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| Benzyl alcohol | 100-51-6 | | 3.0E-01 | | 3.0E-01 | | 1.1E+03 | | | | | 1.1E+04 | 1.1E+04 |
| Benzyl chloride | 100-44-7 | 1.7E-01 | 2.9E-03 | 1.7E-01 | 2.9E-03 | 3.9E-02 | 1.1E+01 | 7.8E-02 | 4.0E-01 | 6.5E-02 | 2.1E+01 | 1.1E+02 | 1.8E+01 |
| Beryllium and compounds | 7440-41-7 | | 2.0E-03 | 8.4E+00 | 2.0E-06 | 7.9E-04 | 7.3E-03 | | | | | 7.3E+01 | 7.3E+01 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 (ug/m3) | AMBIENT AIR Chronic HQ = 1 (ug/m3) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bidrin | 141-66-2 | | 1.0E-04 | | 1.0E-04 | | 3.7E-01 | | | | | 3.7E+00 | 3.7E+00 |
| Biphenthrin (Talstar) | 82657-04-3 | | 1.5E-02 | | 1.5E-02 | | 5.5E+01 | | | | | 5.5E+02 | 5.5E+02 |
| 1,1-Biphenyl | 92-52-4 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | 3.7E+02 | 1.8E+03 | 3.0E+02 |
| Bis(2-chloroethyl)ether | 111-44-4 | 2.5E+00 | | 2.5E+00 | | 2.7E-03 | | 5.3E-03 | 2.7E-02 | 4.4E-03 | | | |
| Bis(2-chloroisopropyl)ether | 108-60-1 | 7.0E-02 | 4.0E-02 | 3.5E-02 | 4.0E-02 | 1.9E-01 | 1.5E+02 | 3.8E-01 | 9.6E-01 | 2.7E-01 | 2.9E+02 | 1.5E+03 | 2.4E+02 |
| Bis(chloromethyl)ether | 542-88-1 | 4.6E+01 | | 4.6E+01 | | 1.4E-04 | | 2.9E-04 | 1.5E-03 | 2.4E-04 | | | |
| Bis(2-chloro-1-methylethyl)ether | 108-60-1 | 7.0E-02 | 4.0E-02 | 3.5E-02 | 4.0E-02 | 1.9E-01 | 1.5E+02 | 3.8E-01 | 9.6E-01 | 2.7E-01 | 2.9E+02 | 1.5E+03 | 2.4E+02 |
| Bis(2-ethylhexyl)phthalate (DEHP) | 117-81-7 | 3.0E-03 | 2.0E-02 | 8.4E-03 | 2.0E-02 | 7.9E-01 | 7.3E+01 | | 2.2E+01 | 2.2E+01 | | 7.3E+02 | 7.3E+02 |
| Bisphenol A | 80-05-7 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Boron | 7440-42-8 | | 2.0E-01 | | 5.7E-03 | | 2.1E+01 | | | | | 7.3E+03 | 7.3E+03 |
| Boron trifluoride | 7637-07-2 | | | | 2.0E-04 | | 7.3E-01 | | | | | | |
| Bromate | 15541-45-4 | 7.0E-01 | 4.0E-03 | 7.0E-01 | 4.0E-03 | 9.5E-03 | 1.5E+01 | | 9.6E-02 | 9.6E-02 | | 1.5E+02 | 1.5E+02 |
| Bromobenzene | 108-86-1 | | 2.0E-02 | | 2.9E-03 | | 1.0E+01 | | | | 2.1E+01 | 7.3E+02 | 2.0E+01 |
| Bromodichloromethane | 75-27-4 | 1.3E-01 | 2.0E-02 | 1.3E-01 | 2.0E-02 | 5.1E-02 | 7.3E+01 | 1.0E-01 | 5.2E-01 | 8.5E-02 | 1.5E+02 | 7.3E+02 | 1.2E+02 |
| Bromoform (tribromomethane) | 75-25-2 | 7.9E-03 | 2.0E-02 | 3.9E-03 | 2.0E-02 | 1.7E+00 | 7.3E+01 | | 8.5E+00 | 8.5E+00 | | 7.3E+02 | 7.3E+02 |
| Bromomethane (Methyl bromide) | 74-83-9 | | 1.4E-03 | | 1.4E-03 | | 5.2E+00 | | | | 1.0E+01 | 5.1E+01 | 8.7E+00 |
| Bromophos | 2104-96-3 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Bromoxynil | 1689-84-5 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Bromoxynil octanoate | 1689-99-2 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| 1,3-Butadiene | 106-99-0 | 3.4E+00 | 5.7E-03 | 6.0E-01 | 5.7E-03 | 1.1E-02 | 2.1E+01 | 2.2E-02 | 2.0E-02 | 1.0E-02 | 4.2E+01 | 2.1E+02 | 3.5E+01 |
| 1-Butanol | 71-36-3 | | 1.0E-01 | | 2.6E-03 | | 9.5E+00 | | | | | 3.7E+03 | 3.7E+03 |
| Butylate | 2008-41-5 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| n-Butylbenzene | 104-51-8 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | 2.9E+02 | 1.5E+03 | 2.4E+02 |
| sec-Butylbenzene | 135-9-88 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | 2.9E+02 | 1.5E+03 | 2.4E+02 |
| tert-Butylbenzene | 98-06-6 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | 2.9E+02 | 1.5E+03 | 2.4E+02 |
| Butyl benzyl phthalate | 85-68-7 | | 2.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | | 7.3E+03 | 7.3E+03 |
| Butylphthalyl butylglycolate | 85-70-1 | | 1.0E+00 | | 1.0E+00 | | 3.7E+03 | | | | | 3.7E+04 | 3.7E+04 |
| Cadmium and compounds | 7440-43-9 | | 5.0E-04 | 1.5E+01 | 5.7E-06 | 4.4E-04 | 2.1E-02 | | | | | 1.8E+01 | 1.8E+01 |
| Caprolactam | 105-60-2 | | 5.0E-01 | | 5.0E-01 | | 1.8E+03 | | | | | 1.8E+04 | 1.8E+04 |
| Captafol | 2425-06-1 | 1.5E-01 | 2.0E-03 | 1.5E-01 | 2.0E-03 | 4.4E-02 | 7.3E+00 | | 4.5E-01 | 4.5E-01 | | 7.3E+01 | 7.3E+01 |
| Captan | 133-06-2 | 2.3E-03 | 1.3E-01 | 2.3E-03 | 1.3E-01 | 2.9E+00 | 4.7E+02 | | 2.9E+01 | 2.9E+01 | | 4.7E+03 | 4.7E+03 |
| Carbaryl | 63-25-2 | | 1.0E-01 | | 1.1E-01 | | 4.0E+02 | | | | | 3.7E+03 | 3.7E+03 |
| Carbazole | 86-74-8 | 2.0E-02 | | 2.0E-02 | | 3.3E-01 | | | 3.4E+00 | 3.4E+00 | | | |
| Carbofuran | 1563-66-2 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Carbon disulfide | 75-15-0 | | 1.0E-01 | | 2.3E-01 | | 8.3E+02 | | | | 1.7E+03 | 3.7E+03 | 1.1E+03 |
| Carbon tetrachloride | 56-23-5 | 1.5E-01 | 7.0E-04 | 1.5E-01 | 1.1E-02 | 4.4E-02 | 4.2E+01 | 8.8E-02 | 4.5E-01 | 7.4E-02 | 8.3E+01 | 2.6E+01 | 2.0E+01 |
| Carbosulfan | 55285-14-8 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Carboxin | 5234-68-4 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| Chloramben | 133-90-4 | | 1.5E-02 | | 1.5E-02 | | 5.5E+01 | | | | | 5.5E+02 | 5.5E+02 |
| Chloranil | 118-75-2 | 4.0E-01 | | 4.0E-01 | | 1.7E-02 | | | 1.7E-01 | 1.7E-01 | | | |
| Chlordane | 57-74-9 | 1.3E+00 | | 1.2E+00 | | 5.5E-03 | | | 5.2E-02 | 5.2E-02 | | | |
| Chlorimuron-ethyl | 90982-32-4 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Chlorine | 7782-50-5 | | 1.0E-01 | | 5.7E-05 | | 2.1E-01 | | | | | 3.7E+03 | 3.7E+03 |
| Chlorine dioxide | 10049-04-4 | | 3.0E-02 | | 1.7E-04 | | 6.3E-01 | | | | | 1.1E+03 | 1.1E+03 |
| Chloroacetic acid | 79-11-8 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| 2-Chloroacetophenone | 532-27-4 | | 8.6E-06 | | 8.6E-06 | | 3.1E-02 | | | | 6.3E-02 | 3.1E-01 | 5.2E-02 |
| 4-Chloroaniline | 106-47-8 | | 4.0E-03 | | 4.0E-03 | | 1.5E+01 | | | | | 1.5E+02 | 1.5E+02 |
| Chlorobenzene | 108-90-7 | | 2.0E-02 | | 2.9E-01 | | 1.0E+03 | | | | 2.1E+03 | 7.3E+02 | 5.4E+02 |
| Chlorobenzilate | 510-15-6 | 1.1E-01 | 2.0E-02 | 1.1E-01 | 2.0E-02 | 6.0E-02 | 7.3E+01 | | 6.1E-01 | 6.1E-01 | | 7.3E+02 | 7.3E+02 |
| p-Chlorobenzoic acid | 74-11-3 | | 2.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | | 7.3E+03 | 7.3E+03 |
| 4-Chlorobenzotrifluoride | 98-56-6 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| 2-Chloro-1,3-butadiene | 126-99-8 | | 2.0E-02 | | 2.0E-03 | | 7.3E+00 | | | | 1.5E+01 | 7.3E+02 | 1.4E+01 |
| 1-Chlorobutane | 109-69-3 | | 4.0E-01 | | 4.0E-01 | | 1.5E+03 | | | | 2.9E+03 | 1.5E+04 | 2.4E+03 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR: Cancer Risk = 1E-06 ($ug/m^3$) | AMBIENT AIR: Chronic HQ = 1 ($ug/m^3$) | TAP WATER: Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER: Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER: Cancer Risk = 1E-06 combined (ug/l) | TAP WATER: Chronic HQ = 1 water-inhale (ug/l) | TAP WATER: Chronic HQ = 1 water-ingest (ug/l) | TAP WATER: Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Chloro-1,1-difluoroethane (HCFC-142b) | 75-68-3 | | 1.4E+01 | | 1.4E+01 | | 5.2E+04 | | | | 1.0E+05 | 5.2E+05 | 8.7E+04 |
| Chlorodifluoromethane | 75-45-6 | | 1.4E+01 | | 1.4E+01 | | 5.1E+04 | | | | 1.0E+05 | 5.1E+05 | 8.5E+04 |
| Chloroethane | 75-00-3 | 2.9E-03 | 4.0E-01 | 2.9E-03 | 8.6E+00 | 2.3E+00 | 3.1E+04 | 4.6E+00 | 2.3E+01 | 3.8E+00 | 6.3E+04 | 1.5E+04 | 1.2E+04 |
| Chloroform | 67-66-3 | 3.1E-02 | 1.0E-02 | 1.9E-02 | 8.6E-02 | 3.5E-01 | 3.1E+02 | 7.0E-01 | 2.2E+00 | 5.3E-01 | 6.3E+02 | 3.7E+02 | 2.3E+02 |
| Chloromethane (methyl chloride) | 74-87-3 | | 2.6E-02 | | 2.6E-02 | | 9.5E+01 | | | | 1.9E+02 | 9.5E+02 | 1.6E+02 |
| 4-Chloro-2-methylaniline | 95-69-2 | 2.7E-01 | | 2.7E-01 | | 2.5E-02 | | | 2.5E-01 | 2.5E-01 | | | |
| 4-Chloro-2-methylaniline hydrochloride | 3165-93-3 | 4.6E-01 | | 4.6E-01 | | 1.4E-02 | | | 1.5E-01 | 1.5E-01 | | | |
| beta-Chloronaphthalene | 91-58-7 | | 8.0E-02 | | 8.0E-02 | | 2.9E+02 | | | | 5.8E+02 | 2.9E+03 | 4.9E+02 |
| o-Chloronitrobenzene | 88-73-3 | 9.7E-03 | 1.0E-03 | 9.7E-03 | 2.0E-05 | 6.8E-01 | 7.3E-02 | 1.4E+00 | 6.9E+00 | 1.1E+00 | 1.5E-01 | 3.7E+01 | 1.5E-01 |
| p-Chloronitrobenzene | 100-00-5 | 6.7E-03 | 1.0E-03 | 6.7E-03 | 1.7E-04 | 9.9E-01 | 6.2E-01 | 2.0E+00 | 1.0E+01 | 1.7E+00 | 1.2E+00 | 3.7E+01 | 1.2E+00 |
| 2-Chlorophenol | 95-57-8 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | 3.7E+01 | 1.8E+02 | 3.0E+01 |
| 2-Chloropropane | 75-29-6 | | 2.9E-02 | | 2.9E-02 | | 1.0E+02 | | | | 2.1E+02 | 1.1E+03 | 1.7E+02 |
| Chlorothalonil | 1897-45-6 | 3.1E-03 | 1.5E-02 | 3.1E-03 | 1.5E-02 | 2.1E+00 | 5.5E+01 | | 2.2E+01 | 2.2E+01 | | 5.5E+02 | 5.5E+02 |
| o-Chlorotoluene | 95-49-8 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | 1.5E+02 | 7.3E+02 | 1.2E+02 |
| Chlorpropham | 101-21-3 | | 2.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | | 7.3E+03 | 7.3E+03 |
| Chlorpyrifos | 2921-88-2 | | 3.0E-03 | | 3.0E-03 | | 1.1E+01 | | | | | 1.1E+02 | 1.1E+02 |
| Chlorpyrifos-methyl | 5598-13-0 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Chlorsulfuron | 64902-72-3 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Chlorthiophos | 60238-56-4 | | 8.0E-04 | | 8.0E-04 | | 2.9E+00 | | | | | 2.9E+01 | 2.9E+01 |
| Total Chromium (1:6 ratio Cr VI:Cr III)+++ | 7440-47-3 | | | 4.2E+01 | | 1.6E-04 | | | | | | | |
| Chromium III | 16065-83-1 | | 1.5E+00 | | | | | | | | | 5.5E+04 | 5.5E+04 |
| Chromium VI+++ | 18540-29-9 | | 3.0E-03 | 5.1E+02 | 5.7E-05 | 1.3E-05 | 2.1E-01 | | | | | 1.1E+02 | 1.1E+02 |
| Cobalt | 7440-48-4 | | 2.0E-02 | 9.8E+00 | 5.7E-06 | 6.8E-04 | 2.1E-02 | | | | | 7.3E+02 | 7.3E+02 |
| Coke Oven Emissions | 8007-45-2 | | | 2.2E+00 | | 3.1E-03 | | | | | | | |
| Copper and compounds | 7440-50-8 | | 4.0E-02 | | | | | | | | | 1.5E+03 | 1.5E+03 |
| Crotonaldehyde | 123-73-9 | 1.9E+00 | | 1.9E+00 | | 3.5E-03 | | 7.0E-03 | 3.5E-02 | 5.8E-03 | | | |
| Cumene (isopropylbenzene) | 98-82-8 | | 1.0E-01 | | 1.1E-01 | | 4.0E+02 | | | | 8.0E+02 | 3.7E+03 | 6.6E+02 |
| Cyanazine | 21725-46-2 | 8.4E-01 | 2.0E-03 | 8.4E-01 | 2.0E-03 | 7.9E-03 | 7.3E+00 | | 8.0E-02 | 8.0E-02 | | 7.3E+01 | 7.3E+01 |
| Cyanide (free) | 57-12-5 | | 2.0E-02 | | | | | | | | | 7.3E+02 | 7.3E+02 |
| Cyanide (hydrogen) | 74-90-8 | | 2.0E-02 | | 2.6E-03 | | 9.4E+00 | | | | 1.9E+01 | 7.3E+02 | 1.8E+01 |
| Cyanogen | 460-19-5 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | 2.9E+02 | 1.5E+03 | 2.4E+02 |
| Cyanogen bromide | 506-68-3 | | 9.0E-02 | | 9.0E-02 | | 3.3E+02 | | | | 6.6E+02 | 3.3E+03 | 5.5E+02 |
| Cyanogen chloride | 506-77-4 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | 3.7E+02 | 1.8E+03 | 3.0E+02 |
| Cyclohexane | 110-82-7 | | 1.7E+00 | | 1.7E+00 | | 6.2E+03 | | | | 1.2E+04 | 6.2E+04 | 1.0E+04 |
| Cyclohexanone | 108-94-1 | | 5.0E+00 | | 5.0E+00 | | 1.8E+04 | | | | | 1.8E+05 | 1.8E+05 |
| Cyclohexylamine | 108-91-8 | | 2.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | | 7.3E+03 | 7.3E+03 |
| Cyhalothrin/Karate | 68085-85-8 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Cypermethrin | 52315-07-8 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Cyromazine | 66215-27-8 | | 7.5E-03 | | 7.5E-03 | | 2.7E+01 | | | | | 2.7E+02 | 2.7E+02 |
| Dacthal | 1861-32-1 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Dalapon | 75-99-0 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| Danitol | 39515-41-8 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| DDD | 72-54-8 | 2.4E-01 | | 2.4E-01 | | 2.8E-02 | | | 2.8E-01 | 2.8E-01 | | | |
| DDE | 72-55-9 | 3.4E-01 | | 3.4E-01 | | 2.0E-02 | | | 2.0E-01 | 2.0E-01 | | | |
| DDT | 50-29-3 | 3.4E-01 | 5.0E-04 | 3.4E-01 | 5.0E-04 | 2.0E-02 | 1.8E+00 | | 2.0E-01 | 2.0E-01 | | 1.8E+01 | 1.8E+01 |
| Decabromodiphenyl ether | 1163-19-5 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Demeton | 8065-48-3 | | 4.0E-05 | | 4.0E-05 | | 1.5E-01 | | | | | 1.5E+00 | 1.5E+00 |
| Diallate | 2303-16-4 | 6.1E-02 | | 6.1E-02 | | 1.1E-01 | | | 1.1E+00 | 1.1E+00 | | | |
| Diazinon | 333-41-5 | | 9.0E-04 | | 9.0E-04 | | 3.3E+00 | | | | | 3.3E+01 | 3.3E+01 |
| Dibenzofuran | 132-64-9 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | 1.5E+01 | 7.3E+01 | 1.2E+01 |
| 1,4-Dibromobenzene | 106-37-6 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Dibromochloromethane | 124-48-1 | 9.4E-02 | 2.0E-02 | 9.4E-02 | 2.0E-02 | 7.1E-02 | 7.3E+01 | 1.4E-01 | 7.2E-01 | 1.2E-01 | 1.5E+02 | 7.3E+02 | 1.2E+02 |
| | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR: Cancer Risk = 1E-06 (ug/m3) | AMBIENT AIR: Chronic HQ = 1 (ug/m3) | TAP WATER: Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER: Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER: Cancer Risk = 1E-06 combined (ug/l) | TAP WATER: Chronic HQ = 1 water-inhale (ug/l) | TAP WATER: Chronic HQ = 1 water-ingest (ug/l) | TAP WATER: Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 7.0E+00 | 5.7E-05 | 7.0E+00 | 5.7E-05 | 9.5E-04 | 2.1E-01 | 1.9E-03 | 9.6E-03 | 1.6E-03 | 4.2E-01 | 2.1E+00 | 3.5E-01 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 3.6E+00 | 9.0E-03 | 2.5E-01 | 2.3E-04 | 2.7E-02 | 8.3E-01 | 5.3E-02 | 1.9E-02 | 1.4E-02 | 1.7E+00 | 3.3E+02 | 1.7E+00 |
| Dibutyl phthalate | 84-74-2 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| Dicamba | 1918-00-9 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| 1,2-Dichlorobenzene | 95-50-1 | | 9.0E-02 | | 5.7E-02 | | 2.1E+02 | | | | 4.2E+02 | 3.3E+03 | 3.7E+02 |
| 1,3-Dichlorobenzene | 541-73-1 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | 2.2E+02 | 1.1E+03 | 1.8E+02 |
| 1,4-Dichlorobenzene | 106-46-7 | 5.4E-03 | 3.0E-02 | 4.0E-02 | 2.3E-01 | 1.7E-01 | 8.3E+02 | 3.3E-01 | 1.2E+01 | 3.2E-01 | 1.7E+03 | 1.1E+03 | 6.6E+02 |
| 3,3-Dichlorobenzidine | 91-94-1 | 1.2E+00 | | 1.2E+00 | | 5.5E-03 | | | 5.6E-02 | 5.6E-02 | | | |
| 4,4'-Dichlorobenzophenone | 90-98-2 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| 1,4-Dichloro-2-butene | 764-41-0 | 9.3E+00 | | 9.3E+00 | | 7.1E-04 | | 1.4E-03 | 7.2E-03 | 1.2E-03 | | | |
| Dichlorodifluoromethane | 75-71-8 | | 2.0E-01 | | 5.7E-02 | | 2.1E+02 | | | | 4.2E+02 | 7.3E+03 | 3.9E+02 |
| | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| 1,1-Dichloroethane | 75-34-3 | 5.7E-03 | 1.0E-01 | 5.7E-03 | 1.4E-01 | 1.2E+00 | 5.2E+02 | 2.3E+00 | 1.2E+01 | 1.9E+00 | 1.0E+03 | 3.7E+03 | 8.1E+02 |
| 1,2-Dichloroethane (EDC) | 107-06-2 | 4.7E-02 | 2.0E-02 | 7.2E-02 | 1.1E-01 | 9.2E-02 | 4.2E+02 | 1.8E-01 | 1.4E+00 | 1.6E-01 | 8.3E+02 | 7.3E+02 | 3.9E+02 |
| 1,1-Dichloroethylene | 75-35-4 | | 5.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | 1.5E+02 | 1.8E+03 | 1.4E+02 |
| 1,2-Dichloroethylene (cis) | 156-59-2 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | 7.3E+01 | 3.7E+02 | 6.1E+01 |
| 1,2-Dichloroethylene (trans) | 156-60-5 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | 1.5E+02 | 7.3E+02 | 1.2E+02 |
| 2,4-Dichlorophenol | 120-83-2 | | 3.0E-03 | | 3.0E-03 | | 1.1E+01 | | | | | 1.1E+02 | 1.1E+02 |
| 4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB) | 94-82-6 | | 8.0E-03 | | 8.0E-03 | | 2.9E+01 | | | | | 2.9E+02 | 2.9E+02 |
| 2,4-Dichlorophenoxyacetic Acid (2,4-D) | 94-75-7 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| 1,2-Dichloropropane | 78-87-5 | 3.6E-02 | 1.1E-03 | 3.6E-02 | 1.1E-03 | 1.8E-01 | 4.2E+00 | 3.7E-01 | 1.9E+00 | 3.1E-01 | 8.3E+00 | 4.0E+01 | 6.9E+00 |
| 1,3-Dichloropropane | 142-28-9 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | 1.5E+02 | 7.3E+02 | 1.2E+02 |
| 1,3-Dichloropropene | 542-75-6 | 9.1E-02 | 3.0E-02 | 5.5E-02 | 5.7E-03 | 1.2E-01 | 2.1E+01 | 2.4E-01 | 7.4E-01 | 1.8E-01 | 4.2E+01 | 1.1E+03 | 4.0E+01 |
| 2,3-Dichloropropanol | 616-23-9 | | 3.0E-03 | | 3.0E-03 | | 1.1E+01 | | | | | 1.1E+02 | 1.1E+02 |
| Dichlorvos | 62-73-7 | 4.1E-01 | 5.0E-04 | 2.9E-01 | 1.4E-04 | 2.3E-02 | 5.2E-01 | | 1.6E-01 | 1.6E-01 | | 1.8E+01 | 1.8E+01 |
| Dicofol | 115-32-2 | 4.4E-01 | | 4.4E-01 | | 1.5E-02 | | | 1.5E-01 | 1.5E-01 | | | |
| Dicyclopentadiene | 77-73-6 | | 3.0E-02 | | 5.7E-05 | | 2.1E-01 | | | | 4.2E-01 | 1.1E+03 | 4.2E-01 |
| Dieldrin | 60-57-1 | 1.6E+01 | 5.0E-05 | 1.6E+01 | 5.0E-05 | 4.1E-04 | 1.8E-01 | | 4.2E-03 | 4.2E-03 | | 1.8E+00 | 1.8E+00 |
| Diethylene glycol, monobutyl ether | 112-34-5 | | 1.0E-02 | | 5.7E-03 | | 2.1E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Diethylene glycol, monoethyl ether | 111-90-0 | | 6.0E-02 | | 8.6E-04 | | 3.1E+00 | | | | | 2.2E+03 | 2.2E+03 |
| Diethylformamide | 617-84-5 | | 4.0E-04 | | 4.0E-04 | | 1.5E+00 | | | | | 1.5E+01 | 1.5E+01 |
| Di(2-ethylhexyl)adipate | 103-23-1 | 1.2E-03 | 6.0E-01 | 1.2E-03 | 6.0E-01 | 5.5E+00 | 2.2E+03 | | 5.6E+01 | 5.6E+01 | | 2.2E+04 | 2.2E+04 |
| Diethyl phthalate | 84-66-2 | | 8.0E-01 | | 8.0E-01 | | 2.9E+03 | | | | | 2.9E+04 | 2.9E+04 |
| Diethylstilbestrol | 56-53-1 | 3.5E+02 | | 3.5E+02 | | 1.9E-05 | | | 1.9E-04 | 1.9E-04 | | | |
| Difenzoquat (Avenge) | 43222-48-6 | | 8.0E-02 | | 8.0E-02 | | 2.9E+02 | | | | | 2.9E+03 | 2.9E+03 |
| Diflubenzuron | 35367-38-5 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| 1,1-Difluoroethane | 75-37-6 | | 1.1E+01 | | 1.1E+01 | | 4.2E+04 | | | | | 4.2E+05 | 4.2E+05 |
| Diisononyl phthalate | 28553-12-0 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Diisopropyl ether | 108-20-3 | | | | 1.1E-01 | | 4.0E+02 | | | | | | |
| Diisopropyl methylphosphonate | 1445-75-6 | | 8.0E-02 | | 8.0E-02 | | 2.9E+02 | | | | | 2.9E+03 | 2.9E+03 |
| Dimethipin | 55290-64-7 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Dimethoate | 60-51-5 | | 2.0E-04 | | 2.0E-04 | | 7.3E-01 | | | | | 7.3E+00 | 7.3E+00 |
| 3,3'-Dimethoxybenzidine | 119-90-4 | 1.4E-02 | | 1.4E-02 | | 4.7E-01 | | | 4.8E+00 | 4.8E+00 | | | |
| Dimethylamine | 124-40-3 | | 5.7E-06 | | 5.7E-06 | | 2.1E-02 | | | | 4.2E-02 | 2.1E-01 | 3.5E-02 |
| N-N-Dimethylaniline | 121-69-7 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| 2,4-Dimethylaniline | 95-68-1 | 7.5E-01 | | 7.5E-01 | | 8.8E-03 | | | 9.0E-02 | 9.0E-02 | | | |
| 2,4-Dimethylaniline hydrochloride | 21436-96-4 | 5.8E-01 | | 5.8E-01 | | 1.1E-02 | | | 1.2E-01 | 1.2E-01 | | | |
| 3,3'-Dimethylbenzidine | 119-93-7 | 2.3E+00 | | 2.3E+00 | | 2.9E-03 | | | 2.9E-02 | 2.9E-02 | | | |
| N,N-Dimethylformamide | 68-12-2 | | 1.0E-01 | | 2.3E-02 | | 8.3E+01 | | | | | 3.7E+03 | 3.7E+03 |
| Dimethylphenethylamine | 122-09-8 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| 2,4-Dimethylphenol | 105-67-9 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| 2,6-Dimethylphenol | 576-26-1 | | 6.0E-04 | | 6.0E-04 | | 2.2E+00 | | | | | 2.2E+01 | 2.2E+01 |
| 3,4-Dimethylphenol | 95-65-8 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 (ug/m3) | AMBIENT AIR Chronic HQ = 1 (ug/m3) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimethyl phthalate | 131-11-3 | | 1.0E+01 | | 1.0E+01 | | 3.7E+04 | | | | | 3.7E+05 | 3.7E+05 |
| Dimethyl terephthalate | 120-61-6 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| 4,6-Dinitro-o-cresol | 534-52-1 | | 1.0E-04 | | 1.0E-04 | | 3.7E-01 | | | | | 3.7E+00 | 3.7E+00 |
| 4,6-Dinitro-o-cyclohexyl phenol | 131-89-5 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| 1,2-Dinitrobenzene | 528-29-0 | | 1.0E-04 | | 1.0E-04 | | 3.7E-01 | | | | | 3.7E+00 | 3.7E+00 |
| 1,3-Dinitrobenzene | 99-65-0 | | 1.0E-04 | | 1.0E-04 | | 3.7E-01 | | | | | 3.7E+00 | 3.7E+00 |
| 1,4-Dinitrobenzene | 100-25-4 | | 1.0E-04 | | 1.0E-04 | | 3.7E-01 | | | | | 3.7E+00 | 3.7E+00 |
| 2,4-Dinitrophenol | 51-28-5 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Dinitrotoluene mixture | 25321-14-6 | 6.8E-01 | | 6.8E-01 | | 9.8E-03 | | | 9.9E-02 | 9.9E-02 | | | |
| 2,4-Dinitrotoluene (also see Dinitrotoluene mixture) | 121-14-2 | 3.1E-01 | 2.0E-03 | 3.1E-01 | 2.0E-03 | 2.1E-02 | 7.3E+00 | | 2.2E-01 | 2.2E-01 | | 7.3E+01 | 7.3E+01 |
| 2,6-Dinitrotoluene (also see Dinitrotoluene mixture) | 606-20-2 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| Dinoseb | 88-85-7 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| di-n-Octyl phthalate | 117-84-0 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | | 1.5E+03 | 1.5E+03 |
| 1,4-Dioxane | 123-91-1 | 2.7E-02 | | 2.7E-02 | 8.6E-01 | 2.5E-01 | 3.1E+03 | | 2.5E+00 | 2.5E+00 | | | |
| Dioxin (2,3,7,8-TCDD)+++ | 1746-01-6 | 1.3E+05 | | 1.3E+05 | 1.1E-08 | 5.1E-08 | 4.2E-05 | | 5.2E-07 | 5.2E-07 | | | |
| Diphenamid | 957-51-7 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| Diphenylamine | 122-39-4 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| N,N-Diphenyl-1,4 benzenediamine (DPPD) | 74-31-7 | | 3.0E-04 | | 3.0E-04 | | 1.1E+00 | | | | | 1.1E+01 | 1.1E+01 |
| 1,2-Diphenylhydrazine | 122-66-7 | 8.7E-01 | | 8.7E-01 | | 7.6E-03 | | | 7.7E-02 | 7.7E-02 | | | |
| Diphenyl sulfone | 127-63-9 | | 3.0E-03 | | 3.0E-03 | | 1.1E+01 | | | | | 1.1E+02 | 1.1E+02 |
| Diquat | 85-00-7 | | 2.2E-03 | | 2.2E-03 | | 8.0E+00 | | | | | 8.0E+01 | 8.0E+01 |
| Direct black 38 | 1937-37-7 | 7.4E+00 | | 7.4E+00 | | 9.0E-04 | | | 9.1E-03 | 9.1E-03 | | | |
| Direct blue 6 | 2602-46-2 | 7.4E+00 | | 7.4E+00 | | 9.0E-04 | | | 9.1E-03 | 9.1E-03 | | | |
| Direct brown 95 | 16071-86-6 | 6.7E+00 | | 6.7E+00 | | 9.9E-04 | | | 1.0E-02 | 1.0E-02 | | | |
| Disulfoton | 298-04-4 | | 4.0E-05 | | 4.0E-05 | | 1.5E-01 | | | | | 1.5E+00 | 1.5E+00 |
| 1,4-Dithiane | 505-29-3 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Diuron | 330-54-1 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Dodine | 2439-10-3 | | 4.0E-03 | | 4.0E-03 | | 1.5E+01 | | | | | 1.5E+02 | 1.5E+02 |
| Dysprosium | 7429-91-6 | | 1.0E-01 | | | | | | | | | 3.7E+03 | 3.7E+03 |
| Endosulfan | 115-29-7 | | 6.0E-03 | | 6.0E-03 | | 2.2E+01 | | | | | 2.2E+02 | 2.2E+02 |
| Endothall | 145-73-3 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Endrin | 72-20-8 | | 3.0E-04 | | 3.0E-04 | | 1.1E+00 | | | | | 1.1E+01 | 1.1E+01 |
| Epichlorohydrin | 106-89-8 | 8.0E-02 | 2.0E-03 | 8.0E-02 | 8.6E-04 | 8.3E-02 | 3.1E+00 | 1.7E-01 | 8.4E-01 | 1.4E-01 | 6.3E+00 | 7.3E+01 | 5.8E+00 |
| 1,2-Epoxybutane | 106-88-7 | | 5.7E-03 | | 5.7E-03 | | 2.1E+01 | | | | | 2.1E+02 | 2.1E+02 |
| EPTC (S-Ethyl dipropylthiocarbamate) | 759-94-4 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| Ethephon (2-chloroethyl phosphonic acid) | 16672-87-0 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Ethion | 563-12-2 | | 5.0E-04 | | 5.0E-04 | | 1.8E+00 | | | | | 1.8E+01 | 1.8E+01 |
| 2-Ethoxyethanol | 110-80-5 | | 4.0E-01 | | 2.0E-02 | | 7.3E+01 | | | | | 1.5E+04 | 1.5E+04 |
| 2-Ethoxyethanol acetate | 111-15-9 | | 3.0E-01 | | 8.6E-02 | | 3.1E+02 | | | | | 1.1E+04 | 1.1E+04 |
| Ethyl acetate | 141-78-6 | | 9.0E-01 | | 9.0E-01 | | 3.3E+03 | | | | 6.6E+03 | 3.3E+04 | 5.5E+03 |
| Ethyl acrylate | 140-88-5 | 4.8E-02 | | 4.8E-02 | | 1.4E-01 | | 2.8E-01 | 1.4E+00 | 2.3E-01 | | | |
| Ethylbenzene | 100-41-4 | 1.1E-02 | 1.0E-01 | 8.7E-03 | 5.7E-01 | 7.6E-01 | 2.1E+03 | 1.5E+00 | 6.1E+00 | 1.2E+00 | 4.2E+03 | 3.7E+03 | 1.9E+03 |
| Ethyl chloride | 75-00-3 | 2.9E-03 | 4.0E-01 | 2.9E-03 | 8.6E+00 | 2.3E+00 | 3.1E+04 | 4.6E+00 | 2.3E+01 | 3.8E+00 | 6.3E+04 | 1.5E+04 | 1.2E+04 |
| Ethylene cyanohydrin | 109-78-4 | | 3.0E-01 | | 3.0E-01 | | 1.1E+03 | | | | | 1.1E+04 | 1.1E+04 |
| Ethylene diamine | 107-15-3 | | 9.0E-02 | | 9.0E-02 | | 3.3E+02 | | | | | 3.3E+03 | 3.3E+03 |
| Ethylene glycol | 107-21-1 | | 2.0E+00 | | 1.1E-01 | | 4.2E+02 | | | | | 7.3E+04 | 7.3E+04 |
| Ethylene glycol, monobutyl ether | 111-76-2 | | 5.0E-01 | | 3.7E+00 | | 1.4E+04 | | | | | 1.8E+04 | 1.8E+04 |
| Ethylene oxide | 75-21-8 | 3.1E-01 | | 3.1E-01 | 8.6E-03 | 2.1E-02 | 3.1E+01 | 4.3E-02 | 2.2E-01 | 3.6E-02 | 6.3E+01 | | 6.3E+01 |
| Ethylene thiourea (ETU) | 96-45-7 | 4.5E-02 | 8.0E-05 | 4.5E-02 | 8.0E-05 | 1.5E-01 | 2.9E-01 | | 1.5E+00 | 1.5E+00 | | 2.9E+00 | 2.9E+00 |
| Ethyl ether | 60-29-7 | | 2.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | 1.5E+03 | 7.3E+03 | 1.2E+03 |
| Ethyl methacrylate | 97-63-2 | | 9.0E-02 | | 9.0E-02 | | 3.3E+02 | | | | 6.6E+02 | 3.3E+03 | 5.5E+02 |
| Ethyl p-nitrophenyl phenylphosphorothioate | 2104-64-5 | | 1.0E-05 | | 1.0E-05 | | 3.7E-02 | | | | | 3.7E-01 | 3.7E-01 |
| Ethylphthalyl ethyl glycolate | 84-72-0 | | 3.0E+00 | | 3.0E+00 | | 1.1E+04 | | | | | 1.1E+05 | 1.1E+05 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 ($ug/m^3$) | AMBIENT AIR Chronic HQ = 1 ($ug/m^3$) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Express | 101200-48-0 | | 8.0E-03 | | 8.0E-03 | | 2.9E+01 | | | | | 2.9E+02 | 2.9E+02 |
| Fenamiphos | 22224-92-6 | | 2.5E-04 | | 2.5E-04 | | 9.1E-01 | | | | | 9.1E+00 | 9.1E+00 |
| Fluometuron | 2164-17-2 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |
| Fluorine (soluble fluoride) | 16984-48-8 | | 6.0E-02 | | 3.7E-03 | | 1.4E+01 | | | | | 2.2E+03 | 2.2E+03 |
| Fluoridone | 59756-60-4 | | 8.0E-02 | | 8.0E-02 | | 2.9E+02 | | | | | 2.9E+03 | 2.9E+03 |
| Flurprimidol | 56425-91-3 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Flutolanil | 66332-96-5 | | 6.0E-02 | | 6.0E-02 | | 2.2E+02 | | | | | 2.2E+03 | 2.2E+03 |
| Fluvalinate | 69409-94-5 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Folpet | 133-07-3 | 3.5E-03 | 1.0E-01 | 3.5E-03 | 1.0E-01 | 1.9E+00 | 3.7E+02 | | 1.9E+01 | 1.9E+01 | | 3.7E+03 | 3.7E+03 |
| Fomesafen | 72178-02-0 | 1.9E-01 | | 1.9E-01 | | 3.5E-02 | | | 3.5E-01 | 3.5E-01 | | | |
| Fonofos | 944-22-9 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Formaldehyde | 50-00-0 | | 1.5E-01 | 2.1E-02 | 8.6E-04 | 3.2E-01 | 3.1E+00 | | | | | 5.5E+03 | 5.5E+03 |
| Formic Acid | 64-18-6 | | 2.0E+00 | | 8.6E-04 | | 3.1E+00 | | | | | 7.3E+04 | 7.3E+04 |
| Fosetyl-al | 39148-24-8 | | 3.0E+00 | | 3.0E+00 | | 1.1E+04 | | | | | 1.1E+05 | 1.1E+05 |
| Freon 113 | 76-13-1 | | 3.0E+01 | | 8.6E+00 | | 3.1E+04 | | | | 6.3E+04 | 1.1E+06 | 5.9E+04 |
| Furan | 110-00-9 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | 7.3E+00 | 3.7E+01 | 6.1E+00 |
| Furazolidone | 67-45-8 | 3.8E+00 | | 3.8E+00 | | 1.7E-03 | | | 1.8E-02 | 1.8E-02 | | | |
| Furfural | 98-01-1 | | 3.0E-03 | | 1.4E-02 | | 5.2E+01 | | | | | 1.1E+02 | 1.1E+02 |
| Furium | 531-82-8 | 1.5E+00 | | 1.5E+00 | | 4.4E-03 | | | 4.5E-02 | 4.5E-02 | | | |
| Furmecyclox | 60568-05-0 | 3.0E-02 | | 3.0E-02 | | 2.2E-01 | | | 2.2E+00 | 2.2E+00 | | | |
| Glufosinate-ammonium | 77182-82-2 | | 4.0E-04 | | 4.0E-04 | | 1.5E+00 | | | | | 1.5E+01 | 1.5E+01 |
| Glycidaldehyde | 765-34-4 | | 4.0E-04 | | 2.9E-04 | | 1.0E+00 | | | | | 1.5E+01 | 1.5E+01 |
| Glyphosate | 1071-83-6 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| Haloxyfop-methyl | 69806-40-2 | | 5.0E-05 | | 5.0E-05 | | 1.8E-01 | | | | | 1.8E+00 | 1.8E+00 |
| Harmony | 79277-27-3 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |
| Heptachlor | 76-44-8 | 4.1E+00 | 5.0E-04 | 4.1E+00 | 5.0E-04 | 1.6E-03 | 1.8E+00 | | 1.6E-02 | 1.6E-02 | | 1.8E+01 | 1.8E+01 |
| Heptachlor epoxide | 1024-57-3 | 5.5E+00 | 1.3E-05 | 5.5E+00 | 1.3E-05 | 1.2E-03 | 4.7E-02 | | 1.2E-02 | 1.2E-02 | | 4.7E-01 | 4.7E-01 |
| Hexabromobenzene | 87-82-1 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Hexachlorobenzene | 118-74-1 | 1.8E+00 | 8.0E-04 | 1.8E+00 | 8.0E-04 | 3.7E-03 | 2.9E+00 | | 3.7E-02 | 3.7E-02 | | 2.9E+01 | 2.9E+01 |
| Hexachlorobutadiene | 87-68-3 | 7.8E-02 | 3.0E-04 | 7.8E-02 | 3.0E-04 | 8.5E-02 | 1.1E+00 | | 8.6E-01 | 8.6E-01 | | 1.1E+01 | 1.1E+01 |
| HCH (alpha) | 319-84-6 | 2.7E+00 | 5.0E-04 | 2.7E+00 | 5.0E-04 | 2.5E-03 | 1.8E+00 | | 2.5E-02 | 2.5E-02 | | 1.8E+01 | 1.8E+01 |
| HCH (beta) | 319-85-7 | 1.5E+00 | 2.0E-04 | 1.5E+00 | 2.0E-04 | 4.4E-03 | 7.3E-01 | | 4.5E-02 | 4.5E-02 | | 7.3E+00 | 7.3E+00 |
| HCH (gamma) Lindane | 58-89-9 | 1.1E+00 | 3.0E-04 | 1.1E+00 | 3.0E-04 | 6.0E-03 | 1.1E+00 | | 6.1E-02 | 6.1E-02 | | 1.1E+01 | 1.1E+01 |
| HCH-technical | 608-73-1 | 4.0E+00 | | 4.0E+00 | | 1.7E-03 | | | 1.7E-02 | 1.7E-02 | | | |
| Hexachlorocyclopentadiene | 77-47-4 | | 6.0E-03 | | 5.7E-05 | | 2.1E-01 | | | | | 2.2E+02 | 2.2E+02 |
| Hexachloroethane | 67-72-1 | 3.9E-02 | 1.0E-03 | 3.9E-02 | 1.0E-03 | 1.7E-01 | 3.7E+00 | | 1.7E+00 | 1.7E+00 | | 3.7E+01 | 3.7E+01 |
| Hexachlorophene | 70-30-4 | | 3.0E-04 | | 3.0E-04 | | 1.1E+00 | | | | | 1.1E+01 | 1.1E+01 |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine | 121-82-4 | 1.1E-01 | 3.0E-03 | 1.1E-01 | 3.0E-03 | 6.0E-02 | 1.1E+01 | | 6.1E-01 | 6.1E-01 | | 1.1E+02 | 1.1E+02 |
| 1,6-Hexamethylene diisocyanate | 822-06-0 | | 2.9E-06 | | 2.9E-06 | | 1.0E-02 | | | | | 1.0E-01 | 1.0E-01 |
| n-Hexane | 110-54-3 | | 1.1E+01 | | 2.0E+00 | | 7.3E+03 | | | | 1.5E+04 | 4.0E+05 | 1.4E+04 |
| Hexazinone | 51235-04-2 | | 3.3E-02 | | 3.3E-02 | | 1.2E+02 | | | | | 1.2E+03 | 1.2E+03 |
| HMX | 2691-41-0 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Hydrazine, hydrazine sulfate | 302-01-2 | 3.0E+00 | | 1.7E+01 | 5.7E-05 | 3.9E-04 | 2.1E-01 | | 2.2E-02 | 2.2E-02 | | | |
| Hydrazine, monomethyl | 60-34-4 | 3.0E+00 | | 1.7E+01 | | 3.9E-04 | | | 2.2E-02 | 2.2E-02 | | | |
| Hydrazine, dimethyl | 57-14-7 | 3.0E+00 | | 1.7E+01 | | 3.9E-04 | | | 2.2E-02 | 2.2E-02 | | | |
| Hydrogen chloride | 7647-01-0 | | | | 2.6E-03 | | 9.4E+00 | | | | | | |
| Hydrogen cyanide | 74-90-8 | | 2.0E-02 | | 2.6E-03 | | 9.4E+00 | | | | 1.9E+01 | 7.3E+02 | 1.8E+01 |
| Hydrogen sulfide | 7783-06-4 | | 3.0E-03 | | 2.9E-03 | | 1.0E+01 | | | | | 1.1E+02 | 1.1E+02 |
| p-Hydroquinone | 123-31-9 | 5.6E-02 | 4.0E-02 | 5.6E-02 | 4.0E-02 | 1.2E-01 | 1.5E+02 | | 1.2E+00 | 1.2E+00 | | 1.5E+03 | 1.5E+03 |
| Imazalil | 35554-44-0 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |
| Imazaquin | 81335-37-7 | | 2.5E-01 | | 2.5E-01 | | 9.1E+02 | | | | | 9.1E+03 | 9.1E+03 |
| Iprodione | 36734-19-7 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | | 1.5E+03 | 1.5E+03 |
| Iron | 7439-89-6 | | 3.0E-01 | | | | | | | | | 1.1E+04 | 1.1E+04 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR: Cancer Risk = 1E-06 ($ug/m^3$) | AMBIENT AIR: Chronic HQ = 1 ($ug/m^3$) | TAP WATER: Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER: Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER: Cancer Risk = 1E-06 combined (ug/l) | TAP WATER: Chronic HQ = 1 water-inhale (ug/l) | TAP WATER: Chronic HQ = 1 water-ingest (ug/l) | TAP WATER: Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Isobutanol | 78-83-1 | | 3.0E-01 | | 3.0E-01 | | 1.1E+03 | | | | 2.2E+03 | 1.1E+04 | 1.8E+03 |
| Isophorone | 78-59-1 | 9.5E-04 | 2.0E-01 | 9.5E-04 | 5.7E-01 | 7.0E+00 | 2.1E+03 | | 7.1E+01 | 7.1E+01 | | 7.3E+03 | 7.3E+03 |
| Isopropalin | 33820-53-0 | | 1.5E-02 | | 1.5E-02 | | 5.5E+01 | | | | | 5.5E+02 | 5.5E+02 |
| Isopropyl methyl phosphonic acid | 1832-54-8 | | 1.0E-01 | | 1.1E-01 | | 4.0E+02 | | | | | 3.7E+03 | 3.7E+03 |
| Isoxaben | 82558-50-7 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Kepone | 143-50-0 | 1.6E+01 | 2.0E-04 | 1.6E+01 | 2.0E-04 | 4.1E-04 | 7.3E-01 | | 4.2E-03 | 4.2E-03 | | 7.3E+00 | 7.3E+00 |
| Lactofen | 77501-63-4 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Lead+++ | 7439-92-1 | 8.5E-03 | | 4.2E-02 | | 1.6E-01 | | | 7.9E+00 | 7.9E+00 | | | |
| Lead (tetraethyl) | 78-00-2 | | 1.0E-07 | | | | | | | | | 3.7E-03 | 3.7E-03 |
| Linuron | 330-55-2 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Lithium | 7439-93-2 | | 2.0E-02 | | | | | | | | | 7.3E+02 | 7.3E+02 |
| Londax | 83055-99-6 | | 2.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | | 7.3E+03 | 7.3E+03 |
| Malathion | 121-75-5 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Maleic anhydride | 108-31-6 | | 1.0E-01 | | 2.0E-04 | | 7.3E-01 | | | | | 3.7E+03 | 3.7E+03 |
| Maleic hydrazide | 123-33-1 | | 5.0E-01 | | 5.0E-01 | | 1.8E+03 | | | | 3.7E+03 | 1.8E+04 | 3.0E+03 |
| Malononitrile | 109-77-3 | | 1.0E-04 | | 1.0E-04 | | 3.7E-01 | | | | | 3.7E+00 | 3.7E+00 |
| Mancozeb | 8018-01-7 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| Maneb | 12427-38-2 | 6.0E-02 | 5.0E-03 | 6.0E-02 | 5.0E-03 | 1.1E-01 | 1.8E+01 | | 1.1E+00 | 1.1E+00 | | 1.8E+02 | 1.8E+02 |
| Manganese and compounds+++ | 7439-96-5 | | 2.4E-02 | | 5.7E-05 | | 2.1E-01 | | | | | 8.8E+02 | 8.8E+02 |
| Mephosfolan | 950-10-7 | | 9.0E-05 | | 9.0E-05 | | 3.3E-01 | | | | | 3.3E+00 | 3.3E+00 |
| Mepiquat chloride | 24307-26-4 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| 2-Mercaptobenzothiazole | 149-30-4 | 2.9E-02 | 1.0E-01 | 2.9E-02 | 1.0E-01 | 2.3E-01 | 3.7E+02 | | 2.3E+00 | 2.3E+00 | | 3.7E+03 | 3.7E+03 |
| Mercury and compounds | 7487-94-7 | | 3.0E-04 | | 2.6E-05 | | 9.4E-02 | | | | | 1.1E+01 | 1.1E+01 |
| Mercury (elemental) | 7439-97-6 | | | | 8.6E-05 | | 3.1E-01 | | | | | | |
| Mercury (methyl) | 22967-92-6 | | 1.0E-04 | | | | | | | | | 3.7E+00 | 3.7E+00 |
| Merphos | 150-50-5 | | 3.0E-05 | | 3.0E-05 | | 1.1E-01 | | | | | 1.1E+00 | 1.1E+00 |
| Merphos oxide | 78-48-8 | | 3.0E-05 | | 3.0E-05 | | 1.1E-01 | | | | | 1.1E+00 | 1.1E+00 |
| Metalaxyl | 57837-19-1 | | 6.0E-02 | | 6.0E-02 | | 2.2E+02 | | | | | 2.2E+03 | 2.2E+03 |
| Methacrylonitrile | 126-98-7 | | 1.0E-04 | | 2.0E-04 | | 7.3E-01 | | | | 1.5E+00 | 3.7E+00 | 1.0E+00 |
| Methamidophos | 10265-92-6 | | 5.0E-05 | | 5.0E-05 | | 1.8E-01 | | | | | 1.8E+00 | 1.8E+00 |
| Methanol | 67-56-1 | | 5.0E-01 | | 1.1E+00 | | 4.2E+03 | | | | | 1.8E+04 | 1.8E+04 |
| Methidathion | 950-37-8 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| Methomyl | 16752-77-5 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | 1.8E+02 | 9.1E+02 | 1.5E+02 |
| Methoxychlor | 72-43-5 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| 2-Methoxyethanol | 109-86-4 | | 1.0E-03 | | 1.7E-02 | | 6.3E+01 | | | | | 3.7E+01 | 3.7E+01 |
| 2-Methoxyethanol acetate | 110-49-6 | | 2.0E-03 | | 2.6E-02 | | 9.4E+01 | | | | | 7.3E+01 | 7.3E+01 |
| 2-Methoxy-5-nitroaniline | 99-59-2 | 4.9E-02 | | 4.9E-02 | | 1.4E-01 | | | 1.4E+00 | 1.4E+00 | | | |
| Methyl acetate | 79-20-9 | | 1.0E+00 | | 1.0E+00 | | 3.7E+03 | | | | 7.3E+03 | 3.7E+04 | 6.1E+03 |
| Methyl acrylate | 96-33-3 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | 2.2E+02 | 1.1E+03 | 1.8E+02 |
| 2-Methylaniline (o-toluidine) | 95-53-4 | 1.8E-01 | | 1.8E-01 | | 3.7E-02 | | | 3.7E-01 | 3.7E-01 | | | |
| 2-Methylaniline hydrochloride | 636-21-5 | 1.3E-01 | | 1.3E-01 | | 5.1E-02 | | | 5.2E-01 | 5.2E-01 | | | |
| 2-Methyl-4-chlorophenoxyacetic acid | 94-74-6 | | 5.0E-04 | | 5.0E-04 | | 1.8E+00 | | | | | 1.8E+01 | 1.8E+01 |
| 4-(2-Methyl-4-chlorophenoxy) butyric acid | 94-81-5 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| 2-(2-Methyl-4-chlorophenoxy) propionic acid | 93-65-2 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | 16484-77-8 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| Methylcyclohexane | 108-87-2 | | 8.6E-01 | | 8.6E-01 | | 3.1E+03 | | | | 6.3E+03 | 3.1E+04 | 5.2E+03 |
| 4,4'-Methylenebisbenzeneamine | 101-77-9 | 1.6E+00 | | 1.6E+00 | 5.7E-03 | 4.1E-03 | 2.1E+01 | | 4.2E-02 | 4.2E-02 | | | |
| 4,4'-Methylene bis(2-chloroaniline) | 101-14-4 | 1.5E+00 | 7.0E-04 | 1.5E+00 | 7.0E-04 | 4.4E-03 | 2.6E+00 | | 4.5E-02 | 4.5E-02 | | 2.6E+01 | 2.6E+01 |
| 4,4'-Methylene bis(N,N'-dimethyl)aniline | 101-61-1 | 4.6E-02 | | 4.6E-02 | | 1.4E-01 | | | 1.5E+00 | 1.5E+00 | | | |
| Methylene bromide | 74-95-3 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | 7.3E+01 | 3.7E+02 | 6.1E+01 |
| Methylene chloride | 75-09-2 | 1.4E-02 | 6.0E-02 | 3.5E-03 | 1.1E-01 | 1.9E+00 | 4.2E+02 | 3.8E+00 | 4.8E+00 | 2.1E+00 | 8.3E+02 | 2.2E+03 | 6.0E+02 |
| 4,4'-Methylene diphenyl diisocyanate | 101-68-8 | | 1.7E-04 | | 2.0E-04 | | 7.3E-01 | | | | | 6.2E+00 | 6.2E+00 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR: Cancer Risk = 1E-06 (ug/m3) | AMBIENT AIR: Chronic HQ = 1 (ug/m3) | TAP WATER: Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER: Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER: Cancer Risk = 1E-06 combined (ug/l) | TAP WATER: Chronic HQ = 1 water-inhale (ug/l) | TAP WATER: Chronic HQ = 1 water-ingest (ug/l) | TAP WATER: Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnapthalene | 91-57-6 | | 4.0E-03 | | | | | | | | | 1.5E+02 | 1.5E+02 |
| Methyl ethyl ketone (2-Butanone) | 78-93-3 | | 6.0E-01 | | 1.4E+00 | | 5.1E+03 | | | | 1.0E+04 | 2.2E+04 | 7.0E+03 |
| Methyl isobutyl ketone | 108-10-1 | | 8.0E-02 | | 8.6E-01 | | 3.1E+03 | | | | 6.3E+03 | 2.9E+03 | 2.0E+03 |
| Methyl mercaptan | 74-93-1 | | 5.7E-04 | | 5.7E-04 | | 2.1E+00 | | | | | 2.1E+01 | 2.1E+01 |
| Methyl methacrylate | 80-62-6 | | 1.4E+00 | | 2.0E-01 | | 7.3E+02 | | | | 1.5E+03 | 5.1E+04 | 1.4E+03 |
| 2-Methyl-5-nitroaniline | 99-55-8 | 3.3E-02 | | 3.3E-02 | | 2.0E-01 | | | 2.0E+00 | 2.0E+00 | | | |
| Methyl parathion | 298-00-0 | | 2.5E-04 | | 2.5E-04 | | 9.1E-01 | | | | | 9.1E+00 | 9.1E+00 |
| 2-Methylphenol | 95-48-7 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| 3-Methylphenol | 108-39-4 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| 4-Methylphenol | 106-44-5 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Methyl phosphonic acid | 993-13-5 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Methyl styrene (mixture) | 25013-15-4 | | 6.0E-03 | | 1.1E-02 | | 4.2E+01 | | | | 8.3E+01 | 2.2E+02 | 6.0E+01 |
| Methyl styrene (alpha) | 98-83-9 | | 7.0E-02 | | 7.0E-02 | | 2.6E+02 | | | | 5.1E+02 | 2.6E+03 | 4.3E+02 |
| Methyl tertbutyl ether (MTBE) | 1634-04-4 | 1.8E-03 | 8.6E-01 | 9.1E-04 | 2.3E+00 | 7.3E+00 | 8.3E+03 | 1.5E+01 | 3.7E+01 | 1.0E+01 | 1.7E+04 | 3.1E+04 | 1.1E+04 |
| Metolaclor (Dual) | 51218-45-2 | | 1.5E-01 | | 1.5E-01 | | 5.5E+02 | | | | | 5.5E+03 | 5.5E+03 |
| Metribuzin | 21087-64-9 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| Mirex | 2385-85-5 | 1.8E+01 | 2.0E-04 | 1.8E+01 | 2.0E-04 | 3.7E-04 | 7.3E-01 | | 3.7E-03 | 3.7E-03 | | 7.3E+00 | 7.3E+00 |
| Molinate | 2212-67-1 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Molybdenum | 7439-98-7 | | 5.0E-03 | | | | | | | | | 1.8E+02 | 1.8E+02 |
| Monochloramine | 10599-90-3 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| Naled | 300-76-5 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Napropamide | 15299-99-7 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| Nickel (soluble salts) | 7440-02-0 | | 2.0E-02 | 9.1E-01 | 1.4E-05 | 7.3E-03 | 5.2E-02 | | | | | 7.3E+02 | 7.3E+02 |
| Nickel subsulfide | 12035-72-2 | 1.7E+00 | | 1.7E+00 | | 3.9E-03 | | | 4.0E-02 | 4.0E-02 | | | |
| Nitrate+++ | 14797-55-8 | Based on Infant N | | | | | | | #VALUE! | #VALUE! | | | |
| Nitrite+++ | 14797-65-0 | Based on Infant N | | | | | | | #VALUE! | #VALUE! | | | |
| 2-Nitroaniline | 88-74-4 | | 3.0E-03 | | 3.0E-05 | | 1.1E-01 | | | | | 1.1E+02 | 1.1E+02 |
| 3-Nitroaniline | 99-09-2 | 2.1E-02 | 3.0E-04 | 2.1E-02 | 3.0E-04 | 3.2E-01 | 1.1E+00 | | 3.2E+00 | 3.2E+00 | | 1.1E+01 | 1.1E+01 |
| 4-Nitroaniline | 100-01-6 | 2.1E-02 | 3.0E-03 | 2.1E-02 | 1.0E-03 | 3.2E-01 | 3.7E+00 | | 3.2E+00 | 3.2E+00 | | 1.1E+02 | 1.1E+02 |
| Nitrobenzene | 98-95-3 | | 5.0E-04 | | 5.7E-04 | | 2.1E+00 | | | | 4.2E+00 | 1.8E+01 | 3.4E+00 |
| Nitrofurantoin | 67-20-9 | | 7.0E-02 | | 7.0E-02 | | 2.6E+02 | | | | | 2.6E+03 | 2.6E+03 |
| Nitrofurazone | 59-87-0 | 1.3E+00 | | 1.3E+00 | | 5.1E-03 | | | 5.2E-02 | 5.2E-02 | | | |
| Nitroglycerin | 55-63-0 | 1.4E-02 | | 1.4E-02 | | 4.7E-01 | | | 4.8E+00 | 4.8E+00 | | | |
| Nitroguanidine | 556-88-7 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| 2-Nitropropane | 79-46-9 | 9.4E+00 | 5.7E-03 | 9.4E+00 | 5.7E-03 | 7.1E-04 | 2.1E+01 | | 7.2E-03 | 7.2E-03 | | 2.1E+02 | 2.1E+02 |
| N-Nitrosodi-n-butylamine | 924-16-3 | 1.1E+01 | | 1.1E+01 | | 6.0E-04 | | 1.2E-03 | 6.1E-03 | 1.0E-03 | | | |
| N-Nitrosodiethanolamine | 1116-54-7 | 2.8E+00 | | 2.8E+00 | | 2.4E-03 | | | 2.4E-02 | 2.4E-02 | | | |
| N-Nitrosodiethylamine | 55-18-5 | 3.6E+01 | | 3.6E+01 | | 1.8E-04 | | | 1.9E-03 | 1.9E-03 | | | |
| N-Nitrosodimethylamine | 62-75-9 | 1.6E+01 | 8.0E-06 | 1.6E+01 | 8.0E-06 | 4.1E-04 | 2.9E-02 | | 4.2E-03 | 4.2E-03 | | 2.9E-01 | 2.9E-01 |
| N-Nitrosodiphenylamine | 86-30-6 | 9.0E-03 | 2.0E-02 | 9.0E-03 | 2.0E-02 | 7.4E-01 | 7.3E+01 | | 7.5E+00 | 7.5E+00 | | 7.3E+02 | 7.3E+02 |
| N-Nitroso di-n-propylamine | 621-64-7 | 7.0E+00 | | 7.0E+00 | | 9.5E-04 | | | 9.6E-03 | 9.6E-03 | | | |
| N-Nitroso-N-methylethylamine | 10595-95-6 | 2.2E+01 | | 2.2E+01 | | 3.0E-04 | | | 3.1E-03 | 3.1E-03 | | | |
| N-Nitrosopyrrolidine | 930-55-2 | 2.1E+00 | | 2.1E+00 | | 3.2E-03 | | | 3.2E-02 | 3.2E-02 | | | |
| m-Nitrotoluene | 99-08-1 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | 1.5E+02 | 7.3E+02 | 1.2E+02 |
| o-Nitrotoluene | 88-72-2 | 2.3E-01 | 1.0E-02 | 2.3E-01 | 1.0E-02 | 2.9E-02 | 3.7E+01 | 5.8E-02 | 2.9E-01 | 4.8E-02 | 7.3E+01 | 3.7E+02 | 6.1E+01 |
| p-Nitrotoluene | 99-99-0 | 1.7E-02 | 1.0E-02 | 1.7E-02 | 1.0E-02 | 3.9E-01 | 3.7E+01 | 7.8E-01 | 4.0E+00 | 6.5E-01 | 7.3E+01 | 3.7E+02 | 6.1E+01 |
| Norflurazon | 27314-13-2 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | | 1.5E+03 | 1.5E+03 |
| NuStar | 85509-19-9 | | 7.0E-04 | | 7.0E-04 | | 2.6E+00 | | | | | 2.6E+01 | 2.6E+01 |
| Octabromodiphenyl ether | 32536-52-0 | | 3.0E-03 | | 3.0E-03 | | 1.1E+01 | | | | | 1.1E+02 | 1.1E+02 |
| Octamethylpyrophosphoramide | 152-16-9 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Oryzalin | 19044-88-3 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Oxadiazon | 19666-30-9 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Oxamyl | 23135-22-0 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 (ug/m3) | AMBIENT AIR Chronic HQ = 1 (ug/m3) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oxyfluorfen | 42874-03-3 | | 3.0E-03 | | 3.0E-03 | | 1.1E+01 | | | | | 1.1E+02 | 1.1E+02 |
| Paclobutrazol | 76738-62-0 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |
| Paraquat | 4685-14-7 | | 4.5E-03 | | 4.5E-03 | | 1.6E+01 | | | | | 1.6E+02 | 1.6E+02 |
| Parathion | 56-38-2 | | 6.0E-03 | | 6.0E-03 | | 2.2E+01 | | | | | 2.2E+02 | 2.2E+02 |
| Pebulate | 1114-71-2 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Pendimethalin | 40487-42-1 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | | 1.5E+03 | 1.5E+03 |
| Pentabromo-6-chloro cyclohexane | 87-84-3 | 2.3E-02 | | 2.3E-02 | | 2.9E-01 | | | 2.9E+00 | 2.9E+00 | | | |
| Pentabromodiphenyl ether | 32534-81-9 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Pentachlorobenzene | 608-93-5 | | 8.0E-04 | | 8.0E-04 | | 2.9E+00 | | | | | 2.9E+01 | 2.9E+01 |
| Pentachloronitrobenzene | 82-68-8 | 2.6E-01 | 3.0E-03 | 2.6E-01 | 3.0E-03 | 2.6E-02 | 1.1E+01 | | 2.6E-01 | 2.6E-01 | | 1.1E+02 | 1.1E+02 |
| Pentachlorophenol | 87-86-5 | 8.1E-02 | 3.0E-02 | 1.8E-02 | 3.0E-02 | 3.7E-01 | 1.1E+02 | | 8.3E-01 | 8.3E-01 | | 1.1E+03 | 1.1E+03 |
| Perchlorate | 7601-90-3 | | 1.0E-04 | | | | | | | | | 3.7E+00 | 3.7E+00 |
| Permethrin | 52645-53-1 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Phenmedipham | 13684-63-4 | | 2.5E-01 | | 2.5E-01 | | 9.1E+02 | | | | | 9.1E+03 | 9.1E+03 |
| Phenol | 108-95-2 | | 3.0E-01 | | 5.7E-02 | | 2.1E+02 | | | | | 1.1E+04 | 1.1E+04 |
| Phenothiazine | 92-84-2 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| m-Phenylenediamine | 108-45-2 | | 6.0E-03 | | 6.0E-03 | | 2.2E+01 | | | | | 2.2E+02 | 2.2E+02 |
| o-Phenylenediamine | 95-54-5 | 4.7E-02 | | 4.7E-02 | | 1.4E-01 | | | 1.4E+00 | 1.4E+00 | | | |
| p-Phenylenediamine | 106-50-3 | | 1.9E-01 | | 1.9E-01 | | 6.9E+02 | | | | | 6.9E+03 | 6.9E+03 |
| Phenylmercuric acetate | 62-38-4 | | 8.0E-05 | | 8.0E-05 | | 2.9E-01 | | | | | 2.9E+00 | 2.9E+00 |
| 2-Phenylphenol | 90-43-7 | 1.9E-03 | | 1.9E-03 | | 3.5E+00 | | | 3.5E+01 | 3.5E+01 | | | |
| Phorate | 298-02-2 | | 2.0E-04 | | 2.0E-04 | | 7.3E-01 | | | | | 7.3E+00 | 7.3E+00 |
| Phosmet | 732-11-6 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Phosphine | 7803-51-2 | | 3.0E-04 | | 2.3E-04 | | 8.3E-01 | | | | | 1.1E+01 | 1.1E+01 |
| Phosphoric acid | 7664-38-2 | | | | 2.0E-03 | | 7.3E+00 | | | | | | |
| Phosphorus (white) | 7723-14-0 | | 2.0E-05 | | | | | | | | | 7.3E-01 | 7.3E-01 |
| p-Phthalic acid | 100-21-0 | | 1.0E+00 | | 1.0E+00 | | 3.7E+03 | | | | | 3.7E+04 | 3.7E+04 |
| Phthalic anhydride | 85-44-9 | | 2.0E+00 | | 5.7E-03 | | 2.1E+01 | | | | | 7.3E+04 | 7.3E+04 |
| Picloram | 1918-02-1 | | 7.0E-02 | | 7.0E-02 | | 2.6E+02 | | | | | 2.6E+03 | 2.6E+03 |
| Pirimiphos-methyl | 29232-93-7 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Polybrominated biphenyls | PBB | 3.0E+01 | 7.0E-06 | 3.0E+01 | 7.0E-06 | 2.2E-04 | 2.6E-02 | | 2.2E-03 | 2.2E-03 | | 2.6E-01 | 2.6E-01 |
| PCBs (unspeciated mixture, high risk, e.g. Aroclor 1254) | 11097-69-1 | 2.0E+00 | 2.0E-05 | 2.0E+00 | 2.0E-05 | 3.3E-03 | 7.3E-02 | | 3.4E-02 | 3.4E-02 | | 7.3E-01 | 7.3E-01 |
| Polychlorinated terphenyls | 61788-33-8 | 4.5E+00 | | 4.5E+00 | | 1.5E-03 | | | 1.5E-02 | 1.5E-02 | | | |
| Polynuclear aromatic hydrocarbons | | | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | | 6.0E-02 | | 6.0E-02 | | 2.2E+02 | | | | 4.4E+02 | 2.2E+03 | 3.7E+02 |
| Anthracene | 120-12-7 | | 3.0E-01 | | 3.0E-01 | | 1.1E+03 | | | | 2.2E+03 | 1.1E+04 | 1.8E+03 |
| Benz[a]anthracene | 56-55-3 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| Benzo[b]fluoranthene | 205-99-2 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| Benzo[k]fluoranthene | 207-08-9 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| Benzo[a]pyrene | 50-32-8 | 1.2E+01 | | 3.9E+00 | | 1.7E-03 | | | 5.6E-03 | 5.6E-03 | | | |
| Chrysene | 218-01-9 | 1.2E-01 | | 3.9E-02 | | 1.7E-01 | | 3.4E-01 | 5.6E-01 | 2.1E-01 | | | |
| Dibenz[ah]anthracene | 53-70-3 | 4.1E+00 | | 4.1E+00 | | 1.6E-03 | | | 1.6E-02 | 1.6E-02 | | | |
| Fluoranthene | 206-44-0 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | | 1.5E+03 | 1.5E+03 |
| Fluorene | 86-73-7 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | 2.9E+02 | 1.5E+03 | 2.4E+02 |
| Indeno[1,2,3-cd]pyrene | 193-39-5 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| Naphthalene | 91-20-3 | 1.2E-01 | 2.0E-02 | 1.2E-01 | 2.6E-03 | 5.5E-02 | 9.4E+00 | 1.1E-01 | 5.6E-01 | 9.2E-02 | 1.9E+01 | 7.3E+02 | 1.8E+01 |
| Pyrene | 129-00-0 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | 2.2E+02 | 1.1E+03 | 1.8E+02 |
| Prochloraz | 67747-09-5 | 1.5E-01 | 9.0E-03 | 1.5E-01 | 9.0E-03 | 4.4E-02 | 3.3E+01 | | 4.5E-01 | 4.5E-01 | | 3.3E+02 | 3.3E+02 |
| Profluralin | 26399-36-0 | | 6.0E-03 | | 6.0E-03 | | 2.2E+01 | | | | | 2.2E+02 | 2.2E+02 |
| Prometon | 1610-18-0 | | 1.5E-02 | | 1.5E-02 | | 5.5E+01 | | | | | 5.5E+02 | 5.5E+02 |
| Prometryn | 7287-19-6 | | 4.0E-03 | | 4.0E-03 | | 1.5E+01 | | | | | 1.5E+02 | 1.5E+02 |
| Pronamide | 23950-58-5 | | 7.5E-02 | | 7.5E-02 | | 2.7E+02 | | | | | 2.7E+03 | 2.7E+03 |
| Propachlor | 1918-16-7 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR: Cancer Risk = 1E-06 ($ug/m^3$) | AMBIENT AIR: Chronic HQ = 1 ($ug/m^3$) | TAP WATER: Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER: Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER: Cancer Risk = 1E-06 combined (ug/l) | TAP WATER: Chronic HQ = 1 water-inhale (ug/l) | TAP WATER: Chronic HQ = 1 water-ingest (ug/l) | TAP WATER: Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Propanil | 709-98-8 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Propargite | 2312-35-8 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Propargyl alcohol | 107-19-7 | | 2.0E-03 | | 2.0E-03 | | 7.3E+00 | | | | | 7.3E+01 | 7.3E+01 |
| Propazine | 139-40-2 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Propham | 122-42-9 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Propiconazole | 60207-90-1 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |
| Isopropylbenzene (see cumene) | 98-82-8 | | 1.0E-01 | | 1.1E-01 | | 4.0E+02 | | | | 8.0E+02 | 3.7E+03 | 6.6E+02 |
| n-Propylbenzene | 103-65-1 | | 4.0E-02 | | 4.0E-02 | | 1.5E+02 | | | | 2.9E+02 | 1.5E+03 | 2.4E+02 |
| Propylene glycol | 57-55-6 | | 5.0E-01 | | 8.6E-04 | | 3.1E+00 | | | | | 1.8E+04 | 1.8E+04 |
| Propylene glycol, monoethyl ether | 52125-53-8 | | 7.0E-01 | | 7.0E-01 | | 2.6E+03 | | | | | 2.6E+04 | 2.6E+04 |
| Propylene glycol, monomethyl ether | 107-98-2 | | 7.0E-01 | | 2.0E+00 | | 7.3E+03 | | | | | 2.6E+04 | 2.6E+04 |
| Propylene oxide | 75-56-9 | 2.4E-01 | 8.6E-03 | 1.3E-02 | 8.6E-03 | 5.1E-01 | 3.1E+01 | 1.0E+00 | 2.8E-01 | 2.2E-01 | 6.3E+01 | 3.1E+02 | 5.2E+01 |
| Pursuit | 81335-77-5 | | 2.5E-01 | | 2.5E-01 | | 9.1E+02 | | | | | 9.1E+03 | 9.1E+03 |
| Pydrin | 51630-58-1 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| Pyridine | 110-86-1 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| Quinalphos | 13593-03-8 | | 5.0E-04 | | 5.0E-04 | | 1.8E+00 | | | | | 1.8E+01 | 1.8E+01 |
| Quinoline | 91-22-5 | 3.0E+00 | | 3.0E+00 | | 2.2E-03 | | | 2.2E-02 | 2.2E-02 | | | |
| RDX (Cyclonite) | 121-82-4 | 1.1E-01 | 3.0E-03 | 1.1E-01 | 3.0E-03 | 6.0E-02 | 1.1E+01 | | 6.1E-01 | 6.1E-01 | | 1.1E+02 | 1.1E+02 |
| Resmethrin | 10453-86-8 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| Ronnel | 299-84-3 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Rotenone | 83-79-4 | | 4.0E-03 | | 4.0E-03 | | 1.5E+01 | | | | | 1.5E+02 | 1.5E+02 |
| Savey | 78587-05-0 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| Selenious Acid | 7783-00-8 | | 5.0E-03 | | | | | | | | | 1.8E+02 | 1.8E+02 |
| Selenium | 7782-49-2 | | 5.0E-03 | | 5.7E-03 | | 2.1E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Selenourea | 630-10-4 | | 5.0E-03 | | | | | | | | | 1.8E+02 | 1.8E+02 |
| Sethoxydim | 74051-80-2 | | 9.0E-02 | | 9.0E-02 | | 3.3E+02 | | | | | 3.3E+03 | 3.3E+03 |
| Silver and compounds | 7440-22-4 | | 5.0E-03 | | | | | | | | | 1.8E+02 | 1.8E+02 |
| Simazine | 122-34-9 | 1.2E-01 | 5.0E-03 | 1.2E-01 | 5.0E-03 | 5.5E-02 | 1.8E+01 | | 5.6E-01 | 5.6E-01 | | 1.8E+02 | 1.8E+02 |
| Sodium azide | 26628-22-8 | | 4.0E-03 | | | | | | | | | 1.5E+02 | 1.5E+02 |
| Sodium diethyldithiocarbamate | 148-18-5 | 2.7E-01 | 3.0E-02 | 2.7E-01 | 3.0E-02 | 2.5E-02 | 1.1E+02 | | 2.5E-01 | 2.5E-01 | | 1.1E+03 | 1.1E+03 |
| Sodium fluoroacetate | 62-74-8 | | 2.0E-05 | | 2.0E-05 | | 7.3E-02 | | | | | 7.3E-01 | 7.3E-01 |
| Sodium metavanadate | 13718-26-8 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| Strontium, stable | 7440-24-6 | | 6.0E-01 | | | | | | | | | 2.2E+04 | 2.2E+04 |
| Strychnine | 57-24-9 | | 3.0E-04 | | 3.0E-04 | | 1.1E+00 | | | | | 1.1E+01 | 1.1E+01 |
| Styrene | 100-42-5 | | 2.0E-01 | | 2.6E-01 | | 9.4E+02 | | | | 1.9E+03 | 7.3E+03 | 1.5E+03 |
| 1,1'-Sulfonylbis (4-chlorobenzene) | 80-07-9 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Systhane | 88671-89-0 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| 2,3,7,8-TCDD (dioxin) | 1746-01-6 | 1.3E+05 | | 1.3E+05 | 1.1E-08 | 5.1E-08 | 4.2E-05 | | 5.2E-07 | 5.2E-07 | | | |
| Tebuthiuron | 34014-18-1 | | 7.0E-02 | | 7.0E-02 | | 2.6E+02 | | | | | 2.6E+03 | 2.6E+03 |
| Temephos | 3383-96-8 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Terbacil | 5902-51-2 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |
| Terbufos | 13071-79-9 | | 2.5E-05 | | 2.5E-05 | | 9.1E-02 | | | | | 9.1E-01 | 9.1E-01 |
| Terbutryn | 886-50-0 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| 1,2,4,5-Tetrachlorobenzene | 95-94-3 | | 3.0E-04 | | 3.0E-04 | | 1.1E+00 | | | | | 1.1E+01 | 1.1E+01 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | 2.6E-02 | 3.0E-02 | 2.6E-02 | 3.0E-02 | 2.6E-01 | 1.1E+02 | 5.1E-01 | 2.6E+00 | 4.3E-01 | 2.2E+02 | 1.1E+03 | 1.8E+02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 2.7E-01 | 6.0E-02 | 2.0E-01 | 6.0E-02 | 3.3E-02 | 2.2E+02 | 6.6E-02 | 2.5E-01 | 5.2E-02 | 4.4E+02 | 2.2E+03 | 3.7E+02 |
| Tetrachloroethylene (PCE) | 127-18-4 | 5.4E-01 | 1.0E-02 | 2.1E-02 | 1.0E-02 | 3.2E-01 | 3.7E+01 | 6.3E-01 | 1.2E-01 | 1.0E-01 | 7.3E+01 | 3.7E+02 | 6.1E+01 |
| 2,3,4,6-Tetrachlorophenol | 58-90-2 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| p,a,a,a-Tetrachlorotoluene | 5216-25-1 | 2.0E+01 | | 2.0E+01 | | 3.3E-04 | | | 3.4E-03 | 3.4E-03 | | | |
| Tetrachlorovinphos | 961-11-5 | 2.4E-02 | 3.0E-02 | 2.4E-02 | 3.0E-02 | 2.8E-01 | 1.1E+02 | | 2.8E+00 | 2.8E+00 | | 1.1E+03 | 1.1E+03 |
| Tetraethyldithiopyrophosphate | 3689-24-5 | | 5.0E-04 | | 5.0E-04 | | 1.8E+00 | | | | | 1.8E+01 | 1.8E+01 |
| Tetrahydrofuran | 109-99-9 | 7.6E-03 | 2.1E-01 | 6.8E-03 | 8.6E-02 | 9.8E-01 | 3.1E+02 | 2.0E+00 | 8.8E+00 | 1.6E+00 | 6.3E+02 | 7.7E+03 | 5.8E+02 |
| Thallium and compounds+++ | 7440-28-0 | | 6.6E-05 | | | | | | | | | 2.4E+00 | 2.4E+00 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 (ug/m3) | AMBIENT AIR Chronic HQ = 1 (ug/m3) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thiobencarb | 28249-77-6 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| Thiocyanate | N/A | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| Thiofanox | 39196-18-4 | | 3.0E-04 | | 3.0E-04 | | 1.1E+00 | | | | | 1.1E+01 | 1.1E+01 |
| Thiophanate-methyl | 23564-05-8 | | 8.0E-02 | | 8.0E-02 | | 2.9E+02 | | | | | 2.9E+03 | 2.9E+03 |
| Thiram | 137-26-8 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Tin (inorganic, also see tributyltin oxide) | 7440-31-5 | | 6.0E-01 | | | | | | | | | 2.2E+04 | 2.2E+04 |
| Titanium | 7440-32-6 | | 4.0E+00 | | 8.6E-03 | | 3.1E+01 | | | | | 1.5E+05 | 1.5E+05 |
| Toluene | 108-88-3 | | 2.0E-01 | | 8.6E-02 | | 3.1E+02 | | | | 6.3E+02 | 7.3E+03 | 5.8E+02 |
| Toluene-2,4-diamine | 95-80-7 | 3.8E+00 | | 4.0E+00 | | 1.7E-03 | | | 1.8E-02 | 1.8E-02 | | | |
| Toluene-2,5-diamine | 95-70-5 | | 6.0E-01 | | 6.0E-01 | | 2.2E+03 | | | | | 2.2E+04 | 2.2E+04 |
| Toluene-2,6-diamine | 823-40-5 | | 2.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | | 7.3E+03 | 7.3E+03 |
| p-Toluidine | 106-49-0 | 1.9E-01 | | 1.9E-01 | | 3.5E-02 | | | 3.5E-01 | 3.5E-01 | | | |
| Toxaphene | 8001-35-2 | 1.2E+00 | | 1.2E+00 | | 5.5E-03 | | | 5.6E-02 | 5.6E-02 | | | |
| Tralomethrin | 66841-25-6 | | 7.5E-03 | | 7.5E-03 | | 2.7E+01 | | | | | 2.7E+02 | 2.7E+02 |
| Triallate | 2303-17-5 | | 1.3E-02 | | 1.3E-02 | | 4.7E+01 | | | | | 4.7E+02 | 4.7E+02 |
| Triasulfuron | 82097-50-5 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| 1,2,4-Tribromobenzene | 615-54-3 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | | 1.8E+02 | 1.8E+02 |
| Tributyl phosphate | 126-73-8 | 9.2E-03 | 2.0E-01 | 9.2E-03 | 2.0E-01 | 7.2E-01 | 7.3E+02 | | 7.3E+00 | 7.3E+00 | | 7.3E+03 | 7.3E+03 |
| Tributyltin oxide (TBTO) | 56-35-9 | | 3.0E-04 | | | | | | | | | 1.1E+01 | 1.1E+01 |
| 2,4,6-Trichloroaniline | 634-93-5 | 3.4E-02 | | 3.4E-02 | | 2.0E-01 | | | 2.0E+00 | 2.0E+00 | | | |
| 2,4,6-Trichloroaniline hydrochloride | 33663-50-2 | 2.9E-02 | | 2.9E-02 | | 2.3E-01 | | | 2.3E+00 | 2.3E+00 | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | 3.6E-03 | 1.0E-02 | | 1.0E-03 | | 3.7E+00 | | 1.9E+01 | 1.9E+01 | 7.3E+00 | 3.7E+02 | 7.2E+00 |
| 1,1,1-Trichloroethane | 71-55-6 | | 2.8E-01 | | 2.9E-01 | | 1.0E+03 | | | | 2.1E+03 | 1.0E+04 | 1.7E+03 |
| 1,1,2-Trichloroethane | 79-00-5 | 7.2E-02 | 4.0E-03 | 5.7E-02 | 4.0E-03 | 1.2E-01 | 1.5E+01 | 2.3E-01 | 9.3E-01 | 1.9E-01 | 2.9E+01 | 1.5E+02 | 2.4E+01 |
| Trichloroethylene (TCE) | 79-01-6 | 1.3E-02 | 3.0E-04 | 7.0E-03 | 1.7E-01 | 9.5E-01 | 6.3E+02 | 1.9E+00 | 5.2E+00 | 1.4E+00 | 1.3E+03 | 1.1E+01 | 1.1E+01 |
| Trichlorofluoromethane | 75-69-4 | | 3.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | 1.5E+03 | 1.1E+04 | 1.3E+03 |
| 2,4,5-Trichlorophenol | 95-95-4 | | 1.0E-01 | | 1.0E-01 | | 3.7E+02 | | | | | 3.7E+03 | 3.7E+03 |
| 2,4,6-Trichlorophenol | 88-06-2 | 7.0E-02 | 1.0E-04 | 7.0E-02 | 1.0E-04 | 9.5E-02 | 3.7E-01 | | 9.6E-01 | 9.6E-01 | | 3.7E+00 | 3.7E+00 |
| 2,4,5-Trichlorophenoxyacetic Acid | 93-76-5 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| 2-(2,4,5-Trichlorophenoxy) propionic acid | 93-72-1 | | 8.0E-03 | | 8.0E-03 | | 2.9E+01 | | | | | 2.9E+02 | 2.9E+02 |
| 1,1,2-Trichloropropane | 598-77-6 | | 5.0E-03 | | 5.0E-03 | | 1.8E+01 | | | | 3.7E+01 | 1.8E+02 | 3.0E+01 |
| 1,2,3-Trichloropropane | 96-18-4 | 2.0E+00 | 6.0E-03 | 2.0E+00 | 1.4E-03 | 3.3E-03 | 5.1E+00 | 6.6E-03 | 3.4E-02 | 5.5E-03 | 1.0E+01 | 2.2E+02 | 9.8E+00 |
| 1,2,3-Trichloropropene | 96-19-5 | | 1.0E-02 | | 3.0E-04 | | 1.1E+00 | | | | 2.2E+00 | 3.7E+02 | 2.2E+00 |
| Tridiphane | 58138-08-2 | | 3.0E-03 | | 3.0E-03 | | 1.1E+01 | | | | | 1.1E+02 | 1.1E+02 |
| Triethylamine | 121-44-8 | | 2.0E-03 | | 5.7E-02 | | 2.1E+02 | | | | 4.2E+02 | 7.3E+01 | 6.2E+01 |
| Trifluralin | 1582-09-8 | 7.7E-03 | 7.5E-03 | 7.7E-03 | 7.5E-03 | 8.6E-01 | 2.7E+01 | | 8.7E+00 | 8.7E+00 | | 2.7E+02 | 2.7E+02 |
| Trimellitic Anhydride (TMAN) | 552-30-7 | | 1.4E-04 | | 1.4E-04 | | 5.1E-01 | | | | | 5.1E+00 | 5.1E+00 |
| 1,2,4-Trimethylbenzene | 95-63-6 | | 5.0E-02 | | 1.7E-03 | | 6.2E+00 | | | | 1.2E+01 | 1.8E+03 | 1.2E+01 |
| 1,3,5-Trimethylbenzene | 108-67-8 | | 5.0E-02 | | 1.7E-03 | | 6.2E+00 | | | | 1.2E+01 | 1.8E+03 | 1.2E+01 |
| Trimethyl phosphate | 512-56-1 | 3.7E-02 | | 3.7E-02 | | 1.8E-01 | | | 1.8E+00 | 1.8E+00 | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | | 3.0E-02 | | 3.0E-02 | | 1.1E+02 | | | | | 1.1E+03 | 1.1E+03 |
| Trinitrophenylmethylnitramine | 479-45-8 | | 1.0E-02 | | 1.0E-02 | | 3.7E+01 | | | | | 3.7E+02 | 3.7E+02 |
| 2,4,6-Trinitrotoluene | 118-96-7 | 3.0E-02 | 5.0E-04 | 3.0E-02 | 5.0E-04 | 2.2E-01 | 1.8E+00 | | 2.2E+00 | 2.2E+00 | | 1.8E+01 | 1.8E+01 |
| Triphenylphosphine oxide | 791-28-6 | | 2.0E-02 | | 2.0E-02 | | 7.3E+01 | | | | | 7.3E+02 | 7.3E+02 |
| Tris(2-chloroethyl) phosphate | 115-96-8 | 1.4E-02 | 3.1E-01 | 1.4E-02 | 3.1E-01 | 4.7E-01 | 1.1E+03 | | 4.8E+00 | 4.8E+00 | | 1.1E+04 | 1.1E+04 |
| Tris(2-ethylhexyl) phosphate | 78-42-2 | 3.2E-03 | 1.0E-01 | 3.2E-03 | 1.0E-01 | 2.1E+00 | 3.7E+02 | | 2.1E+01 | 2.1E+01 | | 3.7E+03 | 3.7E+03 |
| Uranium (chemical toxicity only) | 7440-61-1 | | 2.0E-04 | | | | | | | | | 7.3E+00 | 7.3E+00 |
| Vanadium and compounds | 7440-62-2 | | 1.0E-03 | | | | | | | | | 3.7E+01 | 3.7E+01 |
| Vernam | 1929-77-7 | | 1.0E-03 | | 1.0E-03 | | 3.7E+00 | | | | | 3.7E+01 | 3.7E+01 |
| Vinclozolin | 50471-44-8 | | 2.5E-02 | | 2.5E-02 | | 9.1E+01 | | | | | 9.1E+02 | 9.1E+02 |
| Vinyl acetate | 108-05-4 | | 1.0E+00 | | 5.7E-02 | | 2.1E+02 | | | | 4.2E+02 | 3.7E+04 | 4.1E+02 |
| Vinyl bromide (bromoethene) | 593-60-2 | 1.1E-01 | 8.6E-04 | 1.1E-01 | 8.6E-04 | 6.0E-02 | 3.1E+00 | 1.2E-01 | 6.1E-01 | 1.0E-01 | 6.3E+00 | 3.1E+01 | 5.2E+00 |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 (ug/m3) | AMBIENT AIR Chronic HQ = 1 (ug/m3) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vinyl chloride (child/adult)+++ | 75-01-4 | 2.7E-01 | 3.0E-03 | 2.7E-01 | 2.9E-02 | 2.5E-02 | 1.0E+02 | 4.9E-02 | 2.5E-01 | 4.1E-02 | 2.1E+02 | 1.1E+02 | 7.2E+01 |
| Vinyl chloride (adult) | 75-01-4 | 2.7E-01 | 3.0E-03 | 2.7E-01 | 2.9E-02 | 2.5E-02 | 1.0E+02 | 4.9E-02 | 2.5E-01 | 4.1E-02 | 2.1E+02 | 1.1E+02 | 7.2E+01 |
| Warfarin | 81-81-2 | | 3.0E-04 | | 3.0E-04 | | 1.1E+00 | | | | | 1.1E+01 | 1.1E+01 |
| Xylenes | 1330-20-7 | | 2.0E-01 | | 2.0E-01 | | 7.3E+02 | | | | 1.5E+03 | 7.3E+03 | 1.2E+03 |
| Zinc | 7440-66-6 | | 3.0E-01 | | | | | | | | | 1.1E+04 | 1.1E+04 |
| Zinc phosphide | 1314-84-7 | | 3.0E-04 | | | | | | | | | 1.1E+01 | 1.1E+01 |
| Zineb | 12122-67-7 | | 5.0E-02 | | 5.0E-02 | | 1.8E+02 | | | | | 1.8E+03 | 1.8E+03 |
| 1,2,3,4,6,7,8,9-Octachlorodibenzofuran | 39001-02-0 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin | 3268-87-9 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | 1.3E+03 | | 1.3E+03 | | 5.1E-06 | | | 5.2E-05 | 5.2E-05 | | | |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 37871-00-4 | 1.3E+03 | | 1.3E+03 | | 5.1E-06 | | | 5.2E-05 | 5.2E-05 | | | |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | 1.3E+03 | | 1.3E+03 | | 5.1E-06 | | | 5.2E-05 | 5.2E-05 | | | |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 39227-28-6 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 57653-85-7 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 19408-74-3 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | 6.5E+03 | | 6.5E+03 | | 1.0E-06 | | | 1.0E-05 | 1.0E-05 | | | |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 40321-76-4 | 1.3E+05 | | 1.3E+05 | | 5.1E-08 | | | 5.2E-07 | 5.2E-07 | | | |
| 1,2-Dimethylhydrazine | 540-73-8 | 5.5E+02 | | 5.5E+02 | | 1.2E-05 | | | 1.2E-04 | 1.2E-04 | | | |
| 1,3-Propane sultone | 1120-71-4 | 2.4E+00 | | 2.4E+00 | | 2.8E-03 | | | 2.8E-02 | 2.8E-02 | | | |
| 1,6-Dinitropyrene | 42397-64-8 | 1.2E+02 | | 3.9E+01 | | 1.7E-04 | | | 5.6E-04 | 5.6E-04 | | | |
| 1,8-Dinitropyrene | 42397-65-9 | 1.2E+01 | | 3.9E+00 | | 1.7E-03 | | | 5.6E-03 | 5.6E-03 | | | |
| 1-[(5-Nitrofurfurylidene)-amino]-2-imidazolidinone | 555-84-0 | 1.8E+00 | | 1.8E+00 | | 3.7E-03 | | | 3.7E-02 | 3.7E-02 | | | |
| 1-Amino-2-methylanthraquinone | 82-28-0 | 1.5E-01 | | 1.5E-01 | | 4.4E-02 | | | 4.5E-01 | 4.5E-01 | | | |
| 1-Nitropyrene | 5522-43-0 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| 2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thiazole | 3570-75-0 | 2.3E+00 | | 2.3E+00 | | 2.9E-03 | | | 2.9E-02 | 2.9E-02 | | | |
| 2,3,3',4,4',5,5'-HpCB | 39635-31-9 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| 2,3,3',4,4',5'-HxCB | 69782-90-7 | 6.5E+01 | | 6.5E+01 | | 1.0E-04 | | | 1.0E-03 | 1.0E-03 | | | |
| 2,3,3',4,4',5-HxCB | 38380-08-4 | 6.5E+01 | | 6.5E+01 | | 1.0E-04 | | | 1.0E-03 | 1.0E-03 | | | |
| 2,3,3',4,4'-PeCB | 32598-14-4 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| 2,3',4,4',5,5'-HxCB | 52663-72-6 | 1.3E+00 | | 1.3E+00 | | 5.1E-03 | | | 5.2E-02 | 5.2E-02 | | | |
| 2',3,4,4',5-PeCB | 65510-44-3 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| 2,3',4,4',5-PeCB | 31508-00-6 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| 2,3,4,4',5-PeCB | 74472-37-0 | 6.5E+01 | | 6.5E+01 | | 1.0E-04 | | | 1.0E-03 | 1.0E-03 | | | |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 2,3,4,7,8,9-Hexachlorodibenzofuran | 57117-44-9 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | 6.5E+04 | | 6.5E+04 | | 1.0E-07 | | | 1.0E-06 | 1.0E-06 | | | |
| 2,3,7,8-Hexachlorodibenzo-p-dioxin (mixture) | HCDBPmix | 3.3E+03 | | 1.3E+04 | | 5.1E-07 | | | 2.0E-05 | 2.0E-05 | | | |
| 2,3,7,8-Tetrachlorodibenzofuran | 51207-31-9 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 2,4-Diaminoanisole | 615-05-4 | 2.3E-02 | | 2.3E-02 | | 2.9E-01 | | | 2.9E+00 | 2.9E+00 | | | |
| 2,4-Diaminoanisole sulfate | 39156-41-7 | 1.3E-02 | | 1.3E-02 | | 5.1E-01 | | | 5.2E+00 | 5.2E+00 | | | |
| 2-Acetylaminofluorene | 53-96-3 | 3.8E+00 | | 3.8E+00 | | 1.7E-03 | | | 1.8E-02 | 1.8E-02 | | | |
| 2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazol | 712-68-5 | 1.6E+01 | | 1.6E+01 | | 4.1E-04 | | | 4.2E-03 | 4.2E-03 | | | |
| 2-Aminoanthraquinone | 117-79-3 | 3.3E-02 | | 3.3E-02 | | 2.0E-01 | | | 2.0E+00 | 2.0E+00 | | | |
| 2-Methyl-1-nitroanthraquinone (of uncertain purity) | 129-15-7 | 4.3E+00 | | 4.3E+00 | | 1.5E-03 | | | 1.6E-02 | 1.6E-02 | | | |
| 2-Naphthylamine | 91-59-8 | 1.8E+00 | | 1.8E+00 | | 3.7E-03 | | | 3.7E-02 | 3.7E-02 | | | |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 ($ug/m^3$) | AMBIENT AIR Chronic HQ = 1 ($ug/m^3$) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Nitrofluorene | 607-57-8 | 1.2E-01 | | 3.9E-02 | | 1.7E-01 | | | 5.6E-01 | 5.6E-01 | | | |
| 3,3',4,4',5,5'-HxCB | 32774-16-6 | 1.3E+03 | | 1.3E+03 | | 5.1E-06 | | | 5.2E-05 | 5.2E-05 | | | |
| 3,3',4,4',5-PeCB | 57465-28-8 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| 3,3',4,4'-TCB | 32598-13-3 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| 3,4,4'5-TCB | 70362-50-4 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| 3-Amino-9-ethylcarbazolehydrochloride | 6109-97-3 | 7.8E-02 | | 7.8E-02 | | 8.5E-02 | | | 8.6E-01 | 8.6E-01 | | | |
| 3-Chloro-2-methylpropene | 563-47-3 | 1.4E-01 | | 1.4E-01 | | 4.7E-02 | | | 4.8E-01 | 4.8E-01 | | | |
| 3-Methylcholanthrene | 56-49-5 | 2.2E+01 | | 2.2E+01 | | 3.0E-04 | | | 3.1E-03 | 3.1E-03 | | | |
| 4,4-Diaminodiphenyl ether | 101-80-4 | 1.4E-01 | | 1.4E-01 | | 4.7E-02 | | | 4.8E-01 | 4.8E-01 | | | |
| 4,4-Methylene bis(2-methylaniline) | 838-88-0 | 9.2E-01 | | 9.2E-01 | | 7.2E-03 | | | 7.3E-02 | 7.3E-02 | | | |
| 4,4-Methylenedianiline dihydrochloride | 13552-44-8 | 1.2E+00 | | 1.2E+00 | | 5.5E-03 | | | 5.6E-02 | 5.6E-02 | | | |
| 4,4-Thiodianiline | 139-65-1 | 1.5E+01 | | 1.5E+01 | | 4.4E-04 | | | 4.5E-03 | 4.5E-03 | | | |
| 4-Aminobiphenyl (4-aminodiphenyl) | 92-67-1 | 2.1E+01 | | 2.1E+01 | | 3.2E-04 | | | 3.2E-03 | 3.2E-03 | | | |
| 4-Chloro-ortho-phenylenediamine | 95-83-0 | 1.6E-02 | | 1.6E-02 | | 4.1E-01 | | | 4.2E+00 | 4.2E+00 | | | |
| 4-Dimethylaminoazobenzene | 60-11-7 | 4.6E+00 | | 4.6E+00 | | 1.4E-03 | | | 1.5E-02 | 1.5E-02 | | | |
| 4-Nitropyrene | 57835-92-4 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| 5-Methylchrysene | 3697-24-3 | 1.2E+01 | | 3.9E+00 | | 1.7E-03 | | | 5.6E-03 | 5.6E-03 | | | |
| 5-Nitroacenaphthene | 602-87-9 | 1.3E-01 | | 1.3E-01 | | 5.1E-02 | | | 5.2E-01 | 5.2E-01 | | | |
| 6-Nitrochrysene | 7496-02-8 | 1.2E+02 | | 3.9E+01 | | 1.7E-04 | | | 5.6E-04 | 5.6E-04 | | | |
| 7,12-Dimethylbenz(a)anthracene | 57-97-6 | 2.5E+02 | | 2.5E+02 | | 2.7E-05 | | | 2.7E-04 | 2.7E-04 | | | |
| 7H-dibenzo(c,g)carbazole | 194-59-2 | 1.2E+01 | | 3.9E+00 | | 1.7E-03 | | | 5.6E-03 | 5.6E-03 | | | |
| A-alpha-C(2-Amino-9H-pyrido[2,3-b]indole) | 26148-68-5 | 4.0E-01 | | 4.0E-01 | | 1.7E-02 | | | 1.7E-01 | 1.7E-01 | | | |
| Acetamide | 60-35-5 | 7.0E-02 | | 7.0E-02 | | 9.5E-02 | | | 9.6E-01 | 9.6E-01 | | | |
| Actinomycin D | 50-76-0 | 8.7E+03 | | 8.7E+03 | | 7.6E-07 | | | 7.7E-06 | 7.7E-06 | | | |
| AF-2;[2-(2-furyl)-3(5-nitro-2-furyl)]acrylamide | 3688-53-7 | 2.4E-01 | | 2.4E-01 | | 2.8E-02 | | | 2.8E-01 | 2.8E-01 | | | |
| Amitrole | 61-82-5 | 9.4E-01 | | 9.4E-01 | | 7.1E-03 | | | 7.2E-02 | 7.2E-02 | | | |
| Asbestos [1/(100 PCM fibers/m^3)]^-1 | 1332-21-4 | | | 2.2E+02 | | 3.0E-05 | | | | | | | |
| Auramine | 492-80-8 | 8.8E-01 | | 8.8E-01 | | 7.5E-03 | | | 7.6E-02 | 7.6E-02 | | | |
| Azaserine | 115-02-6 | 1.1E+01 | | 1.1E+01 | | 6.0E-04 | | | 6.1E-03 | 6.1E-03 | | | |
| Azathioprine | 446-86-6 | 1.8E+00 | | 1.8E+00 | | 3.7E-03 | | | 3.7E-02 | 3.7E-02 | | | |
| Benzo(j)fluoranthene | 205-82-3 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| Benzyl violet 4B | 1694-09-3 | 2.0E-02 | | 2.0E-02 | | 3.3E-01 | | | 3.4E+00 | 3.4E+00 | | | |
| Beryllium oxide | 1304-56-9 | 7.0E+00 | | 8.4E+00 | | 7.9E-04 | | | 9.6E-03 | 9.6E-03 | | | |
| Beryllium sulfate | 13510-49-1 | 3.0E+03 | | 3.0E+03 | | 2.2E-06 | | | 2.2E-05 | 2.2E-05 | | | |
| beta-Butyrolactone | 3068-88-0 | 1.0E+00 | | 1.0E+00 | | 6.6E-03 | | | 6.7E-02 | 6.7E-02 | | | |
| beta-Propiolactone | 57-57-8 | 1.4E+01 | | 1.4E+01 | | 4.7E-04 | | | 4.8E-03 | 4.8E-03 | | | |
| Butylated hydroxyanisole | 25013-16-5 | 2.0E-04 | | 2.0E-04 | | 3.3E+01 | | | 3.4E+02 | 3.4E+02 | | | |
| C.I. Basic Red 9 monohydrochloride | 569-61-9 | 2.4E+02 | | 2.5E-01 | | 2.7E-02 | | | 2.8E-04 | 2.8E-04 | | | |
| Chlorambucil | 305-03-3 | 2.3E-03 | | 4.4E+02 | | 1.5E-05 | | | 2.9E+01 | 2.9E+01 | | | |
| Chlordane | 57-74-9 | 1.3E+00 | | 1.2E+00 | | 5.5E-03 | | | 5.2E-02 | 5.2E-02 | | | |
| Chlorendic acid | 115-28-6 | 9.1E-02 | | 9.1E-02 | | 7.3E-02 | | | 7.4E-01 | 7.4E-01 | | | |
| Chlorinated paraffins (Avg. chain length,C12:approx.60 | 108171-26-2 | 8.9E-02 | | 8.9E-02 | | 7.5E-02 | | | 7.6E-01 | 7.6E-01 | | | |
| Chloromethyl methyl ether (technical grade) | 107-30-2 | 2.4E+00 | | 2.4E+00 | | 2.8E-03 | | | 2.8E-02 | 2.8E-02 | | | |
| Chlorozotocin | 54749-90-5 | 2.4E+02 | | 2.4E+02 | | 2.8E-05 | | | 2.8E-04 | 2.8E-04 | | | |
| Cinnamyl anthranilate | 87-29-6 | 4.6E-03 | | 4.6E-03 | | 1.4E+00 | | | 1.5E+01 | 1.5E+01 | | | |
| Coke oven emissions | 8007-45-2 | | | 2.2E+00 | | 3.1E-03 | | | | | | | |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 ($ug/m^3$) | AMBIENT AIR Chronic HQ = 1 ($ug/m^3$) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cupferron | 135-20-6 | 2.2E-01 | | 2.2E-01 | | 3.0E-02 | | | 3.1E-01 | 3.1E-01 | | | |
| Cyclophosphamide (anhydrous) | 50-18-0 | 6.1E-01 | | 6.1E-01 | | 1.1E-02 | | | 1.1E-01 | 1.1E-01 | | | |
| Cyclophosphamide (hydrated) | 6055-19-2 | 5.7E-01 | | 5.7E-01 | | 1.2E-02 | | | 1.2E-01 | 1.2E-01 | | | |
| D & C Red No. 9 | 5160-02-1 | 5.3E-03 | | 5.3E-03 | | 1.3E+00 | | | 1.3E+01 | 1.3E+01 | | | |
| Dacarbazine | 4342-03-4 | 4.9E+01 | | 4.9E+01 | | 1.4E-04 | | | 1.4E-03 | 1.4E-03 | | | |
| Dantron | 117-10-2 | 7.6E-02 | | 7.6E-02 | | 8.7E-02 | | | 8.8E-01 | 8.8E-01 | | | |
| Dibenz(a,h)acridine | 226-36-8 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| Dibenz(a,j)acridine | 224-42-0 | 1.2E+00 | | 3.9E-01 | | 1.7E-02 | | | 5.6E-02 | 5.6E-02 | | | |
| Dibenzo(a,e)pyrene | 192-65-4 | 1.2E+01 | | 3.9E+00 | | 1.7E-03 | | | 5.6E-03 | 5.6E-03 | | | |
| Dibenzo(a,h)pyrene | 189-64-0 | 1.2E+02 | | 3.9E+01 | | 1.7E-04 | | | 5.6E-04 | 5.6E-04 | | | |
| Dibenzo(a,i)pyrene | 189-55-9 | 1.2E+02 | | 3.9E+01 | | 1.7E-04 | | | 5.6E-04 | 5.6E-04 | | | |
| Dibenzo(a,l)pyrene | 191-30-0 | 1.2E+02 | | 3.9E+01 | | 1.7E-04 | | | 5.6E-04 | 5.6E-04 | | | |
| Diesel exhaust particulate | DEP | | | 1.1E+00 | | 6.0E-03 | | | | | | | |
| Diglycidyl resorcinol ether (DGRE) | 101-90-6 | 1.7E+00 | | 1.7E+00 | | 3.9E-03 | | | 4.0E-02 | 4.0E-02 | | | |
| Dihydrosafrole | 94-58-6 | 4.4E-02 | | 4.4E-02 | | 1.5E-01 | | | 1.5E+00 | 1.5E+00 | | | |
| Dimethylcarbamyl chloride | 79-44-7 | 1.3E+01 | | 1.3E+01 | | 5.1E-04 | | | 5.2E-03 | 5.2E-03 | | | |
| Dimethylvinylchloride | 513-37-1 | 4.5E-02 | | 4.5E-02 | | 1.5E-01 | | | 1.5E+00 | 1.5E+00 | | | |
| Disperse Blue 1 (technical grade) | 2475-45-8 | 4.5E-03 | | 4.5E-03 | | 1.5E+00 | | | 1.5E+01 | 1.5E+01 | | | |
| Estradiol 17B | 50-28-2 | 3.9E+01 | | 3.9E+01 | | 1.7E-04 | | | 1.7E-03 | 1.7E-03 | | | |
| Ethyleneimine | 151-56-4 | 6.5E+01 | | 6.5E+01 | | 1.0E-04 | | | 1.0E-03 | 1.0E-03 | | | |
| d]imidazole) | 67730-11-4 | 4.8E+00 | | 4.8E+00 | | 1.4E-03 | | | 1.4E-02 | 1.4E-02 | | | |
| Glu-P-2 (2-Aminodipyrido[1,2-a:3',2'-d]indole) | 67730-10-3 | 1.4E+00 | | 1.4E+00 | | 4.7E-03 | | | 4.8E-02 | 4.8E-02 | | | |
| Gyromitrin | 16568-02-8 | 1.0E+01 | | 1.0E+01 | | 6.6E-04 | | | 6.7E-03 | 6.7E-03 | | | |
| HC Blue 1 | 2784-94-3 | 5.1E-02 | | 5.1E-02 | | 1.3E-01 | | | 1.3E+00 | 1.3E+00 | | | |
| Hexachlorodibenzo-p-dioxin | 34465-46-8 | 1.3E+04 | | 1.3E+04 | | 5.1E-07 | | | 5.2E-06 | 5.2E-06 | | | |
| Hydrazine Sulfate | 10034-93-2 | 3.0E+00 | | 3.0E+00 | | 2.2E-03 | | | 2.2E-02 | 2.2E-02 | | | |
| IQ (2-Amino-3-methylimidazo-[4,5-f]quinoline) | 76180-96-6 | 1.4E+00 | | 1.4E+00 | | 4.7E-03 | | | 4.8E-02 | 4.8E-02 | | | |
| Lasiocarpine | 303-34-4 | 7.8E+00 | | 7.8E+00 | | 8.5E-04 | | | 8.6E-03 | 8.6E-03 | | | |
| Lead acetate | 301-04-2 | 2.8E-01 | | 2.8E-01 | | 2.4E-02 | | | 2.4E-01 | 2.4E-01 | | | |
| Lead subacetate | 1335-32-6 | 3.8E-02 | | 3.8E-02 | | 1.7E-01 | | | 1.8E+00 | 1.8E+00 | | | |
| Me-A-alpha-C (2-Amino-3-methyl-9H-pyrido[2,3-b]indole | 68006-83-7 | 1.2E+00 | | 1.2E+00 | | 5.5E-03 | | | 5.6E-02 | 5.6E-02 | | | |
| Melphalan | 3223-07-2 | 1.3E+02 | | 1.3E+02 | | 5.1E-05 | | | 5.2E-04 | 5.2E-04 | | | |
| Methyl methanesulfonate | 66-27-3 | 9.9E-02 | | 9.9E-02 | | 6.7E-02 | | | 6.8E-01 | 6.8E-01 | | | |
| Methylthiouracil | 56-04-2 | 4.0E-01 | | 4.0E-01 | | 1.7E-02 | | | 1.7E-01 | 1.7E-01 | | | |
| Michler's ketone | 90-94-8 | 8.6E-01 | | 8.6E-01 | | 7.7E-03 | | | 7.8E-02 | 7.8E-02 | | | |
| Mitomycin C | 50-07-7 | 8.2E+03 | | 8.2E+03 | | 8.1E-07 | | | 8.2E-06 | 8.2E-06 | | | |
| Monocrotaline | 315-22-0 | 1.0E+01 | | 1.0E+01 | | 6.6E-04 | | | 6.7E-03 | 6.7E-03 | | | |
| Nitrilotriacetic acid | 139-13-9 | 5.3E-03 | | 5.3E-03 | | 1.3E+00 | | | 1.3E+01 | 1.3E+01 | | | |
| Nitrilotriacetic acid, trisodium salt monohydrate | 18662-53-8 | 1.0E-02 | | 1.0E-02 | | 6.6E-01 | | | 6.7E+00 | 6.7E+00 | | | |
| Nitrofen (technical grade) | 1836-75-5 | 8.2E-02 | | 8.2E-02 | | 8.1E-02 | | | 8.2E-01 | 8.2E-01 | | | |
| N-Methyl-N-nitro-N-nitrosoguanidine | 70-25-7 | 8.3E+00 | | 8.3E+00 | | 8.0E-04 | | | 8.1E-03 | 8.1E-03 | | | |
| N-Nitrosomorpholine | 59-89-2 | 6.7E+00 | | 6.7E+00 | | 9.9E-04 | | | 1.0E-02 | 1.0E-02 | | | |
| N-Nitroso-N-ethylurea | 759-73-9 | 2.7E+01 | | 2.7E+01 | | 2.5E-04 | | | 2.5E-03 | 2.5E-03 | | | |
| N-Nitroso-N-methylurea | 684-93-5 | 1.2E+02 | | 1.2E+02 | | 5.5E-05 | | | 5.6E-04 | 5.6E-04 | | | |
| N-Nitroso-N-methylurethane | 615-53-2 | 1.1E+02 | | 1.1E+02 | | 6.0E-05 | | | 6.1E-04 | 6.1E-04 | | | |
| N-Nitrosonornicotine | 16543-55-8 | 1.4E+00 | | 1.4E+00 | | 4.7E-03 | | | 4.8E-02 | 4.8E-02 | | | |

**Table H-4**
**PRG Intercalculation Tables for Tap Water and Ambient Air with Updated OEHHA Toxicity Values**

| CONTAMINANT | CAS | SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | AMBIENT AIR Cancer Risk = 1E-06 ($ug/m^3$) | AMBIENT AIR Chronic HQ = 1 ($ug/m^3$) | TAP WATER Cancer Risk = 1E-06 water-inhale (ug/l) | TAP WATER Cancer Risk = 1E-06 water-ingest (ug/l) | TAP WATER Cancer Risk = 1E-06 combined (ug/l) | TAP WATER Chronic HQ = 1 water-inhale (ug/l) | TAP WATER Chronic HQ = 1 water-ingest (ug/l) | TAP WATER Chronic HQ = 1 combined (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosopiperidine | 100-75-4 | 9.4E+00 | | 9.4E+00 | | 7.1E-04 | | | 7.2E-03 | 7.2E-03 | | | |
| O-Phenylphenate, sodium | 132-27-4 | 3.0E-03 | | 3.0E-03 | | 2.2E+00 | | | 2.2E+01 | 2.2E+01 | | | |
| ortho-Aminoazotoluene | 97-56-3 | 3.8E+00 | | 3.8E+00 | | 1.7E-03 | | | 1.8E-02 | 1.8E-02 | | | |
| ortho-Anisidine | 90-04-0 | 1.4E-01 | | 1.4E-01 | | 4.7E-02 | | | 4.8E-01 | 4.8E-01 | | | |
| ortho-Anisidine hydrochloride | 134-29-2 | 1.1E-01 | | 1.1E-01 | | 6.0E-02 | | | 6.1E-01 | 6.1E-01 | | | |
| para-Cresidine | 120-71-8 | 1.5E-01 | | 1.5E-01 | | 4.4E-02 | | | 4.5E-01 | 4.5E-01 | | | |
| Phenacetin | 62-44-2 | 2.2E-03 | | 2.2E-03 | | 3.0E+00 | | | 3.1E+01 | 3.1E+01 | | | |
| Phenazopyridine | 94-78-0 | 1.7E-01 | | 1.7E-01 | | 3.9E-02 | | | 4.0E-01 | 4.0E-01 | | | |
| Phenazopyridine hydrochloride | 136-40-3 | 1.5E-01 | | 1.5E-01 | | 4.4E-02 | | | 4.5E-01 | 4.5E-01 | | | |
| Phenesterin | 3546-10-9 | 1.5E+02 | | 1.5E+02 | | 4.4E-05 | | | 4.5E-04 | 4.5E-04 | | | |
| Phenobarbital | 50-06-6 | 4.6E-01 | | 4.6E-01 | | 1.4E-02 | | | 1.5E-01 | 1.5E-01 | | | |
| Phenoxybenzamine | 59-96-1 | 3.1E+00 | | 3.1E+00 | | 2.1E-03 | | | 2.2E-02 | 2.2E-02 | | | |
| Phenoxybenzamine hydrochloride | 63-92-3 | 2.7E+00 | | 2.7E+00 | | 2.5E-03 | | | 2.5E-02 | 2.5E-02 | | | |
| p-Nitrosodiphenylamine | 156-10-5 | 2.2E-02 | | 2.2E-02 | | 3.0E-01 | | | 3.1E+00 | 3.1E+00 | | | |
| Polybrominated biphenyls | PBB | 3.0E+01 | 7.0E-06 | 3.0E+01 | 7.0E-06 | 2.2E-04 | 2.6E-02 | | 2.2E-03 | 2.2E-03 | | 2.6E-01 | 2.6E-01 |
| Polychlorinated biphenyls | 133-63-63 | 5.0E+00 | | 2.0E+00 | | 3.3E-03 | | | 1.3E-02 | 1.3E-02 | | | |
| Ponceau 3R | 3564-09-8 | 1.6E-02 | | 1.6E-02 | | 4.1E-01 | | | 4.2E+00 | 4.2E+00 | | | |
| Ponceau MX (D&C Red No.5) | 3761-53-3 | 4.5E-03 | | 4.5E-03 | | 1.5E+00 | | | 1.5E+01 | 1.5E+01 | | | |
| Potassium bromate | 7758-01-2 | 4.9E-01 | | 4.9E-01 | | 1.4E-02 | | | 1.4E-01 | 1.4E-01 | | | |
| Procarbazine | 671-16-9 | 1.4E+01 | | 1.4E+01 | | 4.7E-04 | | | 4.8E-03 | 4.8E-03 | | | |
| Procarbazine hydrochloride | 366-70-1 | 1.2E+01 | | 1.2E+01 | | 5.5E-04 | | | 5.6E-03 | 5.6E-03 | | | |
| Propylthiouracil | 51-52-5 | 1.0E+00 | | 1.0E+00 | | 6.6E-03 | | | 6.7E-02 | 6.7E-02 | | | |
| Reserpine | 50-55-5 | 1.1E+01 | | 1.1E+01 | | 6.0E-04 | | | 6.1E-03 | 6.1E-03 | | | |
| Safrole | 94-59-7 | 2.2E-01 | | 2.2E-01 | | 3.0E-02 | | | 3.1E-01 | 3.1E-01 | | | |
| Sterigmatocystin | 10048-13-2 | 2.2E-01 | | 3.5E+01 | | 1.9E-04 | | | 3.1E-01 | 3.1E-01 | | | |
| Streptozotocin | 18883-66-4 | 1.1E+02 | | 1.1E+02 | | 6.0E-05 | | | 6.1E-04 | 6.1E-04 | | | |
| Styrene oxide | 96-09-3 | 1.6E-01 | | 1.6E-01 | | 4.1E-02 | | | 4.2E-01 | 4.2E-01 | | | |
| Sulfallate | 95-06-7 | 1.9E-01 | | 1.9E-01 | | 3.5E-02 | | | 3.5E-01 | 3.5E-01 | | | |
| Thioacetamide | 62-55-5 | 6.1E+00 | | 6.1E+00 | | 1.1E-03 | | | 1.1E-02 | 1.1E-02 | | | |
| Thiourea | 62-56-6 | 7.2E-02 | | 7.2E-02 | | 9.2E-02 | | | 9.3E-01 | 9.3E-01 | | | |
| Toluene diisocyanate | 26471-62-5 | 3.9E-02 | | 3.9E-02 | | 1.7E-01 | | | 1.7E+00 | 1.7E+00 | | | |
| trans-2[(Dimethylamino)-methylimino]-5-[2-(5-nitro-2-fur | 55738-54-0 | 4.4E-01 | | 4.4E-01 | | 1.5E-02 | | | 1.5E-01 | 1.5E-01 | | | |
| Tris-(1-aziridinyl)phosphine sulfide | 52-24-4 | 1.2E+01 | | 1.2E+01 | | 5.5E-04 | | | 5.6E-03 | 5.6E-03 | | | |
| Tris(2,3-dibromopropyl)phosphate | 126-72-7 | 2.3E+00 | | 2.3E+00 | | 2.9E-03 | | | 2.9E-02 | 2.9E-02 | | | |
| Trp-P-1 (Tryptophan-P-1) | 62450-06-0 | 2.6E+01 | | 2.6E+01 | | 2.6E-04 | | | 2.6E-03 | 2.6E-03 | | | |
| Trp-P-2 (Tryptophan-P-2) | 62450-07-1 | 3.2E+00 | | 3.2E+00 | | 2.1E-03 | | | 2.1E-02 | 2.1E-02 | | | |
| Urethane | 51-79-6 | 1.0E+00 | | 1.0E+00 | | 6.6E-03 | | | 6.7E-02 | 6.7E-02 | | | |

mg/kg-d = milligrams per kilogram per day
$\mu g/m^3$ = microgram per cubic meter
$\mu g/L$ = microgram per liter
mg/kg = milligrams per kilogram

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| ALAR | 1596845 | 8.90E+00 | 6.40E+00 | — |
| Acenaphthene | 83329 | 7.30E+02 | 5.20E+02 | — |
| Acenaphthylene | 208968 | — | — | — |
| Acephate | 30560191 | 5.70E-01 | 4.10E-01 | 3.50E-02 |
| Acetaldehyde | 75070 | — | — | — |
| Acetochlor | 34256821 | 1.70E+02 | 1.30E+02 | — |
| Acetone | 67641 | 2.90E+02 | 2.10E+02 | — |
| Acetone Cyanohydrin | 75865 | 1.30E+00 | 9.00E-01 | — |
| Acetonitrile | 75058 | 1.70E+00 | 1.20E+00 | — |
| Acetophenone | 98862 | 3.30E+02 | 2.30E+02 | — |
| Acrolein | 107028 | 1.90E-01 | 1.40E-01 | — |
| Acrylamide | 79061 | 3.60E-02 | 2.60E-02 | 8.60E-05 |
| Acrylic Acid | 79107 | 2.70E+02 | 1.90E+02 | — |
| Acrylonitrile | 107131 | 6.00E-01 | 4.30E-01 | 2.40E-03 |
| Alachlor | 15972608 | 8.20E+01 | 5.90E+01 | 2.20E-01 |
| Aldicarb | 116063 | 1.80E+00 | 1.30E+00 | — |
| Aldicarb Sulfone | 1646884 | 2.10E-01 | 1.50E-01 | — |
| Aldrin | 309002 | 2.60E-01 | 1.90E-01 | 1.10E-03 |
| Ally | 74223646 | 1.10E+02 | 7.90E+01 | — |
| Allyl Alcohol | 107186 | 1.60E+00 | 1.20E+00 | — |
| Allyl Chloride | 107051 | 1.20E+02 | 8.60E+01 | — |
| Aluminum | 7429905 | 1.30E+04 | 9.50E+03 | — |
| Aluminum Phosphide | 20859738 | — | — | — |
| Amdro | 67485294 | — | — | — |
| Ametryn | 834128 | 3.20E+01 | 2.30E+01 | — |
| Aminophenol, m- | 591275 | 4.60E+01 | 3.30E+01 | — |
| Aminophenol, p- | 123308 | — | — | — |
| Aminopyridine, 4- | 504245 | 1.20E-02 | 8.90E-03 | — |
| Amitraz | 33089611 | 3.30E+01 | 2.30E+01 | — |
| Ammonia | 7664417 | — | — | — |
| Ammonium Perchlorate | 7790989 | — | — | — |
| Ammonium Sulfamate | 7773060 | — | — | — |
| Aniline | 62533 | 9.40E+00 | 6.80E+00 | 5.10E-01 |
| Anthracene | 120127 | 3.70E+03 | 2.60E+03 | — |
| Antimony (metallic) | 7440360 | 5.10E+00 | 3.70E+00 | — |
| Antimony Pentoxide | 1314609 | — | — | — |
| Antimony Potassium Tartrate | 304610 | — | — | — |
| Antimony Tetroxide | 1332816 | — | — | — |
| Antimony Trioxide | 1309644 | — | — | — |
| Apollo | 74115245 | 1.20E+02 | 8.40E+01 | — |
| Aramite | 140578 | 6.30E+02 | 4.60E+02 | 1.10E+00 |
| Aroclor 1016 | 12674112 | 9.20E-01 | 6.60E-01 | 1.40E-02 |
| Aroclor 1221 | 11104282 | — | — | 1.30E-02 |
| Aroclor 1232 | 11141165 | — | — | 1.00E-02 |
| Aroclor 1242 | 53469219 | — | — | 1.30E-02 |
| Aroclor 1248 | 12672296 | — | — | 1.40E-02 |
| Aroclor 1254 | 11097691 | 2.60E-01 | 1.90E-01 | 1.40E-02 |
| Aroclor 1260 | 11096825 | — | — | 1.40E-02 |
| Arsenic Salts | 1 | — | — | — |
| Arsenic, Inorganic | 7440382 | 3.80E+00 | 2.80E+00 | 1.80E-02 |
| Arsine | 7784421 | — | — | — |
| Asbestos | 1332214 | — | — | — |
| Assure | 76578148 | 1.10E+02 | 7.80E+01 | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Asulam | 3337711 | 1.50E+01 | 1.10E+01 | — |
| Atrazine | 1912249 | 2.60E+02 | 1.90E+02 | 7.20E-02 |
| Avermectin B1 | 65195553 | — | — | — |
| Azobenzene | 103333 | — | — | 2.20E-01 |
| Barium | 7440393 | 2.60E+03 | 1.90E+03 | — |
| Barium Cyanide | 542621 | — | — | — |
| Baygon | 114261 | 1.20E+01 | 8.50E+00 | — |
| Bayleton | 43121433 | 1.70E+02 | 1.20E+02 | — |
| Baythroid | 68359375 | 3.30E+02 | 2.40E+02 | — |
| Benefin | 1861401 | 3.70E+03 | 2.70E+03 | — |
| Benomyl | 17804352 | 2.80E+02 | 2.00E+02 | — |
| Bentazon | 25057890 | 5.10E+01 | 3.70E+01 | — |
| Benz[a]anthracene | 56553 | — | — | 3.90E-02 |
| Benzaldehyde | 100527 | 5.60E+02 | 4.00E+02 | — |
| Benzene | 71432 | 1.90E+01 | 1.40E+01 | 1.90E-01 |
| Benzene, Ethyldimethyl | 29224553 | — | — | — |
| Benzene, Ethylmethyl | 25550145 | — | — | — |
| Benzene, Methylpropenyl | 768003 | — | — | — |
| Benzene, Methylpropyl | 28729546 | — | — | — |
| Benzene, Trimethyl | 25551137 | — | — | — |
| Benzenethiol | 108985 | 6.50E-02 | 4.70E-02 | — |
| Benzidine | 92875 | 6.40E+00 | 4.60E+00 | 2.00E-05 |
| Benzo[a]pyrene | 50328 | — | — | 3.90E-03 |
| Benzo[b]fluoranthene | 205992 | — | — | 3.90E-02 |
| Benzo[g,h,i]perylene | 191242 | — | — | — |
| Benzo[k]fluoranthene | 207089 | — | — | 3.90E-01 |
| Benzoic Acid | 65850 | 1.60E+04 | 1.10E+04 | — |
| Benzotrichloride | 98077 | — | — | 1.40E-03 |
| Benzyl Alcohol | 100516 | 8.50E+02 | 6.10E+02 | — |
| Benzyl Chloride | 100447 | 1.10E+01 | 8.10E+00 | 7.10E-02 |
| Beryllium and compounds | 7440417 | 2.60E+01 | 1.90E+01 | 6.60E-03 |
| Bidrin | 141662 | 1.80E-02 | 1.30E-02 | — |
| Biphenthrin | 82657043 | — | — | — |
| Biphenyl, 1,1'- | 92524 | 5.90E+02 | 4.20E+02 | — |
| Bis(2-chloro-1-methylethyl)ether (Technical) | 108601 | — | — | 2.10E-01 |
| Bis(2-chloroethoxy)methane | 111911 | 6.20E+00 | 4.50E+00 | |
| Bis(2-chloroethyl)ether | 111444 | — | — | 4.20E-03 |
| Bis(2-chloroisopropyl)ether | 39638329 | 1.90E+02 | 1.40E+02 | — |
| Bis(2-ethylhexyl)phthalate | 117817 | 2.50E+02 | 1.80E+02 | 2.00E+00 |
| Bis(chloromethyl)ether | 542881 | — | — | 6.90E-06 |
| Bisphenol A | 80057 | 5.30E+02 | 3.80E+02 | — |
| Boron And Borates Only | 7440428 | 5.50E+02 | 3.90E+02 | — |
| Boron Trifluoride | 7637072 | — | — | — |
| Bromate | 15541454 | 2.20E+01 | 1.60E+01 | 1.70E-02 |
| Bromobenzene | 108861 | — | — | — |
| Bromochloromethane | 74975 | — | — | — |
| Bromodichloromethane | 75274 | 9.50E+01 | 6.80E+01 | 1.70E-01 |
| Bromodiphenyl Ether, p- | 101553 | — | — | — |
| Bromoform | 75252 | 1.20E+02 | 8.70E+01 | 1.70E+00 |
| Bromomethane | 74839 | 2.70E+00 | 1.90E+00 | — |
| Bromophos | 2104963 | 6.40E+01 | 4.60E+01 | — |
| Bromotrichloromethane | 75627 | — | — | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Bromoxynil | 1689845 | 1.60E+01 | 1.20E+01 | — |
| Bromoxynil Octanoate | 1689992 | 2.60E+02 | 1.90E+02 | — |
| Butadiene, 1,3- | 106990 | — | — | — |
| Butanol, N- | 71363 | 9.90E+01 | 7.10E+01 | — |
| Butanone-2, 4-chloro-4,4-difluoro | 2 | — | — | — |
| Butyl Benzyl Phthlate | 85687 | 2.50E+03 | 1.80E+03 | 1.40E+01 |
| Butylate | 2008415 | 5.90E+02 | 4.30E+02 | — |
| Butylchloride, t- | 507200 | — | — | — |
| Butylphthalyl Butylglycolate | 85701 | 1.20E+04 | 8.60E+03 | — |
| Cacodylic Acid | 75605 | 1.30E-01 | 9.40E-02 | 3.80E-03 |
| Cadmium | 7440439 | 8.70E+00 | 6.20E+00 | — |
| Calcium Cyanide | 592018 | — | — | — |
| Caprolactam | 105602 | 1.70E+02 | 1.20E+02 | — |
| Captafol | 2425061 | 1.30E+01 | 9.40E+00 | 1.60E+00 |
| Captan | 133062 | 7.30E+02 | 5.20E+02 | 3.50E+00 |
| Carbaryl | 63252 | 5.60E+02 | 4.00E+02 | — |
| Carbazole | 86748 | — | — | 1.20E+00 |
| Carbofuran | 1563662 | 1.50E+01 | 1.10E+01 | — |
| Carbon Disulfide | 75150 | 5.20E+02 | 3.70E+02 | — |
| Carbon Tetrachloride | 56235 | 5.40E+00 | 3.90E+00 | 1.30E-01 |
| Carbosulfan | 55285148 | — | — | — |
| Carboxin | 5234684 | 4.70E+02 | 3.40E+02 | — |
| Ceric oxide | 1306383 | — | — | — |
| Cerium, Stable | 7440451 | — | — | — |
| Chloral | 75876 | — | — | — |
| Chloral Hydrate | 302170 | 1.50E+02 | 1.10E+02 | — |
| Chloramben | 133904 | 4.40E+01 | 3.20E+01 | — |
| Chloranil | 118752 | — | — | 2.80E-02 |
| Chlordane | 57749 | 6.50E+00 | 4.70E+00 | 8.00E-02 |
| Chlordecone (Kepone) | 145500 | — | — | — |
| Chloride | 16887006 | — | — | — |
| Chlorimuron, Ethyl- | 90982324 | 1.30E+02 | 9.30E+01 | — |
| Chlorine | 7782505 | 1.90E+01 | 1.40E+01 | — |
| Chlorine Dioxide | 10049044 | — | — | — |
| Chlorite (Sodium Salt) | 7758192 | — | — | — |
| Chloro-1,1-difluoroethane, 1- | 75683 | — | — | — |
| Chloro-1,3-butadiene, 2- | 126998 | 7.20E+01 | 5.20E+01 | — |
| Chloro-2-methylaniline HCl, 4- | 3165933 | — | — | 2.60E-02 |
| Chloro-2-methylaniline, 4- | 95692 | — | — | 2.00E-02 |
| Chloroacetic Acid | 79118 | 3.80E+00 | 2.70E+00 | — |
| Chloroacetophenone, 2- | 532274 | — | — | — |
| Chloroaniline, p- | 106478 | 3.10E+01 | 2.20E+01 | 3.10E-01 |
| Chlorobenzene | 108907 | 1.60E+02 | 1.10E+02 | — |
| Chlorobenzilate | 510156 | 2.50E+02 | 1.80E+02 | 9.90E-02 |
| Chlorobenzoic Acid, p- | 74113 | 1.50E+03 | 1.10E+03 | — |
| Chlorobenzotrifluoride, 4- | 98566 | 2.20E+02 | 1.60E+02 | — |
| Chlorobutane, 1- | 109693 | 2.80E+02 | 2.00E+02 | — |
| Chlorobutane, 2- | 78864 | — | — | — |
| Chlorocyclopentadiene | 41851507 | — | — | — |
| Chlorodibromoethane | 73506942 | — | — | — |
| Chlorodifluoromethane | 75456 | — | — | — |
| Chloroform | 67663 | 4.30E+01 | 3.10E+01 | 1.50E+00 |
| Chloromethane | 74873 | — | — | 2.30E-01 |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Chloromethyl Methyl Ether | 107302 | — | — | — |
| Chloronaphthalene, Beta- | 91587 | 9.40E+02 | 6.80E+02 | — |
| Chloronitrobenzene, o- | 88733 | 5.20E+00 | 3.70E+00 | 1.20E+00 |
| Chloronitrobenzene, p- | 100005 | 6.00E+00 | 4.30E+00 | 1.90E+00 |
| Chlorophenol, 2- | 95578 | 2.60E+01 | 1.90E+01 | — |
| Chlorophenyl Methyl Sulfide, p- | 123091 | — | — | — |
| Chlorophenyl Methyl Sulfoxide | 934736 | — | — | — |
| Chloropropane, 2- | 75296 | — | — | — |
| Chlorothalonil | 1897456 | 1.70E+02 | 1.20E+02 | 2.20E+00 |
| Chlorotoluene, o- | 95498 | 2.00E+02 | 1.50E+02 | — |
| Chlorotoluene, p- | 106434 | 7.10E+02 | 5.10E+02 | — |
| Chlorpropham | 101213 | 1.60E+03 | 1.20E+03 | — |
| Chlorpyrifos | 2921882 | 3.90E+01 | 2.80E+01 | — |
| Chlorpyrifos Methyl | 5598130 | 1.20E+02 | 8.70E+01 | — |
| Chlorsulfuron | 64902723 | 3.70E+00 | 2.70E+00 | — |
| Chlorthiophos | 60238564 | — | — | — |
| Chromium (III) (Insoluble Salts) | 16065831 | 2.00E+04 | 1.40E+04 | — |
| Chromium Salts | 3 | — | — | — |
| Chromium VI (particulates) | 18540299 | 4.00E+01 | 2.90E+01 | — |
| Chrysene | 218019 | — | — | 3.90E+00 |
| Cobalt | 7440484 | 2.40E+02 | 1.80E+02 | — |
| Coke Oven Emissions | 8007452 | — | — | — |
| Commercial Hexane | 4 | — | — | — |
| Copper | 7440508 | 4.10E+02 | 2.90E+02 | — |
| Copper Cyanide | 544923 | — | — | — |
| Creosote | 8001589 | — | — | — |
| Cresol, m- | 108394 | 2.20E+02 | 1.60E+02 | — |
| Cresol, o- | 95487 | 2.00E+02 | 1.40E+02 | — |
| Cresol, p- | 106445 | 2.00E+01 | 1.40E+01 | — |
| Cresol, p-chloro-m- | 59507 | — | — | — |
| Crotonaldehyde, trans- | 123739 | — | — | 4.10E-03 |
| Cumene | 98828 | 1.00E+03 | 7.50E+02 | — |
| Cyanazine | 21725462 | 1.00E+01 | 7.60E+00 | 1.40E-02 |
| Cyanide (CN-) | 57125 | 3.40E+01 | 2.40E+01 | — |
| Cyanogen | 460195 | 1.90E+01 | 1.40E+01 | — |
| Cyanogen Bromide | 506683 | — | — | — |
| Cyanogen Chloride | 506774 | 2.80E+01 | 2.00E+01 | — |
| Cyclohexane | 110827 | — | — | — |
| Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro- | 87843 | — | — | 1.20E+00 |
| Cyclohexanone | 108941 | 6.00E+03 | 4.30E+03 | — |
| Cyclohexylamine | 108918 | 5.30E+02 | 3.80E+02 | — |
| Cyclopentadiene | 542927 | — | — | — |
| Cyhalothrin/karate | 68085858 | 6.60E+01 | 4.80E+01 | — |
| Cypermethrin | 52315078 | 1.30E+02 | 9.50E+01 | — |
| Cyromazine | 66215278 | — | — | — |
| DDD | 72548 | 2.60E+01 | 1.90E+01 | 1.20E-01 |
| DDE | 72559 | — | — | 8.30E-02 |
| DDT | 50293 | 6.60E+00 | 4.70E+00 | 8.40E-02 |
| Dacthal | 1861321 | 1.20E+02 | 8.80E+01 | — |
| Dalapon | 75990 | 3.50E+01 | 2.50E+01 | — |
| Decabromodiphenyl Ether | 1163195 | 1.30E+02 | 9.30E+01 | — |
| Demeton | 8065483 | — | — | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Di(2-ethylhexyl)adipate | 103231 | 7.90E+03 | 5.70E+03 | 2.40E+01 |
| Diallate | 2303164 | — | — | 3.90E-02 |
| Diathane, 1,4- | 505293 | 2.30E+01 | 1.70E+01 | — |
| Diazinon | 333415 | 1.00E+01 | 7.30E+00 | — |
| Dibenz[a,h]anthracene | 53703 | — | — | 3.90E-03 |
| Dibenzofuran | 132649 | 2.40E+01 | 1.70E+01 | — |
| Dibromo-3-chloropropane, 1,2- | 96128 | 1.40E+00 | 9.90E-01 | 1.90E-02 |
| Dibromobenzene, 1,4- | 106376 | 1.10E+02 | 8.10E+01 | — |
| Dibromochloromethane | 124481 | 1.00E+02 | 7.40E+01 | 1.30E-01 |
| Dibromodichloromethane | 594183 | — | — | — |
| Dibromodiphenyl Ether, p,p'- | 2050477 | — | — | — |
| Dibromoethane, 1,2- | 106934 | 3.90E+01 | 2.80E+01 | 4.70E-03 |
| Dibromomethane (Methylene Bromide) | 74953 | 1.90E+01 | 1.40E+01 | — |
| Dibutyl Phthalate | 84742 | 1.30E+03 | 9.20E+02 | — |
| Dibutyltin Compounds | | — | — | — |
| Dicamba | 1918009 | 2.60E+02 | 1.90E+02 | — |
| Dichloro-2-butene, 1,4- | 764410 | — | — | — |
| Dichloroacetic Acid | 79436 | 5.50E+00 | 4.00E+00 | 5.90E-02 |
| Dichlorobenzene, 1,2- | 95501 | 9.10E+02 | 6.50E+02 | — |
| Dichlorobenzene, 1,3- | 541731 | — | — | — |
| Dichlorobenzene, 1,4- | 106467 | — | — | 9.10E-01 |
| Dichlorobenzidine, 3,3'- | 91941 | — | — | 5.00E-02 |
| Dichlorobenzophenone, 4,4'- | 90982 | 3.70E+02 | 2.70E+02 | — |
| Dichlorodifluoromethane | 75718 | 1.00E+03 | 7.40E+02 | — |
| Dichloroethane, 1,1- | 75343 | 7.20E+02 | 5.20E+02 | — |
| Dichloroethane, 1,2- | 107062 | 5.30E+01 | 3.80E+01 | 6.30E-02 |
| Dichloroethylene, 1,1- | 75354 | 1.80E+02 | 1.30E+02 | 1.30E-02 |
| Dichloroethylene, 1,2- (Mixed Isomers) | 540590 | 7.20E+00 | 5.20E+00 | — |
| Dichloroethylene, 1,2-cis- | 156592 | 4.00E+01 | 2.90E+01 | — |
| Dichloroethylene, 1,2-trans- | 156605 | 1.60E+01 | 1.20E+01 | — |
| Dichlorophenol, 2,4- | 120832 | 2.50E+01 | 1.80E+01 | — |
| Dichlorophenoxy Acetic Acid, 2,4- | 94757 | 6.50E+01 | 4.70E+01 | — |
| Dichlorophenoxy)butyric Acid, 4-(2,4- | 94826 | 8.40E+01 | 6.00E+01 | — |
| Dichloropropane, 1,2- | 78875 | — | — | 1.40E-01 |
| Dichloropropane, 1,3- | 142289 | — | — | — |
| Dichloropropanol, 2,3- | 616239 | 9.20E-01 | 6.60E-01 | — |
| Dichloropropene, 1,3- | 542756 | 8.80E+01 | 6.40E+01 | 6.40E-02 |
| Dichlorvos | 62737 | 2.20E+00 | 1.60E+00 | 3.30E-02 |
| Dicofol | 115322 | — | — | — |
| Dicyclopentadiene | 77736 | 6.50E+01 | 4.70E+01 | — |
| Dieldrin | 60571 | 6.20E-01 | 4.50E-01 | 1.70E-03 |
| Diethyl Phthalate | 84662 | 5.20E+03 | 3.70E+03 | — |
| Diethyl-p-nitrophenylphosphate | 311455 | — | — | — |
| Diethylene Glycol Dinitrate (DEGDN) | 693210 | — | — | — |
| Diethylene Glycol Monobutyl Ether | 112345 | 1.30E+00 | 9.30E-01 | — |
| Diethylene Glycol Monoethyl Ether | 111900 | 2.30E+01 | 1.70E+01 | — |
| Diethylformamide | 617845 | 1.80E-01 | 1.30E-01 | — |
| Diethylstilbesterol | 56531 | — | — | 6.00E-06 |
| Difenzoquat | 43222486 | — | — | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Diflubenzuron | 35367385 | 2.30E+02 | 1.60E+02 | — |
| Difluoroethane, 1,1- | 75376 | — | — | — |
| Diisopropyl Ether | 108203 | — | — | — |
| Diisopropyl Methylphosphonate | 1445756 | 1.30E+02 | 9.00E+01 | — |
| Dimethipin | 55290647 | 6.90E+00 | 5.00E+00 | — |
| Dimethoate | 60515 | 1.50E+00 | 1.10E+00 | — |
| Dimethoxybenzidine, 3,3'- | 119904 | — | — | 5.60E-01 |
| Dimethyl Sulfate | 77781 | — | — | — |
| Dimethyl methylphosphonate | 756796 | — | — | — |
| Dimethylaniline HCl, 2,4- | 21436964 | — | — | — |
| Dimethylaniline, 2,4- | 95681 | — | — | 1.50E-02 |
| Dimethylaniline, N,N- | 121697 | 1.40E+01 | 1.00E+01 | — |
| Dimethylbenzidine, 3,3'- | 119937 | — | — | 5.30E-03 |
| Dimethylethyl Lead | 107584407 | — | — | — |
| Dimethylformamide | 68122 | 1.20E+01 | 8.40E+00 | — |
| Dimethylhydrazine, 1,1- | 57147 | — | — | 6.70E-04 |
| Dimethylhydrazine, 1,2- | 540738 | — | — | — |
| Dimethylphenol, 2,4- | 105679 | 1.10E+02 | 8.10E+01 | — |
| Dimethylphenol, 2,6- | 576261 | 3.50E+00 | 2.50E+00 | — |
| Dimethylphenol, 3,4- | 95658 | 5.20E+00 | 3.70E+00 | — |
| Dimethylphthalate | 131113 | 2.90E+04 | 2.10E+04 | — |
| Dimethylterephthalate | 120616 | 8.60E+02 | 6.20E+02 | — |
| Dinitro-o-cresol, 4,6- | 534521 | 7.30E-01 | 5.30E-01 | — |
| Dinitro-o-cyclohexyl Phenol, 4,6- | 131895 | 2.40E-02 | 1.80E-02 | — |
| Dinitrobenzene, 1,2- | 528290 | 2.90E-01 | 2.10E-01 | — |
| Dinitrobenzene, 1,3- | 99650 | 2.90E-01 | 2.10E-01 | — |
| Dinitrobenzene, 1,4- | 100254 | 2.70E-01 | 2.00E-01 | — |
| Dinitrophenol, 2,4- | 51285 | 5.30E+00 | 3.80E+00 | — |
| Dinitrotoluene Mixture, 2,4/2,6- | 25321146 | 8.70E+00 | 6.30E+00 | 1.40E-02 |
| Dinitrotoluene, 2,4- | 121142 | 8.70E+00 | 6.30E+00 | 1.40E-02 |
| Dinitrotoluene, 2,6- | 606202 | 3.30E+00 | 2.40E+00 | 1.00E-02 |
| Dinitrotoluene, 2-Amino-4,6- | 35572782 | — | — | — |
| Dinitrotoluene, 4-Amino-2,6- | 19406510 | — | — | — |
| Dinoseb | 88857 | 1.10E+01 | 7.90E+00 | — |
| Dioxane, 1,4- | 123911 | — | — | 6.00E-02 |
| Diphenamid | 957517 | 1.50E+02 | 1.10E+02 | — |
| Diphenyl Sulfone | 127639 | — | — | — |
| Diphenylamine | 122394 | 2.60E+02 | 1.90E+02 | — |
| Diphenylhydrazine, 1,2- | 122667 | — | — | 2.20E-02 |
| Diquat | 85007 | 1.70E-02 | 1.20E-02 | — |
| Direct Black 38 | 1937377 | — | — | 1.10E-03 |
| Direct Blue 6 | 2602462 | — | — | — |
| Direct Brown 95 | 16071866 | — | — | — |
| Direct Sky Blue | 2610051 | — | — | — |
| Disulfoton | 298044 | 4.60E-01 | 3.30E-01 | — |
| Diuron | 330541 | 1.50E+01 | 1.10E+01 | — |
| Dodine | 2439103 | 2.80E+01 | 2.00E+01 | — |
| EPTC | 759944 | 2.40E+02 | 1.70E+02 | — |
| Endosulfan | 115297 | 6.30E+01 | 4.60E+01 | — |
| Endothall | 145733 | 8.00E+01 | 5.80E+01 | — |
| Endrin | 72208 | 3.70E+00 | 2.70E+00 | — |
| Epichlorohydrin | 106898 | 2.00E+00 | 1.50E+00 | 7.30E-02 |
| Epoxybutane, 1,2- | 106887 | — | — | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Ethephon | 16672870 | 2.30E+00 | 1.70E+00 | — |
| Ethion | 563122 | 6.40E+00 | 4.60E+00 | — |
| Ethoxyethanol Acetate, 2- | 111159 | 3.00E+02 | 2.10E+02 | — |
| Ethoxyethanol, 2- | 110805 | 1.50E+02 | 1.10E+02 | — |
| Ethyl Acetate | 141786 | 1.10E+03 | 7.80E+02 | — |
| Ethyl Acrylate | 140885 | — | — | 9.60E-02 |
| Ethyl Chloride | 75003 | 9.50E+02 | 6.90E+02 | 1.80E+00 |
| Ethyl Ether | 60297 | 2.60E+02 | 1.90E+02 | — |
| Ethyl Methacrylate | 97632 | 3.60E+02 | 2.60E+02 | — |
| Ethyl-p-nitrophenyl Phosphonate | 2104645 | 1.10E-01 | 8.10E-02 | — |
| Ethylbenzene | 100414 | 9.00E+02 | 6.50E+02 | — |
| Ethylene Cyanohydrin | 109784 | 1.80E+00 | 1.30E+00 | — |
| Ethylene Diamine | 107153 | 4.20E+01 | 3.00E+01 | — |
| Ethylene Glycol | 107211 | 7.10E+01 | 5.10E+01 | — |
| Ethylene Glycol Monobutyl Ether | 111762 | 6.20E+02 | 4.40E+02 | — |
| Ethylene Oxide | 75218 | — | — | 6.20E-04 |
| Ethylene Thiourea | 96457 | 1.50E-02 | 1.10E-02 | 3.60E-03 |
| Ethylphthalyl Ethyl Glycolate | 84720 | 1.50E+04 | 1.10E+04 | — |
| Express | 101200480 | — | — | — |
| Fenamiphos | 22224926 | 2.40E+00 | 1.70E+00 | — |
| Fenpropathrin | 39515418 | 3.30E+02 | 2.40E+02 | — |
| Fluometuron | 2164172 | 7.80E+01 | 5.60E+01 | — |
| Fluoranthene | 206440 | 5.10E+02 | 3.70E+02 | — |
| Fluorene | 86737 | 4.90E+02 | 3.50E+02 | — |
| Fluorine (Soluble Fluoride) | 7782414 | — | — | — |
| Fluridone | 59756604 | 7.40E+02 | 5.30E+02 | — |
| Flurprimidol | 56425913 | 2.00E+02 | 1.40E+02 | — |
| Flutolanil | 66332965 | — | — | — |
| Fluvalinate | 69409945 | 1.30E+02 | 9.50E+01 | — |
| Folpet | 133073 | 9.00E+02 | 6.50E+02 | 5.60E+00 |
| Fomesafen | 72178020 | — | — | 9.40E-02 |
| Fonofos | 944229 | 2.30E+01 | 1.70E+01 | — |
| Formaldehyde | 50000 | 8.70E+01 | 6.20E+01 | — |
| Formic Acid | 64186 | 4.30E+02 | 3.10E+02 | — |
| Fosetyl-AL | 39148248 | — | — | — |
| Furan | 110009 | 2.10E+00 | 1.50E+00 | — |
| Furazolidone | 67458 | — | — | 5.80E-04 |
| Furfural | 98011 | 3.10E+01 | 2.20E+01 | — |
| Furium | 531828 | — | — | — |
| Furmecyclox | 60568050 | — | — | — |
| Glufosinate, Ammonium | 77182822 | — | — | — |
| Glycidyl | 765344 | 6.70E-02 | 4.80E-02 | — |
| Glyphosate | 1071836 | 8.10E-01 | 5.90E-01 | — |
| Goal | 42874033 | 3.80E+01 | 2.70E+01 | — |
| Haloxyfop, Methyl | 69806402 | 5.20E-01 | 3.80E-01 | — |
| Harmony | 79277273 | 3.70E+01 | 2.60E+01 | — |
| Heptachlor | 76448 | 6.10E+00 | 4.40E+00 | 5.80E-03 |
| Heptachlor Epoxide | 1024573 | 1.70E-01 | 1.20E-01 | 3.10E-03 |
| Heptane, N- | 142825 | — | — | — |
| Hexabromobenzene | 87821 | 2.60E+01 | 1.90E+01 | — |
| Hexachlorobenzene | 118741 | 1.00E+01 | 7.50E+00 | 1.80E-02 |
| Hexachlorobutadiene | 87683 | 2.50E+00 | 1.80E+00 | 3.50E-01 |
| Hexachlorocyclohexane, Alpha- | 319846 | — | — | 3.90E-03 |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Hexachlorocyclohexane, Beta- | 319857 | — | — | 1.40E-02 |
| Hexachlorocyclohexane, Delta- | 319868 | — | — | — |
| Hexachlorocyclohexane, Epsilon | 6108107 | — | — | — |
| Hexachlorocyclohexane, Gamma- | 58899 | 3.30E+00 | 2.40E+00 | 1.80E-02 |
| Hexachlorocyclohexane, Technical | 608731 | — | — | 1.40E-02 |
| Hexachlorocyclopentadiene | 77474 | 7.00E+01 | 5.00E+01 | — |
| Hexachlorodibenzo-p-dioxin, Mixture | 19408743 | — | — | 4.60E-06 |
| Hexachloroethane | 67721 | 1.10E+01 | 8.20E+00 | 1.80E+00 |
| Hexachlorophene | 70304 | 4.00E+00 | 2.90E+00 | — |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) | 121824 | 2.90E+01 | 2.10E+01 | 1.90E-01 |
| Hexamethylene Diisocyanate, 1,6- | 822060 | — | — | — |
| Hexane, N- | 110543 | 6.80E+02 | 4.90E+02 | — |
| Hexanedioic Acid | 124049 | — | — | — |
| Hexanone, 2- | 591786 | — | — | — |
| Hexazinone | 51235042 | 4.10E-02 | 3.00E-02 | — |
| HpCDD, 2,3,7,8- | 37871004 | — | — | 1.90E-05 |
| HpCDF, 2,3,7,8- | 38998753 | — | — | — |
| HxCDD, 2,3,7,8- | 34465468 | — | — | — |
| HxCDF, 2,3,7,8- | 55684941 | — | — | — |
| Hydrazine | 302012 | — | — | 2.00E-05 |
| Hydrazine Sulfate | 10034932 | — | — | 2.00E-05 |
| Hydrogen Chloride | 7647010 | — | — | — |
| Hydrogen Cyanide | 74908 | 1.40E+01 | 1.00E+01 | — |
| Hydrogen Sulfide | 7783064 | 4.30E+00 | 3.10E+00 | — |
| Hydroquinone | 123319 | 3.50E+01 | 2.50E+01 | 3.40E-02 |
| Imazalil | 35554440 | 1.50E+02 | 1.10E+02 | — |
| Imazaquin | 81335377 | 9.60E+02 | 6.90E+02 | — |
| Indeno[1,2,3-cd]pyrene | 193395 | — | — | 3.90E-02 |
| Iprodione | 36734197 | 3.40E+02 | 2.50E+02 | — |
| Iron | 7439896 | 4.00E+03 | 2.90E+03 | — |
| Isobutyl Alcohol | 78831 | 3.70E+02 | 2.70E+02 | — |
| Isophorone | 78591 | 6.50E+02 | 4.70E+02 | 7.40E+00 |
| Isopropalin | 33820530 | 2.00E+02 | 1.40E+02 | — |
| Isopropanol | 67630 | — | — | — |
| Isopropyl Methyl Phosphonic Acid | 1832548 | 6.10E+01 | 4.40E+01 | — |
| Isoxaben | 82558507 | — | — | — |
| Kerb | 23950585 | 7.60E+02 | 5.50E+02 | — |
| Lactofen | 77501634 | 2.50E+01 | 1.80E+01 | — |
| Lead Alkyls | 6 | — | — | — |
| Lead And Compounds | 7439921 | — | — | — |
| Linuron | 330552 | 1.90E+01 | 1.40E+01 | — |
| Lithium | 7439932 | — | — | — |
| Londax | 83055996 | 7.20E+02 | 5.20E+02 | — |
| MCPA | 94746 | 2.80E+00 | 2.00E+00 | — |
| MCPB | 94815 | 1.00E+02 | 7.50E+01 | — |
| MCPP | 93652 | 6.90E+00 | 5.00E+00 | — |
| Magnesium | 7439954 | — | — | — |
| Malathion | 121755 | 1.60E+02 | 1.20E+02 | — |
| Maleic Anhydride | 108316 | 4.30E+01 | 3.10E+01 | — |
| Maleic Hydrazide | 123331 | 1.30E+02 | 9.30E+01 | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Malononitrile | 109773 | 4.60E-02 | 3.30E-02 | — |
| Mancozeb | 8018017 | — | — | — |
| Maneb | 12427382 | 2.20E+00 | 1.60E+00 | — |
| Manganese | 7439965 | 1.50E+03 | 1.10E+03 | — |
| Mephosfolan | 950107 | 1.40E-01 | 1.00E-01 | — |
| Mepiquat Chloride | 24307264 | — | — | — |
| Mercuric Chloride | 7487947 | — | — | — |
| Mercuric Sulfide | 1344485 | — | — | — |
| Mercury (elemental) | 7439976 | — | — | — |
| Mercury, Inorganic Salts | 7439976 | 1.80E+00 | 1.30E+00 | — |
| Merphos | 150505 | 4.00E-01 | 2.90E-01 | — |
| Merphos Oxide | 78488 | 3.90E-01 | 2.80E-01 | — |
| Metalaxyl | 57837191 | 1.90E+02 | 1.30E+02 | — |
| Methacrylonitrile | 126987 | 8.60E-02 | 6.20E-02 | — |
| Methamidophos | 10265926 | 9.10E-03 | 6.60E-03 | — |
| Methanol | 67561 | 7.90E+01 | 5.70E+01 | — |
| Methidathion | 950378 | 6.10E+00 | 4.40E+00 | — |
| Methomyl | 16752775 | 2.30E+01 | 1.70E+01 | — |
| Methoxy-5-nitroaniline, 2- | 99592 | — | — | 1.20E-01 |
| Methoxychlor | 72435 | 6.10E+01 | 4.40E+01 | — |
| Methoxyethanol Acetate, 2- | 110496 | 1.10E+00 | 7.90E-01 | — |
| Methoxyethanol, 2- | 109864 | 4.70E-01 | 3.40E-01 | — |
| Methyl Acetate | 79209 | 5.50E+02 | 3.90E+02 | — |
| Methyl Acrylate | 96333 | 3.00E+01 | 2.20E+01 | — |
| Methyl Ethyl Ketone | 78933 | 3.70E+02 | 2.60E+02 | — |
| Methyl Hydrazine | 60344 | — | — | 7.90E-05 |
| Methyl Isobutyl Ketone | 108101 | 1.50E+02 | 1.10E+02 | — |
| Methyl Mercaptan | 74931 | — | — | — |
| Methyl Mercury | 22967926 | — | — | — |
| Methyl Methacrylate | 80626 | 3.00E+03 | 2.20E+03 | — |
| Methyl Parathion | 298000 | 9.90E-01 | 7.10E-01 | — |
| Methyl Phosphonic Acid | 993135 | — | — | — |
| Methyl Styrene (Mixed Isomers) | 25013154 | 5.90E+01 | 4.30E+01 | — |
| Methyl tert-Butyl Ether (MTBE) | 1634044 | — | — | 1.70E+00 |
| Methyl-5-Nitroaniline, 2- | 99558 | — | — | 2.90E-01 |
| Methylanaline, N- | 100618 | — | — | — |
| Methylaniline Hydrochloride, 2- | 636215 | — | — | 5.20E-03 |
| Methylcyclohexane | 108872 | — | — | — |
| Methylcyclopentane | 96377 | — | — | — |
| Methylene Chloride | 75092 | 1.20E+02 | 9.00E+01 | 6.00E-01 |
| Methylene-bis(2-chloroaniline), 4,4'- | 101144 | 2.30E+01 | 1.60E+01 | 2.20E-01 |
| Methylene-bis(N,N-dimethyl) Aniline, 4,4'- | 101611 | — | — | 5.90E-01 |
| Methylenebisbenzenamine, 4,4'- | 101779 | — | — | 2.60E-02 |
| Methylenediphenyl Diisocyanate | 101688 | — | — | — |
| Methylstyrene, Alpha- | 98839 | 6.90E+02 | 5.00E+02 | — |
| Methyltriethyl Lead | 1762283 | — | — | — |
| Metolachlor | 51218452 | 1.40E+03 | 9.90E+02 | — |
| Metribuzin | 21087649 | 8.20E+01 | 5.90E+01 | — |
| Mirex | 2385855 | 2.60E+00 | 1.90E+00 | 1.60E-02 |
| Molinate | 2212671 | 2.10E+01 | 1.50E+01 | — |
| Molybdenum | 7439987 | 5.10E+01 | 3.70E+01 | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Monobutyltin Compounds | | — | — | — |
| Monochloramine | 10599903 | — | — | — |
| Monochlorobutanes | 25154421 | — | — | — |
| N,N'-Diphenyl-1,4-benzenediamine | 74317 | — | — | — |
| Naled | 300765 | 1.60E+01 | 1.10E+01 | — |
| Naphthalene | 91203 | 1.90E+02 | 1.40E+02 | — |
| Naphthalene, 1-Methyl | 90120 | — | — | — |
| Naphthalene, 2-Methyl | 91576 | 4.60E+01 | 3.30E+01 | — |
| Napropamide | 15299997 | 1.00E+02 | 7.20E+01 | — |
| Niagara Blue 4B | 2429745 | — | — | — |
| Nickel Carbonyl | 13463393 | — | — | — |
| Nickel Refinery Dust | 7 | — | — | — |
| Nickel Soluble Salts | 7440020 | 2.20E+02 | 1.60E+02 | — |
| Nickel Subsulfide | 12035722 | — | — | — |
| Nitrapyrin | 1929824 | 1.30E+01 | 9.30E+00 | — |
| Nitrate | 14797558 | — | — | — |
| Nitric Oxide | 10102439 | — | — | — |
| Nitrite | 14797650 | — | — | — |
| Nitroaniline, 2- | 88744 | 1.10E+01 | 7.80E+00 | — |
| Nitroaniline, 3- | 99092 | — | — | — |
| Nitroaniline, 4- | 100016 | — | — | — |
| Nitrobenzene | 98953 | 1.80E+00 | 1.30E+00 | — |
| Nitrofurantoin | 67209 | 1.70E+01 | 1.20E+01 | — |
| Nitrofurazone | 59870 | — | — | 8.30E-04 |
| Nitrogen Dioxide | 10102440 | — | — | — |
| Nitroglycerin | 55630 | — | — | — |
| Nitroguanidine | 556887 | 1.40E+01 | 9.80E+00 | — |
| Nitromethane | 75525 | — | — | — |
| Nitrophenol, 4- | 100027 | 3.20E+01 | 2.30E+01 | — |
| Nitropropane, 2- | 79469 | — | — | 2.00E-04 |
| Nitroso-N-ethylurea, N- | 759739 | — | — | 9.00E-06 |
| Nitroso-N-methylurea, N- | 684935 | — | — | — |
| Nitroso-di-N-butylamine, N- | 924163 | — | — | 1.60E-03 |
| Nitroso-di-N-propylamine, N- | 621647 | — | — | 7.40E-04 |
| Nitrosodiethanolamine, N- | 1116547 | — | — | 4.10E-05 |
| Nitrosodiethylamine, N- | 55185 | — | — | 1.20E-05 |
| Nitrosodimethylamine, N- | 62759 | 1.60E-03 | 1.20E-03 | 8.70E-06 |
| Nitrosodiphenylamine, N- | 86306 | 1.80E+02 | 1.30E+02 | 4.00E+00 |
| Nitrosomethylethylamine, N- | 10595956 | — | — | 4.50E-05 |
| Nitrosomethylvinylamine, N- | 4549400 | — | — | — |
| Nitrosopyrrolidine, N- | 930552 | — | — | 1.10E-04 |
| Nitrotoluene, 4-Amino-2- | 119324 | — | — | — |
| Nitrotoluene, m- | 99081 | 1.20E+02 | 8.70E+01 | — |
| Nitrotoluene, o- | 88722 | 5.60E+01 | 4.00E+01 | 5.30E-02 |
| Nitrotoluene, p- | 99990 | 6.00E+01 | 4.30E+01 | 7.70E-01 |
| Norflurazon | 27314132 | 2.20E+02 | 1.60E+02 | — |
| Nustar | 85509199 | — | — | — |
| OCDD | 3268879 | — | — | 1.90E-04 |
| OCDF | 39001020 | — | — | 1.90E-04 |
| Octabromodiphenyl Ether | 32536520 | — | — | — |
| Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetra (HMX) < | 2691410 | 4.60E+01 | 3.30E+01 | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Octamethylpyrophosphoramide | 152169 | 4.40E-01 | 3.20E-01 | — |
| Octyl Phthalate, di-N- | 117840 | 5.30E+02 | 3.80E+02 | — |
| Oryzalin | 19044883 | 3.70E+02 | 2.70E+02 | — |
| Oxadiazon | 19666309 | 6.30E+01 | 4.60E+01 | — |
| Oxamyl | 23135220 | 5.80E+00 | 4.20E+00 | — |
| Paclobutrazol | 76738620 | 1.20E+02 | 8.80E+01 | — |
| Paraquat | 1910425 | 7.20E-03 | 5.20E-03 | — |
| Parathion | 56382 | 6.70E+01 | 4.80E+01 | — |
| PeCDD, 2,3,7,8- | 36088229 | — | — | 3.80E-07 |
| PeCDF, 1,2,3,7,8- | 57117416 | — | — | 3.80E-07 |
| PeCDF, 2,3,4,7,8- | 57117314 | — | — | 3.80E-06 |
| Pebulate | 1114712 | 5.60E+02 | 4.10E+02 | — |
| Pendimethalin | 40487421 | 5.20E+02 | 3.70E+02 | — |
| Pentabromodiphenyl Ether | 32534819 | — | — | — |
| Pentachlorobenzene | 608935 | 1.00E+01 | 7.40E+00 | — |
| Pentachlorocyclopentadiene | 25329355 | — | — | — |
| Pentachloronitrobenzene | 82688 | 3.70E+01 | 2.70E+01 | 1.00E-01 |
| Pentachlorophenol | 87865 | 3.90E+02 | 2.80E+02 | 2.40E-01 |
| Pentyl Alcohol, N- | 71410 | — | — | — |
| Perchlorate and Perchlorate Salts | 7790989 | — | — | — |
| Permethrin | 52645531 | 5.20E+02 | 3.70E+02 | — |
| Phenanthrene | 85018 | — | — | — |
| Phenmedipham | 13684634 | 2.00E+01 | 1.40E+01 | — |
| Phenol | 108952 | 8.00E+02 | 5.70E+02 | — |
| Phenylenediamine, m- | 108452 | 9.70E-01 | 7.00E-01 | — |
| Phenylenediamine, o- | 95545 | — | — | 3.50E-02 |
| Phenylenediamine, p- | 106503 | 1.70E+01 | 1.20E+01 | — |
| Phenylmercuric Acetate | 62384 | 8.50E-02 | 6.10E-02 | — |
| Phenylphenol, 2- | 90437 | — | — | 1.00E+01 |
| Phorate | 298022 | 6.50E-01 | 4.70E-01 | — |
| Phosmet | 732116 | 1.60E+02 | 1.10E+02 | — |
| Phosphine | 7803512 | 1.70E+00 | 1.20E+00 | — |
| Phosphoric Acid | 7664382 | — | — | — |
| Phthalic Acid, P- | 100210 | 3.30E+03 | 2.40E+03 | — |
| Phthalic Anhydride | 85449 | 3.90E+02 | 2.80E+02 | — |
| Picloram | 1918021 | 4.20E+02 | 3.00E+02 | — |
| Picramic Acid (2-Amino-4,6-dinitrophenol) | 96913 | — | — | — |
| Picric Acid (2,4,6-Trinitrophenol) | 88891 | — | — | — |
| Pirimiphos, Methyl | 29232937 | 1.20E+02 | 8.60E+01 | — |
| Polybrominated Biphenyls | 59536651 | — | — | — |
| Polychlorinated Biphenyls (high risk) | 1336363 | — | — | 1.40E-02 |
| Polymeric Methylene Diphenyl Diisocyanate (PMDI) | 9016879 | — | — | — |
| Potassium Cyanide | 151508 | 1.60E+01 | 1.10E+01 | — |
| Potassium Perchlorate | 7778747 | — | — | — |
| Potassium Silver Cyanide | 506616 | — | — | — |
| Prochloraz | 67747095 | 1.10E+02 | 7.60E+01 | 1.70E-01 |
| Profluralin | 26399360 | 7.80E+01 | 5.60E+01 | — |
| Prometon | 1610180 | 8.40E+01 | 6.00E+01 | — |
| Prometryn | 7287196 | 2.60E+01 | 1.90E+01 | — |
| Propachlor | 1918167 | 6.60E+01 | 4.80E+01 | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Propanil | 709988 | 4.50E+01 | 3.30E+01 | — |
| Propargite | 2312358 | 2.60E+02 | 1.80E+02 | — |
| Propargyl Alcohol | 107197 | 5.30E-01 | 3.80E-01 | — |
| Propazine | 139402 | 1.20E+02 | 8.70E+01 | — |
| Propham | 122429 | 1.90E+02 | 1.40E+02 | — |
| Propiconazole | 60207901 | 1.40E+02 | 9.70E+01 | — |
| Propylene Glycol | 57556 | 2.30E+01 | 1.70E+01 | — |
| Propylene Glycol Monoethyl Ether | 1569024 | — | — | — |
| Propylene Glycol Monomethyl Ether | 107982 | 2.40E+02 | 1.70E+02 | — |
| Propylene Oxide | 75569 | — | — | 4.10E-03 |
| Pursuit | 81335775 | — | — | — |
| Pydrin | 51630581 | 3.10E+02 | 2.20E+02 | — |
| Pyrene | 129000 | 3.80E+02 | 2.70E+02 | — |
| Pyridine | 110861 | 2.10E+00 | 1.50E+00 | — |
| Quinalphos | 13593038 | 4.40E+00 | 3.20E+00 | — |
| Quinoline | 91225 | — | — | 3.40E-03 |
| Refractory Ceramic Fibers | 8 | — | — | — |
| Resmethrin | 10453868 | 4.00E+02 | 2.90E+02 | — |
| Ronnel | 299843 | 6.40E+02 | 4.60E+02 | — |
| Rotenone | 83794 | 4.70E+01 | 3.40E+01 | — |
| Savey | 78587050 | — | — | — |
| Selenious Acid | 7783008 | — | — | — |
| Selenite | 14124675 | — | — | — |
| Selenium | 7782492 | 4.80E+01 | 3.40E+01 | — |
| Selenium Sulfide | 7446346 | — | — | — |
| Selenourea | 630104 | — | — | — |
| Sethoxydim | 74051802 | 1.10E+03 | 7.90E+02 | — |
| Silver | 7440224 | 6.60E+01 | 4.80E+01 | — |
| Silver Cyanide | 506649 | — | — | — |
| Simazine | 122349 | 2.60E+01 | 1.90E+01 | 9.30E-02 |
| Sodium | 7440235 | — | — | — |
| Sodium Acifluorfen | 62476599 | — | — | — |
| Sodium Azide | 26628228 | — | — | — |
| Sodium Cyanide | 143339 | 5.90E+00 | 4.30E+00 | — |
| Sodium Diethyldithiocarbamate | 148185 | 1.80E+01 | 1.30E+01 | 4.90E-03 |
| Sodium Fluoroacetate | 62748 | 5.70E-05 | 4.10E-05 | — |
| Sodium Metavanadate | 13718268 | — | — | — |
| Sodium Perchlorate | 7601890 | — | — | — |
| Stirofos (Tetrachlorovinphos) | 961115 | 3.10E+02 | 2.30E+02 | 9.50E-01 |
| Strontium, Stable | 7440246 | 4.40E+03 | 3.20E+03 | — |
| Strychnine | 57249 | 1.20E+00 | 8.60E-01 | — |
| Styrene | 100425 | 1.60E+03 | 1.20E+03 | — |
| Sulfate | 14808798 | — | — | — |
| Sulfonylbis(4-chlorobenzene), 1,1'- | 80079 | — | — | — |
| Systhane | 88671890 | — | — | — |
| TCDD, 2,3,7,8- | 1746016 | — | — | 1.90E-07 |
| TCDF, 2,3,7,8- | 51207319 | — | — | 1.90E-06 |
| TCMTB | 21564170 | 2.90E+02 | 2.10E+02 | — |
| Tebuthiuron | 34014181 | 3.70E+01 | 2.60E+01 | — |
| Temephos | 3383968 | 2.60E+02 | 1.90E+02 | — |
| Terbacil | 5902512 | 5.10E+01 | 3.70E+01 | — |
| Terbufos | 13071799 | 2.70E-01 | 2.00E-01 | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Terbutryn | 886500 | 1.10E+01 | 8.00E+00 | — |
| Tetrabutyl Lead | 1920907 | — | — | — |
| Tetrachlorobenzene, 1,2,4,5- | 95943 | 3.70E+00 | 2.70E+00 | — |
| Tetrachloroethane, 1,1,1,2- | 630206 | 2.60E+02 | 1.90E+02 | 7.20E-01 |
| Tetrachloroethane, 1,1,2,2- | 79345 | 3.60E+02 | 2.60E+02 | 6.50E-02 |
| Tetrachloroethylene | 127184 | 6.90E+01 | 5.00E+01 | 2.80E-02 |
| Tetrachlorophenol, 2,3,4,6- | 58902 | 3.50E+02 | 2.50E+02 | — |
| Tetrachlorotoluene, p- alpha, alpha, alpha- | 5216251 | — | — | 1.30E-03 |
| Tetraethyl Dithiopyrophosphate | 3689245 | 4.30E+00 | 3.10E+00 | — |
| Tetraethyl Lead | 78002 | 6.00E-04 | 4.30E-04 | — |
| Tetrafluoroethane, 1,1,1,2- | 811972 | — | — | — |
| Tetramethyl Lead | 75741 | — | — | — |
| Tetrapropyl Lead | 3440753 | — | — | — |
| Thallic Oxide | 1314325 | — | — | — |
| Thallium (I) Nitrate | 10102451 | — | — | — |
| Thallium (Soluble Salts) | 7440280 | — | — | — |
| Thallium Acetate | 563688 | — | — | — |
| Thallium Carbonate | 6533739 | — | — | — |
| Thallium Chloride | 7791120 | — | — | — |
| Thallium Selenite | 12039520 | — | — | — |
| Thallium Sulfate | 7446186 | — | — | — |
| Thiobencarb | 28249776 | 1.00E+02 | 7.30E+01 | — |
| Thiocyanate | 463569 | 1.80E-01 | 1.30E-01 | — |
| Thiofanox | 39196184 | 1.40E-02 | 1.00E-02 | — |
| Thiophanate, Methyl | 23564058 | 1.90E+02 | 1.40E+02 | — |
| Thiram | 137268 | 1.60E+01 | 1.20E+01 | — |
| Thorium | 232 | — | — | — |
| Tin | 7440315 | 3.70E+03 | 2.70E+03 | — |
| Titanium | 7440326 | 5.30E+04 | 3.80E+04 | — |
| Toluene | 108883 | 5.90E+02 | 4.20E+02 | — |
| Toluene diisocyanate mixture (TDI) | 26471625 | — | — | — |
| Toluene-2,4-diamine | 95807 | — | — | 4.50E-04 |
| Toluene-2,5-diamine | 95705 | 3.20E+02 | 2.30E+02 | — |
| Toluene-2,6-diamine | 823405 | 7.60E+01 | 5.50E+01 | — |
| Toluidine, o- (Methylaniline, 2-) | 95534 | — | — | 1.90E-02 |
| Toluidine, p- | 106490 | — | — | 5.00E-02 |
| Total Petroleum Hydrocarbons (Aliphatic High) | 9 | — | — | — |
| Total Petroleum Hydrocarbons (Aliphatic Low) | 10 | — | — | — |
| Total Petroleum Hydrocarbons (Aliphatic Medium) | 11 | — | — | — |
| Total Petroleum Hydrocarbons (Aromatic High) | 12 | — | — | — |
| Total Petroleum Hydrocarbons (Aromatic Low) | 13 | — | — | — |
| Total Petroleum Hydrocarbons (Aromatic Medium) | 14 | — | — | — |
| Toxaphene | 8001352 | — | — | 2.50E-02 |
| Tralomethrin | 66841256 | — | — | — |
| Triallate | 2303175 | 1.50E+02 | 1.10E+02 | — |

**Table H-5**
**Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables**

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Triasulfuron | 82097505 | — | — | — |
| Tribromobenzene, 1,2,4- | 615543 | 6.30E+01 | 4.50E+01 | — |
| Tribromochloromethane | 594150 | — | — | — |
| Tribromodiphenyl Ether | 49690940 | — | — | — |
| Tributyl Phosphate | 126738 | — | — | — |
| Tributyltin Compounds | | — | — | — |
| Tributyltin Oxide | 56359 | — | — | — |
| Trichloro-1,2,2-trifluoroethane, 1,1,2-<sup>+</su | 76131 | 2.10E+05 | 1.50E+05 | — |
| Trichloro-2'-hydroxydiphenylether | 3380345 | — | — | — |
| Trichloroacetic Acid | 76039 | — | — | — |
| Trichloroaniline HCl, 2,4,6- | 33663502 | — | — | — |
| Trichloroaniline, 2,4,6- | 634935 | — | — | 6.70E-01 |
| Trichlorobenzene, 1,2,4- | 120821 | 1.20E+02 | 8.40E+01 | — |
| Trichloroethane, 1,1,1- | 71556 | 1.30E+03 | 9.30E+02 | — |
| Trichloroethane, 1,1,2- | 79005 | 1.70E+01 | 1.30E+01 | 1.70E-01 |
| Trichloroethylene | 79016 | 1.80E+00 | 1.30E+00 | 3.30E-02 |
| Trichlorofluoromethane | 75694 | 1.90E+03 | 1.40E+03 | — |
| Trichlorophenol, 2,4,5- | 95954 | 1.10E+03 | 8.10E+02 | — |
| Trichlorophenol, 2,4,6- | 88062 | — | — | 2.20E+00 |
| Trichlorophenoxy) Propionic Acid, 2(2,4,5- | 93721 | 9.10E+01 | 6.60E+01 | — |
| Trichlorophenoxyacetic Acid, 2,4,5- | 93765 | 1.20E+02 | 8.40E+01 | — |
| Trichloropropane, 1,1,2- | 598776 | 1.60E+01 | 1.10E+01 | — |
| Trichloropropane, 1,2,3- | 96184 | 7.50E+01 | 5.40E+01 | 3.90E-03 |
| Trichloropropene, 1,2,3- | 96195 | 7.70E+01 | 5.50E+01 | |
| Trichlorotoluene, 2,3,6- | 2077465 | — | — | — |
| Trichlorotoluene, alpha 2,6- | 2014837 | — | — | — |
| Tridiphane | 58138082 | — | — | — |
| Triethyl Lead | 5224237 | — | — | — |
| Triethylamine | 121448 | — | — | — |
| Trifluralin | 1582098 | 9.70E+01 | 7.00E+01 | 3.60E+00 |
| Trimethyl Lead | 7442139 | — | — | — |
| Trimethyl Phosphate | 512561 | — | — | 1.10E-02 |
| Trimethylbenzene, 1,2,4- | 95636 | 5.60E+02 | 4.00E+02 | — |
| Trimethylbenzene, 1,3,5- | 108678 | 5.10E+02 | 3.70E+02 | — |
| Trimethylethyl Lead | 1762261 | — | — | — |
| Trinitrobenzene, 1,3,5- | 99354 | 5.70E+01 | 4.10E+01 | — |
| Trinitrophenylmethylnitramine | 479458 | 1.70E+01 | 1.30E+01 | — |
| Trinitrotoluene, 2,4,6- | 118967 | 2.80E+00 | 2.00E+00 | 4.00E-01 |
| Triphenylphosphine Oxide | 791286 | — | — | — |
| Tripropyl Lead | 6618037 | — | — | — |
| Tris(2-chloroethyl)phosphate | 115968 | — | — | — |
| Tris(2-ethylhexyl)phosphate | 78422 | — | — | — |
| Tungsten | 7440337 | — | — | — |
| Uranium (Soluble Salts) | 238 | 7.90E+00 | 5.70E+00 | — |
| Vanadium Pentoxide | 1314621 | — | — | — |
| Vanadium Sulfate | 36907423 | — | — | — |
| Vanadium, Metallic | 7440622 | 9.20E+01 | 6.60E+01 | — |
| Vanadyl Sulfate | 27774136 | — | — | — |
| Vernolate | 1929777 | 1.10E+01 | 8.10E+00 | — |
| Vinclozolin | 50471448 | 2.30E+02 | 1.60E+02 | — |
| Vinyl Acetate | 108054 | 1.10E+03 | 7.90E+02 | — |

## Table H-5
## Region 4 Agricultural Soil PRGs for Chemicals for Ingestion of Fruit and Vegetables

| Analyte Name | CAS | Adult Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Child Ingestion of Fruit & Vegetables Contaminated Soil PRG Hazard Quotient = 1 (mg/kg) | Ingestion of Fruit & Vegetables Contaminated Soil PRG Cancer Risk = $10^{-6}$ (mg/kg) |
|---|---|---|---|---|
| Vinyl Bromide | 593602 | — | — | — |
| Vinyl Chloride | 75014 | 7.10E+00 | 5.10E+00 | 3.40E-03 |
| Warfarin | 81812 | 2.80E+00 | 2.00E+00 | — |
| White Phosphorus | 7723140 | — | — | — |
| Xylene, Mixture | 1330207 | 1.90E+03 | 1.40E+03 | — |
| Xylene, P- | 106423 | — | — | — |
| Xylene, m- | 108383 | 1.90E+04 | 1.30E+04 | — |
| Xylene, o- | 95476 | 1.90E+04 | 1.30E+04 | — |
| Zinc (Metallic) | 7440666 | 2.00E+03 | 1.40E+03 | — |
| Zinc Cyanide | 557211 | — | — | — |
| Zinc Phosphide | 1314847 | — | — | — |
| Zineb | 12122677 | 1.10E+02 | 7.70E+01 | — |
| Zirconium | 7440677 | — | — | — |

— = No PRG established for this chemical

mg/kg = milligrams per kilogram

PRG = Preliminary Remediation Goals

Source = Risk Assessment Information System (RAIS) developed for assessment of sites on the Oak Ridge Reservation in Oak Ridge, Tennessee and approved by EPA Region 4, , which were last updated in May 2007.

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | RfDi | O | abs. | CAS No. | | Residential | Industrial | | Ambient Air | | Tap Water | | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | (mg/kg-d) | C | soils | | | Soil (mg/kg) | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | | |
| 8.7E-03 | i | 4.0E-03 | i | 8.7E-03 | r | 4.0E-03 | r | 0.1 | 30560-19-1 | Acephate | 3.5E-02 | ca | 2.0E+02 | ca | 7.6E-01 | ca | 7.7E+00 | ca |
| | | | | 1.0E-02 | c | 2.6E-03 | i | y | 75-07-0 | Acetaldehyde | 8.3E+00 | ca | 1.8E+01 | ca | 6.6E-01 | ca | 1.3E+00 | ca |
| | | 2.0E-02 | i | | | 2.0E-02 | r | 0.1 | 34256-82-1 | Acetochlor | 1.2E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 9.0E-01 | i | | | 9.0E-01 | r | y | 67-64-1 | Acetone | 2.1E+02 | nc | 5.4E+04 | nc | 3.3E+03 | nc | 5.5E+03 | nc |
| | | 8.0E-04 | h | | | 8.0E-04 | r | 0.1 | 75-86-5 | Acetone cyanohydrin | 8.8E-01 | nc | 4.9E+02 | nc | 2.9E+00 | nc | 2.9E+01 | nc |
| | | 1.7E-02 | r | | | 1.7E-02 | i | y | 75-05-8 | Acetonitrile | 1.2E+00 | nc | 1.8E+03 | nc | 6.2E+01 | nc | 1.0E+02 | nc |
| | | 5.0E-04 | i | | | 1.7E-05 | c | y | 107-02-8 | Acrolein | 9.6E-02 | nc | 1.0E+00 | nc | 6.3E-02 | nc | 1.2E-01 | nc |
| 4.5E+00 | i | 2.0E-04 | i | 4.5E+00 | i | 2.0E-04 | r | 0.1 | 79-06-1 | Acrylamide | 8.6E-05 | ca | 3.8E-01 | ca | 1.5E-03 | ca | 1.5E-02 | ca |
| | | 5.0E-01 | i | | | 2.9E-04 | i | 0.1 | 79-10-7 | Acrylic acid | 1.9E+02 | nc | 1.0E+05 | max | 1.0E+00 | nc | 1.8E+04 | nc |
| | | | | | | | | y | 107-13-1 | Acrylonitrile | | | | | | | | |
| 1.0E+00 | r | 1.0E-03 | h | 1.0E+00 | c | 1.4E-03 | c | y | | "CAL-Modified PRG" | 2.3E-03 | ca | 1.2E-01 | ca | 6.6E-03 | ca | 1.1E-02 | ca |
| 5.6E-02 | c | 1.0E-02 | i | 8.0E-02 | r | 1.0E-02 | r | 0.1 | 15972-60-8 | Alachlor | 2.1E-01 | ca | 3.1E+01 | ca | 8.3E-02 | ca | 1.2E+00 | ca |
| 1.8E-02 | c | 1.5E-01 | i | 1.8E-02 | c | 1.5E-01 | r | 0.1 | 1596-84-5 | Alar | 6.4E+00 | nc | 9.6E+01 | ca | 3.7E-01 | ca | 3.7E+00 | ca |
| | | 1.0E-03 | i | | | 1.0E-03 | r | 0.1 | 116-06-3 | Aldicarb | 1.3E+00 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 1.0E-03 | i | | | 1.0E-03 | r | 0.1 | 1646-88-4 | Aldicarb sulfone | 1.5E-01 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| 1.7E+01 | i | 3.0E-05 | i | 1.7E+01 | c | 3.0E-05 | r | 0.1 | 309-00-2 | Aldrin | 1.1E-03 | ca | 1.0E-01 | ca | 3.9E-04 | ca | 4.0E-03 | ca |
| | | 2.5E-01 | i | | | 2.5E-01 | r | 0.1 | 74223-64-6 | Ally | 7.9E+01 | nc | 1.0E+05 | max | 9.1E+02 | nc | 9.1E+03 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r | 0.1 | 107-18-6 | Allyl alcohol | 1.2E+00 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| 2.1E-02 | c | 2.9E-04 | r | 2.1E-02 | c | 2.9E-04 | i | 0.1 | 107-05-1 | Allyl chloride | 1.5E+01 | nc | 8.2E+01 | ca | 3.2E-01 | ca | 3.2E+00 | ca |
| | | 1.0E+00 | p | | | 1.4E-03 | p | | 7429-90-5 | Aluminum | 8.4E+03 | nc | 1.0E+05 | max | 5.1E+00 | nc | 3.7E+04 | nc |
| | | 4.0E-04 | i | | | | | | 20859-73-8 | Aluminum phosphide | 3.1E+01 | nc | 4.1E+02 | nc | | | 1.5E+01 | nc |
| | | 3.0E-04 | i | | | 3.0E-04 | r | 0.1 | 67485-29-4 | Amdro | 1.8E+01 | nc | 1.8E+02 | nc | 1.1E+00 | nc | 1.1E+01 | nc |
| | | 9.0E-03 | i | | | 9.0E-03 | r | 0.1 | 834-12-8 | Ametryn | 2.2E+01 | nc | 5.5E+03 | nc | 3.3E+01 | nc | 3.3E+02 | nc |
| | | 2.0E-04 | n | | | 2.0E-04 | r | 0.1 | 1321-12-6 | Aminodinitrotoluene | 1.2E+01 | nc | 1.2E+02 | nc | | | | |
| | | 7.0E-02 | h | | | 7.0E-02 | r | 0.1 | 591-27-5 | m-Aminophenol | 3.3E+01 | nc | 4.3E+04 | nc | 2.6E+02 | nc | 2.6E+03 | nc |
| | | 2.0E-05 | h | | | 2.0E-05 | r | 0.1 | 504-24-5 | 4-Aminopyridine | 8.8E-03 | nc | 1.2E+01 | nc | 7.3E-02 | nc | 7.3E-01 | nc |
| | | 2.5E-03 | i | | | 2.5E-03 | r | 0.1 | 33089-61-1 | Amitraz | 2.0E+01 | nc | 1.5E+03 | nc | 9.1E+00 | nc | 9.1E+01 | nc |
| | | | | | | 5.7E-02 | c | | 7664-41-7 | Ammonia | 1.2E+08 | nc | 3.8E+08 | nc | 2.1E+02 | nc | | |
| | | 2.0E-01 | i | | | | | 0.1 | 7773-06-0 | Ammonium sulfamate | 1.2E+04 | nc | 1.0E+05 | max | | | 7.3E+03 | nc |
| 5.7E-03 | i | 7.0E-03 | p | 5.7E-03 | r | 2.9E-04 | i | 0.1 | 62-53-3 | Aniline | 5.1E-01 | ca | 3.0E+02 | ca | 1.0E+00 | nc | 1.2E+01 | ca |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | 4.0E-04 | i | | | | | 7440-36-0 | Antimony and compounds | 3.3E+00 | nc | 4.1E+02 | nc | | | 1.5E+01 | nc |
| | | 1.3E-02 | i | | | 1.3E-02 | r | 0.1 | 74115-24-5 Apollo | 7.6E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| 3.0E-02 | c | 5.0E-02 | h | 3.0E-02 | c | 5.0E-02 | r | 0.1 | 140-57-8 Aramite | 1.0E+00 | ca | 5.7E+01 | ca | 2.2E-01 | ca | 2.2E+00 | ca |
| | | | | | | | | 0.03 | 7440-38-2 Arsenic | | | | | | | | |
| 9.5E+00 | c | 3.0E-04 | i | 1.2E+01 | c | 8.6E-06 | c | 0.03 | "CAL-Modified PRG" | 1.4E-02 | ca | 2.5E-01 | ca | 5.5E-04 | ca | 7.1E-03 | ca |
| | | | | | | 1.4E-05 | i | | 7784-42-1 Arsine | 2.9E+04 | nc | 9.6E+04 | nc | 5.2E-02 | nc | | |
| | | 9.0E-03 | i | | | 9.0E-03 | r | 0.1 | 76578-14-8 Assure | 6.8E+01 | nc | 5.5E+03 | nc | 3.3E+01 | nc | 3.3E+02 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 3337-71-1 Asulam | 1.1E+01 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| 2.3E-01 | c | 3.5E-02 | i | 2.2E-01 | r | 3.5E-02 | r | 0.1 | 1912-24-9 Atrazine | 7.0E-02 | ca | 7.5E+00 | ca | 3.0E-02 | ca | 2.9E-01 | ca |
| | | 4.0E-04 | i | | | 4.0E-04 | r | 0.1 | 71751-41-2 Avermectin B1 | 2.4E+01 | nc | 2.5E+02 | nc | 1.5E+00 | nc | 1.5E+01 | nc |
| 1.1E-01 | i | | | 1.1E-01 | c | | | 0.1 | 103-33-3 Azobenzene | 2.1E-01 | ca | 1.6E+01 | ca | 6.0E-02 | ca | 6.1E-01 | ca |
| | | 7.0E-02 | i | | | 1.4E-04 | h | | 7440-39-3 Barium and compounds | 1.4E+03 | nc | 6.7E+04 | nc | 5.2E-01 | nc | 2.6E+03 | nc |
| | | 4.0E-03 | i | | | 4.0E-03 | r | 0.1 | 114-26-1 Baygon | 8.2E+00 | nc | 2.5E+03 | nc | 1.5E+01 | nc | 1.5E+02 | nc |
| | | 3.0E-02 | i | | | 3.0E-02 | r | 0.1 | 43121-43-3 Bayleton | 1.1E+02 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 | r | 0.1 | 68359-37-5 Baythroid | 2.1E+02 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| | | 3.0E-01 | i | | | 3.0E-01 | r | 0.1 | 1861-40-1 Benefin | 2.4E+03 | nc | 1.0E+05 | max | 1.1E+03 | nc | 1.1E+04 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 17804-35-2 Benomyl | 1.9E+02 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 3.0E-02 | i | | | 3.0E-02 | r | 0.1 | 25057-89-0 Bentazon | 3.6E+01 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| | | 1.0E-01 | i | | | 1.0E-01 | r | 0.1 | 100-52-7 Benzaldehyde | 3.8E+02 | nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| 1.0E-01 | c | 4.0E-03 | i | 1.0E-01 | c | 1.7E-02 | c | y | 71-43-2 Benzene | 9.1E-02 | ca | 3.9E-01 | ca | 6.6E-02 | ca | 1.1E-01 | ca |
| 5.0E+02 | c | 3.0E-03 | i | 5.0E+02 | c | 3.0E-03 | r | 0.1 | 92-87-5 Benzidine | 2.0E-05 | ca | 3.4E-03 | ca | 1.3E-05 | ca | 1.3E-04 | ca |
| | | 4.0E+00 | i | | | 4.0E+00 | r | 0.1 | 65-85-0 Benzoic acid | 1.0E+05 | max | 1.0E+05 | max | 1.5E+04 | nc | 1.5E+05 | nc |
| 1.3E+01 | i | | | 1.3E+01 | r | | | 0.1 | 98-07-7 Benzotrichloride | 1.3E-03 | ca | 1.3E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| | | 3.0E-01 | h | | | 3.0E-01 | r | 0.1 | 100-51-6 Benzyl alcohol | 5.9E+02 | nc | 1.0E+05 | max | 1.1E+03 | nc | 1.1E+04 | nc |
| 1.7E-01 | i | 2.9E-03 | r | 1.7E-01 | r | 2.9E-03 | n | y | 100-44-7 Benzyl chloride | 6.6E-02 | ca | 2.2E+00 | ca | 3.9E-02 | ca | 6.5E-02 | ca |
| | | 2.0E-03 | i | 8.4E+00 | i | 2.0E-06 | c | | 7440-41-7 Beryllium and compounds | 6.6E-03 | ca | 1.8E+03 | nc | 7.9E-04 | ca | 7.3E+01 | nc |
| | | 1.0E-04 | i | | | 1.0E-04 | r | 0.1 | 141-66-2 Bidrin | 1.3E-02 | nc | 6.2E+01 | nc | 3.7E-01 | nc | 3.7E+00 | nc |
| | | 1.5E-02 | i | | | 1.5E-02 | r | 0.1 | 82657-04-3 Biphenthrin (Talstar) | 9.2E+02 | nc | 9.2E+03 | nc | 5.5E+01 | nc | 5.5E+02 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | y | 92-52-4 1,1-Biphenyl | 3.7E+02 | nc | 2.3E+04 | nc | 1.8E+02 | nc | 3.0E+02 | nc |
| 2.5E+00 | c | | | 2.5E+00 | c | | | y | 111-44-4 Bis(2-chloroethyl)ether | 4.0E-03 | ca | 2.5E-01 | ca | 2.7E-03 | ca | 4.4E-03 | ca |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | RfDi | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | (mg/kg-d) | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| 7.0E-02 | x | 4.0E-02 | i | 3.5E-02 | x | 4.0E-02 r | y | | 108-60-1 | Bis(2-chloroisopropyl)ether | 2.0E-01 | ca | 7.4E+00 | ca | 1.9E-01 | ca | 2.7E-01 | ca |
| 4.6E+01 | c | | | 4.6E+01 | c | | y | | 542-88-1 | Bis(chloromethyl)ether | 6.8E-06 | ca | 2.0E-03 | ca | 1.4E-04 | ca | 2.4E-04 | ca |
| 7.0E-02 | x | 4.0E-02 | i | 3.5E-02 | x | 4.0E-02 r | y | | 108-60-1 | Bis(2-chloro-1-methylethyl)ether | 2.0E-01 | ca | 7.4E+00 | ca | 1.9E-01 | ca | 2.7E-01 | ca |
| 3.0E-03 | c | 2.0E-02 | i | 8.4E-03 | c | 2.0E-02 r | | 0.1 | 117-81-7 | Bis(2-ethylhexyl)phthalate (DEHP) | 2.0E+00 | ca | 5.7E+02 | ca | 7.9E-01 | ca | 2.2E+01 | ca |
| | | 5.0E-02 | i | | | 5.0E-02 r | | 0.1 | 80-05-7 | Bisphenol A | 3.4E+02 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 2.0E-01 | i | | | 5.7E-03 h | | | 7440-42-8 | Boron | 3.8E+02 | nc | 1.0E+05 | max | 2.1E+01 | nc | 7.3E+03 | nc |
| | | | | | | 2.0E-04 h | | | 7637-07-2 | Boron trifluoride | 4.1E+05 | nc | 1.3E+06 | nc | 7.3E-01 | nc | | |
| 7.0E-01 | i | 4.0E-03 | i | 7.0E-01 | r | 4.0E-03 r | | 0.1 | 15541-45-4 | Bromate | 1.7E-02 | ca | 2.5E+00 | ca | 9.5E-03 | ca | 9.6E-02 | ca |
| | | 2.0E-02 | p | | | 2.9E-03 p | y | | 108-86-1 | Bromobenzene | 2.8E+01 | nc | 9.2E+01 | nc | 1.0E+01 | nc | 2.0E+01 | nc |
| 1.3E-01 | c | 2.0E-02 | i | 1.3E-01 | c | 2.0E-02 r | y | | 75-27-4 | Bromodichloromethane | 1.2E-01 | ca | 8.7E-01 | ca | 5.1E-02 | ca | 8.5E-02 | ca |
| 7.9E-03 | i | 2.0E-02 | i | 3.9E-03 | i | 2.0E-02 r | | 0.1 | 75-25-2 | Bromoform (tribromomethane) | 1.7E+00 | ca | 2.2E+02 | ca | 1.7E+00 | ca | 8.5E+00 | ca |
| | | 1.4E-03 | i | | | 1.4E-03 i | y | | 74-83-9 | Bromomethane (Methyl bromide) | 1.3E+00 | nc | 1.3E+01 | nc | 5.2E+00 | nc | 8.7E+00 | nc |
| | | 5.0E-03 | h | | | 5.0E-03 r | | 0.1 | 2104-96-3 | Bromophos | 4.0E+01 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 2.0E-02 | i | | | 2.0E-02 r | | 0.1 | 1689-84-5 | Bromoxynil | 1.2E+01 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 2.0E-02 | i | | | 2.0E-02 r | | 0.1 | 1689-99-2 | Bromoxynil octanoate | 1.6E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | | | | | | y | | 106-99-0 | 1,3-Butadiene | | | | | | | | |
| 3.4E+00 | c | 5.7E-03 | r | 6.0E-01 | c | 5.7E-03 c | y | | 106-99-0 | "CAL-Modified PRG" | 1.0E-02 | ca | 2.2E-02 | ca | 1.1E-02 | ca | 1.0E-02 | ca |
| | | 1.0E-01 | i | | | 2.6E-03 n | | 0.1 | 71-36-3 | 1-Butanol | 7.0E+01 | nc | 6.1E+04 | nc | 9.5E+00 | nc | 3.7E+03 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 r | | 0.1 | 2008-41-5 | Butylate | 3.8E+02 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 4.0E-02 | n | | | 4.0E-02 r | y | | 104-51-8 | n-Butylbenzene | 2.4E+02 | sat | 2.4E+02 | sat | 1.5E+02 | nc | 2.4E+02 | nc |
| | | 4.0E-02 | n | | | 4.0E-02 r | y | | 135-9-88 | sec-Butylbenzene | 2.2E+02 | sat | 2.2E+02 | sat | 1.5E+02 | nc | 2.4E+02 | nc |
| | | 4.0E-02 | n | | | 4.0E-02 r | y | | 98-06-6 | tert-Butylbenzene | 3.9E+02 | sat | 3.9E+02 | sat | 1.5E+02 | nc | 2.4E+02 | nc |
| | | 2.0E-01 | i | | | 2.0E-01 r | | 0.1 | 85-68-7 | Butyl benzyl phthalate | 1.4E+01 | ca | 1.0E+05 | max | 7.3E+02 | nc | 7.3E+03 | nc |
| | | 1.0E+00 | i | | | 1.0E+00 r | | 0.1 | 85-70-1 | Butylphthalyl butylglycolate | 7.5E+03 | nc | 1.0E+05 | max | 3.7E+03 | nc | 3.7E+04 | nc |
| | | 5.0E-04 | i | 1.5E+01 | c | 5.7E-06 c | | 0.001 | 7440-43-9 | Cadmium and compounds | 5.3E+00 | nc | 5.0E+02 | nc | 4.4E-04 | ca | 1.8E+01 | nc |
| | | 5.0E-01 | i | | | 5.0E-01 r | | 0.1 | 105-60-2 | Caprolactam | 1.2E+02 | nc | 1.0E+05 | max | 1.8E+03 | nc | 1.8E+04 | nc |
| 1.5E-01 | c | 2.0E-03 | i | 1.5E-01 | c | 2.0E-03 r | | 0.1 | 2425-06-1 | Captafol | 1.1E+00 | ca | 1.1E+01 | ca | 4.4E-02 | ca | 4.5E-01 | ca |
| 2.3E-03 | c | 1.3E-01 | i | 2.3E-03 | c | 1.3E-01 r | | 0.1 | 133-06-2 | Captan | 3.4E+00 | ca | 7.5E+02 | ca | 2.9E+00 | ca | 2.9E+01 | ca |
| | | 1.0E-01 | i | | | 1.1E-01 r | | 0.1 | 63-25-2 | Carbaryl | 3.8E+02 | nc | 6.2E+04 | nc | 4.0E+02 | nc | 3.7E+03 | nc |
| 2.0E-02 | h | | | 2.0E-02 | r | | | 0.1 | 86-74-8 | Carbazole | 1.1E+00 | ca | 8.6E+01 | ca | 3.3E-01 | ca | 3.4E+00 | ca |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | Rural | | "Direct Contact Exposure Pathways" | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | 5.0E-03 | i | | | | 0.1 | 1563-66-2 | Carbofuran | 1.1E+01 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 1.0E-01 | i | | | y | | 75-15-0 | Carbon disulfide | 1.9E+02 | nc | 7.2E+02 | sat | 8.3E+02 | nc | 1.1E+03 | nc |
| 1.5E-01 | c | 7.0E-04 | i | 1.5E-01 | c | y | | 56-23-5 | Carbon tetrachloride | 5.3E-02 | ca | 2.0E-01 | ca | 4.4E-02 | ca | 7.4E-02 | ca |
| | | 1.0E-02 | i | | | | 0.1 | 55285-14-8 | Carbosulfan | 6.1E+02 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 1.0E-01 | i | | | | 0.1 | 5234-68-4 | Carboxin | 3.2E+02 | nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| | | 1.5E-02 | i | | | | 0.1 | 133-90-4 | Chloramben | 3.1E+01 | nc | 9.2E+03 | nc | 5.5E+01 | nc | 5.5E+02 | nc |
| 4.0E-01 | h | | | 4.0E-01 | r | | 0.1 | 118-75-2 | Chloranil | 2.7E-02 | ca | 4.3E+00 | ca | 1.7E-02 | ca | 1.7E-01 | ca |
| 3.5E-01 | i | 5.0E-04 | i | 3.5E-01 | i | | 0.04 | 12789-03-6 | Chlordane (technical) | | | | | | | | |
| | | 2.0E-02 | i | | | | 0.1 | 90982-32-4 | Chlorimuron-ethyl | 8.6E+01 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 1.0E-01 | i | | | | | 7782-50-5 | Chlorine | 1.4E+01 | nc | 8.1E+04 | nc | 2.1E-01 | nc | 3.7E+03 | nc |
| | | 3.0E-02 | i | | | | | 10049-04-4 | Chlorine dioxide | 2.3E+03 | nc | 3.0E+04 | nc | 6.3E-01 | nc | 1.1E+03 | nc |
| | | 2.0E-03 | h | | | | 0.1 | 79-11-8 | Chloroacetic acid | 2.6E+00 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 8.6E-06 | r | | | y | | 532-27-4 | 2-Chloroacetophenone | 3.3E-02 | nc | 1.1E-01 | nc | 3.1E-02 | nc | 5.2E-02 | nc |
| | | 4.0E-03 | i | | | | 0.1 | 106-47-8 | 4-Chloroaniline | 3.1E-01 | ca | 2.5E+03 | nc | 1.5E+01 | nc | 1.5E+02 | nc |
| | | 2.0E-02 | i | | | y | | 108-90-7 | Chlorobenzene | 9.9E+01 | nc | 6.3E+03 | nc | 1.0E+03 | nc | 5.4E+02 | nc |
| 1.1E-01 | c | 2.0E-02 | i | 1.1E-01 | c | | 0.1 | 510-15-6 | Chlorobenzilate | 9.7E-02 | ca | 1.6E+01 | ca | 6.0E-02 | ca | 6.1E-01 | ca |
| | | 2.0E-01 | h | | | | 0.1 | 74-11-3 | p-Chlorobenzoic acid | 1.0E+03 | nc | 1.0E+05 | max | 7.3E+02 | nc | 7.3E+03 | nc |
| | | 2.0E-02 | h | | | | 0.1 | 98-56-6 | 4-Chlorobenzotrifluoride | 1.4E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 2.0E-02 | h | | | y | | 126-99-8 | 2-Chloro-1,3-butadiene | 3.4E+00 | nc | 1.2E+01 | nc | 7.3E+00 | nc | 1.4E+01 | nc |
| | | 4.0E-01 | h | | | y | | 109-69-3 | 1-Chlorobutane | 4.8E+02 | sat | 4.8E+02 | sat | 1.5E+03 | nc | 2.4E+03 | nc |
| | | 1.4E+01 | r | | | y | | 75-68-3 | 1-Chloro-1,1-difluoroethane (HCFC-142b) | 3.4E+02 | sat | 3.4E+02 | sat | 5.2E+04 | nc | 8.7E+04 | nc |
| | | 1.4E+01 | r | | | y | | 75-45-6 | Chlorodifluoromethane | 3.4E+02 | sat | 3.4E+02 | sat | 5.1E+04 | nc | 8.5E+04 | nc |
| 2.9E-03 | n | 4.0E-01 | n | 2.9E-03 | r | y | | 75-00-3 | Chloroethane | 1.1E+00 | ca | 6.5E+00 | ca | 2.3E+00 | ca | 3.8E+00 | ca |
| | | | | | | y | | 67-66-3 | Chloroform | | | | | | | | |
| 3.1E-02 | c | 1.0E-02 | i | 1.9E-02 | c | y | | | "CAL-Modified PRG" | 5.6E-01 | ca | 2.0E+00 | ca | 3.5E-01 | ca | 5.3E-01 | ca |
| | | 2.6E-02 | r | | | y | | 74-87-3 | Chloromethane (methyl chloride) | 2.3E-01 | ca | 1.6E+02 | nc | 9.5E+01 | nc | 1.6E+02 | nc |
| 2.7E-01 | c | | | 2.7E-01 | c | | 0.1 | 95-69-2 | 4-Chloro-2-methylaniline | 2.0E-02 | ca | 6.4E+00 | ca | 2.5E-02 | ca | 2.5E-01 | ca |
| 4.6E-01 | h | | | 4.6E-01 | r | | 0.1 | 3165-93-3 | 4-Chloro-2-methylaniline hydrochloride | 2.5E-02 | ca | 3.7E+00 | ca | 1.4E-02 | ca | 1.5E-01 | ca |
| | | 8.0E-02 | i | | | y | | 91-58-7 | beta-Chloronaphthalene | 5.8E+02 | nc | 2.3E+04 | nc | 2.9E+02 | nc | 4.9E+02 | nc |
| 9.7E-03 | p | 1.0E-03 | p | 9.7E-03 | r | p y | | 88-73-3 | o-Chloronitrobenzene | 9.9E-01 | nc | 4.5E+00 | nc | 7.3E-02 | nc | 1.5E-01 | nc |

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Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | RfDi | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | (mg/kg-d) | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| 6.7E-03 | p | 1.0E-03 | p | 6.7E-03 | r | 1.7E-04 | p | y | 100-00-5 | p-Chloronitrobenzene | 1.8E+00 | ca | 3.7E+01 | nc | 6.2E-01 | nc | 1.2E+00 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r | y | 95-57-8 | 2-Chlorophenol | 1.5E+01 | nc | 2.4E+02 | nc | 1.8E+01 | nc | 3.0E+01 | nc |
| | | 2.9E-02 | r | | | 2.9E-02 | h | y | 75-29-6 | 2-Chloropropane | 1.7E+02 | nc | 5.9E+02 | nc | 1.0E+02 | nc | 1.7E+02 | nc |
| 3.1E-03 | c | 1.5E-02 | i | 3.1E-03 | c | 1.5E-02 | r | 0.1 | 1897-45-6 | Chlorothalonil | 2.2E+00 | ca | 5.6E+02 | ca | 2.1E+00 | ca | 2.2E+01 | ca |
| | | 2.0E-02 | i | | | 2.0E-02 | r | y | 95-49-8 | o-Chlorotoluene | 7.7E+01 | nc | 5.6E+02 | nc | 7.3E+01 | nc | 1.2E+02 | nc |
| | | 2.0E-01 | i | | | 2.0E-01 | r | 0.1 | 101-21-3 | Chlorpropham | 1.1E+03 | nc | 1.0E+05 | max | 7.3E+02 | nc | 7.3E+03 | nc |
| | | 3.0E-03 | i | | | 3.0E-03 | r | 0.1 | 2921-88-2 | Chlorpyrifos | 2.4E+01 | nc | 1.8E+03 | nc | 1.1E+01 | nc | 1.1E+02 | nc |
| | | 1.0E-02 | h | | | 1.0E-02 | r | 0.1 | 5598-13-0 | Chlorpyrifos-methyl | 7.6E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 64902-72-3 | Chlorsulfuron | 2.7E+00 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 8.0E-04 | h | | | 8.0E-04 | r | 0.1 | 60238-56-4 | Chlorthiophos | 4.9E+01 | nc | 4.9E+02 | nc | 2.9E+00 | nc | 2.9E+01 | nc |
| | | | | 4.2E+01 | i | | | | | Total Chromium (1:6 ratio Cr VI:Cr III)+++ | 2.1E+02 | ca | 4.5E+02 | ca | 1.6E-04 | ca | | |
| | | 1.5E+00 | i | | | | | | 16065-83-1 | Chromium III | 1.0E+05 | max | 1.0E+05 | max | | | 5.5E+04 | nc |
| | | 3.0E-03 | i | 5.1E+02 | c | 5.7E-05 | c | | 18540-29-9 | Chromium VI+++ | 1.7E+01 | ca | 3.7E+01 | ca | 1.3E-05 | ca | 1.1E+02 | nc |
| | | 2.0E-02 | p | 9.8E+00 | p | 5.7E-06 | p | | 7440-48-4 | Cobalt | 1.6E+02 | nc | 1.9E+03 | ca | 6.8E-04 | ca | 7.3E+02 | nc |
| | | | | 2.2E+00 | i | | | | 8007-45-2 | Coke Oven Emissions | 4.0E+03 | ca | 8.7E+03 | ca | 3.1E-03 | ca | | |
| | | 4.0E-02 | h | | | | | | 7440-50-8 | Copper and compounds | 2.7E+02 | nc | 4.1E+04 | nc | | | 1.5E+03 | nc |
| 1.9E+00 | h | | | 1.9E+00 | r | | | y | 123-73-9 | Crotonaldehyde | 2.3E-03 | ca | 1.1E-02 | ca | 3.5E-03 | ca | 5.8E-03 | ca |
| | | 1.0E-01 | i | | | 1.1E-01 | i | y | 98-82-8 | Cumene (isopropylbenzene) | 3.2E+02 | nc | 2.0E+03 | nc | 4.0E+02 | nc | 6.6E+02 | nc |
| 8.4E-01 | h | 2.0E-03 | h | 8.4E-01 | r | 2.0E-03 | r | 0.1 | 21725-46-2 | Cyanazine | 1.4E-02 | ca | 2.1E+00 | ca | 7.9E-03 | ca | 8.0E-02 | ca |
| | | 2.0E-02 | i | | | | | 0.1 | 57-12-5 | Cyanide (free) | 2.4E+01 | nc | 1.2E+04 | nc | | | 7.3E+02 | nc |
| | | 2.0E-02 | i | | | 2.6E-03 | c | y | 74-90-8 | Cyanide (hydrogen) | 7.6E+00 | nc | 1.1E+02 | nc | 9.4E+00 | nc | 1.8E+01 | nc |
| | | 4.0E-02 | i | | | 4.0E-02 | r | y | 460-19-5 | Cyanogen | 1.3E+01 | nc | 4.3E+02 | nc | 1.5E+02 | nc | 2.4E+02 | nc |
| | | 9.0E-02 | i | | | 9.0E-02 | r | y | 506-68-3 | Cyanogen bromide | 2.9E+02 | nc | 9.7E+02 | nc | 3.3E+02 | nc | 5.5E+02 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | y | 506-77-4 | Cyanogen chloride | 1.8E+01 | nc | 5.4E+02 | nc | 1.8E+02 | nc | 3.0E+02 | nc |
| | | 1.7E+00 | r | | | 1.7E+00 | i | y | 110-82-7 | Cyclohexane | 1.4E+02 | sat | 1.4E+02 | sat | 6.2E+03 | nc | 1.0E+04 | nc |
| | | 5.0E+00 | i | | | 5.0E+00 | r | 0.1 | 108-94-1 | Cyclohexanone | 1.0E+05 | max | 1.0E+05 | max | 1.8E+04 | nc | 1.8E+05 | nc |
| | | 2.0E-01 | i | | | 2.0E-01 | r | 0.1 | 108-91-8 | Cyclohexylamine | 3.7E+02 | nc | 1.0E+05 | max | 7.3E+02 | nc | 7.3E+03 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r | 0.1 | 68085-85-8 | Cyhalothrin/Karate | 4.1E+01 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 1.0E-02 | i | | | 1.0E-02 | r | 0.1 | 52315-07-8 | Cypermethrin | 8.2E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 7.5E-03 | i | | | 7.5E-03 | r | 0.1 | 66215-27-8 | Cyromazine | 4.6E+02 | nc | 4.6E+03 | nc | 2.7E+01 | nc | 2.7E+02 | nc |

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ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | | "Direct Contact Exposure Pathways" | | | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Rural Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | 1.0E-02 | i | | | | 0.1 | 1861-32-1 | Dacthal | 7.7E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 3.0E-02 | i | | | | 0.1 | 75-99-0 | Dalapon | 2.5E+01 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| | | 2.5E-02 | i | | | | 0.1 | 39515-41-8 | Danitol | 2.1E+02 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| 2.4E-01 | i | | | 2.4E-01 | r | | 0.03 | 72-54-8 | DDD | 1.1E-01 | ca | 1.0E+01 | ca | 2.8E-02 | ca | 2.8E-01 | ca |
| 3.4E-01 | i | | | 3.4E-01 | r | | 0.03 | 72-55-9 | DDE | 7.9E-02 | ca | 7.0E+00 | ca | 2.0E-02 | ca | 2.0E-01 | ca |
| 3.4E-01 | i | 5.0E-04 | i | 3.4E-01 | c | 5.0E-04 | r | 0.03 | 50-29-3 | DDT | 8.0E-02 | ca | 7.0E+00 | ca | 2.0E-02 | ca | 2.0E-01 | ca |
| | | 1.0E-02 | i | | | 1.0E-02 | r | 0.1 | 1163-19-5 | Decabromodiphenyl ether | 8.1E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 4.0E-05 | i | | | 4.0E-05 | r | 0.1 | 8065-48-3 | Demeton | 2.4E+00 | nc | 2.5E+01 | nc | 1.5E-01 | nc | 1.5E+00 | nc |
| 6.1E-02 | h | | | 6.1E-02 | r | | | 0.1 | 2303-16-4 | Diallate | 3.9E-02 | ca | 2.8E+01 | ca | 1.1E-01 | ca | 1.1E+00 | ca |
| | | 9.0E-04 | h | | | 9.0E-04 | r | 0.1 | 333-41-5 | Diazinon | 6.4E+00 | nc | 5.5E+02 | nc | 3.3E+00 | nc | 3.3E+01 | nc |
| | | 2.0E-03 | n | | | 2.0E-03 | r | y | 132-64-9 | Dibenzofuran | 1.5E+01 | nc | 1.6E+03 | nc | 7.3E+00 | nc | 1.2E+01 | nc |
| | | 1.0E-02 | i | | | 1.0E-02 | r | 0.1 | 106-37-6 | 1,4-Dibromobenzene | 7.2E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| 9.4E-02 | c | 2.0E-02 | i | 9.4E-02 | c | 2.0E-02 | r | y | 124-48-1 | Dibromochloromethane | 1.1E-01 | ca | 2.3E+00 | ca | 7.1E-02 | ca | 1.2E-01 | ca |
| 7.0E+00 | c | 5.7E-05 | r | 7.0E+00 | c | 5.7E-05 | i | y | 96-12-8 | 1,2-Dibromo-3-chloropropane (DBCP) | 1.2E-02 | ca | 7.6E-02 | ca | 9.5E-04 | ca | 1.6E-03 | ca |
| 7.0E+00 | c | 5.7E-05 | r | 7.0E+00 | c | 5.7E-05 | i | y | 96-12-8 | "CAL-Modified PRG" | 1.2E-02 | ca | 7.6E-02 | ca | 9.5E-04 | ca | 1.6E-03 | ca |
| 3.6E+00 | c | 9.0E-03 | i | 2.5E-01 | c | 2.3E-04 | c | y | 106-93-4 | 1,2-Dibromoethane (EDB) | 4.5E-03 | ca | 3.5E-01 | ca | 2.7E-02 | ca | 1.4E-02 | ca |
| | | 1.0E-01 | i | | | 1.0E-01 | r | 0.1 | 84-74-2 | Dibutyl phthalate | 8.0E+02 | nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| | | 3.0E-02 | i | | | 3.0E-02 | r | 0.1 | 1918-00-9 | Dicamba | 1.7E+02 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| | | 9.0E-02 | i | | | 5.7E-02 | h | y | 95-50-1 | 1,2-Dichlorobenzene | 6.0E+02 | sat | 6.0E+02 | sat | 2.1E+02 | nc | 3.7E+02 | nc |
| | | 3.0E-02 | n | | | 3.0E-02 | r | y | 541-73-1 | 1,3-Dichlorobenzene | 5.3E+02 | nc | 6.0E+02 | sat | 1.1E+02 | nc | 1.8E+02 | nc |
| 5.4E-03 | c | 3.0E-02 | n | 4.0E-02 | c | 2.3E-01 | c | y | 106-46-7 | 1,4-Dichlorobenzene | 6.4E-01 | ca | 4.6E+00 | ca | 1.7E-01 | ca | 3.2E-01 | ca |
| 1.2E+00 | c | | | 1.2E+00 | c | | | 0.1 | 91-94-1 | 3,3-Dichlorobenzidine | 4.5E-02 | ca | 1.4E+00 | ca | 5.5E-03 | ca | 5.6E-02 | ca |
| | | 3.0E-02 | n | | | 3.0E-02 | r | 0.1 | 90-98-2 | 4,4'-Dichlorobenzophenone | 2.4E+02 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| 9.3E+00 | r | | | 9.3E+00 | h | | | y | 764-41-0 | 1,4-Dichloro-2-butene | 7.8E-03 | ca | 1.8E-02 | ca | 7.1E-04 | ca | 1.2E-03 | ca |
| | | 2.0E-01 | i | | | 5.7E-02 | h | y | 75-71-8 | Dichlorodifluoromethane | 8.3E+01 | nc | 3.1E+02 | nc | 2.1E+02 | nc | 3.9E+02 | nc |
| | | | | | | | | y | 75-34-3 | 1,1-Dichloroethane | | | | | | | | |
| 5.7E-03 | c | 1.0E-01 | h | 5.7E-03 | c | 1.4E-01 | h | y | | "CAL-Modified PRG" | 2.8E+00 | ca | 6.0E+00 | ca | 1.2E+00 | ca | 1.9E+00 | ca |
| 4.7E-02 | c | 2.0E-02 | n | 7.2E-02 | c | 1.1E-01 | c | y | 107-06-2 | 1,2-Dichloroethane (EDC) | 5.3E-02 | ca | 7.7E-01 | ca | 9.2E-02 | ca | 1.6E-01 | ca |
| | | 5.0E-02 | i | | | 2.0E-02 | c | y | 75-35-4 | 1,1-Dichloroethylene | 1.3E-02 | ca | 1.5E+02 | nc | 7.3E+01 | nc | 1.4E+02 | nc |
| | | 1.0E-02 | p | | | 1.0E-02 | r | y | 156-59-2 | 1,2-Dichloroethylene (cis) | 1.7E+01 | nc | 1.5E+02 | nc | 3.7E+01 | nc | 6.1E+01 | nc |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | 2.0E-02 | i | | | | | 2.0E-02 | r y | 156-60-5 | 1,2-Dichloroethylene (trans) | 1.0E+01 | nc | 2.3E+02 | nc | 7.3E+01 | nc | 1.2E+02 | nc |
| | | 3.0E-03 | i | | | | | 3.0E-03 | r | 120-83-2 | 2,4-Dichlorophenol | 1.6E+01 | nc | 1.8E+03 | nc | 1.1E+01 | nc | 1.1E+02 | nc |
| | | 8.0E-03 | i | | | | | 8.0E-03 | r | 94-82-6 | 4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB) | 5.3E+01 | nc | 4.9E+03 | nc | 2.9E+01 | nc | 2.9E+02 | nc |
| | | 1.0E-02 | i | | | | | 1.0E-02 | r | 94-75-7 | 2,4-Dichlorophenoxyacetic Acid (2,4-D) | 4.4E+01 | nc | 7.7E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| 3.6E-02 | c | 1.1E-03 | r | 3.6E-02 | c | 1.1E-03 | i y | | 78-87-5 | | 1,2-Dichloropropane | 1.1E-01 | ca | 1.4E+00 | ca | 1.8E-01 | ca | 3.1E-01 | ca |
| | | 2.0E-02 | p | | | 2.0E-02 | r y | | 142-28-9 | | 1,3-Dichloropropane | 1.0E+02 | nc | 3.6E+02 | nc | 7.3E+01 | nc | 1.2E+02 | nc |
| 9.1E-02 | c | 3.0E-02 | i | 5.5E-02 | c | 5.7E-03 | i y | | 542-75-6 | | 1,3-Dichloropropene | 4.9E-02 | ca | 4.7E-01 | ca | 1.2E-01 | ca | 1.8E-01 | ca |
| | | 3.0E-03 | i | | | 3.0E-03 | r | 0.1 | 616-23-9 | | 2,3-Dichloropropanol | 6.6E-01 | nc | 1.8E+03 | nc | 1.1E+01 | nc | 1.1E+02 | nc |
| 4.1E-01 | c | 5.0E-04 | i | 2.9E-01 | r | 1.4E-04 | i | 0.1 | 62-73-7 | | Dichlorvos | 3.2E-02 | ca | 4.2E+00 | ca | 2.3E-02 | ca | 1.6E-01 | ca |
| 4.4E-01 | x | | | 4.4E-01 | r | | | 0.1 | 115-32-2 | | Dicofol | 1.1E+00 | ca | 3.9E+00 | ca | 1.5E-02 | ca | 1.5E-01 | ca |
| | | 3.0E-02 | h | | | 5.7E-05 | x y | | 77-73-6 | | Dicyclopentadiene | 5.4E-01 | nc | 1.8E+00 | nc | 2.1E-01 | nc | 4.2E-01 | nc |
| 1.6E+01 | i | 5.0E-05 | i | 1.6E+01 | c | 5.0E-05 | r | 0.1 | 60-57-1 | | Dieldrin | 1.6E-03 | ca | 1.1E-01 | ca | 4.1E-04 | ca | 4.2E-03 | ca |
| | | 1.0E-02 | p | | | 5.7E-03 | p | 0.1 | 112-34-5 | | Diethylene glycol, monobutyl ether | 9.3E-01 | nc | 6.2E+03 | nc | 2.1E+01 | nc | 3.7E+02 | nc |
| | | 6.0E-02 | p | | | 8.6E-04 | p | 0.1 | 111-90-0 | | Diethylene glycol, monoethyl ether | 1.7E+01 | nc | 3.7E+04 | nc | 3.1E+00 | nc | 2.2E+03 | nc |
| | | 4.0E-04 | p | | | 4.0E-04 | r | 0.1 | 617-84-5 | | Diethylformamide | 1.3E-01 | nc | 2.5E+02 | nc | 1.5E+00 | nc | 1.5E+01 | nc |
| 1.2E-03 | i | 6.0E-01 | i | 1.2E-03 | r | 6.0E-01 | r | 0.1 | 103-23-1 | | Di(2-ethylhexyl)adipate | 2.3E+01 | ca | 1.4E+03 | ca | 5.5E+00 | ca | 5.6E+01 | ca |
| | | 8.0E-01 | i | | | 8.0E-01 | r | 0.1 | 84-66-2 | | Diethyl phthalate | 3.4E+03 | nc | 1.0E+05 | max | 2.9E+03 | nc | 2.9E+04 | nc |
| 3.5E+02 | c | | | 3.5E+02 | c | | | 0.1 | 56-53-1 | | Diethylstilbestrol | 6.0E-06 | ca | 4.9E-03 | ca | 1.9E-05 | ca | 1.9E-04 | ca |
| | | 8.0E-02 | i | | | 8.0E-02 | r | 0.1 | 43222-48-6 | | Difenzoquat (Avenge) | 4.9E+03 | nc | 4.9E+04 | nc | 2.9E+02 | nc | 2.9E+03 | nc |
| | | 2.0E-02 | i | | | 2.0E-02 | r | 0.1 | 35367-38-5 | | Diflubenzuron | 1.4E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 1.1E+01 | r | | | 1.1E+01 | i y | | 75-37-6 | | 1,1-Difluoroethane | 8.9E+05 | nc | 1.2E+07 | nc | 4.2E+04 | nc | 4.2E+05 | nc |
| | | 2.0E-02 | n | | | 2.0E-02 | r | 0.1 | 28553-12-0 | | Diisononyl phthalate | 1.2E+03 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | | | | | 1.1E-01 | p | | 108-20-3 | | Diisopropyl ether | 2.3E+08 | nc | 7.4E+08 | nc | 4.0E+02 | nc | | |
| | | 8.0E-02 | i | | | 8.0E-02 | r | 0.1 | 1445-75-6 | | Diisopropyl methylphosphonate | 8.8E+01 | nc | 4.9E+04 | nc | 2.9E+02 | nc | 2.9E+03 | nc |
| | | 2.0E-02 | i | | | 2.0E-02 | r | 0.1 | 55290-64-7 | | Dimethipin | 5.0E+00 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 2.0E-04 | i | | | 2.0E-04 | r | 0.1 | 60-51-5 | | Dimethoate | 1.0E+00 | nc | 1.2E+02 | nc | 7.3E-01 | nc | 7.3E+00 | nc |
| 1.4E-02 | h | | | 1.4E-02 | r | | | 0.1 | 119-90-4 | | 3,3'-Dimethoxybenzidine | 5.5E-01 | ca | 1.2E+02 | ca | 4.7E-01 | ca | 4.8E+00 | ca |
| | | 5.7E-06 | r | | | 5.7E-06 | x y | | 124-40-3 | | Dimethylamine | 6.7E-02 | nc | 2.5E-01 | nc | 2.1E-02 | nc | 3.5E-02 | nc |
| | | 2.0E-03 | i | | | 2.0E-03 | r | 0.1 | 121-69-7 | | N-N-Dimethylaniline | 9.2E+00 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| 7.5E-01 | h | | | 7.5E-01 | r | | | 0.1 | 95-68-1 | | 2,4-Dimethylaniline | 1.5E-02 | ca | 2.3E+00 | ca | 8.8E-03 | ca | 9.0E-02 | ca |

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Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | Rural | | "Direct Contact Exposure Pathways" | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| 5.8E-01 | h | | | 5.8E-01 | r | | 0.1 | 21436-96-4 | 2,4-Dimethylaniline hydrochloride | 8.4E-01 | ca | 3.0E+00 | ca | 1.1E-02 | ca | 1.2E-01 | ca |
| 2.3E+00 | p | | | 2.3E+00 | r | | 0.1 | 119-93-7 | 3,3'-Dimethylbenzidine | 5.2E-03 | ca | 7.5E-01 | ca | 2.9E-03 | ca | 2.9E-02 | ca |
| | | 1.0E-01 | h | | | 2.3E-02 | c 0.1 | 68-12-2 | N,N-Dimethylformamide | 8.4E+00 | nc | 6.2E+04 | nc | 8.3E+01 | nc | 3.7E+03 | nc |
| | | 1.0E-03 | n | | | 1.0E-03 | r 0.1 | 122-09-8 | Dimethylphenethylamine | 6.1E+01 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 2.0E-02 | i | | | 2.0E-02 | r 0.1 | 105-67-9 | 2,4-Dimethylphenol | 7.6E+01 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 6.0E-04 | i | | | 6.0E-04 | r 0.1 | 576-26-1 | 2,6-Dimethylphenol | 2.3E+00 | nc | 3.7E+02 | nc | 2.2E+00 | nc | 2.2E+01 | nc |
| | | 1.0E-03 | i | | | 1.0E-03 | r 0.1 | 95-65-8 | 3,4-Dimethylphenol | 3.5E+00 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 1.0E+01 | h | | | 1.0E+01 | r 0.1 | 131-11-3 | Dimethyl phthalate | 1.0E+05 | max | 1.0E+05 | max | 3.7E+04 | nc | 3.7E+05 | nc |
| | | 1.0E-01 | i | | | 1.0E-01 | r 0.1 | 120-61-6 | Dimethyl terephthalate | 5.6E+02 | nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| | | 1.0E-04 | p | | | 1.0E-04 | r 0.1 | 534-52-1 | 4,6-Dinitro-o-cresol | 4.9E-01 | nc | 6.2E+01 | nc | 3.7E-01 | nc | 3.7E+00 | nc |
| | | 2.0E-03 | i | | | 2.0E-03 | r 0.1 | 131-89-5 | 4,6-Dinitro-o-cyclohexyl phenol | 1.8E-02 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 1.0E-04 | p | | | 1.0E-04 | r 0.1 | 528-29-0 | 1,2-Dinitrobenzene | 2.0E-01 | nc | 6.2E+01 | nc | 3.7E-01 | nc | 3.7E+00 | nc |
| | | 1.0E-04 | i | | | 1.0E-04 | r 0.1 | 99-65-0 | 1,3-Dinitrobenzene | 2.0E-01 | nc | 6.2E+01 | nc | 3.7E-01 | nc | 3.7E+00 | nc |
| | | 1.0E-04 | p | | | 1.0E-04 | r 0.1 | 100-25-4 | 1,4-Dinitrobenzene | 1.9E-01 | nc | 6.2E+01 | nc | 3.7E-01 | nc | 3.7E+00 | nc |
| | | 2.0E-03 | i | | | 2.0E-03 | r 0.1 | 51-28-5 | 2,4-Dinitrophenol | 3.7E+00 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| 6.8E-01 | i | | | 6.8E-01 | r | | 0.1 | 25321-14-6 | Dinitrotoluene mixture | 1.4E-02 | ca | 2.5E+00 | ca | 9.8E-03 | ca | 9.9E-02 | ca |
| 3.1E-01 | c | 2.0E-03 | i | 3.1E-01 | c | 2.0E-03 | r 0.1 | 121-14-2 | 2,4-Dinitrotoluene (also see Dinitrotoluene mixture) | 1.4E-02 | ca | 5.6E+00 | ca | 2.1E-02 | ca | 2.2E-01 | ca |
| | | 1.0E-03 | h | | | 1.0E-03 | r 0.1 | 606-20-2 | 2,6-Dinitrotoluene (also see Dinitrotoluene mixture) | 1.0E-02 | ca | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 1.0E-03 | i | | | 1.0E-03 | r 0.1 | 88-85-7 | Dinoseb | 7.0E+00 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 4.0E-02 | p | | | 4.0E-02 | r 0.1 | 117-84-0 | di-n-Octyl phthalate | 3.3E+02 | nc | 2.5E+04 | nc | 1.5E+02 | nc | 1.5E+03 | nc |
| 2.7E-02 | c | | | 2.7E-02 | c | 8.6E-01 | c 0.1 | 123-91-1 | 1,4-Dioxane | 6.0E-02 | ca | 6.4E+01 | ca | 2.5E-01 | ca | 2.5E+00 | ca |
| 1.3E+05 | c | | | 1.3E+05 | c | 1.1E-08 | c 0.03 | 1746-01-6 | Dioxin (2,3,7,8-TCDD)+++ | 1.8E-07 | ca | 1.8E-05 | ca | 5.1E-08 | ca | 5.2E-07 | ca |
| | | 3.0E-02 | i | | | 3.0E-02 | r 0.1 | 957-51-7 | Diphenamid | 1.0E+02 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 | r 0.1 | 122-39-4 | Diphenylamine | 1.7E+02 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| | | 3.0E-04 | p | | | 3.0E-04 | r 0.1 | 74-31-7 | N,N-Diphenyl-1,4 benzenediamine (DPPD) | 1.8E+01 | nc | 1.8E+02 | nc | 1.1E+00 | nc | 1.1E+01 | nc |
| 8.7E-01 | c | | | 8.7E-01 | c | | 0.1 | 122-66-7 | 1,2-Diphenylhydrazine | 2.1E-02 | ca | 2.0E+00 | ca | 7.6E-03 | ca | 7.7E-02 | ca |
| | | 3.0E-03 | p | | | 3.0E-03 | r 0.1 | 127-63-9 | Diphenyl sulfone | 1.8E+02 | nc | 1.8E+03 | nc | 1.1E+01 | nc | 1.1E+02 | nc |
| | | 2.2E-03 | i | | | 2.2E-03 | r 0.1 | 85-00-7 | Diquat | 1.2E-02 | nc | 1.4E+03 | nc | 8.0E+00 | nc | 8.0E+01 | nc |
| 7.4E+00 | c | | | 7.4E+00 | c | | 0.1 | 1937-37-7 | Direct black 38 | 1.1E-03 | ca | 2.3E-01 | ca | 9.0E-04 | ca | 9.1E-03 | ca |
| 7.4E+00 | c | | | 7.4E+00 | c | | 0.1 | 2602-46-2 | Direct blue 6 | 6.6E-02 | ca | 2.3E-01 | ca | 9.0E-04 | ca | 9.1E-03 | ca |

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ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| 6.7E+00 | c | | | 6.7E+00 | c | | 0.1 | | 16071-86-6 | Direct brown 95 | 7.3E-02 | ca | 2.6E-01 | ca | 9.9E-04 | ca | 1.0E-02 | ca |
| | | 4.0E-05 | i | | | 4.0E-05 | r | 0.1 | 298-04-4 | Disulfoton | 2.9E-01 | nc | 2.5E+01 | nc | 1.5E-01 | nc | 1.5E+00 | nc |
| | | 1.0E-02 | i | | | 1.0E-02 | r | 0.1 | 505-29-3 | 1,4-Dithiane | 1.7E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 2.0E-03 | i | | | 2.0E-03 | r | 0.1 | 330-54-1 | Diuron | 1.0E+01 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 4.0E-03 | i | | | 4.0E-03 | r | 0.1 | 2439-10-3 | Dodine | 1.8E+01 | nc | 2.5E+03 | nc | 1.5E+01 | nc | 1.5E+02 | nc |
| | | 1.0E-01 | n | | | | | | 7429-91-6 | Dysprosium | 7.8E+03 | nc | 1.0E+05 | max | | | 3.7E+03 | nc |
| | | 6.0E-03 | i | | | 6.0E-03 | r | 0.1 | 115-29-7 | Endosulfan | 4.1E+01 | nc | 3.7E+03 | nc | 2.2E+01 | nc | 2.2E+02 | nc |
| | | 2.0E-02 | i | | | 2.0E-02 | r | 0.1 | 145-73-3 | Endothall | 5.5E+01 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 3.0E-04 | i | | | 3.0E-04 | r | 0.1 | 72-20-8 | Endrin | 2.4E+00 | nc | 1.8E+02 | nc | 1.1E+00 | nc | 1.1E+01 | nc |
| | | | | | | | y | | 106-89-8 | Epichlorohydrin | | | | | | | | |
| 8.0E-02 | r | 2.0E-03 | h | 8.0E-02 | c | 8.6E-04 | c | y | | "CAL-Modified PRG" | 6.9E-02 | ca | 2.9E+00 | ca | 8.3E-02 | ca | 1.4E-01 | ca |
| | | 5.7E-03 | r | | | 5.7E-03 | i | | 106-88-7 | 1,2-Epoxybutane | 3.5E+02 | nc | 3.5E+03 | nc | 2.1E+01 | nc | 2.1E+02 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 | r | 0.1 | 759-94-4 | EPTC (S-Ethyl dipropylthiocarbamate) | 1.5E+02 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r | 0.1 | 16672-87-0 | Ethephon (2-chloroethyl phosphonic acid) | 1.7E+00 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 5.0E-04 | i | | | 5.0E-04 | r | 0.1 | 563-12-2 | Ethion | 4.0E+00 | nc | 3.1E+02 | nc | 1.8E+00 | nc | 1.8E+01 | nc |
| | | 4.0E-01 | h | | | 2.0E-02 | c | 0.1 | 110-80-5 | 2-Ethoxyethanol | 1.1E+02 | nc | 1.0E+05 | max | 7.3E+01 | nc | 1.5E+04 | nc |
| | | 3.0E-01 | h | | | 8.6E-02 | c | 0.1 | 111-15-9 | 2-Ethoxyethanol acetate | 2.1E+02 | nc | 1.0E+05 | max | 3.1E+02 | nc | 1.1E+04 | nc |
| | | 9.0E-01 | i | | | 9.0E-01 | r | y | 141-78-6 | Ethyl acetate | 7.5E+02 | nc | 3.7E+04 | sat | 3.3E+03 | nc | 5.5E+03 | nc |
| 4.8E-02 | h | | | 4.8E-02 | r | | | y | 140-88-5 | Ethyl acrylate | 6.6E-02 | ca | 4.5E-01 | ca | 1.4E-01 | ca | 2.3E-01 | ca |
| 1.1E-02 | c | 1.0E-01 | i | 8.7E-03 | c | 5.7E-01 | c | y | 100-41-4 | Ethylbenzene | 3.8E+00 | ca | 8.6E+00 | ca | 7.6E-01 | ca | 1.2E+00 | ca |
| 2.9E-03 | n | 4.0E-01 | n | 2.9E-03 | r | 8.6E+00 | c | y | 75-00-3 | Ethyl chloride | 1.1E+00 | ca | 6.5E+00 | ca | 2.3E+00 | ca | 3.8E+00 | ca |
| | | 3.0E-01 | h | | | 3.0E-01 | r | | 0.1 | 109-78-4 | Ethylene cyanohydrin | 1.3E+00 | nc | 1.0E+05 | max | 1.1E+03 | nc | 1.1E+04 | nc |
| | | 9.0E-02 | p | | | 9.0E-02 | r | | 0.1 | 107-15-3 | Ethylene diamine | 3.0E+01 | nc | 5.5E+04 | nc | 3.3E+02 | nc | 3.3E+03 | nc |
| | | 2.0E+00 | i | | | 1.1E-01 | c | | 0.1 | 107-21-1 | Ethylene glycol | 1.0E+05 | max | 1.0E+05 | max | 4.2E+02 | nc | 7.3E+04 | nc |
| | | 5.0E-01 | i | | | 3.7E+00 | i | | 0.1 | 111-76-2 | Ethylene glycol, monobutyl ether | 4.3E+02 | nc | 1.0E+05 | max | 1.4E+04 | nc | 1.8E+04 | nc |
| 3.1E-01 | c | | | 3.1E-01 | c | 8.6E-03 | c | y | | 75-21-8 | Ethylene oxide | 6.2E-04 | ca | 4.1E-01 | ca | 2.1E-02 | ca | 3.6E-02 | ca |
| 4.5E-02 | c | 8.0E-05 | i | 4.5E-02 | c | 8.0E-05 | r | | 0.1 | 96-45-7 | Ethylene thiourea (ETU) | 3.6E-03 | ca | 3.8E+01 | ca | 1.5E-01 | ca | 1.5E+00 | ca |
| | | 2.0E-01 | i | | | 2.0E-01 | r | y | | 60-29-7 | Ethyl ether | 1.8E+03 | sat | 1.8E+03 | sat | 7.3E+02 | nc | 1.2E+03 | nc |
| | | 9.0E-02 | h | | | 9.0E-02 | r | y | | 97-63-2 | Ethyl methacrylate | 1.4E+02 | sat | 1.4E+02 | sat | 3.3E+02 | nc | 5.5E+02 | nc |
| | | 1.0E-05 | i | | | 1.0E-05 | r | | 0.1 | 2104-64-5 | Ethyl p-nitrophenyl phenylphosphorothioate | 7.2E-02 | nc | 6.2E+00 | nc | 3.7E-02 | nc | 3.7E-01 | nc |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | Rural | | "Direct Contact Exposure Pathways" | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | 3.0E+00 | i | | | | 0.1 | 84-72-0 | Ethylphthalyl ethyl glycolate | 1.0E+05 | max | 1.0E+05 | max | 1.1E+04 | nc | 1.1E+05 | nc |
| | | 8.0E-03 | i | | | | 0.1 | 101200-48-0 | Express | 4.9E+02 | nc | 4.9E+03 | nc | 2.9E+01 | nc | 2.9E+02 | nc |
| | | 2.5E-04 | i | | | | 0.1 | 22224-92-6 | Fenamiphos | 1.5E+00 | nc | 1.5E+02 | nc | 9.1E-01 | nc | 9.1E+00 | nc |
| | | 1.3E-02 | i | | | | 0.1 | 2164-17-2 | Fluometuron | 5.2E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| | | 6.0E-02 | i | | | | 0.1 | 16984-48-8 | Fluorine (soluble fluoride) | | | | | 1.4E+01 | nc | 2.2E+03 | nc |
| | | 8.0E-02 | i | | | | 0.1 | 59756-60-4 | Fluoridone | 4.8E+02 | nc | 4.9E+04 | nc | 2.9E+02 | nc | 2.9E+03 | nc |
| | | 2.0E-02 | i | | | | 0.1 | 56425-91-3 | Flurprimidol | 1.3E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 6.0E-02 | i | | | | 0.1 | 66332-96-5 | Flutolanil | 3.7E+03 | nc | 3.7E+04 | nc | 2.2E+02 | nc | 2.2E+03 | nc |
| | | 1.0E-02 | i | | | | 0.1 | 69409-94-5 | Fluvalinate | 8.2E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| 3.5E-03 | i | 1.0E-01 | i | 3.5E-03 | r | | 0.1 | 133-07-3 | Folpet | 5.4E+00 | ca | 4.9E+02 | ca | 1.9E+00 | ca | 1.9E+01 | ca |
| 1.9E-01 | i | | | 1.9E-01 | r | | 0.1 | 72178-02-0 | Fomesafen | 9.1E-02 | ca | 9.1E+00 | ca | 3.5E-02 | ca | 3.5E-01 | ca |
| | | 2.0E-03 | i | | | | 0.1 | 944-22-9 | Fonofos | 1.5E+01 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 1.5E-01 | i | 2.1E-02 | c | | 0.1 | 50-00-0 | Formaldehyde | 6.2E+01 | nc | 9.1E+04 | nc | 3.2E-01 | ca | 5.5E+03 | nc |
| | | 2.0E+00 | h | | | | 0.1 | 64-18-6 | Formic Acid | 1.0E+05 | max | 1.0E+05 | max | 3.1E+00 | nc | 7.3E+04 | nc |
| | | 3.0E+00 | i | | | | 0.1 | 39148-24-8 | Fosetyl-al | 1.0E+05 | max | 1.0E+05 | max | 1.1E+04 | nc | 1.1E+05 | nc |
| | | 3.0E+01 | i | | | | 0.1 | 76-13-1 | Freon 113 | 5.6E+03 | sat | 5.6E+03 | sat | 3.1E+04 | nc | 5.9E+04 | nc |
| | | 1.0E-03 | i | | | | 0.1 | 110-00-9 | Furan | 9.4E-01 | nc | 8.5E+00 | nc | 3.7E+00 | nc | 6.1E+00 | nc |
| 3.8E+00 | h | | | 3.8E+00 | r | | 0.1 | 67-45-8 | Furazolidone | 5.8E-04 | ca | 4.5E-01 | ca | 1.7E-03 | ca | 1.8E-02 | ca |
| | | 3.0E-03 | i | | | | 0.1 | 98-01-1 | Furfural | 2.0E+01 | nc | 1.8E+03 | nc | 5.2E+01 | nc | 1.1E+02 | nc |
| 1.5E+00 | c | | | 1.5E+00 | c | | 0.1 | 531-82-8 | Furium | 3.2E-01 | ca | 1.1E+00 | ca | 4.4E-03 | ca | 4.5E-02 | ca |
| 3.0E-02 | i | | | 3.0E-02 | r | | 0.1 | 60568-05-0 | Furmecyclox | 1.6E+01 | ca | 5.7E+01 | ca | 2.2E-01 | ca | 2.2E+00 | ca |
| | | 4.0E-04 | i | | | | 0.1 | 77182-82-2 | Glufosinate-ammonium | 2.4E+01 | nc | 2.5E+02 | nc | 1.5E+00 | nc | 1.5E+01 | nc |
| | | 4.0E-04 | i | | | | 0.1 | 765-34-4 | Glycidaldehyde | 4.8E-02 | nc | 2.5E+02 | nc | 1.0E+00 | nc | 1.5E+01 | nc |
| | | 1.0E-01 | i | | | | 0.1 | 1071-83-6 | Glyphosate | 5.9E-01 | nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| | | 5.0E-05 | i | | | | 0.1 | 69806-40-2 | Haloxyfop-methyl | 3.4E-01 | nc | 3.1E+01 | nc | 1.8E-01 | nc | 1.8E+00 | nc |
| | | 1.3E-02 | i | | | | 0.1 | 79277-27-3 | Harmony | 2.5E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| 4.1E+00 | c | 5.0E-04 | i | 4.1E+00 | c | | 0.1 | 76-44-8 | Heptachlor | 5.5E-03 | ca | 4.2E-01 | ca | 1.6E-03 | ca | 1.6E-02 | ca |
| 5.5E+00 | c | 1.3E-05 | i | 5.5E+00 | c | | 0.1 | 1024-57-3 | Heptachlor epoxide | 3.0E-03 | ca | 3.1E-01 | ca | 1.2E-03 | ca | 1.2E-02 | ca |
| | | 2.0E-03 | i | | | | 0.1 | 87-82-1 | Hexabromobenzene | 1.6E+01 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| 1.8E+00 | c | 8.0E-04 | i | 1.8E+00 | c | | 0.1 | 118-74-1 | Hexachlorobenzene | 1.7E-02 | ca | 9.6E-01 | ca | 3.7E-03 | ca | 3.7E-02 | ca |

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Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V | skin | | | Rural | | "Direct Contact Exposure Pathways" | | | | | |
| SFo | | RfDo | | SFi | | RfDi | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | (mg/kg-d) | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| 7.8E-02 | i | 3.0E-04 | n | 7.8E-02 | i | 3.0E-04 | r | 0.1 | 87-68-3 | Hexachlorobutadiene | 3.3E-01 | ca | 2.2E+01 | ca | 8.5E-02 | ca | 8.6E-01 | ca |
| 2.7E+00 | c | 5.0E-04 | n | 2.7E+00 | c | 5.0E-04 | r | 0.04 | 319-84-6 | HCH (alpha) | 3.8E-03 | ca | 8.4E-01 | ca | 2.5E-03 | ca | 2.5E-02 | ca |
| 1.5E+00 | c | 2.0E-04 | n | 1.5E+00 | c | 2.0E-04 | r | 0.04 | 319-85-7 | HCH (beta) | 1.4E-02 | ca | 1.5E+00 | ca | 4.4E-03 | ca | 4.5E-02 | ca |
| 1.1E+00 | c | 3.0E-04 | i | 1.1E+00 | c | 3.0E-04 | r | 0.04 | 58-89-9 | HCH (gamma) Lindane | 1.7E-02 | ca | 2.1E+00 | ca | 6.0E-03 | ca | 6.1E-02 | ca |
| 4.0E+00 | c | | | 4.0E+00 | c | | | 0.04 | 608-73-1 | HCH-technical | 1.3E-02 | ca | 5.7E-01 | ca | 1.7E-03 | ca | 1.7E-02 | ca |
| | | 6.0E-03 | i | | | 5.7E-05 | i | 0.1 | 77-47-4 | Hexachlorocyclopentadiene | 4.4E+01 | nc | 3.7E+03 | nc | 2.1E-01 | nc | 2.2E+02 | nc |
| 3.9E-02 | c | 1.0E-03 | i | 3.9E-02 | c | 1.0E-03 | r | 0.1 | 67-72-1 | Hexachloroethane | 1.6E+00 | ca | 4.4E+01 | ca | 1.7E-01 | ca | 1.7E+00 | ca |
| | | 3.0E-04 | i | | | 3.0E-04 | r | 0.1 | 70-30-4 | Hexachlorophene | 2.5E+00 | nc | 1.8E+02 | nc | 1.1E+00 | nc | 1.1E+01 | nc |
| 1.1E-01 | i | 3.0E-03 | i | 1.1E-01 | r | 3.0E-03 | r | 0.1 | 121-82-4 | Hexahydro-1,3,5-trinitro-1,3,5-triazine | 1.8E-01 | ca | 1.6E+01 | ca | 6.0E-02 | ca | 6.1E-01 | ca |
| | | 2.9E-06 | r | | | 2.9E-06 | i | 0.1 | 822-06-0 | 1,6-Hexamethylene diisocyanate | 1.7E-01 | nc | 1.8E+00 | nc | 1.0E-02 | nc | 1.0E-01 | nc |
| | | 1.1E+01 | p | | | 2.0E+00 | c | y | 110-54-3 | n-Hexane | 1.1E+02 | sat | 1.1E+02 | sat | 7.3E+03 | nc | 1.4E+04 | nc |
| | | 3.3E-02 | i | | | 3.3E-02 | r | 0.1 | 51235-04-2 | Hexazinone | 3.0E-02 | nc | 2.0E+04 | nc | 1.2E+02 | nc | 1.2E+03 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 2691-41-0 | HMX | 3.3E+01 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| 3.0E+00 | i | | | 1.7E+01 | c | 5.7E-05 | c | 0.1 | 302-01-2 | Hydrazine, hydrazine sulfate | 2.0E-05 | ca | 5.7E-01 | ca | 3.9E-04 | ca | 2.2E-02 | ca |
| 3.0E+00 | n | | | 1.7E+01 | n | | | 0.1 | 60-34-4 | Hydrazine, monomethyl | 7.9E-05 | ca | 5.7E-01 | ca | 3.9E-04 | ca | 2.2E-02 | ca |
| 3.0E+00 | n | | | 1.7E+01 | n | | | 0.1 | 57-14-7 | Hydrazine, dimethyl | 6.7E-04 | ca | 5.7E-01 | ca | 3.9E-04 | ca | 2.2E-02 | ca |
| | | | | | | 2.6E-03 | c | | 7647-01-0 | Hydrogen chloride | 5.3E+06 | nc | 1.7E+07 | nc | 9.4E+00 | nc | | |
| | | 2.0E-02 | i | | | 2.6E-03 | c | y | 74-90-8 | Hydrogen cyanide | 7.6E+00 | nc | 1.1E+02 | nc | 9.4E+00 | nc | 1.8E+01 | nc |
| | | 3.0E-03 | i | | | 2.9E-03 | c | | 7783-06-4 | Hydrogen sulfide | 3.1E+00 | nc | 3.1E+03 | nc | 1.0E+01 | nc | 1.1E+02 | nc |
| 5.6E-02 | p | 4.0E-02 | p | 5.6E-02 | r | 4.0E-02 | r | 0.1 | 123-31-9 | p-Hydroquinone | 3.4E-02 | ca | 3.1E+01 | ca | 1.2E-01 | ca | 1.2E+00 | ca |
| | | 1.3E-02 | i | | | 1.3E-02 | r | 0.1 | 35554-44-0 | Imazalil | 9.7E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| | | 2.5E-01 | i | | | 2.5E-01 | r | 0.1 | 81335-37-7 | Imazaquin | 6.6E+02 | nc | 1.0E+05 | max | 9.1E+02 | nc | 9.1E+03 | nc |
| | | 4.0E-02 | i | | | 4.0E-02 | r | 0.1 | 36734-19-7 | Iprodione | 2.3E+02 | nc | 2.5E+04 | nc | 1.5E+02 | nc | 1.5E+03 | nc |
| | | 3.0E-01 | n | | | | | | 7439-89-6 | Iron | 2.6E+03 | nc | 1.0E+05 | max | | | 1.1E+04 | nc |
| | | 3.0E-01 | i | | | 3.0E-01 | r | y | 78-83-1 | Isobutanol | 2.6E+02 | nc | 4.0E+04 | sat | 1.1E+03 | nc | 1.8E+03 | nc |
| 9.5E-04 | i | 2.0E-01 | i | 9.5E-04 | r | 5.7E-01 | c | 0.1 | 78-59-1 | Isophorone | 7.3E+00 | ca | 1.8E+03 | ca | 7.0E+00 | ca | 7.1E+01 | ca |
| | | 1.5E-02 | i | | | 1.5E-02 | r | 0.1 | 33820-53-0 | Isopropalin | 1.2E+02 | nc | 9.2E+03 | nc | 5.5E+01 | nc | 5.5E+02 | nc |
| | | 1.0E-01 | i | | | 1.1E-01 | r | 0.1 | 1832-54-8 | Isopropyl methyl phosphonic acid | 4.4E+01 | nc | 6.2E+04 | nc | 4.0E+02 | nc | 3.7E+03 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 82558-50-7 | Isoxaben | 3.1E+03 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| 1.6E+01 | c | 2.0E-04 | p | 1.6E+01 | c | 2.0E-04 | r | 0.1 | 143-50-0 | Kepone | 3.0E-02 | ca | 1.1E-01 | ca | 4.1E-04 | ca | 4.2E-03 | ca |

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ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | Rural | | "Direct Contact Exposure Pathways" | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | 2.0E-03 | i | | | | 0.1 | 77501-63-4 | Lactofen | 1.6E+01 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | | | | | | | 7439-92-1 | Lead+++ | | | 8.0E+02 | nc | | | | |
| 8.5E-03 | c | | | 4.2E-02 | c | | | | "CAL-Modified PRG"+++ | | | 8.0E+02 | nc | NOTE THAT THERE IS NO CAL-Modified INDUSTRIAL VALUE, THIS IS THE REGION 9 VALUE | | | |
| | | 1.0E-07 | i | | | | 0.1 | 78-00-2 | Lead (tetraethyl) | 4.0E-04 | nc | 6.2E-02 | nc | | | 3.7E-03 | nc |
| | | 2.0E-03 | i | | | | 0.1 | 330-55-2 | Linuron | 1.3E+01 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 2.0E-02 | x | | | | | 7439-93-2 | Lithium | 1.6E+03 | nc | 2.0E+04 | nc | | | 7.3E+02 | nc |
| | | 2.0E-01 | i | | | | 0.1 | 83055-99-6 | Londax | 5.0E+02 | nc | 1.0E+05 | max | 7.3E+02 | nc | 7.3E+03 | nc |
| | | 2.0E-02 | i | | | | 0.1 | 121-75-5 | Malathion | 1.1E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 1.0E-01 | i | | | | 0.1 | 108-31-6 | Maleic anhydride | 3.1E+01 | nc | 5.9E+04 | nc | 7.3E-01 | nc | 3.7E+03 | nc |
| | | 5.0E-01 | i | | | | | 123-33-1 | Maleic hydrazide | 8.8E+01 | nc | 2.4E+03 | sat | 1.8E+03 | nc | 3.0E+03 | nc |
| | | 1.0E-04 | p | | | | 0.1 | 109-77-3 | Malononitrile | 3.3E-02 | nc | 6.2E+01 | nc | 3.7E-01 | nc | 3.7E+00 | nc |
| | | 3.0E-02 | h | | | | 0.1 | 8018-01-7 | Mancozeb | 1.8E+03 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| 6.0E-02 | o | 5.0E-03 | i | 6.0E-02 | r | | 0.1 | 12427-38-2 | Maneb | 1.6E+00 | nc | 2.9E+01 | ca | 1.1E-01 | ca | 1.1E+00 | ca |
| | | 2.4E-02 | i | | | | | 7439-96-5 | Manganese and compounds+++ | 6.9E+02 | nc | 2.3E+04 | nc | 2.1E-01 | nc | 8.8E+02 | nc |
| | | 9.0E-05 | h | | | | 0.1 | 950-10-7 | Mephosfolan | 9.8E-02 | nc | 5.5E+01 | nc | 3.3E-01 | nc | 3.3E+00 | nc |
| | | 3.0E-02 | i | | | | 0.1 | 24307-26-4 | Mepiquat chloride | 1.8E+03 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| 2.9E-02 | n | 1.0E-01 | n | 2.9E-02 | r | | 0.1 | 149-30-4 | 2-Mercaptobenzothiazole | 1.7E+01 | ca | 5.9E+01 | ca | 2.3E-01 | ca | 2.3E+00 | ca |
| | | 3.0E-04 | i | | | | | 7487-94-7 | Mercury and compounds | 2.3E+01 | nc | 3.1E+02 | nc | 9.4E-02 | nc | 1.1E+01 | nc |
| | | | | | | | | 7439-97-6 | Mercury (elemental) | 1.8E+05 | nc | 5.8E+05 | nc | 3.1E-01 | nc | | |
| | | 1.0E-04 | i | | | | 0.1 | 22967-92-6 | Mercury (methyl) | 6.1E+00 | nc | 6.2E+01 | nc | | | 3.7E+00 | nc |
| | | 3.0E-05 | i | | | | 0.1 | 150-50-5 | Merphos | 2.5E-01 | nc | 1.8E+01 | nc | 1.1E-01 | nc | 1.1E+00 | nc |
| | | 3.0E-05 | i | | | | 0.1 | 78-48-8 | Merphos oxide | 2.4E-01 | nc | 1.8E+01 | nc | 1.1E-01 | nc | 1.1E+00 | nc |
| | | 6.0E-02 | i | | | | 0.1 | 57837-19-1 | Metalaxyl | 1.3E+02 | nc | 3.7E+04 | nc | 2.2E+02 | nc | 2.2E+03 | nc |
| | | 1.0E-04 | i | | | | | 126-98-7 | Methacrylonitrile | 6.0E-02 | nc | 8.4E+00 | nc | 7.3E-01 | nc | 1.0E+00 | nc |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V O C | skin abs. soils | | | Rural Residential Soil (mg/kg) | | "Direct Contact Exposure Pathways" Industrial Soil (mg/kg) | | Ambient Air (ug/m^3) | | Tap Water (ug/l) | |
| SFo 1/(mg/kg-d) | | RfDo (mg/kg-d) | | SFi 1/(mg/kg-d) | | RfDi (mg/kg-d) | | | CAS No. | | | | | | | | |
| | | 5.0E-05 | i | | | 5.0E-05 | r | 0.1 | 10265-92-6 | Methamidophos | 6.6E-03 | nc | 3.1E+01 | nc | 1.8E-01 | nc | 1.8E+00 | nc |
| | | 5.0E-01 | i | | | 1.1E+00 | c | 0.1 | 67-56-1 | Methanol | 5.7E+01 | nc | 1.0E+05 | max | 4.2E+03 | nc | 1.8E+04 | nc |
| | | 1.0E-03 | i | | | 1.0E-03 | r | 0.1 | 950-37-8 | Methidathion | 4.1E+00 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 | r | y | 16752-77-5 | Methomyl | 1.2E+01 | nc | 1.5E+02 | nc | 9.1E+01 | nc | 1.5E+02 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r | 0.1 | 72-43-5 | Methoxychlor | 3.8E+01 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 1.0E-03 | h | | | 1.7E-02 | c | 0.1 | 109-86-4 | 2-Methoxyethanol | 3.4E-01 | nc | 6.2E+02 | nc | 6.3E+01 | nc | 3.7E+01 | nc |
| | | 2.0E-03 | h | | | 2.6E-02 | c | 0.1 | 110-49-6 | 2-Methoxyethanol acetate | 7.8E-01 | nc | 1.2E+03 | nc | 9.4E+01 | nc | 7.3E+01 | nc |
| 4.9E-02 | c | | | 4.9E-02 | c | | | 0.1 | 99-59-2 | 2-Methoxy-5-nitroaniline | 1.2E-01 | ca | 3.5E+01 | ca | 1.4E-01 | ca | 1.4E+00 | ca |
| | | 1.0E+00 | h | | | 1.0E+00 | r | y | 79-20-9 | Methyl acetate | 3.8E+02 | nc | 9.2E+04 | nc | 3.7E+03 | nc | 6.1E+03 | nc |
| | | 3.0E-02 | h | | | 3.0E-02 | r | y | 96-33-3 | Methyl acrylate | 1.7E+01 | nc | 2.3E+02 | nc | 1.1E+02 | nc | 1.8E+02 | nc |
| 1.8E-01 | c | | | 1.8E-01 | c | | | 0.1 | 95-53-4 | 2-Methylaniline (o-toluidine) | 1.9E-02 | ca | 9.6E+00 | ca | 3.7E-02 | ca | 3.7E-01 | ca |
| 1.3E-01 | c | | | 1.3E-01 | c | | | 0.1 | 636-21-5 | 2-Methylaniline hydrochloride | 5.2E-03 | ca | 1.3E+01 | ca | 5.1E-02 | ca | 5.2E-01 | ca |
| | | 5.0E-04 | i | | | 5.0E-04 | r | 0.1 | 94-74-6 | 2-Methyl-4-chlorophenoxyacetic acid | 1.9E+00 | nc | 3.1E+02 | nc | 1.8E+00 | nc | 1.8E+01 | nc |
| | | 1.0E-02 | i | | | 1.0E-02 | r | 0.1 | 94-81-5 | 4-(2-Methyl-4-chlorophenoxy) butyric acid | 6.7E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 1.0E-03 | i | | | 1.0E-03 | r | 0.1 | 93-65-2 | 2-(2-Methyl-4-chlorophenoxy) propionic acid | 4.6E+00 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 1.0E-03 | i | | | 1.0E-03 | r | 0.1 | 16484-77-8 | 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | 6.1E+01 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 8.6E-01 | r | | | 8.6E-01 | h | y | 108-87-2 | Methylcyclohexane | 2.6E+03 | nc | 8.7E+03 | nc | 3.1E+03 | nc | 5.2E+03 | nc |
| 1.6E+00 | c | | | 1.6E+00 | c | 5.7E-03 | c | 0.1 | 101-77-9 | 4,4'-Methylenebisbenzeneamine | 2.4E-02 | ca | 1.1E+00 | ca | 4.1E-03 | ca | 4.2E-02 | ca |
| 1.5E+00 | c | 7.0E-04 | h | 1.5E+00 | c | 7.0E-04 | r | 0.1 | 101-14-4 | 4,4'-Methylene bis(2-chloroaniline) | 1.3E-01 | ca | 1.1E+00 | ca | 4.4E-03 | ca | 4.5E-02 | ca |
| 4.6E-02 | i | | | 4.6E-02 | r | | | 0.1 | 101-61-1 | 4,4'-Methylene bis(N,N'-dimethyl)aniline | 5.6E-01 | ca | 3.7E+01 | ca | 1.4E-01 | ca | 1.5E+00 | ca |
| | | 1.0E-02 | h | | | 1.0E-02 | r | y | 74-95-3 | Methylene bromide | 1.2E+01 | nc | 2.3E+02 | nc | 3.7E+01 | nc | 6.1E+01 | nc |
| 1.4E-02 | c | 6.0E-02 | i | 3.5E-03 | c | 1.1E-01 | c | y | 75-09-2 | Methylene chloride | 5.3E-01 | ca | 9.7E+00 | ca | 1.9E+00 | ca | 2.1E+00 | ca |
| | | 1.7E-04 | r | | | 2.0E-04 | c | 0.1 | 101-68-8 | 4,4'-Methylene diphenyl diisocyanate | 1.0E+01 | nc | 1.0E+02 | nc | 7.3E-01 | nc | 6.2E+00 | nc |
| | | 4.0E-03 | i | | | | | 0.1 | 91-57-6 | 2-Methylnapthalene | 2.9E+01 | nc | 2.5E+03 | nc | | | 1.5E+02 | nc |
| | | 6.0E-01 | i | | | 1.4E+00 | i | y | 78-93-3 | Methyl ethyl ketone (2-Butanone) | 2.6E+02 | nc | 1.1E+05 | nc | 5.1E+03 | nc | 7.0E+03 | nc |
| | | 8.0E-02 | h | | | 8.6E-01 | i | y | 108-10-1 | Methyl isobutyl ketone | 1.1E+02 | nc | 4.7E+04 | nc | 3.1E+03 | nc | 2.0E+03 | nc |
| | | 5.7E-04 | r | | | 5.7E-04 | n | 0.1 | 74-93-1 | Methyl Mercaptan | 3.5E+01 | nc | 3.5E+02 | nc | 2.1E+00 | nc | 2.1E+01 | nc |
| | | 1.4E+00 | i | | | 2.0E-01 | i | y | 80-62-6 | Methyl methacrylate | 1.1E+03 | nc | 2.7E+03 | sat | 7.3E+02 | nc | 1.4E+03 | nc |
| 3.3E-02 | h | | | 3.3E-02 | r | | | 0.1 | 99-55-8 | 2-Methyl-5-nitroaniline | 2.8E-01 | ca | 5.2E+01 | ca | 2.0E-01 | ca | 2.0E+00 | ca |
| | | 2.5E-04 | i | | | 2.5E-04 | r | 0.1 | 298-00-0 | Methyl parathion | 6.8E-01 | nc | 1.5E+02 | nc | 9.1E-01 | nc | 9.1E+00 | nc |

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Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V O C | skin abs. soils | | | Rural Residential "Direct Contact Exposure Pathways" | | | | | | | |
| SFo 1/(mg/kg-d) | | RfDo (mg/kg-d) | | SFi 1/(mg/kg-d) | | RfDi (mg/kg-d) | | | CAS No. | | | Industrial Soil (mg/kg) | | Ambient Air (ug/m^3) | | Tap Water (ug/l) | |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 95-48-7 | 2-Methylphenol | 1.3E+02 nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 108-39-4 | 3-Methylphenol | 1.5E+02 nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 5.0E-03 | h | | | 5.0E-03 | r | 0.1 | 106-44-5 | 4-Methylphenol | 1.3E+01 nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 2.0E-02 | p | | | 2.0E-02 | r | 0.1 | 993-13-5 | Methyl phosphonic acid | 1.2E+03 nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 6.0E-03 | h | | | 1.1E-02 | h y | | 25013-15-4 | Methyl styrene (mixture) | 3.2E+01 nc | 5.4E+02 | nc | 4.2E+01 | nc | 6.0E+01 | nc |
| | | 7.0E-02 | h | | | 7.0E-02 | r y | | 98-83-9 | Methyl styrene (alpha) | 6.8E+02 sat | 6.8E+02 | sat | 2.6E+02 | nc | 4.3E+02 | nc |
| 1.8E-03 | c | 8.6E-01 | r | 9.1E-04 | c | 2.3E+00 | c y | | 1634-04-4 | Methyl tertbutyl ether (MTBE) | 1.6E+00 ca | 7.0E+01 | ca | 7.3E+00 | ca | 1.0E+01 | ca |
| | | 1.5E-01 | i | | | 1.5E-01 | r | 0.1 | 51218-45-2 | Metolaclor (Dual) | 8.9E+02 nc | 9.2E+04 | nc | 5.5E+02 | nc | 5.5E+03 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 | r | 0.1 | 21087-64-9 | Metribuzin | 5.7E+01 nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| 1.8E+01 | c | 2.0E-04 | i | 1.8E+01 | c | 2.0E-04 | r | 0.1 | 2385-85-5 | Mirex | 1.0E-02 ca | 9.6E-02 | ca | 3.7E-04 | ca | 3.7E-03 | ca |
| | | 2.0E-03 | i | | | 2.0E-03 | r | 0.1 | 2212-67-1 | Molinate | 1.3E+01 nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 5.0E-03 | i | | | | | | 7439-98-7 | Molybdenum | 3.4E+01 nc | 5.1E+03 | nc | | | 1.8E+02 | nc |
| | | 1.0E-01 | i | | | 1.0E-01 | r | 0.1 | 10599-90-3 | Monochloramine | 6.1E+03 nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| | | 2.0E-03 | i | | | 2.0E-03 | r | 0.1 | 300-76-5 | Naled | 1.0E+01 nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 1.0E-01 | i | | | 1.0E-01 | r | 0.1 | 15299-99-7 | Napropamide | 7.1E+01 nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| | | 2.0E-02 | i | 9.1E-01 | c | 1.4E-05 | c | | 7440-02-0 | Nickel (soluble salts) | 1.4E+02 nc | 1.7E+04 | nc | 7.3E-03 | ca | 7.3E+02 | nc |
| | | | | | | | | | | Nickel refinery dust | | | | | | | |
| 1.7E+00 | c | | | 1.7E+00 | i | | | | 12035-72-2 | Nickel subsulfide | 3.8E-01 ca | 1.7E+00 | ca | 3.9E-03 | ca | 4.0E-02 | ca |
| | | 3.0E-03 | p | | | 3.0E-05 | p | 0.1 | 88-74-4 | 2-Nitroaniline | 7.5E+00 nc | 1.8E+03 | nc | 1.1E-01 | nc | 1.1E+02 | nc |
| 2.1E-02 | p | 3.0E-04 | p | 2.1E-02 | r | 3.0E-04 | p | 0.1 | 99-09-2 | 3-Nitroaniline | 1.8E+01 nc | 8.2E+01 | ca | 3.2E-01 | ca | 3.2E+00 | ca |
| 2.1E-02 | p | 3.0E-03 | p | 2.1E-02 | r | 1.0E-03 | p | 0.1 | 100-01-6 | 4-Nitroaniline | 2.3E+01 ca | 8.2E+01 | ca | 3.2E-01 | ca | 3.2E+00 | ca |
| | | 5.0E-04 | i | | | 5.7E-04 | h y | | 98-95-3 | Nitrobenzene | 1.2E+00 nc | 1.0E+02 | nc | 2.1E+00 | nc | 3.4E+00 | nc |
| | | 7.0E-02 | h | | | 7.0E-02 | r | 0.1 | 67-20-9 | Nitrofurantoin | 1.2E+01 nc | 4.3E+04 | nc | 2.6E+02 | nc | 2.6E+03 | nc |
| 1.3E+00 | c | | | 1.3E+00 | c | | | 0.1 | 59-87-0 | Nitrofurazone | 8.3E-04 ca | 1.3E+00 | ca | 5.1E-03 | ca | 5.2E-02 | ca |
| 1.4E-02 | n | | | 1.4E-02 | r | | | 0.1 | 55-63-0 | Nitroglycerin | 3.5E+01 ca | 1.2E+02 | ca | 4.7E-01 | ca | 4.8E+00 | ca |
| | | 1.0E-01 | i | | | 1.0E-01 | r | 0.1 | 556-88-7 | Nitroguanidine | 9.8E+00 nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| 9.4E+00 | r | 5.7E-03 | r | 9.4E+00 | h | 5.7E-03 | i y | | 79-46-9 | 2-Nitropropane | 2.0E-04 ca | 3.0E-01 | ca | 7.1E-04 | ca | 7.2E-03 | ca |
| 1.1E+01 | c | | | 1.1E+01 | c | | y | | 924-16-3 | N-Nitrosodi-n-butylamine | 1.4E-03 ca | 2.9E-02 | ca | 6.0E-04 | ca | 1.0E-03 | ca |
| 2.8E+00 | i | | | 2.8E+00 | r | | | 0.1 | 1116-54-7 | N-Nitrosodiethanolamine | 4.1E-05 ca | 6.2E-01 | ca | 2.4E-03 | ca | 2.4E-02 | ca |
| 3.6E+01 | c | | | 3.6E+01 | c | | | 0.1 | 55-18-5 | N-Nitrosodiethylamine | 1.2E-05 ca | 4.8E-02 | ca | 1.8E-04 | ca | 1.9E-03 | ca |

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ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | RfDi | O | abs. | CAS No. | | Residential | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | (mg/kg-d) | C | soils | | | Soil (mg/kg) | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| 1.6E+01 | c | 8.0E-06 | p | 1.6E+01 | c | 8.0E-06 | r | 0.1 | 62-75-9 | N-Nitrosodimethylamine | 8.7E-06 | ca | 1.1E-01 | ca | 4.1E-04 | ca | 4.2E-03 | ca |
| 9.0E-03 | c | 2.0E-02 | p | 9.0E-03 | c | 2.0E-02 | r | 0.1 | 86-30-6 | N-Nitrosodiphenylamine | 3.7E+00 | ca | 1.9E+02 | ca | 7.4E-01 | ca | 7.5E+00 | ca |
| 7.0E+00 | i | | | 7.0E+00 | r | | | 0.1 | 621-64-7 | N-Nitroso di-n-propylamine | 7.3E-04 | ca | 2.5E-01 | ca | 9.5E-04 | ca | 9.6E-03 | ca |
| 2.2E+01 | i | | | 2.2E+01 | r | | | 0.1 | 10595-95-6 | N-Nitroso-N-methylethylamine | 4.5E-05 | ca | 7.8E-02 | ca | 3.0E-04 | ca | 3.1E-03 | ca |
| 2.1E+00 | i | | | 2.1E+00 | c | | | 0.1 | 930-55-2 | N-Nitrosopyrrolidine | 1.1E-04 | ca | 8.2E-01 | ca | 3.2E-03 | ca | 3.2E-02 | ca |
| | | 2.0E-02 | p | | | 2.0E-02 | r | y | 99-08-1 | m-Nitrotoluene | 7.8E+01 | nc | 1.0E+03 | sat | 7.3E+01 | nc | 1.2E+02 | nc |
| 2.3E-01 | p | 1.0E-02 | h | 2.3E-01 | r | 1.0E-02 | r | y | 88-72-2 | o-Nitrotoluene | 5.0E-02 | ca | 2.2E+00 | ca | 2.9E-02 | ca | 4.8E-02 | ca |
| 1.7E-02 | p | 1.0E-02 | p | 1.7E-02 | r | 1.0E-02 | r | y | 99-99-0 | p-Nitrotoluene | 7.2E-01 | ca | 3.0E+01 | ca | 3.9E-01 | ca | 6.5E-01 | ca |
| | | 4.0E-02 | i | | | 4.0E-02 | r | 0.1 | 27314-13-2 | Norflurazon | 1.5E+02 | nc | 2.5E+04 | nc | 1.5E+02 | nc | 1.5E+03 | nc |
| | | 7.0E-04 | i | | | 7.0E-04 | r | 0.1 | 85509-19-9 | NuStar | 4.3E+01 | nc | 4.3E+02 | nc | 2.6E+00 | nc | 2.6E+01 | nc |
| | | 3.0E-03 | i | | | 3.0E-03 | r | 0.1 | 32536-52-0 | Octabromodiphenyl ether | 1.8E+02 | nc | 1.8E+03 | nc | 1.1E+01 | nc | 1.1E+02 | nc |
| | | 2.0E-03 | h | | | 2.0E-03 | r | 0.1 | 152-16-9 | Octamethylpyrophosphoramide | 3.2E-01 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 19044-88-3 | Oryzalin | 2.5E+02 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r | 0.1 | 19666-30-9 | Oxadiazon | 4.0E+01 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 | r | 0.1 | 23135-22-0 | Oxamyl | 4.2E+00 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| | | 3.0E-03 | i | | | 3.0E-03 | r | 0.1 | 42874-03-3 | Oxyfluorfen | 2.4E+01 | nc | 1.8E+03 | nc | 1.1E+01 | nc | 1.1E+02 | nc |
| | | 1.3E-02 | i | | | 1.3E-02 | r | 0.1 | 76738-62-0 | Paclobutrazol | 7.9E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| | | 4.5E-03 | i | | | 4.5E-03 | r | 0.1 | 4685-14-7 | Paraquat | 2.7E+02 | nc | 2.8E+03 | nc | 1.6E+01 | nc | 1.6E+02 | nc |
| | | 6.0E-03 | h | | | 6.0E-03 | r | 0.1 | 56-38-2 | Parathion | 4.2E+01 | nc | 3.7E+03 | nc | 2.2E+01 | nc | 2.2E+02 | nc |
| | | 5.0E-02 | h | | | 5.0E-02 | r | 0.1 | 1114-71-2 | Pebulate | 3.6E+02 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 4.0E-02 | i | | | 4.0E-02 | r | 0.1 | 40487-42-1 | Pendimethalin | 3.2E+02 | nc | 2.5E+04 | nc | 1.5E+02 | nc | 1.5E+03 | nc |
| 2.3E-02 | h | | | 2.3E-02 | r | | | 0.1 | 87-84-3 | Pentabromo-6-chloro cyclohexane | 1.1E+00 | ca | 7.5E+01 | ca | 2.9E-01 | ca | 2.9E+00 | ca |
| | | 2.0E-03 | i | | | 2.0E-03 | r | 0.1 | 32534-81-9 | Pentabromodiphenyl ether | 1.2E+02 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 8.0E-04 | i | | | 8.0E-04 | r | 0.1 | 608-93-5 | Pentachlorobenzene | 6.4E+00 | nc | 4.9E+02 | nc | 2.9E+00 | nc | 2.9E+01 | nc |
| 2.6E-01 | h | 3.0E-03 | i | 2.6E-01 | r | 3.0E-03 | r | 0.1 | 82-68-8 | Pentachloronitrobenzene | 9.5E-02 | ca | 6.6E+00 | ca | 2.6E-02 | ca | 2.6E-01 | ca |
| 8.1E-02 | c | 3.0E-02 | i | 1.8E-02 | c | 3.0E-02 | r | 0.25 | 87-86-5 | Pentachlorophenol | 2.3E-01 | ca | 1.3E+01 | ca | 3.7E-01 | ca | 8.3E-01 | ca |
| | | 1.0E-04 | n | | | | | | 7601-90-3 | Perchlorate | 7.8E+00 | nc | 1.0E+02 | nc | | | 3.7E+00 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 52645-53-1 | Permethrin | 3.3E+02 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 2.5E-01 | i | | | 2.5E-01 | r | 0.1 | 13684-63-4 | Phenmedipham | 1.4E+01 | nc | 1.0E+05 | max | 9.1E+02 | nc | 9.1E+03 | nc |
| | | 3.0E-01 | i | | | 5.7E-02 | c | 0.1 | 108-95-2 | Phenol | 5.5E+02 | nc | 1.0E+05 | max | 2.1E+02 | nc | 1.1E+04 | nc |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | Rural | | "Direct Contact Exposure Pathways" | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | 2.0E-03 | n | | | | 0.1 | 92-84-2 | Phenothiazine | 1.2E+02 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 6.0E-03 | i | | | | 0.1 | 108-45-2 | m-Phenylenediamine | 7.0E-01 | nc | 3.7E+03 | nc | 2.2E+01 | nc | 2.2E+02 | nc |
| 4.7E-02 | h | | | 4.7E-02 | r | | 0.1 | 95-54-5 | o-Phenylenediamine | 3.5E-02 | ca | 3.7E+01 | ca | 1.4E-01 | ca | 1.4E+00 | ca |
| | | 1.9E-01 | h | | | | 0.1 | 106-50-3 | p-Phenylenediamine | 1.2E+01 | nc | 1.0E+05 | max | 6.9E+02 | nc | 6.9E+03 | nc |
| | | 8.0E-05 | i | | | | 0.1 | 62-38-4 | Phenylmercuric acetate | 6.0E-02 | nc | 4.9E+01 | nc | 2.9E-01 | nc | 2.9E+00 | nc |
| 1.9E-03 | h | | | 1.9E-03 | r | | 0.1 | 90-43-7 | 2-Phenylphenol | 9.6E+00 | ca | 8.9E+02 | ca | 3.5E+00 | ca | 3.5E+01 | ca |
| | | 2.0E-04 | h | | | | 0.1 | 298-02-2 | Phorate | 4.5E-01 | nc | 1.2E+02 | nc | 7.3E-01 | nc | 7.3E+00 | nc |
| | | 2.0E-02 | i | | | | 0.1 | 732-11-6 | Phosmet | 1.0E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 3.0E-04 | i | | | | 0.1 | 7803-51-2 | Phosphine | 1.1E+00 | nc | 1.8E+02 | nc | 8.3E-01 | nc | 1.1E+01 | nc |
| | | | | | | | | 7664-38-2 | Phosphoric acid | 4.1E+06 | nc | 1.3E+07 | nc | 7.3E+00 | nc | | |
| | | 2.0E-05 | i | | | | | 7723-14-0 | Phosphorus (white) | 1.6E+00 | nc | 2.0E+01 | nc | | | 7.3E-01 | nc |
| | | 1.0E+00 | h | | | | 0.1 | 100-21-0 | p-Phthalic acid | 2.3E+03 | nc | 1.0E+05 | max | 3.7E+03 | nc | 3.7E+04 | nc |
| | | 2.0E+00 | i | | | | 0.1 | 85-44-9 | Phthalic anhydride | 1.0E+05 | max | 1.0E+05 | max | 2.1E+01 | nc | 7.3E+04 | nc |
| | | 7.0E-02 | i | | | | 0.1 | 1918-02-1 | Picloram | 2.8E+02 | nc | 4.3E+04 | nc | 2.6E+02 | nc | 2.6E+03 | nc |
| | | 1.0E-02 | i | | | | 0.1 | 29232-93-7 | Pirimiphos-methyl | 7.5E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| 3.0E+01 | c | 7.0E-06 | h | 3.0E+01 | c | 7.0E-06 | r | 0.1 | | Polybrominated biphenyls | | | | | | | |
| 7.0E-02 | i | 7.0E-05 | i | 7.0E-02 | i | 7.0E-05 | r | 0.14 | 12674-11-2 | PCBs (unspeciated mixture, low risk, e.g. Aroclor 1016) | 1.4E-02 | ca | 2.1E+01 | ca | | | |
| 5.0E+00 | #N/A | #N/A | ### | 2.0E+00 | ## | #N/A | ## | 0.14 | | Polychlorinated biphenyls | | | | | | | |
| 2.0E+00 | i | 2.0E-05 | i | 2.0E+00 | i | 2.0E-05 | r | 0.14 | 11097-69-1 | PCBs (unspeciated mixture, high risk, e.g. Aroclor 1254) | 1.3E-02 | ca | 7.4E-01 | ca | 3.3E-03 | ca | 3.4E-02 | ca |
| 4.5E+00 | n | | | 4.5E+00 | r | | | 0.1 | 61788-33-8 | Polychlorinated terphenyls | 1.1E-01 | ca | 3.8E-01 | ca | 1.5E-03 | ca | 1.5E-02 | ca |
| | | | | | | | | | | Polynuclear aromatic hydrocarbons (PAHs) | | | | | | | | |
| | | 6.0E-02 | i | | | 6.0E-02 | r | y | 83-32-9 | Acenaphthene | 4.6E+02 | nc | 2.9E+04 | nc | 2.2E+02 | nc | 3.7E+02 | nc |
| | | 3.0E-01 | i | | | 3.0E-01 | r | y | 120-12-7 | Anthracene | 2.3E+03 | nc | 1.0E+05 | max | 1.1E+03 | nc | 1.8E+03 | nc |
| 1.2E+00 | c | | | 3.9E-01 | c | | | 0.13 | 56-55-3 | Benz[a]anthracene | 3.5E-02 | ca | 1.3E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| 1.2E+00 | c | | | 3.9E-01 | c | | | 0.13 | 205-99-2 | Benzo[b]fluoranthene | 3.5E-02 | ca | 1.3E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| #N/A | #N/A | #N/A | ### | #N/A | ## | #N/A | ## | 0.13 | 207-08-9 | Benzo[k]fluoranthene | | | | | | | | |
| 1.2E+00 | c | | | 3.9E-01 | c | | | 0.13 | 207-08-9 | "CAL-Modified PRG" | 1.9E-01 | ca | 1.3E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| 1.2E+01 | c | | | 3.9E+00 | c | | | 0.13 | 50-32-8 | Benzo[a]pyrene | 3.5E-03 | ca | 1.3E-01 | ca | 1.7E-03 | ca | 5.6E-03 | ca |
| #N/A | #N/A | #N/A | ### | #N/A | ## | #N/A | ## | 0.13 | 218-01-9 | Chrysene | | | | | | | | |
| 1.2E-01 | c | | | 3.9E-02 | c | | | 0.13 | | "CAL-Modified PRG" | 1.9E+00 | ca | 1.3E+01 | ca | 1.7E-01 | ca | 2.1E-01 | ca |

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Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
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| TOXICITY VALUES | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| 4.1E+00 | c | | | 4.1E+00 | c | | 0.13 | 53-70-3 | Dibenz[ah]anthracene | 3.8E-03 | ca | 3.8E-01 | ca | 1.6E-03 | ca | 1.6E-02 | ca |
| | | 4.0E-02 | i | | | | 0.13 | 206-44-0 | Fluoranthene | 3.2E+02 | nc | 2.2E+04 | nc | 1.5E+02 | nc | 1.5E+03 | nc |
| | | 4.0E-02 | i | | | y | | 86-73-7 | Fluorene | 3.1E+02 | nc | 2.6E+04 | nc | 1.5E+02 | nc | 2.4E+02 | nc |
| 1.2E+00 | c | | | 3.9E-01 | c | | 0.13 | 193-39-5 | Indeno[1,2,3-cd]pyrene | 3.5E-02 | ca | 1.3E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| #N/A | #N/A | #N/A | ### | #N/A | ## | y | | 91-20-3 | Naphthalene | | | | | | | | |
| 1.2E-01 | r | 2.0E-02 | i | 1.2E-01 | c | | | | "CAL-Modified PRG" | 1.7E+00 | ca | 4.2E+00 | ca | 5.5E-02 | ca | 9.2E-02 | ca |
| | | 3.0E-02 | i | | | y | | 129-00-0 | Pyrene | 2.4E+02 | nc | 2.9E+04 | nc | 1.1E+02 | nc | 1.8E+02 | nc |
| 1.5E-01 | i | 9.0E-03 | i | 1.5E-01 | r | | 0.1 | 67747-09-5 | Prochloraz | 1.6E-01 | ca | 1.1E+01 | ca | 4.4E-02 | ca | 4.5E-01 | ca |
| | | 6.0E-03 | h | | | | 0.1 | 26399-36-0 | Profluralin | 4.9E+01 | nc | 3.7E+03 | nc | 2.2E+01 | nc | 2.2E+02 | nc |
| | | 1.5E-02 | i | | | | 0.1 | 1610-18-0 | Prometon | 5.6E+01 | nc | 9.2E+03 | nc | 5.5E+01 | nc | 5.5E+02 | nc |
| | | 4.0E-03 | i | | | | 0.1 | 7287-19-6 | Prometryn | 1.8E+01 | nc | 2.5E+03 | nc | 1.5E+01 | nc | 1.5E+02 | nc |
| | | 7.5E-02 | i | | | | 0.1 | 23950-58-5 | Pronamide | 4.9E+02 | nc | 4.6E+04 | nc | 2.7E+02 | nc | 2.7E+03 | nc |
| | | 1.3E-02 | i | | | | 0.1 | 1918-16-7 | Propachlor | 4.5E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| | | 5.0E-03 | i | | | | 0.1 | 709-98-8 | Propanil | 3.0E+01 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 2.0E-02 | i | | | | 0.1 | 2312-35-8 | Propargite | 1.6E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 2.0E-03 | i | | | | 0.1 | 107-19-7 | Propargyl alcohol | 3.8E-01 | nc | 1.2E+03 | nc | 7.3E+00 | nc | 7.3E+01 | nc |
| | | 2.0E-02 | i | | | | 0.1 | 139-40-2 | Propazine | 8.1E+01 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 2.0E-02 | i | | | | 0.1 | 122-42-9 | Propham | 1.3E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 1.3E-02 | i | | | | 0.1 | 60207-90-1 | Propiconazole | 8.6E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| | | 1.0E-01 | i | | | | | 98-82-8 | Isopropylbenzene (see Cumene) | 3.2E+02 | nc | 2.0E+03 | nc | 4.0E+02 | nc | 6.6E+02 | nc |
| | | 4.0E-02 | n | | | y | | 103-65-1 | n-Propylbenzene | 2.4E+02 | sat | 2.4E+02 | sat | 1.5E+02 | nc | 2.4E+02 | nc |
| | | 5.0E-01 | p | | | | 0.1 | 57-55-6 | Propylene glycol | 1.7E+01 | nc | 1.0E+05 | max | 3.1E+00 | nc | 1.8E+04 | nc |
| | | 7.0E-01 | h | | | | 0.1 | 52125-53-8 | Propylene glycol, monoethyl ether | 4.3E+04 | nc | 1.0E+05 | max | 2.6E+03 | nc | 2.6E+04 | nc |
| | | 7.0E-01 | h | | | | 0.1 | 107-98-2 | Propylene glycol, monomethyl ether | 1.7E+02 | nc | 1.0E+05 | max | 7.3E+03 | nc | 2.6E+04 | nc |
| 2.4E-01 | i | 8.6E-03 | r | 1.3E-02 | c | y | | 75-56-9 | Propylene oxide | 4.1E-03 | ca | 6.6E+00 | ca | 5.1E-01 | ca | 2.2E-01 | ca |
| | | 2.5E-01 | i | | | | 0.1 | 81335-77-5 | Pursuit | 1.5E+04 | nc | 1.0E+05 | max | 9.1E+02 | nc | 9.1E+03 | nc |
| | | 2.5E-02 | i | | | | 0.1 | 51630-58-1 | Pydrin | 1.9E+02 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| | | 1.0E-03 | i | | | | 0.1 | 110-86-1 | Pyridine | 1.5E+00 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 5.0E-04 | i | | | | 0.1 | 13593-03-8 | Quinalphos | 2.9E+00 | nc | 3.1E+02 | nc | 1.8E+00 | nc | 1.8E+01 | nc |
| 3.0E+00 | i | | | 3.0E+00 | r | | 0.1 | 91-22-5 | Quinoline | 3.3E-03 | ca | 5.7E-01 | ca | 2.2E-03 | ca | 2.2E-02 | ca |

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ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | RfDi | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | (mg/kg-d) | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| 1.1E-01 | i | 3.0E-03 | i | 1.1E-01 | r | 3.0E-03 r | | 0.1 | 121-82-4 | RDX (Cyclonite) | 1.8E-01 | ca | 1.6E+01 | ca | 6.0E-02 | ca | 6.1E-01 | ca |
| | | 3.0E-02 | i | | | 3.0E-02 r | | 0.1 | 10453-86-8 | Resmethrin | 2.5E+02 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| | | 5.0E-02 | h | | | 5.0E-02 r | | 0.1 | 299-84-3 | Ronnel | 4.0E+02 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 4.0E-03 | i | | | 4.0E-03 r | | 0.1 | 83-79-4 | Rotenone | 3.0E+01 | nc | 2.5E+03 | nc | 1.5E+01 | nc | 1.5E+02 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 r | | 0.1 | 78587-05-0 | Savey | 1.5E+03 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| | | 5.0E-03 | i | | | | | 0.1 | 7783-00-8 | Selenious Acid | 3.1E+02 | nc | 3.1E+03 | nc | | | 1.8E+02 | nc |
| | | 5.0E-03 | i | | | 5.7E-03 c | | | 7782-49-2 | Selenium | 3.1E+01 | nc | 5.1E+03 | nc | 2.1E+01 | nc | 1.8E+02 | nc |
| | | 5.0E-03 | h | | | | | 0.1 | 630-10-4 | Selenourea | 3.1E+02 | nc | 3.1E+03 | nc | | | 1.8E+02 | nc |
| | | 9.0E-02 | i | | | 9.0E-02 r | | 0.1 | 74051-80-2 | Sethoxydim | 6.9E+02 | nc | 5.5E+04 | nc | 3.3E+02 | nc | 3.3E+03 | nc |
| | | 5.0E-03 | i | | | | | | 7440-22-4 | Silver and compounds | 4.3E+01 | nc | 5.1E+03 | nc | | | 1.8E+02 | nc |
| 1.2E-01 | h | 5.0E-03 | i | 1.2E-01 | r | 5.0E-03 r | | 0.1 | 122-34-9 | Simazine | 9.1E-02 | ca | 1.4E+01 | ca | 5.5E-02 | ca | 5.6E-01 | ca |
| | | 4.0E-03 | i | | | | | | 26628-22-8 | Sodium azide | 3.1E+02 | nc | 4.1E+03 | nc | | | 1.5E+02 | nc |
| 2.7E-01 | h | 3.0E-02 | i | 2.7E-01 | r | 3.0E-02 r | | 0.1 | 148-18-5 | Sodium diethyldithiocarbamate | 4.9E-03 | ca | 6.4E+00 | ca | 2.5E-02 | ca | 2.5E-01 | ca |
| | | 2.0E-05 | i | | | 2.0E-05 r | | 0.1 | 62-74-8 | Sodium fluoroacetate | 4.1E-05 | nc | 1.2E+01 | nc | 7.3E-02 | nc | 7.3E-01 | nc |
| | | 1.0E-03 | h | | | 1.0E-03 r | | 0.1 | 13718-26-8 | Sodium metavanadate | 6.1E+01 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 6.0E-01 | i | | | | | | 7440-24-6 | Strontium, stable | 3.0E+03 | nc | 1.0E+05 | max | | | 2.2E+04 | nc |
| | | 3.0E-04 | i | | | 3.0E-04 r | | 0.1 | 57-24-9 | Strychnine | 8.2E-01 | nc | 1.8E+02 | nc | 1.1E+00 | nc | 1.1E+01 | nc |
| | | 2.0E-01 | i | | | 2.6E-01 c | y | | 100-42-5 | Styrene | 1.7E+03 | sat | 1.7E+03 | sat | 9.4E+02 | nc | 1.5E+03 | nc |
| | | 5.0E-03 | p | | | 5.0E-03 r | | | 80-07-9 | 1,1'-Sulfonylbis (4-chlorobenzene) | 3.9E+02 | nc | 5.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 r | | 0.1 | 88671-89-0 | Systhane | 1.5E+03 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| 1.3E+05 | c | | | 1.3E+05 | c | 1.1E-08 c | | 0.03 | 1746-01-6 | 2,3,7,8-TCDD (dioxin) | 1.8E-07 | ca | 1.8E-05 | ca | 5.1E-08 | ca | 5.2E-07 | ca |
| | | 7.0E-02 | i | | | 7.0E-02 r | | 0.1 | 34014-18-1 | Tebuthiuron | 2.6E+01 | nc | 4.3E+04 | nc | 2.6E+02 | nc | 2.6E+03 | nc |
| | | 2.0E-02 | h | | | 2.0E-02 r | | 0.1 | 3383-96-8 | Temephos | 1.6E+02 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| | | 1.3E-02 | i | | | 1.3E-02 r | | 0.1 | 5902-51-2 | Terbacil | 3.5E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| | | 2.5E-05 | h | | | 2.5E-05 r | | 0.1 | 13071-79-9 | Terbufos | 1.8E-01 | nc | 1.5E+01 | nc | 9.1E-02 | nc | 9.1E-01 | nc |
| | | 1.0E-03 | i | | | 1.0E-03 r | | 0.1 | 886-50-0 | Terbutryn | 7.1E+00 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 3.0E-04 | i | | | 3.0E-04 r | | 0.1 | 95-94-3 | 1,2,4,5-Tetrachlorobenzene | 2.4E+00 | nc | 1.8E+02 | nc | 1.1E+00 | nc | 1.1E+01 | nc |
| 2.6E-02 | i | 3.0E-02 | i | 2.6E-02 | i | 3.0E-02 r | y | | 630-20-6 | 1,1,1,2-Tetrachloroethane | 5.9E-01 | ca | 7.3E+00 | ca | 2.6E-01 | ca | 4.3E-01 | ca |
| 2.7E-01 | c | 6.0E-02 | p | 2.0E-01 | c | 6.0E-02 r | y | | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5.6E-02 | ca | 9.2E-01 | ca | 3.3E-02 | ca | 5.2E-02 | ca |
| 5.4E-01 | c | 1.0E-02 | i | 2.1E-02 | c | 1.0E-02 c | y | | 127-18-4 | Tetrachloroethylene (PCE) | 2.6E-02 | ca | 1.3E+00 | ca | 3.2E-01 | ca | 1.0E-01 | ca |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | | "Direct Contact Exposure Pathways" | | | | | | | |
| SFo | | RfDo | | SFi | | O | abs. | CAS No. | | Rural Residential | | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | 3.0E-02 | i | | | | 0.1 | 58-90-2 | 2,3,4,6-Tetrachlorophenol | 2.2E+02 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| 2.0E+01 | h | | | 2.0E+01 | r | | 0.1 | 5216-25-1 | p,a,a,a-Tetrachlorotoluene | 1.2E-03 | ca | 8.6E-02 | ca | 3.3E-04 | ca | 3.4E-03 | ca |
| 2.4E-02 | h | 3.0E-02 | i | 2.4E-02 | r | 3.0E-02 | r | 0.1 | 961-11-5 | Tetrachlorovinphos | 9.1E-01 | ca | 7.2E+01 | ca | 2.8E-01 | ca | 2.8E+00 | ca |
| | | 5.0E-04 | i | | | 5.0E-04 | r | 0.1 | 3689-24-5 | Tetraethyldithiopyrophosphate | 2.8E+00 | nc | 3.1E+02 | nc | 1.8E+00 | nc | 1.8E+01 | nc |
| 7.6E-03 | n | 2.1E-01 | n | 6.8E-03 | n | 8.6E-02 | n | y | 109-99-9 | Tetrahydrofuran | 9.3E+00 | ca | 2.1E+01 | ca | 9.8E-01 | ca | 1.6E+00 | ca |
| | | 6.6E-05 | i | | | | | | 7440-28-0 | Thallium and compounds+++ | 5.2E+00 | nc | 6.7E+01 | nc | | | 2.4E+00 | nc |
| | | 1.0E-02 | i | | | 1.0E-02 | r | 0.1 | 28249-77-6 | Thiobencarb | 6.5E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 5.0E-02 | n | | | 5.0E-02 | r | 0.1 | N/A | Thiocyanate | 3.1E+03 | nc | 1.0E+05 | max | 1.8E+02 | nc | 1.8E+03 | nc |
| | | 3.0E-04 | h | | | 3.0E-04 | r | 0.1 | 39196-18-4 | Thiofanox | 1.0E-02 | nc | 1.8E+02 | nc | 1.1E+00 | nc | 1.1E+01 | nc |
| | | 8.0E-02 | i | | | 8.0E-02 | r | 0.1 | 23564-05-8 | Thiophanate-methyl | 1.4E+02 | nc | 4.9E+04 | nc | 2.9E+02 | nc | 2.9E+03 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r | 0.1 | 137-26-8 | Thiram | 1.2E+01 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| | | 6.0E-01 | h | | | | | | 7440-31-5 | Tin (inorganic, also see tributyltin oxide) | 2.6E+03 | nc | 1.0E+05 | max | | | 2.2E+04 | nc |
| | | 4.0E+00 | n | | | 8.6E-03 | n | | 7440-32-6 | Titanium | 1.0E+05 | max | 1.0E+05 | max | 3.1E+01 | nc | 1.5E+05 | nc |
| | | 2.0E-01 | i | | | 8.6E-02 | c | y | 108-88-3 | Toluene | 5.2E+02 | sat | 5.2E+02 | sat | 3.1E+02 | nc | 5.8E+02 | nc |
| 3.8E+00 | c | | | 4.0E+00 | c | | | 0.1 | 95-80-7 | Toluene-2,4-diamine | 4.5E-04 | ca | 4.5E-01 | ca | 1.7E-03 | ca | 1.8E-02 | ca |
| | | 6.0E-01 | h | | | 6.0E-01 | r | 0.1 | 95-70-5 | Toluene-2,5-diamine | 2.3E+02 | nc | 1.0E+05 | max | 2.2E+03 | nc | 2.2E+04 | nc |
| | | 2.0E-01 | h | | | 2.0E-01 | r | 0.1 | 823-40-5 | Toluene-2,6-diamine | 5.5E+01 | nc | 1.0E+05 | max | 7.3E+02 | nc | 7.3E+03 | nc |
| 1.9E-01 | i | | | 1.9E-01 | r | | | 0.1 | 106-49-0 | p-Toluidine | 4.9E-02 | ca | 9.1E+00 | ca | 3.5E-02 | ca | 3.5E-01 | ca |
| 1.2E+00 | c | | | 1.2E+00 | c | | | 0.1 | 8001-35-2 | Toxaphene | 2.4E-02 | ca | 1.4E+00 | ca | 5.5E-03 | ca | 5.6E-02 | ca |
| | | 7.5E-03 | i | | | 7.5E-03 | r | 0.1 | 66841-25-6 | Tralomethrin | 4.6E+02 | nc | 4.6E+03 | nc | 2.7E+01 | nc | 2.7E+02 | nc |
| | | 1.3E-02 | i | | | 1.3E-02 | r | 0.1 | 2303-17-5 | Triallate | 9.7E+01 | nc | 8.0E+03 | nc | 4.7E+01 | nc | 4.7E+02 | nc |
| | | 1.0E-02 | i | | | 1.0E-02 | r | 0.1 | 82097-50-5 | Triasulfuron | 6.1E+02 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r | 0.1 | 615-54-3 | 1,2,4-Tribromobenzene | 3.9E+01 | nc | 3.1E+03 | nc | 1.8E+01 | nc | 1.8E+02 | nc |
| 9.2E-03 | p | 2.0E-01 | p | 9.2E-03 | r | 2.0E-01 | r | 0.1 | 126-73-8 | Tributyl phosphate | 5.3E+01 | ca | 1.9E+02 | ca | 7.2E-01 | ca | 7.3E+00 | ca |
| | | 3.0E-04 | i | | | | | 0.1 | 56-35-9 | Tributyltin oxide (TBTO) | 1.8E+01 | nc | 1.8E+02 | nc | | | 1.1E+01 | nc |
| 3.4E-02 | h | | | 3.4E-02 | r | | | 0.1 | 634-93-5 | 2,4,6-Trichloroaniline | 6.4E-01 | ca | 5.1E+01 | ca | 2.0E-01 | ca | 2.0E+00 | ca |
| 2.9E-02 | h | | | 2.9E-02 | r | | | 0.1 | 33663-50-2 | 2,4,6-Trichloroaniline hydrochloride | 1.7E+01 | ca | 5.9E+01 | ca | 2.3E-01 | ca | 2.3E+00 | ca |
| 3.6E-03 | c | 1.0E-02 | i | | | 1.0E-03 | p | y | 120-82-1 | 1,2,4-Trichlorobenzene | 3.6E+01 | nc | 2.2E+02 | nc | 3.7E+00 | nc | 7.2E+00 | nc |
| | | 2.8E-01 | n | | | 2.9E-01 | c | y | 71-55-6 | 1,1,1-Trichloroethane | 1.2E+03 | sat | 1.2E+03 | sat | 1.0E+03 | nc | 1.7E+03 | nc |
| 7.2E-02 | c | 4.0E-03 | i | 5.7E-02 | c | 4.0E-03 | r | y | 79-00-5 | 1,1,2-Trichloroethane | 1.4E-01 | ca | 1.6E+00 | ca | 1.2E-01 | ca | 1.9E-01 | ca |

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ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo | | RfDo | | SFi | | RfDi | O | abs. | CAS No. | | Residential | Industrial | | Ambient Air | | Tap Water | |
| 1/(mg/kg-d) | | (mg/kg-d) | | 1/(mg/kg-d) | | (mg/kg-d) | C | soils | | | Soil (mg/kg) | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | |
| | | | | | | | y | | 79-01-6 | Trichloroethylene (TCE) | | | | | | | |
| 1.3E-02 | c | 3.0E-04 | n | 7.0E-03 | c | 1.7E-01 | c y | | 79-01-6 | "CAL-Modified PRG" | 3.3E-02 | ca | 6.5E+00 | ca | 9.5E-01 | ca | 1.4E+00 | ca |
| | | 3.0E-01 | i | | | 2.0E-01 | h y | | 75-69-4 | Trichlorofluoromethane | 3.0E+02 | nc | 2.0E+03 | sat | 7.3E+02 | nc | 1.3E+03 | nc |
| | | 1.0E-01 | i | | | 1.0E-01 | r | 0.1 | 95-95-4 | 2,4,5-Trichlorophenol | 7.2E+02 | nc | 6.2E+04 | nc | 3.7E+02 | nc | 3.7E+03 | nc |
| | | | | | | | | 0.1 | 88-06-2 | 2,4,6-Trichlorophenol | | | | | | | | |
| 7.0E-02 | c | 1.0E-04 | n | 7.0E-02 | c | 1.0E-04 | r | 0.1 | 88-06-2 | "CAL-Modified PRG" | 1.7E+00 | ca | 2.5E+01 | ca | 9.5E-02 | ca | 9.6E-01 | ca |
| | | 1.0E-02 | i | | | 1.0E-02 | r | 0.1 | 93-76-5 | 2,4,5-Trichlorophenoxyacetic Acid | 7.4E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| | | 8.0E-03 | i | | | 8.0E-03 | r | 0.1 | 93-72-1 | 2-(2,4,5-Trichlorophenoxy) propionic acid | 5.8E+01 | nc | 4.9E+03 | nc | 2.9E+01 | nc | 2.9E+02 | nc |
| | | 5.0E-03 | i | | | 5.0E-03 | r y | | 598-77-6 | 1,1,2-Trichloropropane | 9.5E+00 | nc | 2.7E+02 | nc | 1.8E+01 | nc | 3.0E+01 | nc |
| 2.0E+00 | n | 6.0E-03 | i | 2.0E+00 | r | 1.4E-03 | n y | | 96-18-4 | 1,2,3-Trichloropropane | 3.5E-03 | ca | 7.5E-02 | ca | 3.3E-03 | ca | 5.5E-03 | ca |
| | | 1.0E-02 | p | | | 3.0E-04 | p y | | 96-19-5 | 1,2,3-Trichloropropene | 4.7E+00 | nc | 1.7E+01 | nc | 1.1E+00 | nc | 2.2E+00 | nc |
| | | 3.0E-03 | i | | | 3.0E-03 | r | 0.1 | 58138-08-2 | Tridiphane | 1.8E+02 | nc | 1.8E+03 | nc | 1.1E+01 | nc | 1.1E+02 | nc |
| | | 2.0E-03 | r | | | 5.7E-02 | c y | | 121-44-8 | Triethylamine | 1.3E+02 | nc | 1.1E+03 | nc | 2.1E+02 | nc | 6.2E+01 | nc |
| 7.7E-03 | i | 7.5E-03 | i | 7.7E-03 | r | 7.5E-03 | r | 0.1 | 1582-09-8 | Trifluralin | 3.4E+00 | ca | 2.2E+02 | ca | 8.6E-01 | ca | 8.7E+00 | ca |
| | | 1.4E-04 | r | | | 1.4E-04 | n | 0.1 | 552-30-7 | Trimellitic Anhydride (TMAN) | 8.6E+00 | nc | 8.6E+01 | nc | 5.1E-01 | nc | 5.1E+00 | nc |
| | | 5.0E-02 | p | | | 1.7E-03 | p y | | 95-63-6 | 1,2,4-Trimethylbenzene | 4.6E+01 | nc | 1.7E+02 | nc | 6.2E+00 | nc | 1.2E+01 | nc |
| | | 5.0E-02 | p | | | 1.7E-03 | p y | | 108-67-8 | 1,3,5-Trimethylbenzene | 2.0E+01 | nc | 7.0E+01 | nc | 6.2E+00 | nc | 1.2E+01 | nc |
| 3.7E-02 | h | | | 3.7E-02 | r | | | 0.1 | 512-56-1 | Trimethyl phosphate | 1.1E-02 | ca | 4.7E+01 | ca | 1.8E-01 | ca | 1.8E+00 | ca |
| | | 3.0E-02 | i | | | 3.0E-02 | r | 0.1 | 99-35-4 | 1,3,5-Trinitrobenzene | 4.0E+01 | nc | 1.8E+04 | nc | 1.1E+02 | nc | 1.1E+03 | nc |
| | | 1.0E-02 | h | | | 1.0E-02 | r | 0.1 | 479-45-8 | Trinitrophenylmethylnitramine | 1.3E+01 | nc | 6.2E+03 | nc | 3.7E+01 | nc | 3.7E+02 | nc |
| 3.0E-02 | i | 5.0E-04 | i | 3.0E-02 | r | 5.0E-04 | r | 0.1 | 118-96-7 | 2,4,6-Trinitrotoluene | 3.9E-01 | ca | 5.7E+01 | ca | 2.2E-01 | ca | 2.2E+00 | ca |
| | | 2.0E-02 | p | | | 2.0E-02 | r | 0.1 | 791-28-6 | Triphenylphosphine oxide | 1.2E+03 | nc | 1.2E+04 | nc | 7.3E+01 | nc | 7.3E+02 | nc |
| 1.4E-02 | p | 3.1E-01 | p | 1.4E-02 | r | 3.1E-01 | r | 0.1 | 115-96-8 | Tris(2-chloroethyl) phosphate | 3.5E+01 | ca | 1.2E+02 | ca | 4.7E-01 | ca | 4.8E+00 | ca |
| 3.2E-03 | p | 1.0E-01 | p | 3.2E-03 | r | 1.0E-01 | r | 0.1 | 78-42-2 | Tris(2-ethylhexyl) phosphate | 1.5E+02 | ca | 5.4E+02 | ca | 2.1E+00 | ca | 2.1E+01 | ca |
| | | 2.0E-04 | n | | | | | | 7440-61-1 | Uranium (chemical toxicity only) | 1.6E+01 | nc | 2.0E+02 | nc | | | 7.3E+00 | nc |
| | | 1.0E-03 | n | | | | | | 7440-62-2 | Vanadium and compounds | 3.6E+01 | nc | 1.0E+03 | nc | | | 3.7E+01 | nc |
| | | 1.0E-03 | i | | | 1.0E-03 | r | 0.1 | 1929-77-7 | Vernam | 7.2E+00 | nc | 6.2E+02 | nc | 3.7E+00 | nc | 3.7E+01 | nc |
| | | 2.5E-02 | i | | | 2.5E-02 | r | 0.1 | 50471-44-8 | Vinclozolin | 1.4E+02 | nc | 1.5E+04 | nc | 9.1E+01 | nc | 9.1E+02 | nc |
| | | 1.0E+00 | h | | | 5.7E-02 | i y | | 108-05-4 | Vinyl acetate | 2.8E+02 | nc | 1.4E+03 | nc | 2.1E+02 | nc | 4.1E+02 | nc |
| 1.1E-01 | r | 8.6E-04 | r | 1.1E-01 | h | 8.6E-04 | i y | | 593-60-2 | Vinyl bromide (bromoethene) | 1.9E-01 | ca | 4.2E-01 | ca | 6.0E-02 | ca | 1.0E-01 | ca |

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ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
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| TOXICITY VALUES | | | | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | V | skin | | | | "Direct Contact Exposure Pathways" | | | | | | | |
| SFo 1/(mg/kg-d) | | RfDo (mg/kg-d) | | SFi 1/(mg/kg-d) | | RfDi (mg/kg-d) | O C | abs. soils | CAS No. | | Rural Residential Soil (mg/kg) | | Industrial Soil (mg/kg) | | Ambient Air (ug/m^3) | | Tap Water (ug/l) | |
| 2.7E-01 | c | 3.0E-03 | i | 2.7E-01 | c | 2.9E-02 | i y | | 75-01-4 | Vinyl chloride (child/adult)+++ | 3.0E-03 | ca | 5.5E-02 | ca | 2.5E-02 | ca | 4.1E-02 | ca |
| 2.7E-01 | c | 3.0E-03 | i | 2.7E-01 | c | 2.9E-02 | i y | | 75-01-4 | Vinyl chloride (adult) | 3.0E-03 | ca | 5.5E-02 | ca | 2.5E-02 | ca | 4.1E-02 | ca |
| | | 3.0E-04 | i | | | 3.0E-04 | r | 0.1 | 81-81-2 | Warfarin | 1.8E+00 | nc | 1.8E+02 | nc | 1.1E+00 | nc | 1.1E+01 | nc |
| | | 2.0E-01 | i | | | 2.0E-01 | c y | 0.1 | 1330-20-7 | Xylenes | 7.6E+02 | nc | 4.2E+02 | sat | 7.3E+02 | nc | 1.2E+03 | nc |
| | | 3.0E-01 | i | | | | | | 7440-66-6 | Zinc | 1.3E+03 | nc | 1.0E+05 | max | | | 1.1E+04 | nc |
| | | 3.0E-04 | i | | | | | | 1314-84-7 | Zinc phosphide | 2.3E+01 | nc | 3.1E+02 | nc | | | 1.1E+01 | nc |
| | | 5.0E-02 | i | | | 5.0E-02 | r | 0.1 | 12122-67-7 | Zineb | 7.5E+01 | nc | 3.1E+04 | nc | 1.8E+02 | nc | 1.8E+03 | nc |
| 1.3E+01 | c | | | 1.3E+01 | c | | | | 39001-02-0 | 1,2,3,4,6,7,8,9-Octachlorodibenzofuran | 1.9E-04 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 1.3E+01 | c | | | 1.3E+01 | c | | | | 3268-87-9 | 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin | 1.9E-04 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 1.3E+03 | c | | | 1.3E+03 | c | | | | 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 4.9E-04 | ca | 2.2E-03 | ca | 5.1E-06 | ca | 5.2E-05 | ca |
| 1.3E+03 | c | | | 1.3E+03 | c | | | | 37871-00-4 | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | 1.8E-05 | ca | 2.2E-03 | ca | 5.1E-06 | ca | 5.2E-05 | ca |
| 1.3E+03 | c | | | 1.3E+03 | c | | | | 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 4.9E-04 | ca | 2.2E-03 | ca | 5.1E-06 | ca | 5.2E-05 | ca |
| 1.3E+04 | c | | | 1.3E+04 | c | | | | 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | 4.9E-05 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 1.3E+04 | c | | | 1.3E+04 | c | | | | 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin | 4.9E-05 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 1.3E+04 | c | | | 1.3E+04 | c | | | | 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin | 4.9E-05 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 1.3E+04 | c | | | 1.3E+04 | c | | | | 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | 4.9E-05 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 1.3E+04 | c | | | 1.3E+04 | c | | | | 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin | 4.2E-06 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 6.5E+03 | c | | | 6.5E+03 | c | | | | 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | 3.8E-07 | ca | 4.4E-04 | ca | 1.0E-06 | ca | 1.0E-05 | ca |
| 1.3E+05 | c | | | 1.3E+05 | c | | | | 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin | 4.9E-06 | ca | 2.2E-05 | ca | 5.1E-08 | ca | 5.2E-07 | ca |
| 5.5E+02 | c | | | 5.5E+02 | c | | | | 540-73-8 | 1,2-Dimethylhydrazine | 1.2E-03 | ca | 5.2E-03 | ca | 1.2E-05 | ca | 1.2E-04 | ca |
| 2.4E+00 | c | | | 2.4E+00 | c | | | | 1120-71-4 | 1,3-Propane sultone | 2.7E-01 | ca | 1.2E+00 | ca | 2.8E-03 | ca | 2.8E-02 | ca |
| 1.2E+02 | c | | | 3.9E+01 | c | | | | 42397-64-8 | 1,6-Dinitropyrene | 5.3E-03 | ca | 2.4E-02 | ca | 1.7E-04 | ca | 5.6E-04 | ca |
| 1.2E+01 | c | | | 3.9E+00 | c | | | | 42397-65-9 | 1,8-Dinitropyrene | 5.3E-02 | ca | 2.4E-01 | ca | 1.7E-03 | ca | 5.6E-03 | ca |
| 1.8E+00 | c | | | 1.8E+00 | c | | | | 555-84-0 | 1-[(5-Nitrofurfurylidene)-amino]-2-imidazolid | 3.6E-01 | ca | 1.6E+00 | ca | 3.7E-03 | ca | 3.7E-02 | ca |
| 1.5E-01 | c | | | 1.5E-01 | c | | | | 82-28-0 | 1-Amino-2-methylanthraquinone | 4.3E+00 | ca | 1.9E+01 | ca | 4.4E-02 | ca | 4.5E-01 | ca |
| 1.2E+00 | c | | | 3.9E-01 | c | | | | 5522-43-0 | 1-Nitropyrene | 5.3E-01 | ca | 2.4E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| 2.3E+00 | c | | | 2.3E+00 | c | | | | 3570-75-0 | 2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thia | 2.8E-01 | ca | 1.2E+00 | ca | 2.9E-03 | ca | 2.9E-02 | ca |
| 1.3E+01 | c | | | 1.3E+01 | c | | | | 39635-31-9 | 2,3,3',4,4',5,5'-HpCB | 4.9E-02 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 6.5E+01 | c | | | 6.5E+01 | c | | | | 69782-90-7 | 2,3,3',4,4',5'-HxCB | 9.9E-03 | ca | 4.4E-02 | ca | 1.0E-04 | ca | 1.0E-03 | ca |
| 6.5E+01 | c | | | 6.5E+01 | c | | | | 38380-08-4 | 2,3,3',4,4',5-HxCB | 9.9E-03 | ca | 4.4E-02 | ca | 1.0E-04 | ca | 1.0E-03 | ca |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | O abs. C soils | CAS No. | | Residential Soil (mg/kg) | | Industrial Soil (mg/kg) | | Ambient Air (ug/m^3) | | Tap Water (ug/l) | |
| 1.3E+01 c | | 1.3E+01 c | | | 32598-14-4 | 2,3,3',4,4'-PeCB | 4.9E-02 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 1.3E+00 c | | 1.3E+00 c | | | 52663-72-6 | 2,3',4,4',5,5'-HxCB | 4.9E-01 | ca | 2.2E+00 | ca | 5.1E-03 | ca | 5.2E-02 | ca |
| 1.3E+01 c | | 1.3E+01 c | | | 65510-44-3 | 2',3,4,4',5-PeCB | 4.9E-02 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 1.3E+01 c | | 1.3E+01 c | | | 31508-00-6 | 2,3',4,4',5-PeCB | 4.9E-02 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 6.5E+01 c | | 6.5E+01 c | | | 74472-37-0 | 2,3,4,4',5-PeCB | 9.9E-03 | ca | 4.4E-02 | ca | 1.0E-04 | ca | 1.0E-03 | ca |
| 1.3E+04 c | | 1.3E+04 c | | | 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | 4.9E-05 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 1.3E+04 c | | 1.3E+04 c | | | 57117-44-9 | 2,3,4,7,8,9-Hexachlorodibenzofuran | 4.9E-05 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 6.5E+04 c | | 6.5E+04 c | | | 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | 2.7E-06 | ca | 4.4E-05 | ca | 1.0E-07 | ca | 1.0E-06 | ca |
| 3.3E+03 c | | 1.3E+04 c | | | | 2,3,7,8-Hexachlorodibenzo-p-dioxin (mixtur | 1.9E-04 | ca | 8.7E-04 | ca | 5.1E-07 | ca | 2.0E-05 | ca |
| 1.3E+04 c | | 1.3E+04 c | | | 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | 1.8E-06 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 2.3E-02 c | | 2.3E-02 c | | | 615-05-4 | 2,4-Diaminoanisole | 2.8E+01 | ca | 1.2E+02 | ca | 2.9E-01 | ca | 2.9E+00 | ca |
| 1.3E-02 c | | 1.3E-02 c | | | 39156-41-7 | 2,4-Diaminoanisole sulfate | 4.9E+01 | ca | 2.2E+02 | ca | 5.1E-01 | ca | 5.2E+00 | ca |
| 3.8E+00 c | | 3.8E+00 c | | | 53-96-3 | 2-Acetylaminofluorene | 1.7E-01 | ca | 7.5E-01 | ca | 1.7E-03 | ca | 1.8E-02 | ca |
| 1.6E+01 c | | 1.6E+01 c | | | 712-68-5 | 2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazol | 4.0E-02 | ca | 1.8E-01 | ca | 4.1E-04 | ca | 4.2E-03 | ca |
| 3.3E-02 c | | 3.3E-02 c | | | 117-79-3 | 2-Aminoanthraquinone | 1.9E+01 | ca | 8.7E+01 | ca | 2.0E-01 | ca | 2.0E+00 | ca |
| 4.3E+00 c | | 4.3E+00 c | | | 129-15-7 | 2-Methyl-1-nitroanthraquinone (of uncertain | 1.5E-01 | ca | 6.7E-01 | ca | 1.5E-03 | ca | 1.6E-02 | ca |
| 1.8E+00 c | | 1.8E+00 c | | | 91-59-8 | 2-Naphthylamine | 3.6E-01 | ca | 1.6E+00 | ca | 3.7E-03 | ca | 3.7E-02 | ca |
| 1.2E-01 c | | 3.9E-02 c | | | 607-57-8 | 2-Nitrofluorene | 5.3E+00 | ca | 2.4E+01 | ca | 1.7E-01 | ca | 5.6E-01 | ca |
| 1.3E+03 c | | 1.3E+03 c | | | 32774-16-6 | 3,3',4,4',5,5'-HxCB | 4.9E-04 | ca | 2.2E-03 | ca | 5.1E-06 | ca | 5.2E-05 | ca |
| 1.3E+04 c | | 1.3E+04 c | | | 57465-28-8 | 3,3',4,4',5-PeCB | 4.9E-05 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 1.3E+01 c | | 1.3E+01 c | | | 32598-13-3 | 3,3',4,4'-TCB | 4.9E-02 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 1.3E+01 c | | 1.3E+01 c | | | 70362-50-4 | 3,4,4'5-TCB | 4.9E-02 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 7.8E-02 c | | 7.8E-02 c | | | 6109-97-3 | 3-Amino-9-ethylcarbazolehydrochloride | 8.2E+00 | ca | 3.7E+01 | ca | 8.5E-02 | ca | 8.6E-01 | ca |
| 1.4E-01 c | | 1.4E-01 c | | | 563-47-3 | 3-Chloro-2-methylpropene | 4.6E+00 | ca | 2.0E+01 | ca | 4.7E-02 | ca | 4.8E-01 | ca |
| 2.2E+01 c | | 2.2E+01 c | | | 56-49-5 | 3-Methylcholanthrene | 2.9E-02 | ca | 1.3E-01 | ca | 3.0E-04 | ca | 3.1E-03 | ca |
| 1.4E-01 c | | 1.4E-01 c | | | 101-80-4 | 4,4-Diaminodiphenyl ether | 4.6E+00 | ca | 2.0E+01 | ca | 4.7E-02 | ca | 4.8E-01 | ca |
| 9.2E-01 c | | 9.2E-01 c | | | 838-88-0 | 4,4-Methylene bis(2-methylaniline) | 7.0E-01 | ca | 3.1E+00 | ca | 7.2E-03 | ca | 7.3E-02 | ca |
| 1.2E+00 c | | 1.2E+00 c | | | 13552-44-8 | 4,4-Methylenedianiline dihydrochloride | 5.3E-01 | ca | 2.4E+00 | ca | 5.5E-03 | ca | 5.6E-02 | ca |
| 1.5E+01 c | | 1.5E+01 c | | | 139-65-1 | 4,4-Thiodianiline | 4.3E-02 | ca | 1.9E-01 | ca | 4.4E-04 | ca | 4.5E-03 | ca |
| 2.1E+01 c | | 2.1E+01 c | | | 92-67-1 | 4-Aminobiphenyl (4-aminodiphenyl) | 3.0E-02 | ca | 1.4E-01 | ca | 3.2E-04 | ca | 3.2E-03 | ca |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | | |
| SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | O C | abs. soils | CAS No. | | Residential Soil (mg/kg) | | Industrial Soil (mg/kg) | | Ambient Air (ug/m^3) | | Tap Water (ug/l) | |
| 1.6E-02 c | | 1.6E-02 c | | | | 95-83-0 | 4-Chloro-ortho-phenylenediamine | 4.0E+01 | ca | 1.8E+02 | ca | 4.1E-01 | ca | 4.2E+00 | ca |
| 4.6E+00 c | | 4.6E+00 c | | | | 60-11-7 | 4-Dimethylaminoazobenzene | 1.4E-01 | ca | 6.2E-01 | ca | 1.4E-03 | ca | 1.5E-02 | ca |
| 1.2E+00 c | | 3.9E-01 c | | | | 57835-92-4 | 4-Nitropyrene | 5.3E-01 | ca | 2.4E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| 1.2E+01 c | | 3.9E+00 c | | | | 3697-24-3 | 5-Methylchrysene | 5.3E-02 | ca | 2.4E-01 | ca | 1.7E-03 | ca | 5.6E-03 | ca |
| 1.3E-01 c | | 1.3E-01 c | | | | 602-87-9 | 5-Nitroacenaphthene | 4.9E+00 | ca | 2.2E+01 | ca | 5.1E-02 | ca | 5.2E-01 | ca |
| 1.2E+02 c | | 3.9E+01 c | | | | 7496-02-8 | 6-Nitrochrysene | 5.3E-03 | ca | 2.4E-02 | ca | 1.7E-04 | ca | 5.6E-04 | ca |
| 2.5E+02 c | | 2.5E+02 c | | | | 57-97-6 | 7,12-Dimethylbenz(a)anthracene | 2.6E-03 | ca | 1.1E-02 | ca | 2.7E-05 | ca | 2.7E-04 | ca |
| 1.2E+01 c | | 3.9E+00 c | | | | 194-59-2 | 7H-dibenzo(c,g)carbazole | 5.3E-02 | ca | 2.4E-01 | ca | 1.7E-03 | ca | 5.6E-03 | ca |
| 4.0E-01 c | | 4.0E-01 c | | | | 26148-68-5 | A-alpha-C(2-Amino-9H-pyrido[2,3-b]indole) | 1.6E+00 | ca | 7.2E+00 | ca | 1.7E-02 | ca | 1.7E-01 | ca |
| 7.0E-02 c | | 7.0E-02 c | | | | 60-35-5 | Acetamide | 9.1E+00 | ca | 4.1E+01 | ca | 9.5E-02 | ca | 9.6E-01 | ca |
| 8.7E+03 c | | 8.7E+03 c | | | | 50-76-0 | Actinomycin D | 7.4E-05 | ca | 3.3E-04 | ca | 7.6E-07 | ca | 7.7E-06 | ca |
| 2.4E-01 c | | 2.4E-01 c | | | | 3688-53-7 | AF-2;[2-(2-furyl)-3(5-nitro-2-furyl)]acrylamid | 2.7E+00 | ca | 1.2E+01 | ca | 2.8E-02 | ca | 2.8E-01 | ca |
| 9.4E-01 c | | 9.4E-01 c | | | | 61-82-5 | Amitrole | 6.8E-01 | ca | 3.0E+00 | ca | 7.1E-03 | ca | 7.2E-02 | ca |
| c | | 2.2E+02 c | | | | 1332-21-4 | Asbestos [1/(100 PCM fibers/m^3)]^-1 | 4.0E+01 | ca | | ca | 3.0E-05 | ca | | |
| 8.8E-01 c | | 8.8E-01 c | | | | 492-80-8 | Auramine | 7.3E-01 | ca | 3.3E+00 | ca | 7.5E-03 | ca | 7.6E-02 | ca |
| 1.1E+01 c | | 1.1E+01 c | | | | 115-02-6 | Azaserine | 5.8E-02 | ca | 2.6E-01 | ca | 6.0E-04 | ca | 6.1E-03 | ca |
| 1.8E+00 c | | 1.8E+00 c | | | | 446-86-6 | Azathioprine | 3.6E-01 | ca | 1.6E+00 | ca | 3.7E-03 | ca | 3.7E-02 | ca |
| 1.2E+00 c | | 3.9E-01 c | | | | 205-82-3 | Benzo(j)fluoranthene | 5.3E-01 | ca | 2.4E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| 2.0E-02 c | | 2.0E-02 c | | | | 1694-09-3 | Benzyl violet 4B | 3.2E+01 | ca | 1.4E+02 | ca | 3.3E-01 | ca | 3.4E+00 | ca |
| 7.0E+00 c | | 8.4E+00 c | | | | 1304-56-9 | Beryllium oxide | 9.1E-02 | ca | 4.1E-01 | ca | 7.9E-04 | ca | 9.6E-03 | ca |
| 3.0E+03 c | | 3.0E+03 c | | | | 13510-49-1 | Beryllium sulfate | 2.1E-04 | ca | 9.5E-04 | ca | 2.2E-06 | ca | 2.2E-05 | ca |
| 1.0E+00 c | | 1.0E+00 c | | | | 3068-88-0 | beta-Butyrolactone | 6.4E-01 | ca | 2.9E+00 | ca | 6.6E-03 | ca | 6.7E-02 | ca |
| 1.4E+01 c | | 1.4E+01 c | | | | 57-57-8 | beta-Propiolactone | 4.6E-02 | ca | 2.0E-01 | ca | 4.7E-04 | ca | 4.8E-03 | ca |
| 2.0E-04 c | | 2.0E-04 c | | | | 25013-16-5 | Butylated hydroxyanisole | 3.2E+03 | ca | 1.4E+04 | ca | 3.3E+01 | ca | 3.4E+02 | ca |
| 2.4E+02 c | | 2.5E-01 c | | | | 569-61-9 | C.I. Basic Red 9 monohydrochloride | 2.7E-03 | ca | 1.2E-02 | ca | 2.7E-02 | ca | 2.8E-04 | ca |
| 2.3E-03 c | | 4.4E+02 c | | | | 305-03-3 | Chlorambucil | 1.9E+01 | ca | 1.2E+03 | ca | 1.5E-05 | ca | 2.9E+01 | ca |
| 1.3E+00 c | | 1.2E+00 c | | | | 57-74-9 | Chlordane | 6.9E-02 | ca | 2.2E+00 | ca | 5.5E-03 | ca | 5.2E-02 | ca |
| 9.1E-02 c | | 9.1E-02 c | | | | 115-28-6 | Chlorendic acid | 7.0E+00 | ca | 3.1E+01 | ca | 7.3E-02 | ca | 7.4E-01 | ca |
| 8.9E-02 c | | 8.9E-02 c | | | | 108171-26-2 | Chlorinated paraffins (Avg. chain length,C1 | 7.2E+00 | ca | 3.2E+01 | ca | 7.5E-02 | ca | 7.6E-01 | ca |
| 2.4E+00 c | | 2.4E+00 c | | | | 107-30-2 | Chloromethyl methyl ether (technical grade) | 2.7E-01 | ca | 1.2E+00 | ca | 2.8E-03 | ca | 2.8E-02 | ca |

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ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | O abs. C soils | CAS No. | | Residential Soil (mg/kg) | | Industrial Soil (mg/kg) | | Ambient Air (ug/m^3) | | Tap Water (ug/l) | |
| 2.4E+02 c | | 2.4E+02 c | | | 54749-90-5 | Chlorozotocin | 2.7E-03 | ca | 1.2E-02 | ca | 2.8E-05 | ca | 2.8E-04 | ca |
| 4.6E-03 c | | 4.6E-03 c | | | 87-29-6 | Cinnamyl anthranilate | 1.4E+02 | ca | 6.2E+02 | ca | 1.4E+00 | ca | 1.5E+01 | ca |
| c | | 2.2E+00 c | | | | Coke oven emissions | | | | | | | | |
| 2.2E-01 c | | 2.2E-01 c | | | 135-20-6 | Cupferron | 2.9E+00 | ca | 1.3E+01 | ca | 3.0E-02 | ca | 3.1E-01 | ca |
| 6.1E-01 c | | 6.1E-01 c | | | 50-18-0 | Cyclophosphamide (anhydrous) | 1.0E+00 | ca | 4.7E+00 | ca | 1.1E-02 | ca | 1.1E-01 | ca |
| 5.7E-01 c | | 5.7E-01 c | | | 6055-19-2 | Cyclophosphamide (hydrated) | 1.1E+00 | ca | 5.0E+00 | ca | 1.2E-02 | ca | 1.2E-01 | ca |
| 5.3E-03 c | | 5.3E-03 c | | | 5160-02-1 | D & C Red No. 9 | 1.2E+02 | ca | 5.4E+02 | ca | 1.3E+00 | ca | 1.3E+01 | ca |
| 4.9E+01 c | | 4.9E+01 c | | | 4342-03-4 | Dacarbazine | 1.3E-02 | ca | 5.8E-02 | ca | 1.4E-04 | ca | 1.4E-03 | ca |
| 7.6E-02 c | | 7.6E-02 c | | | 117-10-2 | Dantron | 8.4E+00 | ca | 3.8E+01 | ca | 8.7E-02 | ca | 8.8E-01 | ca |
| 1.2E+00 c | | 3.9E-01 c | | | 226-36-8 | Dibenz(a,h)acridine | 5.3E-01 | ca | 2.4E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| 1.2E+00 c | | 3.9E-01 c | | | 224-42-0 | Dibenz(a,j)acridine | 5.3E-01 | ca | 2.4E+00 | ca | 1.7E-02 | ca | 5.6E-02 | ca |
| 1.2E+01 c | | 3.9E+00 c | | | 192-65-4 | Dibenzo(a,e)pyrene | 5.3E-02 | ca | 2.4E-01 | ca | 1.7E-03 | ca | 5.6E-03 | ca |
| 1.2E+02 c | | 3.9E+01 c | | | 189-64-0 | Dibenzo(a,h)pyrene | 5.3E-03 | ca | 2.4E-02 | ca | 1.7E-04 | ca | 5.6E-04 | ca |
| 1.2E+02 c | | 3.9E+01 c | | | 189-55-9 | Dibenzo(a,i)pyrene | 5.3E-03 | ca | 2.4E-02 | ca | 1.7E-04 | ca | 5.6E-04 | ca |
| 1.2E+02 c | | 3.9E+01 c | | | 191-30-0 | Dibenzo(a,l)pyrene | 5.3E-03 | ca | 2.4E-02 | ca | 1.7E-04 | ca | 5.6E-04 | ca |
| c | | 1.1E+00 c | | | | Diesel exhaust particulate | 7.9E+03 | ca | | ca | 6.0E-03 | ca | | |
| 1.7E+00 c | | 1.7E+00 c | | | 101-90-6 | Diglycidyl resorcinol ether (DGRE) | 3.8E-01 | ca | 1.7E+00 | ca | 3.9E-03 | ca | 4.0E-02 | ca |
| 4.4E-02 c | | 4.4E-02 c | | | 94-58-6 | Dihydrosafrole | 1.5E+01 | ca | 6.5E+01 | ca | 1.5E-01 | ca | 1.5E+00 | ca |
| 1.3E+01 c | | 1.3E+01 c | | | 79-44-7 | Dimethylcarbamyl chloride | 4.9E-02 | ca | 2.2E-01 | ca | 5.1E-04 | ca | 5.2E-03 | ca |
| 4.5E-02 c | | 4.5E-02 c | | | 513-37-1 | Dimethylvinylchloride | 1.4E+01 | ca | 6.4E+01 | ca | 1.5E-01 | ca | 1.5E+00 | ca |
| 4.5E-03 c | | 4.5E-03 c | | | 2475-45-8 | Disperse Blue 1 (technical grade) | 1.4E+02 | ca | 6.4E+02 | ca | 1.5E+00 | ca | 1.5E+01 | ca |
| 3.9E+01 c | | 3.9E+01 c | | | 50-28-2 | Estradiol 17B | 1.6E-02 | ca | 7.3E-02 | ca | 1.7E-04 | ca | 1.7E-03 | ca |
| 6.5E+01 c | | 6.5E+01 c | | | 151-56-4 | Ethyleneimine | 9.9E-03 | ca | 4.4E-02 | ca | 1.0E-04 | ca | 1.0E-03 | ca |
| 4.8E+00 c | | 4.8E+00 c | | | 67730-11-4 | d]imidazole) | 1.3E-01 | ca | 6.0E-01 | ca | 1.4E-03 | ca | 1.4E-02 | ca |
| 1.4E+00 c | | 1.4E+00 c | | | 67730-10-3 | Glu-P-2 (2-Aminodipyrido[1,2-a:3',2'-d]indol | 4.6E-01 | ca | 2.0E+00 | ca | 4.7E-03 | ca | 4.8E-02 | ca |
| 1.0E+01 c | | 1.0E+01 c | | | 16568-02-8 | Gyromitrin | 6.4E-02 | ca | 2.9E-01 | ca | 6.6E-04 | ca | 6.7E-03 | ca |
| 5.1E-02 c | | 5.1E-02 c | | | 2784-94-3 | HC Blue 1 | 1.3E+01 | ca | 5.6E+01 | ca | 1.3E-01 | ca | 1.3E+00 | ca |
| 1.3E+04 c | | 1.3E+04 c | | | 34465-46-8 | Hexachlorodibenzo-p-dioxin | 4.9E-05 | ca | 2.2E-04 | ca | 5.1E-07 | ca | 5.2E-06 | ca |
| 3.0E+00 c | | 3.0E+00 c | | | 10034-93-2 | Hydrazine Sulfate | 2.0E-05 | ca | 9.5E-01 | ca | 2.2E-03 | ca | 2.2E-02 | ca |
| 1.4E+00 c | | 1.4E+00 c | | | 76180-96-6 | IQ (2-Amino-3-methylimidazo-[4,5-f]quinolin | 4.6E-01 | ca | 2.0E+00 | ca | 4.7E-03 | ca | 4.8E-02 | ca |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V | skin | | | Rural | | "Direct Contact Exposure Pathways" | | | | | | | |
| SFo | RfDo | SFi | RfDi | O | abs. | CAS No. | | Residential | | Industrial | | Ambient Air | | Tap Water | | | |
| 1/(mg/kg-d) | (mg/kg-d) | 1/(mg/kg-d) | (mg/kg-d) | C | soils | | | Soil (mg/kg) | | Soil (mg/kg) | | (ug/m^3) | | (ug/l) | | | |
| 7.8E+00 | c | 7.8E+00 | c | | | 303-34-4 | Lasiocarpine | 8.2E-02 | ca | 3.7E-01 | ca | 8.5E-04 | ca | 8.6E-03 | ca | | |
| 2.8E-01 | c | 2.8E-01 | c | | | 301-04-2 | Lead acetate | 2.3E+00 | ca | 1.0E+01 | ca | 2.4E-02 | ca | 2.4E-01 | ca | | |
| 3.8E-02 | c | 3.8E-02 | c | | | 1335-32-6 | Lead subacetate | 1.7E+01 | ca | 7.5E+01 | ca | 1.7E-01 | ca | 1.8E+00 | ca | | |
| 1.2E+00 | c | 1.2E+00 | c | | | 68006-83-7 | Me-A-alpha-C (2-Amino-3-methyl-9H-pyrido | 5.3E-01 | ca | 2.4E+00 | ca | 5.5E-03 | ca | 5.6E-02 | ca | | |
| 1.3E+02 | c | 1.3E+02 | c | | | 3223-07-2 | Melphalan | 4.9E-03 | ca | 2.2E-02 | ca | 5.1E-05 | ca | 5.2E-04 | ca | | |
| 9.9E-02 | c | 9.9E-02 | c | | | 66-27-3 | Methyl methanesulfonate | 6.5E+00 | ca | 2.9E+01 | ca | 6.7E-02 | ca | 6.8E-01 | ca | | |
| 4.0E-01 | c | 4.0E-01 | c | | | 56-04-2 | Methylthiouracil | 1.6E+00 | ca | 7.2E+00 | ca | 1.7E-02 | ca | 1.7E-01 | ca | | |
| 8.6E-01 | c | 8.6E-01 | c | | | 90-94-8 | Michler's ketone | 7.4E-01 | ca | 3.3E+00 | ca | 7.7E-03 | ca | 7.8E-02 | ca | | |
| 8.2E+03 | c | 8.2E+03 | c | | | 50-07-7 | Mitomycin C | 7.8E-05 | ca | 3.5E-04 | ca | 8.1E-07 | ca | 8.2E-06 | ca | | |
| 1.0E+01 | c | 1.0E+01 | c | | | 315-22-0 | Monocrotaline | 6.4E-02 | ca | 2.9E-01 | ca | 6.6E-04 | ca | 6.7E-03 | ca | | |
| 5.3E-03 | c | 5.3E-03 | c | | | 139-13-9 | Nitrilotriacetic acid | 1.2E+02 | ca | 5.4E+02 | ca | 1.3E+00 | ca | 1.3E+01 | ca | | |
| 1.0E-02 | c | 1.0E-02 | c | | | 18662-53-8 | Nitrilotriacetic acid, trisodium salt monohydr | 6.4E+01 | ca | 2.9E+02 | ca | 6.6E-01 | ca | 6.7E+00 | ca | | |
| 8.2E-02 | c | 8.2E-02 | c | | | 1836-75-5 | Nitrofen (technical grade) | 7.8E+00 | ca | 3.5E+01 | ca | 8.1E-02 | ca | 8.2E-01 | ca | | |
| 8.3E+00 | c | 8.3E+00 | c | | | 70-25-7 | N-Methyl-N-nitro-N-nitrosoguanidine | 7.7E-02 | ca | 3.4E-01 | ca | 8.0E-04 | ca | 8.1E-03 | ca | | |
| 6.7E+00 | c | 6.7E+00 | c | | | 59-89-2 | N-Nitrosomorpholine | 9.6E-02 | ca | 4.3E-01 | ca | 9.9E-04 | ca | 1.0E-02 | ca | | |
| 2.7E+01 | c | 2.7E+01 | c | | | 759-73-9 | N-Nitroso-N-ethylurea | 9.0E-06 | ca | 1.1E-01 | ca | 2.5E-04 | ca | 2.5E-03 | ca | | |
| 1.2E+02 | c | 1.2E+02 | c | | | 684-93-5 | N-Nitroso-N-methylurea | 5.3E-03 | ca | 2.4E-02 | ca | 5.5E-05 | ca | 5.6E-04 | ca | | |
| 1.1E+02 | c | 1.1E+02 | c | | | 615-53-2 | N-Nitroso-N-methylurethane | 5.8E-03 | ca | 2.6E-02 | ca | 6.0E-05 | ca | 6.1E-04 | ca | | |
| 1.4E+00 | c | 1.4E+00 | c | | | 16543-55-8 | N-Nitrosonornicotine | 4.6E-01 | ca | 2.0E+00 | ca | 4.7E-03 | ca | 4.8E-02 | ca | | |
| 9.4E+00 | c | 9.4E+00 | c | | | 100-75-4 | N-Nitrosopiperidine | 6.8E-02 | ca | 3.0E-01 | ca | 7.1E-04 | ca | 7.2E-03 | ca | | |
| 3.0E-03 | c | 3.0E-03 | c | | | 132-27-4 | O-Phenylphenate, sodium | 2.1E+02 | ca | 9.5E+02 | ca | 2.2E+00 | ca | 2.2E+01 | ca | | |
| 3.8E+00 | c | 3.8E+00 | c | | | 97-56-3 | ortho-Aminoazotoluene | 1.7E-01 | ca | 7.5E-01 | ca | 1.7E-03 | ca | 1.8E-02 | ca | | |
| 1.4E-01 | c | 1.4E-01 | c | | | 90-04-0 | ortho-Anisidine | 4.6E+00 | ca | 2.0E+01 | ca | 4.7E-02 | ca | 4.8E-01 | ca | | |
| 1.1E-01 | c | 1.1E-01 | c | | | 134-29-2 | ortho-Anisidine hydrochloride | 5.8E+00 | ca | 2.6E+01 | ca | 6.0E-02 | ca | 6.1E-01 | ca | | |
| 1.5E-01 | c | 1.5E-01 | c | | | 120-71-8 | para-Cresidine | 4.3E+00 | ca | 1.9E+01 | ca | 4.4E-02 | ca | 4.5E-01 | ca | | |
| 2.2E-03 | c | 2.2E-03 | c | | | 62-44-2 | Phenacetin | 2.9E+02 | ca | 1.3E+03 | ca | 3.0E+00 | ca | 3.1E+01 | ca | | |
| 1.7E-01 | c | 1.7E-01 | c | | | 94-78-0 | Phenazopyridine | 3.8E+00 | ca | 1.7E+01 | ca | 3.9E-02 | ca | 4.0E-01 | ca | | |
| 1.5E-01 | c | 1.5E-01 | c | | | 136-40-3 | Phenazopyridine hydrochloride | 4.3E+00 | ca | 1.9E+01 | ca | 4.4E-02 | ca | 4.5E-01 | ca | | |
| 1.5E+02 | c | 1.5E+02 | c | | | 3546-10-9 | Phenesterin | 4.3E-03 | ca | 1.9E-02 | ca | 4.4E-05 | ca | 4.5E-04 | ca | | |
| 4.6E-01 | c | 4.6E-01 | c | | | 50-06-6 | Phenobarbital | 1.4E+00 | ca | 6.2E+00 | ca | 1.4E-02 | ca | 1.5E-01 | ca | | |

**Table H-6**

**Updated Rural Resident PRGs including Updated OEHHA Toxicity Values and Ingestion of Fruits and Vegetables**

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS p=PPRTV c=California EPA n=NCEA h=HEAST x=Withdrawn r=Route-extrapolation ca=Cancer PRG nc= Noncancer PRG
ca* (where: nc PRG < 100X ca PRG) ca** (where nc PRG < 10X ca PRG) +++=Non-Standard Method Applied (See User's Guide) sat=Soil Saturation (See User's Guide) max=Ceiling limit (See User's Guide)
DAF=Dilution Attenuation Factor (See User's Guide) CAS=Chemical Abstract Services

| TOXICITY VALUES | | | | | | | CONTAMINANT | PRELIMINARY REMEDIATION GOALS (PRGs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V | skin | | | Rural | "Direct Contact Exposure Pathways" | | | | | | |
| SFo 1/(mg/kg-d) | RfDo (mg/kg-d) | SFi 1/(mg/kg-d) | RfDi (mg/kg-d) | O C | abs. soils | CAS No. | | Residential Soil (mg/kg) | | Industrial Soil (mg/kg) | | Ambient Air (ug/m^3) | | Tap Water (ug/l) | |
| 3.1E+00 c | | 3.1E+00 c | | | | 59-96-1 | Phenoxybenzamine | 2.1E-01 | ca | 9.2E-01 | ca | 2.1E-03 | ca | 2.2E-02 | ca |
| 2.7E+00 c | | 2.7E+00 c | | | | 63-92-3 | Phenoxybenzamine hydrochloride | 2.4E-01 | ca | 1.1E+00 | ca | 2.5E-03 | ca | 2.5E-02 | ca |
| 2.2E-02 c | | 2.2E-02 c | | | | 156-10-5 | p-Nitrosodiphenylamine | 2.9E+01 | ca | 1.3E+02 | ca | 3.0E-01 | ca | 3.1E+00 | ca |
| 5.0E+00 c | | 2.0E+00 c | | | | 133-63-63 | Polychlorinated biphenyls | | | | | | | | |
| 1.6E-02 c | | 1.6E-02 c | | | | 3564-09-8 | Ponceau 3R | 4.0E+01 | ca | 1.8E+02 | ca | 4.1E-01 | ca | 4.2E+00 | ca |
| 4.5E-03 c | | 4.5E-03 c | | | | 3761-53-3 | Ponceau MX (D&C Red No.5) | 1.4E+02 | ca | 6.4E+02 | ca | 1.5E+00 | ca | 1.5E+01 | ca |
| 4.9E-01 c | | 4.9E-01 c | | | | 7758-01-2 | Potassium bromate | 1.3E+00 | ca | 5.8E+00 | ca | 1.4E-02 | ca | 1.4E-01 | ca |
| 1.4E+01 c | | 1.4E+01 c | | | | 671-16-9 | Procarbazine | 4.6E-02 | ca | 2.0E-01 | ca | 4.7E-04 | ca | 4.8E-03 | ca |
| 1.2E+01 c | | 1.2E+01 c | | | | 366-70-1 | Procarbazine hydrochloride | 5.3E-02 | ca | 2.4E-01 | ca | 5.5E-04 | ca | 5.6E-03 | ca |
| 1.0E+00 c | | 1.0E+00 c | | | | 51-52-5 | Propylthiouracil | 6.4E-01 | ca | 2.9E+00 | ca | 6.6E-03 | ca | 6.7E-02 | ca |
| 1.1E+01 c | | 1.1E+01 c | | | | 50-55-5 | Reserpine | 5.8E-02 | ca | 2.6E-01 | ca | 6.0E-04 | ca | 6.1E-03 | ca |
| 2.2E-01 c | | 2.2E-01 c | | | | 94-59-7 | Safrole | 2.9E+00 | ca | 1.3E+01 | ca | 3.0E-02 | ca | 3.1E-01 | ca |
| 2.2E-01 c | | 3.5E+01 c | | | | 10048-13-2 | Sterigmatocystin | 2.9E+00 | ca | 1.3E+01 | ca | 1.9E-04 | ca | 3.1E-01 | ca |
| 1.1E+02 c | | 1.1E+02 c | | | | 18883-66-4 | Streptozotocin | 5.8E-03 | ca | 2.6E-02 | ca | 6.0E-05 | ca | 6.1E-04 | ca |
| 1.6E-01 c | | 1.6E-01 c | | | | 96-09-3 | Styrene oxide | 4.0E+00 | ca | 1.8E+01 | ca | 4.1E-02 | ca | 4.2E-01 | ca |
| 1.9E-01 c | | 1.9E-01 c | | | | 95-06-7 | Sulfallate | 3.4E+00 | ca | 1.5E+01 | ca | 3.5E-02 | ca | 3.5E-01 | ca |
| 6.1E+00 c | | 6.1E+00 c | | | | 62-55-5 | Thioacetamide | 1.0E-01 | ca | 4.7E-01 | ca | 1.1E-03 | ca | 1.1E-02 | ca |
| 7.2E-02 c | | 7.2E-02 c | | | | 62-56-6 | Thiourea | 8.9E+00 | ca | 4.0E+01 | ca | 9.2E-02 | ca | 9.3E-01 | ca |
| 3.9E-02 c | | 3.9E-02 c | | | | 26471-62-5 | Toluene diisocyanate | 1.6E+01 | ca | 7.3E+01 | ca | 1.7E-01 | ca | 1.7E+00 | ca |
| 4.4E-01 c | | 4.4E-01 c | | | | 55738-54-0 | trans-2[(Dimethylamino)-methylimino]-5-[2-( | 1.5E+00 | ca | 6.5E+00 | ca | 1.5E-02 | ca | 1.5E-01 | ca |
| 1.2E+01 c | | 1.2E+01 c | | | | 52-24-4 | Tris-(1-aziridinyl)phosphine sulfide | 5.3E-02 | ca | 2.4E-01 | ca | 5.5E-04 | ca | 5.6E-03 | ca |
| 2.3E+00 c | | 2.3E+00 c | | | | 126-72-7 | Tris(2,3-dibromopropyl)phosphate | 2.8E-01 | ca | 1.2E+00 | ca | 2.9E-03 | ca | 2.9E-02 | ca |
| 2.6E+01 c | | 2.6E+01 c | | | | 62450-06-0 | Trp-P-1 (Tryptophan-P-1) | 2.5E-02 | ca | 1.1E-01 | ca | 2.6E-04 | ca | 2.6E-03 | ca |
| 3.2E+00 c | | 3.2E+00 c | | | | 62450-07-1 | Trp-P-2 (Tryptophan-P-2) | 2.0E-01 | ca | 8.9E-01 | ca | 2.1E-03 | ca | 2.1E-02 | ca |
| 1.0E+00 c | | 1.0E+00 c | | | | 51-79-6 | Urethane | 6.4E-01 | ca | 2.9E+00 | ca | 6.6E-03 | ca | 6.7E-02 | ca |

mg/kg-d = milligrams per kilogram per day
$\mu g/m^3$ = microgram per cubic meter
$\mu g/L$ = microgram per liter
mg/kg = milligrams per kilogram

# Appendix I

# Chemical Data Gap
# Analysis Results for Soil

# Appendix I
# Chemical Data Gap Analysis Results for Soil

Appendix I contains tables supporting the determination of the number of soil samples needed to fill the chemical data gap for soils for the Santa Susana Field Laboratory (SSFL) Area IV Environmental Impact Statement (EIS). The objectives of the chemical data gap analysis are to determine the number of samples needed to augment the existing data in order to: 1) perform a human health risk assessment, 2) characterize the soil in areas of known or suspected chemical use, 3) determine the nature and extent of identified soil contamination for use in evaluating alternatives, and 4) adequately characterize all of Area IV. Tables I-1 through I-6 support the calculation of the number of samples and analyses required to perform a human health risk assessment for each exposure unit (EU). Tables I-7 and I-8 summarize the number of samples and analyses required to fully characterize all of Area IV (including areas of known or suspected contamination), as well as determine the horizontal and vertical extent of contamination.

Tables I-1 through I-4 summarize the results of the chemical data gap analysis (i.e., the minimum number of additional soil samples that need to be collected) as detailed in Tables I-5 and I-6 to conduct a human health risk assessment (on soils). The chemical data gap analysis for the risk assessment was performed for two exposure scenarios (residential and rural residential) at two soil depth intervals (0 to 2 feet and 2 to 10 feet). Additional discussion is provided below to assist the reader in interpreting the information in the tables.

For example, in Table I-5, the results of the chemical risk data gap analysis are presented for both exposure scenarios at the 0 to 2 foot soil depth interval. Summary statistics (i.e., number of detections, maximum detected result, number of valid samples [n], average concentration, and standard deviation [σ]) are provided for each EU for the selected chemicals of interest (COIs). Non-detect results with detection limits greater than the screening level for the COI (i.e., the preliminary remediation goal [PRG] and/or background, if applicable) were rejected and not included as a valid sample.

The number of soil samples required to complete a risk assessment for each exposure scenario at the specified soil depth interval within each EU was determined statistically for all COIs based on the COI's relative shift. The relative shift ($\Delta/\sigma$) is the ratio of delta ($\Delta$), or the gray region, to the standard deviation. Delta ($\Delta$) was set equal either to one-half the applicable PRG or background if the background value was greater than the PRG. In circumstances where the number of valid samples was less than that required to perform a statistical analysis (i.e., $n < 8$) and/or the average concentration of the COI within the EU exceeded the screening level (i.e., EU identified as being impacted – "Y"), the relative shift was set to 1.5. A statistical test (Sign Test or Wilcoxon Rank Sum Test for COIs with background values) was used to determine the required number of samples per EU (N) for each COI based on the COI's relative shift, a false negative rate ($\alpha$) of 5%, and a false positive rate ($\beta$) of 10%. The number of additional samples needed to complete a risk assessment (i.e., risk data gap) was calculated as the difference

between the number of required risk assessment samples and the number of existing valid samples (i.e., data gap = N – n).

The results in Table I-5 (i.e., 0 to 2 foot soil depth interval) are summarized by chemical group in Tables I-1 and I-2 for the residential and rural residential exposure scenarios, respectively. The number of additional samples required by chemical group (e.g., metals) is driven by the largest data gap for any COI in that chemical group within a particular EU. For example, the data gap for metals in EU-10 (486 samples) is dictated by lead.

The summary tables also show whether an EU is impacted ("Y") by at least one COI in the chemical group. A unit is considered to be impacted if the average concentration of at least one COI in that chemical group is greater than the applicable screening level. If the EU is not considered impacted, then the impact status of the unit is considered indeterminate ("I") because the EU either may not have been impacted or there may have been an insufficient number of samples ($n < 8$) to perform the statistical analysis. If an EU was determined to be impacted, then the number of additional samples required (data gap) for each chemical group was adjusted because extensive sampling would not be required prior to remediation. If the relative shift for a COI was less than 1.0, then the relative shift for that COI was set to 1.0 and the data gap was calculated. If the relative shift was greater than or equal to 1.0, then no adjustment to the relative shift was made. The largest data gap for any COI after this adjustment was reported for the chemical group in the summary tables. For example, the data gap for lead in EU-10 (486 samples) was adjusted because the EU was determined to be impacted for semivolatile organic compounds (SVOCs).

The overall data gap for an EU is defined as the largest "adjusted" data gap between the chemical groups for that specific EU. The "adjusted" data gaps for each EU were then added together to establish the overall number of additional samples that need to be collected, at a minimum, to complete a risk assessment for a given exposure scenario for the SSFL Area IV EIS.

Tables I-7 and I-8 provide a listing of chemical use areas and underdeveloped land within each EU, and indicate the number of sampling locations that standard practice would indicate was required to characterize or delineate contamination in each area. Table I-7 indicates the data needs for soil from 0 to 10-ft depths and it is assumed that two samples (one from 0 to 2 feet and one from 2 to 10 feet) would be collected at each location. Table I-8 indicates the data needs for depths greater than 10 feet. In general, a sample at a depth greater than 10 feet would only be required if the vertical extent of identified contamination needs to be defined.

It is important to recognize that the number of samples shown is an estimate and that many field-specific factors may lead to an increase or decrease in the number of samples that are required to characterize or delineate soil contamination. For example, if contamination is identified in a previously uncharacterized chemical use area, additional samples would most likely be needed in order to define the area of contamination. On the other hand, in areas where bedrock is found at shallow depths, deeper soil samples may not be available and the number of samples required to delineate soil contamination would therefore be fewer than indicated.

# Appendix I - Chemical Data Gap Analysis Results for Soil

## Table I-1. Chemical Risk Data Gap Summary for Residential Scenario (0-2 ft. Soil Interval)

| Exposure Unit (EU ID) | Data Gap (Additional Number of Samples Required) by Chemical Group | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | VOCs | | | SVOCs | | | PCBs | | | Dioxins/Furans | | | Metals | | | |
| | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | Overall Adjusted EU Data Gap |
| **EU-01** | 8 | I | 8 | 0 | **Y** | 0 | 149 | **Y** | 0 | 0 | **Y** | 0 | 0 | I | 0 | **8** |
| **EU-02** | 15 | I | 15 | 8 | I | 8 | 11 | I | 11 | 0 | **Y** | 0 | 14 | I | 14 | **15** |
| **EU-03** | 9 | I | 9 | 9 | I | 9 | 0 | **Y** | 0 | 4 | **Y** | 4 | 7 | I | 7 | **9** |
| **EU-04** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 10 | I | 10 | **15** |
| **EU-05** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-06** | 15 | I | 15 | 11 | I | 11 | 2 | I | 2 | 15 | I | 15 | 10 | I | 10 | **15** |
| **EU-07** | 15 | I | 15 | 401 | **Y** | 14 | 1 | I | 1 | 11 | I | 11 | 2 | I | 2 | **15** |
| **EU-08** | 14 | I | 14 | 14 | I | 14 | 13 | I | 13 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-09** | 15 | I | 15 | 15 | I | 15 | 0 | I | 0 | 15 | I | 15 | 11 | I | 11 | **15** |
| **EU-10** | 14 | I | 14 | 0 | **Y** | 0 | 0 | I | 0 | 0 | I | 0 | 486 | I | 10 | **14** |
| **EU-11** | 15 | I | 15 | 0 | I | 0 | 0 | I | 0 | 0 | I | 0 | 14 | I | 14 | **15** |
| **EU-12** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 12 | I | 12 | **15** |
| **EU-13** | 12 | I | 12 | 3 | I | 3 | 0 | I | 0 | 2 | I | 2 | 10 | **Y** | 10 | **12** |
| **EU-14** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-15** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-16** | 15 | I | 15 | 15 | I | 15 | 13 | I | 13 | 11 | I | 11 | 13 | I | 13 | **15** |
| **TOTAL** | 222 | | 222 | 551 | | 164 | 264 | | 115 | 148 | | 148 | 645 | | 169 | **223** |

Y = Yes; the average (mean) of existing data [n ≥ 8] for an analyte within the specified chemical group exceeds its associated screening level (DCGL).

I = Indeterminate; the unit is not impacted (i.e., mean of existing data ≤ DCGL for n ≥ 8) or insufficent data exists (i.e., n < 8) to statistically evaluate whether the unit has been impacted.

# Appendix I - Chemical Data Gap Analysis Results for Soil

## Table I-2. Chemical Risk Data Gap Summary for Rural Residential Scenario (0-2 ft. Soil Interval)

| Exposure Unit (EU ID) | Data Gap (Additional Number of Samples Required) by Chemical Group | | | | | | | | | | | | | | | Overall Adjusted EU Data Gap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | VOCs | | | SVOCs | | | PCBs | | | Dioxins/Furans | | | Metals | | | |
| | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | |
| **EU-01** | 13 | I | 13 | 4 | Y | 0 | 14 | Y | 14 | 0 | Y | 0 | 0 | I | 0 | **14** |
| **EU-02** | 15 | I | 15 | 14 | I | 14 | 14 | I | 14 | 0 | Y | 0 | 68 | I | 14 | **15** |
| **EU-03** | 15 | Y | 15 | 12 | I | 12 | 12 | Y | 12 | 5 | Y | 5 | 9 | I | 7 | **15** |
| **EU-04** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 10 | I | 10 | **15** |
| **EU-05** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-06** | 15 | I | 15 | 14 | I | 14 | 12 | I | 12 | 15 | I | 15 | 10 | I | 10 | **15** |
| **EU-07** | 15 | I | 15 | 11 | Y | 11 | 14 | Y | 14 | 13 | I | 13 | 2 | Y | 2 | **15** |
| **EU-08** | 14 | I | 14 | 15 | I | 15 | 13 | I | 13 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-09** | 15 | I | 15 | 15 | I | 15 | 9 | I | 9 | 15 | I | 15 | 11 | I | 11 | **15** |
| **EU-10** | 14 | I | 14 | 13 | Y | 13 | 13 | I | 13 | 4 | Y | 4 | 486 | I | 10 | **14** |
| **EU-11** | 15 | I | 15 | 14 | I | 14 | 10 | Y | 10 | 0 | Y | 0 | 14 | I | 14 | **15** |
| **EU-12** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 12 | I | 12 | **15** |
| **EU-13** | 12 | I | 12 | 14 | I | 14 | 12 | I | 12 | 11 | I | 11 | 10 | Y | 10 | **14** |
| **EU-14** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-15** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-16** | 15 | I | 15 | 13 | I | 13 | 13 | I | 13 | 13 | I | 13 | 13 | I | 13 | **15** |
| **TOTAL** | 233 | | 233 | 214 | | 210 | 211 | | 211 | 166 | | 166 | 701 | | 169 | **237** |

Y = Yes; the average (mean) of existing data [n ≥ 8] for an analyte within the specified chemical group exceeds its associated screening level (DCGL).

I = Indeterminate; the unit is not impacted (i.e., mean of existing data ≤ DCGL for n ≥ 8) or insufficent data exists (i.e., n < 8) to statistically evaluate whether the unit has been impacted.

# Appendix I - Chemical Data Gap Analysis Results for Soil

## Table I-3. Chemical Risk Data Gap Summary for Residential Scenario (2-10 ft. Soil Interval)

| Exposure Unit (EU ID) | Data Gap (Additional Number of Samples Required) by Chemical Group | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | VOCs | | | SVOCs | | | PCBs | | | Dioxins/Furans | | | Metals | | | |
| | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | Overall Adjusted EU Data Gap |
| **EU-01** | 13 | I | 13 | 166 | Y | 4 | 158 | Y | 0 | 0 | Y | 0 | 0 | I | 0 | **13** |
| **EU-02** | 15 | I | 15 | 14 | I | 14 | 15 | I | 15 | 11 | I | 11 | 14 | I | 14 | **15** |
| **EU-03** | 2 | I | 2 | 60 | Y | 13 | 14 | I | 14 | 13 | I | 13 | 0 | I | 0 | **14** |
| **EU-04** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-05** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-06** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-07** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-08** | 12 | I | 12 | 11 | I | 11 | 12 | I | 12 | 15 | I | 15 | 0 | I | 0 | **15** |
| **EU-09** | 43 | I | 14 | 14 | I | 14 | 14 | I | 14 | 15 | I | 15 | 131 | Y | 18 | **18** |
| **EU-10** | 13 | I | 13 | 11 | I | 11 | 0 | I | 0 | 0 | I | 0 | 11 | I | 11 | **13** |
| **EU-11** | 13 | I | 13 | 8 | I | 8 | 0 | I | 0 | 0 | I | 0 | 12 | I | 12 | **13** |
| **EU-12** | 15 | I | 15 | 12 | I | 12 | 15 | I | 15 | 15 | I | 15 | 8 | I | 8 | **15** |
| **EU-13** | 14 | I | 14 | 15 | I | 15 | 14 | I | 14 | 13 | I | 13 | 14 | Y | 14 | **15** |
| **EU-14** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-15** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-16** | 15 | I | 15 | 15 | I | 15 | 3 | I | 3 | 3 | I | 3 | 14 | I | 14 | **15** |
| **TOTAL** | 245 | | 216 | 416 | | 207 | 335 | | 177 | 175 | | 175 | 288 | | 175 | **236** |

Y = Yes; the average (mean) of existing data [n ≥ 8] for an analyte within the specified chemical group exceeds its associated screening level (DCGL).

I = Indeterminate; the unit is not impacted (i.e., mean of existing data ≤ DCGL for n ≥ 8) or insufficent data exists (i.e., n < 8) to statistically evaluate whether the unit has been impacted.

# Appendix I - Chemcial Data Gap Analysis Results for Soil

## Table I-4. Chemical Risk Data Gap Summary for Rural Residential Scenario (2-10 ft. Soil Interval)

| Exposure Unit (EU ID) | Data Gap (Additional Number of Samples Required) by Chemical Group | | | | | | | | | | | | | | | Overall Adjusted EU Data Gap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | VOCs | | | SVOCs | | | PCBs | | | Dioxins/Furans | | | Metals | | | |
| | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | No. of Samples (Statistical-based) | Area Impacted? | Adjusted No. of Samples | |
| **EU-01** | 14 | I | 14 | 50 | Y | 10 | 10 | I | 10 | 0 | Y | 0 | 7 | I | 7 | **14** |
| **EU-02** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 12 | I | 12 | 14 | I | 14 | **15** |
| **EU-03** | 12 | Y | 12 | 399 | Y | 13 | 15 | I | 15 | 13 | I | 13 | 0 | I | 0 | **15** |
| **EU-04** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-05** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-06** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-07** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-08** | 15 | I | 15 | 11 | I | 11 | 12 | I | 12 | 15 | I | 15 | 0 | I | 0 | **15** |
| **EU-09** | 13 | Y | 13 | 14 | I | 14 | 15 | I | 15 | 15 | I | 15 | 534 | Y | 18 | **18** |
| **EU-10** | 13 | I | 13 | 14 | I | 14 | 15 | I | 15 | 5 | Y | 5 | 11 | I | 11 | **15** |
| **EU-11** | 13 | I | 13 | 15 | I | 15 | 12 | I | 12 | 0 | Y | 0 | 12 | I | 12 | **15** |
| **EU-12** | 15 | I | 15 | 14 | I | 14 | 15 | I | 15 | 15 | I | 15 | 8 | I | 8 | **15** |
| **EU-13** | 14 | I | 14 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | 14 | Y | 14 | **15** |
| **EU-14** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-15** | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 15 | I | 15 | 14 | I | 14 | **15** |
| **EU-16** | 15 | I | 15 | 3 | I | 3 | 3 | I | 3 | 10 | I | 10 | 14 | I | 14 | **15** |
| **TOTAL** | 229 | | 229 | 640 | | 214 | 217 | | 217 | 189 | | 189 | 698 | | 182 | **242** |

Y = Yes; the average (mean) of existing data [n ≥ 8] for an analyte within the specified chemical group exceeds its associated screening level (DCGL).

I = Indeterminate; the unit is not impacted (i.e., mean of existing data ≤ DCGL for n ≥ 8) or insufficent data exists (i.e., n < 8) to statistically evaluate whether the unit has been impacted.

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-01 | 18.82 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 17 | 1.84E-04 | 26 | 1.19E-05 | 3.63E-05 | 1.5 | 15 | 0 | Y | 22 | 1.40E-05 | 3.93E-05 | 1.5 | 15 | 0 | Y |
| EU-01 | 18.82 | Inorganic | Aluminum | mg/kg | 37 | 24000 | 38 | 1.21E+04 | 4.86E+03 | 3.0 | 8 | 0 | I | 38 | 1.21E+04 | 4.86E+03 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Antimony | mg/kg | 11 | 11.7 | 31 | 4.34E+00 | 5.05E+00 | 3.0 | 8 | 0 | I | 21 | 1.22E+00 | 2.49E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Arsenic | mg/kg | 33 | 6.6 | 44 | 3.79E+00 | 1.37E+00 | 3.0 | 8 | 0 | I | 44 | 3.79E+00 | 1.37E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Barium | mg/kg | 44 | 140 | 44 | 8.22E+01 | 2.31E+01 | 3.0 | 8 | 0 | I | 44 | 8.22E+01 | 2.31E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Beryllium | mg/kg | 36 | 1 | 44 | 5.02E-01 | 1.78E-01 | 3.0 | 8 | 0 | I | 44 | 5.02E-01 | 1.78E-01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Boron | mg/kg | 18 | 31.8 | 38 | 7.62E+00 | 5.06E+00 | 3.0 | 8 | 0 | I | 38 | 7.62E+00 | 5.06E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Cadmium | mg/kg | 24 | 3.2 | 44 | 8.65E-01 | 7.24E-01 | 3.0 | 8 | 0 | I | 44 | 8.65E-01 | 7.24E-01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Chromium | mg/kg | 44 | 79.1 | 44 | 1.97E+01 | 1.17E+01 | 3.0 | 8 | 0 | I | 44 | 1.97E+01 | 1.17E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Cobalt | mg/kg | 43 | 10 | 44 | 6.06E+00 | 2.03E+00 | 3.0 | 8 | 0 | I | 44 | 6.06E+00 | 2.03E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Copper | mg/kg | 44 | 634 | 44 | 4.31E+01 | 1.30E+02 | 3.0 | 8 | 0 | I | 44 | 4.31E+01 | 1.30E+02 | 1.0 | 26 | 0 | I |
| EU-01 | 18.82 | Inorganic | Lead | mg/kg | 42 | 552 | 44 | 3.64E+01 | 8.31E+01 | 0.9 | 31 | 0 | I | 44 | 3.64E+01 | 8.31E+01 | 0.9 | 31 | 0 | I |
| EU-01 | 18.82 | Inorganic | Manganese | mg/kg | 11 | 362 | 11 | 2.29E+02 | 8.77E+01 | 3.0 | 8 | 0 | I | 11 | 2.29E+02 | 8.77E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Mercury | mg/kg | 26 | 23 | 44 | 6.51E-01 | 3.45E+00 | 3.0 | 8 | 0 | I | 44 | 6.51E-01 | 3.45E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Molybdenum | mg/kg | 18 | 1.2 | 44 | 4.71E+00 | 4.95E+00 | 3.0 | 8 | 0 | I | 44 | 4.71E+00 | 4.95E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Nickel | mg/kg | 41 | 75 | 44 | 1.63E+01 | 1.21E+01 | 3.0 | 8 | 0 | I | 44 | 1.63E+01 | 1.21E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Selenium | mg/kg | 5 | 0.37 | 38 | 2.35E+00 | 2.29E+00 | 3.0 | 8 | 0 | I | 38 | 2.35E+00 | 2.29E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Silver | mg/kg | 31 | 49.9 | 49 | 3.37E+00 | 8.85E+00 | 3.0 | 8 | 0 | I | 49 | 3.37E+00 | 8.85E+00 | 2.4 | 9 | 0 | I |
| EU-01 | 18.82 | Inorganic | Thallium | mg/kg | 27 | 2.4 | 42 | 1.33E+00 | 1.88E+00 | 1.4 | 15 | 0 | I | 42 | 1.33E+00 | 1.88E+00 | 1.4 | 15 | 0 | I |
| EU-01 | 18.82 | Inorganic | Vanadium | mg/kg | 44 | 66 | 44 | 3.26E+01 | 1.17E+01 | 3.0 | 8 | 0 | I | 44 | 3.26E+01 | 1.17E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Zinc | mg/kg | 44 | 732 | 44 | 9.82E+01 | 1.04E+02 | 3.0 | 8 | 0 | I | 44 | 9.82E+01 | 1.04E+02 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | PCBs | Aroclor 1242 | mg/kg | | | 35 | 7.78E-02 | 4.01E-02 | 2.8 | 11 | 0 | I | 37 | | | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | PCBs | Aroclor 1248 | mg/kg | 1 | 0.18 | 35 | 7.72E-02 | 3.85E-02 | 2.9 | 11 | 0 | I | 1 | 1.80E-01 | | 1.5 | 15 | 14 | I |
| EU-01 | 18.82 | PCBs | Aroclor 1254 | mg/kg | 18 | 2.2 | 37 | 2.37E-01 | 4.31E-01 | 1.5 | 15 | 0 | Y | 18 | 4.12E-01 | 5.74E-01 | 1.5 | 15 | 0 | Y |
| EU-01 | 18.82 | PCBs | Aroclor 1260 | mg/kg | 13 | 2 | 36 | 1.70E-01 | 3.58E-01 | 0.3 | 185 | 149 | I | 13 | 3.31E-01 | 5.72E-01 | 1.5 | 15 | 2 | Y |
| EU-01 | 18.82 | SVOC | 2-Methylnaphthalene | mg/kg | 8 | 0.78 | 33 | 7.21E-02 | 1.54E-01 | 3.0 | 11 | 0 | I | 33 | 7.21E-02 | 1.54E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Acenaphthene | mg/kg | 1 | 0.008 | 50 | 2.30E-01 | 6.50E-01 | 3.0 | 11 | 0 | I | 50 | 2.30E-01 | 6.50E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Anthracene | mg/kg | 7 | 0.039 | 50 | 2.31E-01 | 6.49E-01 | 3.0 | 11 | 0 | I | 50 | 2.31E-01 | 6.49E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Benzo(a)anthracene | mg/kg | 12 | 0.34 | 47 | 1.00E-01 | 1.29E-01 | 1.5 | 15 | 0 | I | 36 | 5.16E-02 | 9.29E-02 | 1.5 | 15 | 0 | Y |
| EU-01 | 18.82 | SVOC | Benzo(a)pyrene | mg/kg | 12 | 0.28 | 37 | 4.33E-02 | 7.04E-02 | 1.5 | 15 | 0 | Y | 16 | 6.72E-02 | 1.04E-01 | 1.5 | 15 | 0 | Y |
| EU-01 | 18.82 | SVOC | Benzo(b)fluoranthene | mg/kg | 15 | 0.46 | 47 | 1.03E-01 | 1.38E-01 | 1.4 | 16 | 0 | I | 37 | 5.60E-02 | 1.08E-01 | 1.5 | 15 | 0 | Y |
| EU-01 | 18.82 | SVOC | Benzo(k)fluoranthene | mg/kg | 12 | 0.38 | 47 | 1.00E-01 | 1.27E-01 | 1.5 | 15 | 0 | I | 38 | 5.16E-02 | 8.65E-02 | 1.1 | 21 | 0 | I |
| EU-01 | 18.82 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 6 | 0.23 | 32 | 8.80E-01 | 2.17E+00 | 3.0 | 11 | 0 | I | 29 | 2.82E-01 | 3.24E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Chrysene | mg/kg | 18 | 0.5 | 50 | 2.73E-01 | 6.50E-01 | 2.9 | 11 | 0 | I | 48 | 1.56E-01 | 2.92E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Dibenzo(a,h)anthracene | mg/kg | 8 | 0.033 | 38 | 2.20E-02 | 1.69E-02 | 3.0 | 11 | 0 | I | 12 | 1.03E-02 | 1.12E-02 | 1.5 | 15 | 3 | Y |
| EU-01 | 18.82 | SVOC | Diethyl phthalate | mg/kg | 1 | 0.0061 | 32 | 8.52E-01 | 2.18E+00 | 3.0 | 11 | 0 | I | 32 | 8.52E-01 | 2.18E+00 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Di-n-butyl phthalate | mg/kg | 3 | 0.02 | 32 | 8.62E-01 | 2.18E+00 | 3.0 | 11 | 0 | I | 32 | 8.62E-01 | 2.18E+00 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Fluoranthene | mg/kg | 17 | 2.1 | 50 | 3.50E-01 | 7.45E-01 | 3.0 | 11 | 0 | I | 50 | 3.50E-01 | 7.45E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Fluorene | mg/kg | 1 | 0.006 | 50 | 2.30E-01 | 6.50E-01 | 3.0 | 11 | 0 | I | 50 | 2.30E-01 | 6.50E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 9 | 0.11 | 47 | 8.33E-02 | 1.12E-01 | 1.7 | 14 | 0 | I | 36 | 2.80E-02 | 2.58E-02 | 0.7 | 40 | 4 | I |
| EU-01 | 18.82 | SVOC | Naphthalene | mg/kg | 7 | 0.64 | 49 | 8.72E-02 | 1.38E-01 | 3.0 | 11 | 0 | I | 49 | 8.72E-02 | 1.38E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Pyrene | mg/kg | 18 | 1.6 | 50 | 3.18E-01 | 6.85E-01 | 3.0 | 11 | 0 | I | 50 | 3.18E-01 | 6.85E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | 1,1-Dichloroethane | mg/kg | | | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | 1,1-Dichloroethene | mg/kg | | | 23 | 5.97E-03 | 1.60E-03 | 3.0 | 11 | 0 | I | 23 | 5.97E-03 | 1.60E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Acetone | mg/kg | 2 | 4.8 | 18 | 3.16E-01 | 1.12E+00 | 3.0 | 11 | 0 | I | 18 | 3.16E-01 | 1.12E+00 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Benzene | mg/kg | | | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 13 | 5.82E-03 | 2.54E-03 | 3.0 | 11 | 0 | I | 13 | 5.82E-03 | 2.54E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Ethylbenzene | mg/kg | | | 23 | 5.38E-03 | 2.03E-03 | 3.0 | 11 | 0 | I | 23 | 5.38E-03 | 2.03E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | m,p-Xylenes | mg/kg | | | 13 | 5.82E-03 | 2.54E-03 | 3.0 | 11 | 0 | I | 13 | 5.82E-03 | 2.54E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Methyl ethyl ketone | mg/kg | 2 | 0.011 | 19 | 3.89E-02 | 3.13E-02 | 3.0 | 11 | 0 | I | 19 | 3.89E-02 | 3.13E-02 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Methylene chloride | mg/kg | 4 | 0.28 | 23 | 3.56E-02 | 6.42E-02 | 3.0 | 11 | 0 | I | 23 | 3.56E-02 | 6.42E-02 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Tetrachloroethene | mg/kg | | | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Toluene | mg/kg | 5 | 0.014 | 23 | 6.20E-03 | 3.29E-03 | 3.0 | 11 | 0 | I | 23 | 6.20E-03 | 3.29E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 18 | 5.59E-03 | 2.17E-03 | 3.0 | 11 | 0 | I | 18 | 5.59E-03 | 2.17E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Trichloroethene | mg/kg | | | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I | 23 | 5.42E-03 | 2.01E-03 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | Vinyl chloride | mg/kg | | | 23 | 9.94E-03 | 3.69E-03 | 3.0 | 11 | 0 | I | 2 | 2.35E-03 | 4.95E-04 | 1.5 | 15 | 13 | I |
| EU-01 | 18.82 | VOC | Xylenes, Total | mg/kg | 4 | 0.013 | 7 | 8.29E-03 | 3.25E-03 | 1.5 | 15 | 8 | I | 7 | 8.29E-03 | 3.25E-03 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 27 | 6.64E-04 | 34 | 6.32E-05 | 1.63E-04 | 1.5 | 15 | 0 | Y | 29 | 7.39E-05 | 1.75E-04 | 1.5 | 15 | 0 | Y |
| EU-02 | 17.64 | Inorganic | Aluminum | mg/kg | 9 | 14000 | 9 | 1.11E+04 | 2.21E+03 | 3.0 | 8 | 0 | I | 9 | 1.11E+04 | 2.21E+03 | 3.0 | 8 | 0 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-02 | 17.64 | Inorganic | Antimony | mg/kg | | | 11 | 1.01E+01 | 3.41E+00 | 3.0 | 8 | 0 | I | 1 | 3.40E-02 | | 1.5 | 14 | 13 | I |
| EU-02 | 17.64 | Inorganic | Arsenic | mg/kg | 10 | 9 | 19 | 4.16E+00 | 2.00E+00 | 3.0 | 8 | 0 | I | 19 | 4.16E+00 | 2.00E+00 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Barium | mg/kg | 22 | 1000 | 22 | 2.06E+02 | 3.19E+02 | 3.0 | 8 | 0 | I | 22 | 2.06E+02 | 3.19E+02 | 2.2 | 10 | 0 | I |
| EU-02 | 17.64 | Inorganic | Beryllium | mg/kg | 11 | 0.7 | 19 | 4.95E-01 | 1.21E-01 | 3.0 | 8 | 0 | I | 19 | 4.95E-01 | 1.21E-01 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Boron | mg/kg | 1 | 2.5 | 9 | 5.87E+00 | 1.44E+00 | 3.0 | 8 | 0 | I | 9 | 5.87E+00 | 1.44E+00 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Cadmium | mg/kg | 12 | 20 | 19 | 1.81E+00 | 4.49E+00 | 3.0 | 8 | 0 | I | 19 | 1.81E+00 | 4.49E+00 | 0.6 | 64 | 45 | I |
| EU-02 | 17.64 | Inorganic | Chromium | mg/kg | 19 | 72 | 19 | 2.26E+01 | 1.56E+01 | 3.0 | 8 | 0 | I | 19 | 2.26E+01 | 1.56E+01 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Cobalt | mg/kg | 19 | 14 | 19 | 6.15E+00 | 2.77E+00 | 3.0 | 8 | 0 | I | 19 | 6.15E+00 | 2.77E+00 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Copper | mg/kg | 19 | 200 | 19 | 2.69E+01 | 4.78E+01 | 3.0 | 8 | 0 | I | 19 | 2.69E+01 | 4.78E+01 | 2.8 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Lead | mg/kg | 25 | 100 | 25 | 2.46E+01 | 2.28E+01 | 3.0 | 8 | 0 | I | 25 | 2.46E+01 | 2.28E+01 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-02 | 17.64 | Inorganic | Mercury | mg/kg | 7 | 1 | 20 | 1.59E-01 | 2.16E-01 | 3.0 | 8 | 0 | I | 20 | 1.59E-01 | 2.16E-01 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Molybdenum | mg/kg | 2 | 0.49 | 19 | 6.07E+00 | 5.47E+00 | 3.0 | 8 | 0 | I | 19 | 6.07E+00 | 5.47E+00 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Nickel | mg/kg | 18 | 130 | 19 | 2.13E+01 | 3.09E+01 | 3.0 | 8 | 0 | I | 19 | 2.13E+01 | 3.09E+01 | 2.3 | 9 | 0 | I |
| EU-02 | 17.64 | Inorganic | Selenium | mg/kg | | | 19 | 3.00E+00 | 2.73E+00 | 3.0 | 8 | 0 | I | 19 | 3.00E+00 | 2.73E+00 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Silver | mg/kg | 13 | 150 | 22 | 1.70E+01 | 4.12E+01 | 3.0 | 8 | 0 | I | 22 | 1.70E+01 | 4.12E+01 | 0.5 | 90 | 68 | I |
| EU-02 | 17.64 | Inorganic | Thallium | mg/kg | 9 | 0.35 | 14 | 1.95E+00 | 2.36E+00 | 1.1 | 22 | 8 | I | 14 | 1.95E+00 | 2.36E+00 | 1.1 | 22 | 8 | I |
| EU-02 | 17.64 | Inorganic | Vanadium | mg/kg | 19 | 38 | 19 | 2.79E+01 | 6.35E+00 | 3.0 | 8 | 0 | I | 19 | 2.79E+01 | 6.35E+00 | 3.0 | 8 | 0 | I |
| EU-02 | 17.64 | Inorganic | Zinc | mg/kg | 22 | 3400 | 22 | 4.99E+02 | 9.71E+02 | 3.0 | 8 | 0 | I | 22 | 4.99E+02 | 9.71E+02 | 0.7 | 48 | 26 | I |
| EU-02 | 17.64 | PCBs | Aroclor 1242 | mg/kg | | | 4 | 1.71E-01 | 5.86E-02 | 1.5 | 15 | 11 | I | 5 | | | 1.5 | 15 | 10 | I |
| EU-02 | 17.64 | PCBs | Aroclor 1248 | mg/kg | | | 4 | 1.71E-01 | 5.86E-02 | 1.5 | 15 | 11 | I | 5 | | | 1.5 | 15 | 10 | I |
| EU-02 | 17.64 | PCBs | Aroclor 1254 | mg/kg | 1 | 0.071 | 5 | 1.51E-01 | 6.76E-02 | 1.5 | 15 | 10 | I | 1 | 7.10E-02 | | 1.5 | 15 | 14 | I |
| EU-02 | 17.64 | PCBs | Aroclor 1260 | mg/kg | | | 4 | 1.71E-01 | 5.86E-02 | 1.5 | 15 | 11 | I | 5 | | | 1.5 | 15 | 10 | I |
| EU-02 | 17.64 | SVOC | 2-Methylnaphthalene | mg/kg | | | 9 | 6.97E-02 | 7.55E-02 | 3.0 | 11 | 2 | I | 9 | 6.97E-02 | 7.55E-02 | 3.0 | 11 | 2 | I |
| EU-02 | 17.64 | SVOC | Acenaphthene | mg/kg | | | 13 | 8.98E-02 | 7.75E-02 | 3.0 | 11 | 0 | I | 13 | 8.98E-02 | 7.75E-02 | 3.0 | 11 | 0 | I |
| EU-02 | 17.64 | SVOC | Anthracene | mg/kg | | | 13 | 8.98E-02 | 7.75E-02 | 3.0 | 11 | 0 | I | 13 | 8.98E-02 | 7.75E-02 | 3.0 | 11 | 0 | I |
| EU-02 | 17.64 | SVOC | Benzo(a)anthracene | mg/kg | 1 | 0.012 | 13 | 9.04E-02 | 7.68E-02 | 2.5 | 11 | 0 | I | 7 | 2.21E-02 | 5.34E-03 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Benzo(a)pyrene | mg/kg | 2 | 0.043 | 7 | 2.41E-02 | 9.10E-03 | 1.5 | 15 | 8 | I | 2 | 2.80E-02 | 2.12E-02 | 1.5 | 15 | 13 | I |
| EU-02 | 17.64 | SVOC | Benzo(b)fluoranthene | mg/kg | 2 | 0.065 | 13 | 9.40E-02 | 7.41E-02 | 2.6 | 11 | 0 | I | 7 | 2.89E-02 | 1.60E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Benzo(k)fluoranthene | mg/kg | 1 | 0.012 | 13 | 9.04E-02 | 7.68E-02 | 2.5 | 11 | 0 | I | 13 | 9.04E-02 | 7.68E-02 | 1.2 | 18 | 5 | I |
| EU-02 | 17.64 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 1 | 0.022 | 8 | 1.43E-01 | 5.45E-02 | 3.0 | 11 | 3 | I | 8 | 1.43E-01 | 5.45E-02 | 3.0 | 11 | 3 | I |
| EU-02 | 17.64 | SVOC | Chrysene | mg/kg | 2 | 0.027 | 13 | 9.16E-02 | 7.56E-02 | 3.0 | 11 | 0 | I | 13 | 9.16E-02 | 7.56E-02 | 3.0 | 11 | 0 | I |
| EU-02 | 17.64 | SVOC | Dibenzo(a,h)anthracene | mg/kg | 1 | 0.008 | 7 | 2.16E-02 | 6.65E-03 | 1.5 | 15 | 8 | I | 1 | 8.00E-03 | | 1.5 | 15 | 14 | I |
| EU-02 | 17.64 | SVOC | Diethyl phthalate | mg/kg | | | 8 | 1.43E-01 | 5.48E-02 | 3.0 | 11 | 3 | I | 8 | 1.43E-01 | 5.48E-02 | 3.0 | 11 | 3 | I |
| EU-02 | 17.64 | SVOC | Di-n-butyl phthalate | mg/kg | | | 8 | 1.43E-01 | 5.48E-02 | 3.0 | 11 | 3 | I | 8 | 1.43E-01 | 5.48E-02 | 3.0 | 11 | 3 | I |
| EU-02 | 17.64 | SVOC | Fluoranthene | mg/kg | 3 | 0.036 | 13 | 9.27E-02 | 7.46E-02 | 3.0 | 11 | 0 | I | 13 | 9.27E-02 | 7.46E-02 | 3.0 | 11 | 0 | I |
| EU-02 | 17.64 | SVOC | Fluorene | mg/kg | | | 13 | 8.98E-02 | 7.75E-02 | 3.0 | 11 | 0 | I | 13 | 8.98E-02 | 7.75E-02 | 3.0 | 11 | 0 | I |
| EU-02 | 17.64 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 2 | 0.053 | 13 | 9.24E-02 | 7.53E-02 | 2.5 | 11 | 0 | I | 7 | 2.59E-02 | 1.23E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Naphthalene | mg/kg | | | 13 | 8.98E-02 | 7.75E-02 | 3.0 | 11 | 0 | I | 13 | 8.98E-02 | 7.75E-02 | 3.0 | 11 | 0 | I |
| EU-02 | 17.64 | SVOC | Pyrene | mg/kg | 3 | 0.043 | 13 | 9.27E-02 | 7.47E-02 | 3.0 | 11 | 0 | I | 13 | 9.27E-02 | 7.47E-02 | 3.0 | 11 | 0 | I |
| EU-02 | 17.64 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | 1,1-Dichloroethane | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | 1,1-Dichloroethene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | | | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Acetone | mg/kg | | | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-02 | 17.64 | VOC | Benzene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | VOC | Ethylbenzene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | VOC | Methyl ethyl ketone | mg/kg | | | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-02 | 17.64 | VOC | Methylene chloride | mg/kg | | | 6 | 3.00E-01 | 5.44E-09 | 1.5 | 15 | 9 | I | 6 | 3.00E-01 | 5.44E-09 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Tetrachloroethene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | | | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Toluene | mg/kg | 2 | 0.11 | 6 | 7.00E-02 | 3.10E-02 | 1.5 | 15 | 9 | I | 6 | 7.00E-02 | 3.10E-02 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Trichloroethene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | | | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Vinyl chloride | mg/kg | | | 3 | | | 1.5 | 15 | 12 | I | 6 | | | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Xylenes, Total | mg/kg | | | 3 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-03 | 18.12 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 9 | 2.62E-05 | 11 | 4.77E-06 | 7.98E-06 | 1.5 | 15 | 4 | Y | 10 | 5.23E-06 | 8.26E-06 | 1.5 | 15 | 5 | Y |
| EU-03 | 18.12 | Inorganic | Aluminum | mg/kg | 17 | 15000 | 17 | 1.03E+04 | 2.74E+03 | 3.0 | 8 | 0 | I | 17 | 1.03E+04 | 2.74E+03 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Antimony | mg/kg | 10 | 0.86 | 23 | 4.12E+00 | 5.09E+00 | 3.0 | 8 | 0 | I | 18 | 1.59E+00 | 1.30E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Arsenic | mg/kg | 25 | 9 | 29 | 3.58E+00 | 1.98E+00 | 3.0 | 8 | 0 | I | 29 | 3.58E+00 | 1.98E+00 | 3.0 | 8 | 0 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-03 | 18.12 | Inorganic | Barium | mg/kg | 29 | 200 | 29 | 6.75E+01 | 2.96E+01 | 3.0 | 8 | 0 | I | 29 | 6.75E+01 | 2.96E+01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Beryllium | mg/kg | 18 | 1.4 | 29 | 5.26E-01 | 2.23E-01 | 3.0 | 8 | 0 | I | 29 | 5.26E-01 | 2.23E-01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Boron | mg/kg | 4 | 10 | 17 | 4.68E+00 | 2.79E+00 | 3.0 | 8 | 0 | I | 17 | 4.68E+00 | 2.79E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Cadmium | mg/kg | 14 | 4.6 | 29 | 7.07E-01 | 9.36E-01 | 3.0 | 8 | 0 | I | 29 | 7.07E-01 | 9.36E-01 | 2.9 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Chromium | mg/kg | 29 | 41 | 29 | 1.66E+01 | 8.23E+00 | 3.0 | 8 | 0 | I | 29 | 1.66E+01 | 8.23E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Cobalt | mg/kg | 29 | 15 | 29 | 5.73E+00 | 2.53E+00 | 3.0 | 8 | 0 | I | 29 | 5.73E+00 | 2.53E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Copper | mg/kg | 29 | 130 | 29 | 2.32E+01 | 3.14E+01 | 3.0 | 8 | 0 | I | 29 | 2.32E+01 | 3.14E+01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Lead | mg/kg | 29 | 89.6 | 29 | 1.81E+01 | 2.14E+01 | 3.0 | 8 | 0 | I | 29 | 1.81E+01 | 2.14E+01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Manganese | mg/kg | 7 | 907 | 7 | 3.29E+02 | 2.64E+02 | 1.5 | 14 | 7 | I | 7 | 3.29E+02 | 2.64E+02 | 1.5 | 14 | 7 | I |
| EU-03 | 18.12 | Inorganic | Mercury | mg/kg | 58 | 35 | 75 | 1.73E+00 | 5.17E+00 | 2.3 | 9 | 0 | I | 75 | 1.73E+00 | 5.17E+00 | 2.3 | 9 | 0 | I |
| EU-03 | 18.12 | Inorganic | Molybdenum | mg/kg | 8 | 0.88 | 29 | 4.80E+00 | 5.44E+00 | 3.0 | 8 | 0 | I | 29 | 4.80E+00 | 5.44E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Nickel | mg/kg | 26 | 24 | 29 | 9.39E+00 | 4.70E+00 | 3.0 | 8 | 0 | I | 29 | 9.39E+00 | 4.70E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Selenium | mg/kg | 1 | 0.77 | 31 | 1.74E+00 | 2.30E+00 | 3.0 | 8 | 0 | I | 31 | 1.74E+00 | 2.30E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Silver | mg/kg | 6 | 4.8 | 32 | 1.19E+00 | 1.56E+00 | 3.0 | 8 | 0 | I | 32 | 1.19E+00 | 1.56E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Thallium | mg/kg | 11 | 0.33 | 26 | 4.74E-01 | 3.87E-01 | 3.0 | 8 | 0 | I | 26 | 4.74E-01 | 3.87E-01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Vanadium | mg/kg | 29 | 77 | 29 | 2.60E+01 | 1.13E+01 | 3.0 | 8 | 0 | I | 29 | 2.60E+01 | 1.13E+01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Zinc | mg/kg | 29 | 4630 | 29 | 3.42E+02 | 8.78E+02 | 3.0 | 8 | 0 | I | 29 | 3.42E+02 | 8.78E+02 | 0.8 | 38 | 9 | I |
| EU-03 | 18.12 | PCBs | Aroclor 1242 | mg/kg | | | 23 | 6.95E-02 | 4.84E-02 | 2.3 | 12 | 0 | I | 3 | 4.73E-03 | 2.12E-03 | 1.5 | 15 | 12 | I |
| EU-03 | 18.12 | PCBs | Aroclor 1248 | mg/kg | | | 23 | 6.95E-02 | 4.84E-02 | 2.3 | 12 | 0 | I | 3 | 4.73E-03 | 2.12E-03 | 1.5 | 15 | 12 | I |
| EU-03 | 18.12 | PCBs | Aroclor 1254 | mg/kg | 7 | 0.43 | 23 | 9.28E-02 | 8.89E-02 | 1.2 | 18 | 0 | I | 7 | 1.15E-01 | 1.50E-01 | 1.5 | 15 | 8 | I |
| EU-03 | 18.12 | PCBs | Aroclor 1260 | mg/kg | 10 | 7.8 | 28 | 1.22E+00 | 2.52E+00 | 1.5 | 15 | 0 | Y | 10 | 3.27E+00 | 3.42E+00 | 1.5 | 15 | 5 | Y |
| EU-03 | 18.12 | SVOC | 2-Methylnaphthalene | mg/kg | 1 | 0.00449 | 7 | 7.93E-03 | 6.69E-03 | 1.5 | 15 | 8 | I | 7 | 7.93E-03 | 6.69E-03 | 1.5 | 15 | 8 | I |
| EU-03 | 18.12 | SVOC | Acenaphthene | mg/kg | | | 10 | 5.62E-02 | 1.28E-01 | 3.0 | 11 | 1 | I | 10 | 5.62E-02 | 1.28E-01 | 3.0 | 11 | 1 | I |
| EU-03 | 18.12 | SVOC | Anthracene | mg/kg | | | 10 | 5.62E-02 | 1.28E-01 | 3.0 | 11 | 1 | I | 10 | 5.62E-02 | 1.28E-01 | 3.0 | 11 | 1 | I |
| EU-03 | 18.12 | SVOC | Benzo(a)anthracene | mg/kg | 2 | 0.004 | 9 | 1.58E-02 | 1.35E-02 | 3.0 | 11 | 2 | I | 8 | 1.29E-02 | 1.10E-02 | 1.6 | 14 | 6 | I |
| EU-03 | 18.12 | SVOC | Benzo(a)pyrene | mg/kg | 2 | 0.004 | 7 | 1.40E-02 | 1.13E-02 | 1.5 | 15 | 8 | I | 3 | 3.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-03 | 18.12 | SVOC | Benzo(b)fluoranthene | mg/kg | 4 | 0.0144 | 8 | 1.74E-02 | 1.30E-02 | 3.0 | 11 | 3 | I | 7 | 1.43E-02 | 1.04E-02 | 1.5 | 15 | 8 | I |
| EU-03 | 18.12 | SVOC | Benzo(k)fluoranthene | mg/kg | 2 | 0.006 | 8 | 1.74E-02 | 1.34E-02 | 3.0 | 11 | 3 | I | 8 | 1.74E-02 | 1.34E-02 | 3.0 | 11 | 3 | I |
| EU-03 | 18.12 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 3 | 0.0194 | 6 | 2.80E-01 | 5.51E-01 | 1.5 | 15 | 9 | I | 6 | 2.80E-01 | 5.51E-01 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | SVOC | Chrysene | mg/kg | 3 | 0.008 | 10 | 5.71E-02 | 1.28E-01 | 3.0 | 11 | 1 | I | 10 | 5.71E-02 | 1.28E-01 | 3.0 | 11 | 1 | I |
| EU-03 | 18.12 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 8 | 1.69E-02 | 1.40E-02 | 3.0 | 11 | 3 | I | 3 | 3.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-03 | 18.12 | SVOC | Diethyl phthalate | mg/kg | | | 6 | 2.82E-01 | 5.50E-01 | 1.5 | 15 | 9 | I | 6 | 2.82E-01 | 5.50E-01 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | SVOC | Di-n-butyl phthalate | mg/kg | 3 | 0.011 | 6 | 2.78E-01 | 5.52E-01 | 1.5 | 15 | 9 | I | 6 | 2.78E-01 | 5.52E-01 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | SVOC | Fluoranthene | mg/kg | 4 | 0.0084 | 10 | 5.59E-02 | 1.29E-01 | 3.0 | 11 | 1 | I | 10 | 5.59E-02 | 1.29E-01 | 3.0 | 11 | 1 | I |
| EU-03 | 18.12 | SVOC | Fluorene | mg/kg | | | 10 | 5.62E-02 | 1.28E-01 | 3.0 | 11 | 1 | I | 10 | 5.62E-02 | 1.28E-01 | 3.0 | 11 | 1 | I |
| EU-03 | 18.12 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 1 | 0.005 | 8 | 1.71E-02 | 1.37E-02 | 3.0 | 11 | 3 | I | 7 | 1.40E-02 | 1.13E-02 | 1.5 | 15 | 8 | I |
| EU-03 | 18.12 | SVOC | Naphthalene | mg/kg | 1 | 0.00613 | 10 | 5.50E-02 | 1.29E-01 | 3.0 | 11 | 1 | I | 10 | 5.50E-02 | 1.29E-01 | 3.0 | 11 | 1 | I |
| EU-03 | 18.12 | SVOC | Pyrene | mg/kg | 4 | 0.00982 | 10 | 5.60E-02 | 1.28E-01 | 3.0 | 11 | 1 | I | 10 | 5.60E-02 | 1.28E-01 | 3.0 | 11 | 1 | I |
| EU-03 | 18.12 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 14 | 3.09E-02 | 2.29E-02 | 3.0 | 11 | 0 | I | 14 | 3.09E-02 | 2.29E-02 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | 1,1-Dichloroethane | mg/kg | | | 14 | 3.09E-02 | 2.29E-02 | 3.0 | 11 | 0 | I | 14 | 3.09E-02 | 2.29E-02 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | 1,1-Dichloroethene | mg/kg | | | 14 | 3.09E-02 | 2.29E-02 | 3.0 | 11 | 0 | I | 6 | 5.33E-03 | 5.16E-04 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | VOC | Acetone | mg/kg | 3 | 5.2 | 14 | 9.70E-01 | 1.30E+00 | 3.0 | 11 | 0 | I | 14 | 9.70E-01 | 1.30E+00 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | Benzene | mg/kg | | | 14 | 3.09E-02 | 2.29E-02 | 3.0 | 11 | 0 | I | 14 | 3.09E-02 | 2.29E-02 | 2.0 | 12 | 0 | I |
| EU-03 | 18.12 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 6 | 5.33E-03 | 5.16E-04 | 1.5 | 15 | 9 | I | 6 | 5.33E-03 | 5.16E-04 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | VOC | Ethylbenzene | mg/kg | | | 14 | 3.09E-02 | 2.29E-02 | 3.0 | 11 | 0 | I | 14 | 3.09E-02 | 2.29E-02 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | m,p-Xylenes | mg/kg | | | 6 | 7.83E-03 | 2.79E-03 | 1.5 | 15 | 9 | I | 6 | 7.83E-03 | 2.79E-03 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | VOC | Methyl ethyl ketone | mg/kg | 3 | 0.037 | 6 | 3.62E-02 | 2.38E-02 | 1.5 | 15 | 9 | I | 6 | 3.62E-02 | 2.38E-02 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | VOC | Methylene chloride | mg/kg | 2 | 0.013 | 14 | 1.79E-01 | 1.46E-01 | 3.0 | 11 | 0 | I | 14 | 1.79E-01 | 1.46E-01 | 1.8 | 12 | 0 | I |
| EU-03 | 18.12 | VOC | Tetrachloroethene | mg/kg | 1 | 0.1 | 14 | 3.44E-02 | 2.92E-02 | 3.0 | 11 | 0 | I | 7 | 1.89E-02 | 3.58E-02 | 1.5 | 15 | 8 | I |
| EU-03 | 18.12 | VOC | Toluene | mg/kg | 1 | 0.42 | 14 | 8.21E-02 | 1.08E-01 | 3.0 | 11 | 0 | I | 14 | 8.21E-02 | 1.08E-01 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 6 | 5.33E-03 | 5.16E-04 | 1.5 | 15 | 9 | I | 6 | 5.33E-03 | 5.16E-04 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | VOC | Trichloroethene | mg/kg | 2 | 0.22 | 14 | 4.87E-02 | 6.03E-02 | 3.0 | 11 | 0 | I | 8 | 4.78E-02 | 8.21E-02 | 1.5 | 15 | 7 | Y |
| EU-03 | 18.12 | VOC | Vinyl chloride | mg/kg | | | 6 | 8.33E-03 | 3.33E-03 | 1.5 | 15 | 9 | I | | | | 1.5 | 15 | 15 | I |
| EU-03 | 18.12 | VOC | Xylenes, Total | mg/kg | 1 | 0.08 | 11 | 4.34E-02 | 1.99E-02 | 3.0 | 11 | 0 | I | 11 | 4.34E-02 | 1.99E-02 | 3.0 | 11 | 0 | I |
| EU-04 | 18.26 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | Inorganic | Aluminum | mg/kg | 4 | 14000 | 4 | 1.23E+04 | 1.50E+03 | 1.5 | 14 | 10 | I | 4 | 1.23E+04 | 1.50E+03 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Antimony | mg/kg | 2 | 0.16 | 4 | 1.35E-01 | 3.08E-02 | 1.5 | 14 | 10 | I | 4 | 1.35E-01 | 3.08E-02 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Arsenic | mg/kg | 4 | 3.4 | 4 | 2.90E+00 | 7.57E-01 | 1.5 | 14 | 10 | I | 4 | 2.90E+00 | 7.57E-01 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Barium | mg/kg | 4 | 79 | 4 | 7.35E+01 | 4.12E+00 | 1.5 | 14 | 10 | I | 4 | 7.35E+01 | 4.12E+00 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Beryllium | mg/kg | 4 | 0.56 | 4 | 4.75E-01 | 8.27E-02 | 1.5 | 14 | 10 | I | 4 | 4.75E-01 | 8.27E-02 | 1.5 | 14 | 10 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-04 | 18.26 | Inorganic | Boron | mg/kg | 4 | 3.5 | 4 | 2.93E+00 | 4.57E-01 | 1.5 | 14 | 10 | I | 4 | 2.93E+00 | 4.57E-01 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Cadmium | mg/kg | 4 | 0.39 | 4 | 1.79E-01 | 1.41E-01 | 1.5 | 14 | 10 | I | 4 | 1.79E-01 | 1.41E-01 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Chromium | mg/kg | 4 | 24 | 4 | 1.83E+01 | 3.95E+00 | 1.5 | 14 | 10 | I | 4 | 1.83E+01 | 3.95E+00 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Cobalt | mg/kg | 4 | 6.5 | 4 | 6.00E+00 | 3.92E-01 | 1.5 | 14 | 10 | I | 4 | 6.00E+00 | 3.92E-01 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Copper | mg/kg | 4 | 15 | 4 | 1.13E+01 | 2.53E+00 | 1.5 | 14 | 10 | I | 4 | 1.13E+01 | 2.53E+00 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Lead | mg/kg | 4 | 40 | 4 | 1.47E+01 | 1.69E+01 | 1.5 | 14 | 10 | I | 4 | 1.47E+01 | 1.69E+01 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Manganese | mg/kg | 4 | 290 | 4 | 2.88E+02 | 5.00E+00 | 1.5 | 14 | 10 | I | 4 | 2.88E+02 | 5.00E+00 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Mercury | mg/kg | 4 | 0.024 | 4 | 1.34E-02 | 7.15E-03 | 1.5 | 14 | 10 | I | 4 | 1.34E-02 | 7.15E-03 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Molybdenum | mg/kg | | | 4 | 5.48E-01 | 1.05E-01 | 1.5 | 14 | 10 | I | 4 | 5.48E-01 | 1.05E-01 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Nickel | mg/kg | 4 | 14 | 4 | 1.15E+01 | 1.73E+00 | 1.5 | 14 | 10 | I | 4 | 1.15E+01 | 1.73E+00 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Selenium | mg/kg | 2 | 0.26 | 4 | 4.33E-01 | 2.60E-01 | 1.5 | 14 | 10 | I | 4 | 4.33E-01 | 2.60E-01 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Silver | mg/kg | 5 | 0.15 | 5 | 8.76E-02 | 5.70E-02 | 1.5 | 14 | 9 | I | 5 | 8.76E-02 | 5.70E-02 | 1.5 | 14 | 9 | I |
| EU-04 | 18.26 | Inorganic | Thallium | mg/kg | 4 | 0.48 | 4 | 4.00E-01 | 9.06E-02 | 1.5 | 14 | 10 | I | 4 | 4.00E-01 | 9.06E-02 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Vanadium | mg/kg | 4 | 36 | 4 | 3.18E+01 | 3.69E+00 | 1.5 | 14 | 10 | I | 4 | 3.18E+01 | 3.69E+00 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | Inorganic | Zinc | mg/kg | 4 | 120 | 4 | 6.58E+01 | 3.66E+01 | 1.5 | 14 | 10 | I | 4 | 6.58E+01 | 3.66E+01 | 1.5 | 14 | 10 | I |
| EU-04 | 18.26 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | SVOC | Acenaphthene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Anthracene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Benzo(a)anthracene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Chrysene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Diethyl phthalate | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Di-n-butyl phthalate | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Fluoranthene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Fluorene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | SVOC | Naphthalene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | SVOC | Pyrene | mg/kg | | | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I | 3 | 3.00E-01 | 6.08E-09 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | 1,1-Dichloroethane | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | 1,1-Dichloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | Acetone | mg/kg | 2 | 0.01 | 2 | 1.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | VOC | Benzene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | VOC | Ethylbenzene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | VOC | Methyl ethyl ketone | mg/kg | 2 | 0.09 | 2 | 5.00E-02 | 5.66E-02 | 1.5 | 15 | 13 | I | 2 | 5.00E-02 | 5.66E-02 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | VOC | Methylene chloride | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | Tetrachloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | Toluene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | Trichloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | Vinyl chloride | mg/kg | | | 3 | 1.00E-02 | 1.34E-10 | 1.5 | 15 | 12 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-04 | 18.26 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | Inorganic | Aluminum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Antimony | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Arsenic | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Barium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Beryllium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Boron | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Cadmium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-05 | 18.87 | Inorganic | Chromium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Cobalt | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Copper | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Lead | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Mercury | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Molybdenum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Nickel | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Selenium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Silver | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Thallium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Vanadium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Zinc | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | SVOC | Acenaphthene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Anthracene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Benzo(a)anthracene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Benzo(a)pyrene | mg/kg | | | 2 | | | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Chrysene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 2 | | | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Diethyl phthalate | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Di-n-butyl phthalate | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Fluoranthene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Fluorene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Naphthalene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | SVOC | Pyrene | mg/kg | | | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | 1,1-Dichloroethane | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | 1,1-Dichloroethene | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | Acetone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | VOC | Benzene | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | VOC | Ethylbenzene | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | VOC | Methylene chloride | mg/kg | | | 2 | 3.00E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | Tetrachloroethene | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | Toluene | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | Trichloroethene | mg/kg | | | 2 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | Vinyl chloride | mg/kg | | | 2 | | | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-05 | 18.87 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | Inorganic | Aluminum | mg/kg | 6 | 14400 | 6 | 1.14E+04 | 2.70E+03 | 1.5 | 14 | 8 | I | 6 | 1.14E+04 | 2.70E+03 | 1.5 | 14 | 8 | I |
| EU-06 | 18.08 | Inorganic | Antimony | mg/kg | 2 | 4.3 | 12 | 4.39E+00 | 3.12E+00 | 3.0 | 8 | 0 | I | 10 | 3.07E+00 | 5.08E-01 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Arsenic | mg/kg | 14 | 5.9 | 17 | 3.93E+00 | 1.31E+00 | 3.0 | 8 | 0 | I | 17 | 3.93E+00 | 1.31E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Barium | mg/kg | 17 | 126 | 17 | 9.64E+01 | 2.00E+01 | 3.0 | 8 | 0 | I | 17 | 9.64E+01 | 2.00E+01 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Beryllium | mg/kg | 14 | 1.2 | 17 | 6.65E-01 | 2.80E-01 | 3.0 | 8 | 0 | I | 17 | 6.65E-01 | 2.80E-01 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Boron | mg/kg | | | 4 | 3.25E+00 | 2.65E-01 | 1.5 | 14 | 10 | I | 4 | 3.25E+00 | 2.65E-01 | 1.5 | 14 | 10 | I |
| EU-06 | 18.08 | Inorganic | Cadmium | mg/kg | 9 | 2.1 | 17 | 1.01E+00 | 8.41E-01 | 3.0 | 8 | 0 | I | 17 | 1.01E+00 | 8.41E-01 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Chromium | mg/kg | 17 | 28 | 17 | 1.86E+01 | 6.38E+00 | 3.0 | 8 | 0 | I | 17 | 1.86E+01 | 6.38E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Cobalt | mg/kg | 17 | 10.6 | 17 | 7.64E+00 | 1.78E+00 | 3.0 | 8 | 0 | I | 17 | 7.64E+00 | 1.78E+00 | 3.0 | 8 | 0 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-06 | 18.08 | Inorganic | Copper | mg/kg | 17 | 15.8 | 17 | 1.19E+01 | 3.34E+00 | 3.0 | 8 | 0 | I | 17 | 1.19E+01 | 3.34E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Lead | mg/kg | 16 | 15.7 | 17 | 8.32E+00 | 3.45E+00 | 3.0 | 8 | 0 | I | 17 | 8.32E+00 | 3.45E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Manganese | mg/kg | 4 | 346 | 4 | 2.80E+02 | 4.50E+01 | 1.5 | 14 | 10 | I | 4 | 2.80E+02 | 4.50E+01 | 1.5 | 14 | 10 | I |
| EU-06 | 18.08 | Inorganic | Mercury | mg/kg | 3 | 0.1 | 17 | 1.74E-01 | 8.43E-02 | 3.0 | 8 | 0 | I | 17 | 1.74E-01 | 8.43E-02 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Molybdenum | mg/kg | | | 16 | 2.13E+00 | 3.47E+00 | 3.0 | 8 | 0 | I | 16 | 2.13E+00 | 3.47E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Nickel | mg/kg | 17 | 17.5 | 17 | 1.22E+01 | 3.64E+00 | 3.0 | 8 | 0 | I | 17 | 1.22E+01 | 3.64E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Selenium | mg/kg | 3 | 0.6 | 17 | 1.72E+00 | 2.19E+00 | 3.0 | 8 | 0 | I | 17 | 1.72E+00 | 2.19E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Silver | mg/kg | 3 | 7 | 14 | 1.93E+00 | 2.00E+00 | 3.0 | 8 | 0 | I | 14 | 1.93E+00 | 2.00E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Thallium | mg/kg | | | 12 | 1.49E+00 | 1.44E+00 | 1.8 | 11 | 0 | I | 12 | 1.49E+00 | 1.44E+00 | 1.8 | 11 | 0 | I |
| EU-06 | 18.08 | Inorganic | Vanadium | mg/kg | 17 | 43.7 | 17 | 3.12E+01 | 7.00E+00 | 3.0 | 8 | 0 | I | 17 | 3.12E+01 | 7.00E+00 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | Inorganic | Zinc | mg/kg | 17 | 119 | 17 | 6.89E+01 | 2.31E+01 | 3.0 | 8 | 0 | I | 17 | 6.89E+01 | 2.31E+01 | 3.0 | 8 | 0 | I |
| EU-06 | 18.08 | PCBs | Aroclor 1242 | mg/kg | | | 9 | 4.57E-02 | 9.01E-03 | 3.0 | 11 | 2 | I | 9 | | | 3.0 | 11 | 2 | I |
| EU-06 | 18.08 | PCBs | Aroclor 1248 | mg/kg | | | 9 | 4.57E-02 | 9.01E-03 | 3.0 | 11 | 2 | I | 9 | | | 3.0 | 11 | 2 | I |
| EU-06 | 18.08 | PCBs | Aroclor 1254 | mg/kg | | | 9 | 4.57E-02 | 9.01E-03 | 3.0 | 11 | 2 | I | 9 | | | 3.0 | 11 | 2 | I |
| EU-06 | 18.08 | PCBs | Aroclor 1260 | mg/kg | 3 | 0.12 | 9 | 5.23E-02 | 2.83E-02 | 3.0 | 11 | 2 | I | 3 | 5.63E-02 | 5.51E-02 | 1.5 | 15 | 12 | I |
| EU-06 | 18.08 | SVOC | 2-Methylnaphthalene | mg/kg | | | 4 | 2.05E-02 | 1.91E-02 | 1.5 | 15 | 11 | I | 4 | 2.05E-02 | 1.91E-02 | 1.5 | 15 | 11 | I |
| EU-06 | 18.08 | SVOC | Acenaphthene | mg/kg | | | 16 | 8.01E-02 | 7.25E-02 | 3.0 | 11 | 0 | I | 16 | 8.01E-02 | 7.25E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | SVOC | Anthracene | mg/kg | | | 16 | 1.95E-02 | 1.29E-02 | 3.0 | 11 | 0 | I | 16 | 1.95E-02 | 1.29E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | SVOC | Benzo(a)anthracene | mg/kg | 2 | 0.007 | 16 | 2.15E-02 | 1.14E-02 | 3.0 | 11 | 0 | I | 14 | 1.93E-02 | 1.04E-02 | 1.7 | 14 | 0 | I |
| EU-06 | 18.08 | SVOC | Benzo(a)pyrene | mg/kg | 2 | 0.007 | 16 | 2.18E-02 | 1.10E-02 | 1.7 | 14 | 0 | I | 2 | 6.50E-03 | 7.07E-04 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | SVOC | Benzo(b)fluoranthene | mg/kg | 2 | 0.008 | 16 | 2.19E-02 | 1.08E-02 | 3.0 | 11 | 0 | I | 14 | 1.97E-02 | 9.76E-03 | 1.8 | 12 | 0 | I |
| EU-06 | 18.08 | SVOC | Benzo(k)fluoranthene | mg/kg | 2 | 0.006 | 16 | 2.16E-02 | 1.13E-02 | 3.0 | 11 | 0 | I | 16 | 2.16E-02 | 1.13E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 1 | 0.27 | 6 | 7.00E-02 | 9.80E-02 | 1.5 | 15 | 9 | I | 6 | 7.00E-02 | 9.80E-02 | 1.5 | 15 | 9 | I |
| EU-06 | 18.08 | SVOC | Chrysene | mg/kg | 2 | 0.011 | 16 | 2.23E-02 | 1.03E-02 | 3.0 | 11 | 0 | I | 16 | 2.23E-02 | 1.03E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | SVOC | Dibenzo(a,h)anthracene | mg/kg | 1 | 0.019 | 16 | 2.93E-02 | 7.90E-03 | 3.0 | 11 | 0 | I | 1 | 1.90E-02 | | 1.5 | 15 | 14 | I |
| EU-06 | 18.08 | SVOC | Diethyl phthalate | mg/kg | | | 6 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 9 | I | 6 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 9 | I |
| EU-06 | 18.08 | SVOC | Di-n-butyl phthalate | mg/kg | 2 | 0.06 | 6 | 3.67E-02 | 1.21E-02 | 1.5 | 15 | 9 | I | 6 | 3.67E-02 | 1.21E-02 | 1.5 | 15 | 9 | I |
| EU-06 | 18.08 | SVOC | Fluoranthene | mg/kg | 2 | 0.007 | 16 | 2.16E-02 | 1.13E-02 | 3.0 | 11 | 0 | I | 16 | 2.16E-02 | 1.13E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | SVOC | Fluorene | mg/kg | | | 16 | 2.14E-02 | 1.15E-02 | 3.0 | 11 | 0 | I | 16 | 2.14E-02 | 1.15E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 2 | 0.02 | 16 | 2.31E-02 | 9.63E-03 | 3.0 | 11 | 0 | I | 14 | 2.11E-02 | 8.53E-03 | 2.1 | 12 | 0 | I |
| EU-06 | 18.08 | SVOC | Naphthalene | mg/kg | | | 16 | 4.69E-02 | 2.92E-02 | 3.0 | 11 | 0 | I | 16 | 4.69E-02 | 2.92E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | SVOC | Pyrene | mg/kg | 2 | 0.006 | 16 | 2.15E-02 | 1.14E-02 | 3.0 | 11 | 0 | I | 16 | 2.15E-02 | 1.14E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | 1,1-Dichloroethane | mg/kg | | | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | 1,1-Dichloroethene | mg/kg | | | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | Acetone | mg/kg | 3 | 0.059 | 5 | 3.00E-02 | 1.66E-02 | 1.5 | 15 | 10 | I | 5 | 3.00E-02 | 1.66E-02 | 1.5 | 15 | 10 | I |
| EU-06 | 18.08 | VOC | Benzene | mg/kg | | | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 5 | 5.00E-03 | 7.36E-11 | 1.5 | 15 | 10 | I | 5 | 5.00E-03 | 7.36E-11 | 1.5 | 15 | 10 | I |
| EU-06 | 18.08 | VOC | Ethylbenzene | mg/kg | 4 | 0.008 | 11 | 5.09E-03 | 1.04E-03 | 3.0 | 11 | 0 | I | 11 | 5.09E-03 | 1.04E-03 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | VOC | Methyl ethyl ketone | mg/kg | 1 | 0.01 | 2 | 7.50E-03 | 3.54E-03 | 1.5 | 15 | 13 | I | 2 | 7.50E-03 | 3.54E-03 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Methylene chloride | mg/kg | 1 | 0.007 | 11 | 5.18E-03 | 6.03E-04 | 3.0 | 11 | 0 | I | 11 | 5.18E-03 | 6.03E-04 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | Tetrachloroethene | mg/kg | | | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | Toluene | mg/kg | 6 | 0.051 | 11 | 2.04E-02 | 1.61E-02 | 3.0 | 11 | 0 | I | 11 | 2.04E-02 | 1.61E-02 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | Trichloroethene | mg/kg | | | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I | 11 | 5.00E-03 | 1.09E-10 | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | Vinyl chloride | mg/kg | | | 11 | 7.73E-03 | 2.61E-03 | 3.0 | 11 | 0 | I | 11 | | | 3.0 | 11 | 0 | I |
| EU-06 | 18.08 | VOC | Xylenes, Total | mg/kg | 6 | 0.03 | 11 | 1.23E-02 | 8.76E-03 | 3.0 | 11 | 0 | I | 11 | 1.23E-02 | 8.76E-03 | 3.0 | 11 | 0 | I |
| EU-07 | 16.12 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 2 | 8.65E-06 | 4 | 3.17E-06 | 3.91E-06 | 1.5 | 15 | 11 | I | 2 | 5.97E-06 | 3.80E-06 | 1.5 | 15 | 13 | I |
| EU-07 | 16.12 | Inorganic | Aluminum | mg/kg | 11 | 17900 | 11 | 9.76E+03 | 3.97E+03 | 3.0 | 8 | 0 | I | 11 | 9.76E+03 | 3.97E+03 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Antimony | mg/kg | 9 | 11 | 12 | 7.44E+00 | 3.19E+00 | 3.0 | 8 | 0 | I | 10 | 6.93E+00 | 3.27E+00 | 2.7 | 9 | 0 | I |
| EU-07 | 16.12 | Inorganic | Arsenic | mg/kg | 2 | 11.3 | 12 | 3.19E+00 | 3.03E+00 | 3.0 | 8 | 0 | I | 12 | 3.19E+00 | 3.03E+00 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Barium | mg/kg | 12 | 150 | 12 | 7.98E+01 | 3.05E+01 | 3.0 | 8 | 0 | I | 12 | 7.98E+01 | 3.05E+01 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Beryllium | mg/kg | 9 | 0.86 | 12 | 6.00E-01 | 2.87E-01 | 3.0 | 8 | 0 | I | 12 | 6.00E-01 | 2.87E-01 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Boron | mg/kg | | | 11 | 5.86E+00 | 3.23E+00 | 3.0 | 8 | 0 | I | 11 | 5.86E+00 | 3.23E+00 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Cadmium | mg/kg | 8 | 2.9 | 12 | 9.66E-01 | 8.38E-01 | 3.0 | 8 | 0 | I | 12 | 9.66E-01 | 8.38E-01 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Chromium | mg/kg | 12 | 46 | 12 | 2.19E+01 | 1.35E+01 | 3.0 | 8 | 0 | I | 12 | 2.19E+01 | 1.35E+01 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Cobalt | mg/kg | 12 | 12 | 12 | 6.91E+00 | 2.74E+00 | 3.0 | 8 | 0 | I | 12 | 6.91E+00 | 2.74E+00 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Copper | mg/kg | 12 | 70.7 | 12 | 2.64E+01 | 2.33E+01 | 3.0 | 8 | 0 | I | 12 | 2.64E+01 | 2.33E+01 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Lead | mg/kg | 11 | 79 | 12 | 2.42E+01 | 2.29E+01 | 3.0 | 8 | 0 | I | 12 | 2.42E+01 | 2.29E+01 | 3.0 | 8 | 0 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-07 | 16.12 | Inorganic | Manganese | mg/kg | 9 | 340 | 9 | 2.14E+02 | 8.56E+01 | 3.0 | 8 | 0 | I | 9 | 2.14E+02 | 8.56E+01 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Mercury | mg/kg | 7 | 1.1 | 12 | 3.71E-01 | 3.77E-01 | 3.0 | 8 | 0 | I | 12 | 3.71E-01 | 3.77E-01 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Molybdenum | mg/kg | 1 | 1.3 | 12 | 3.04E+00 | 4.20E+00 | 3.0 | 8 | 0 | I | 12 | 3.04E+00 | 4.20E+00 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Nickel | mg/kg | 12 | 72 | 12 | 2.35E+01 | 2.09E+01 | 3.0 | 8 | 0 | I | 12 | 2.35E+01 | 2.09E+01 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Selenium | mg/kg | | | 12 | 2.01E+00 | 2.41E+00 | 3.0 | 8 | 0 | I | 12 | 2.01E+00 | 2.41E+00 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Silver | mg/kg | 14 | 615 | 24 | 5.27E+01 | 1.47E+02 | 1.3 | 17 | 0 | I | 24 | 5.27E+01 | 1.47E+02 | 1.5 | 14 | 0 | Y |
| EU-07 | 16.12 | Inorganic | Thallium | mg/kg | 1 | 2.4 | 12 | 1.90E+00 | 1.77E+00 | 1.5 | 14 | 2 | I | 12 | 1.90E+00 | 1.77E+00 | 1.5 | 14 | 2 | I |
| EU-07 | 16.12 | Inorganic | Vanadium | mg/kg | 12 | 38 | 12 | 2.71E+01 | 7.95E+00 | 3.0 | 8 | 0 | I | 12 | 2.71E+01 | 7.95E+00 | 3.0 | 8 | 0 | I |
| EU-07 | 16.12 | Inorganic | Zinc | mg/kg | 12 | 1200 | 12 | 3.52E+02 | 4.23E+02 | 3.0 | 8 | 0 | I | 12 | 3.52E+02 | 4.23E+02 | 1.6 | 13 | 1 | I |
| EU-07 | 16.12 | PCBs | Aroclor 1242 | mg/kg | | | 16 | 3.75E-02 | 1.99E-02 | 3.0 | 11 | 0 | I | 1 | 3.40E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | PCBs | Aroclor 1248 | mg/kg | 2 | 0.34 | 16 | 6.69E-02 | 8.56E-02 | 1.3 | 17 | 1 | I | 3 | 1.81E-01 | 1.69E-01 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | PCBs | Aroclor 1254 | mg/kg | 11 | 0.22 | 16 | 7.32E-02 | 4.95E-02 | 2.2 | 12 | 0 | I | 11 | 8.85E-02 | 5.29E-02 | 1.5 | 15 | 4 | Y |
| EU-07 | 16.12 | PCBs | Aroclor 1260 | mg/kg | 3 | 0.18 | 16 | 5.15E-02 | 4.23E-02 | 2.6 | 11 | 0 | I | 4 | 8.29E-02 | 7.52E-02 | 1.5 | 15 | 11 | I |
| EU-07 | 16.12 | SVOC | 2-Methylnaphthalene | mg/kg | 3 | 0.008 | 9 | 1.68E+00 | 3.01E+00 | 3.0 | 11 | 2 | I | 9 | 1.68E+00 | 3.01E+00 | 3.0 | 11 | 2 | I |
| EU-07 | 16.12 | SVOC | Acenaphthene | mg/kg | 1 | 0.004 | 9 | 1.68E+00 | 3.01E+00 | 3.0 | 11 | 2 | I | 9 | 1.68E+00 | 3.01E+00 | 3.0 | 11 | 2 | I |
| EU-07 | 16.12 | SVOC | Anthracene | mg/kg | 4 | 8.2 | 9 | 2.03E+00 | 3.57E+00 | 3.0 | 11 | 2 | I | 9 | 2.03E+00 | 3.57E+00 | 3.0 | 11 | 2 | I |
| EU-07 | 16.12 | SVOC | Benzo(a)anthracene | mg/kg | 7 | 16 | 8 | 2.67E+00 | 5.68E+00 | 1.5 | 15 | 7 | Y | 8 | 2.67E+00 | 5.68E+00 | 1.5 | 15 | 7 | Y |
| EU-07 | 16.12 | SVOC | Benzo(a)pyrene | mg/kg | 9 | 31 | 9 | 5.91E+00 | 1.17E+01 | 1.5 | 15 | 6 | Y | 9 | 5.91E+00 | 1.17E+01 | 1.5 | 15 | 6 | Y |
| EU-07 | 16.12 | SVOC | Benzo(b)fluoranthene | mg/kg | 9 | 26 | 9 | 5.02E+00 | 9.84E+00 | 1.5 | 15 | 6 | Y | 9 | 5.02E+00 | 9.84E+00 | 1.5 | 15 | 6 | Y |
| EU-07 | 16.12 | SVOC | Benzo(k)fluoranthene | mg/kg | 9 | 15 | 9 | 3.29E+00 | 6.36E+00 | 1.5 | 15 | 6 | Y | 9 | 3.29E+00 | 6.36E+00 | 1.5 | 15 | 6 | Y |
| EU-07 | 16.12 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 8 | 1.16E+00 | 1.74E+00 | 3.0 | 11 | 3 | I | 7 | 6.01E-01 | 7.58E-01 | 1.5 | 15 | 8 | I |
| EU-07 | 16.12 | SVOC | Chrysene | mg/kg | 9 | 22 | 9 | 3.64E+00 | 7.63E+00 | 0.2 | 410 | 401 | I | 9 | 3.64E+00 | 7.63E+00 | 1.5 | 15 | 6 | Y |
| EU-07 | 16.12 | SVOC | Dibenzo(a,h)anthracene | mg/kg | 4 | 0.021 | 6 | 1.10E-02 | 8.12E-03 | 1.5 | 15 | 9 | I | 4 | 1.38E-02 | 8.85E-03 | 1.5 | 15 | 11 | I |
| EU-07 | 16.12 | SVOC | Diethyl phthalate | mg/kg | | | 8 | 1.89E+00 | 3.14E+00 | 3.0 | 11 | 3 | I | 8 | 1.89E+00 | 3.14E+00 | 3.0 | 11 | 3 | I |
| EU-07 | 16.12 | SVOC | Di-n-butyl phthalate | mg/kg | 1 | 0.098 | 8 | 1.91E+00 | 3.13E+00 | 3.0 | 11 | 3 | I | 8 | 1.91E+00 | 3.13E+00 | 3.0 | 11 | 3 | I |
| EU-07 | 16.12 | SVOC | Fluoranthene | mg/kg | 9 | 32 | 9 | 5.78E+00 | 1.16E+01 | 3.0 | 11 | 2 | I | 9 | 5.78E+00 | 1.16E+01 | 3.0 | 11 | 2 | I |
| EU-07 | 16.12 | SVOC | Fluorene | mg/kg | 1 | 0.004 | 9 | 1.68E+00 | 3.01E+00 | 3.0 | 11 | 2 | I | 9 | 1.68E+00 | 3.01E+00 | 3.0 | 11 | 2 | I |
| EU-07 | 16.12 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 9 | 77 | 9 | 1.16E+01 | 2.58E+01 | 1.5 | 15 | 6 | Y | 9 | 1.16E+01 | 2.58E+01 | 1.5 | 15 | 6 | Y |
| EU-07 | 16.12 | SVOC | Naphthalene | mg/kg | 3 | 0.006 | 6 | 4.33E-03 | 1.86E-03 | 1.5 | 15 | 9 | I | 6 | 4.33E-03 | 1.86E-03 | 1.5 | 15 | 9 | I |
| EU-07 | 16.12 | SVOC | Pyrene | mg/kg | 9 | 27 | 9 | 6.15E+00 | 1.18E+01 | 3.0 | 11 | 2 | I | 9 | 6.15E+00 | 1.18E+01 | 3.0 | 11 | 2 | I |
| EU-07 | 16.12 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 1 | 1.00E-02 | | 1.5 | 15 | 14 | I | 1 | 1.00E-02 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | 1,1-Dichloroethane | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | 1,1-Dichloroethene | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | Acetone | mg/kg | | | 1 | 2.00E-02 | | 1.5 | 15 | 14 | I | 1 | 2.00E-02 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | Benzene | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | Ethylbenzene | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Methylene chloride | mg/kg | | | 1 | 1.00E-02 | | 1.5 | 15 | 14 | I | 1 | 1.00E-02 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | Tetrachloroethene | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | Toluene | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | Trichloroethene | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | Vinyl chloride | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | | | 1.5 | 15 | 14 | I |
| EU-07 | 16.12 | VOC | Xylenes, Total | mg/kg | | | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I | 1 | 5.00E-03 | | 1.5 | 15 | 14 | I |
| EU-08 | 19.85 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-08 | 19.85 | Inorganic | Aluminum | mg/kg | 4 | 28000 | 4 | 2.08E+04 | 7.54E+03 | 1.5 | 14 | 10 | I | 4 | 2.08E+04 | 7.54E+03 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Antimony | mg/kg | | | 4 | 6.22E+00 | 6.68E+00 | 1.5 | 14 | 10 | I | 2 | 4.47E-01 | 4.99E-01 | 1.5 | 14 | 12 | I |
| EU-08 | 19.85 | Inorganic | Arsenic | mg/kg | 2 | 5.8 | 4 | 4.93E+00 | 2.02E+00 | 1.5 | 14 | 10 | I | 4 | 4.93E+00 | 2.02E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Barium | mg/kg | 4 | 150 | 4 | 1.14E+02 | 3.01E+01 | 1.5 | 14 | 10 | I | 4 | 1.14E+02 | 3.01E+01 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Beryllium | mg/kg | 4 | 1 | 4 | 8.13E-01 | 2.59E-01 | 1.5 | 14 | 10 | I | 4 | 8.13E-01 | 2.59E-01 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Boron | mg/kg | | | 4 | 1.12E+01 | 7.82E+00 | 1.5 | 14 | 10 | I | 4 | 1.12E+01 | 7.82E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Cadmium | mg/kg | 1 | 0.07 | 4 | 6.43E-01 | 4.49E-01 | 1.5 | 14 | 10 | I | 4 | 6.43E-01 | 4.49E-01 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Chromium | mg/kg | 4 | 32 | 4 | 2.43E+01 | 8.73E+00 | 1.5 | 14 | 10 | I | 4 | 2.43E+01 | 8.73E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Cobalt | mg/kg | 4 | 11 | 4 | 8.98E+00 | 2.83E+00 | 1.5 | 14 | 10 | I | 4 | 8.98E+00 | 2.83E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Copper | mg/kg | 4 | 18 | 4 | 1.37E+01 | 4.81E+00 | 1.5 | 14 | 10 | I | 4 | 1.37E+01 | 4.81E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Lead | mg/kg | 4 | 11 | 4 | 8.08E+00 | 3.42E+00 | 1.5 | 14 | 10 | I | 4 | 8.08E+00 | 3.42E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-08 | 19.85 | Inorganic | Mercury | mg/kg | 1 | 0.01 | 4 | 1.28E-01 | 9.14E-02 | 1.5 | 14 | 10 | I | 4 | 1.28E-01 | 9.14E-02 | 1.5 | 14 | 10 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-08 | 19.85 | Inorganic | Molybdenum | mg/kg | 1 | 0.33 | 4 | 6.21E+00 | 6.69E+00 | 1.5 | 14 | 10 | I | 4 | 6.21E+00 | 6.69E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Nickel | mg/kg | 4 | 20 | 4 | 1.58E+01 | 4.86E+00 | 1.5 | 14 | 10 | I | 4 | 1.58E+01 | 4.86E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Selenium | mg/kg | | | 4 | 3.67E+00 | 2.85E+00 | 1.5 | 14 | 10 | I | 4 | 3.67E+00 | 2.85E+00 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Silver | mg/kg | | | 4 | 7.62E-01 | 4.77E-01 | 1.5 | 14 | 10 | I | 4 | 7.62E-01 | 4.77E-01 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Thallium | mg/kg | 1 | 0.28 | 2 | 1.39E+00 | 1.57E+00 | 1.5 | 14 | 12 | I | 2 | 1.39E+00 | 1.57E+00 | 1.5 | 14 | 12 | I |
| EU-08 | 19.85 | Inorganic | Vanadium | mg/kg | 4 | 62 | 4 | 4.70E+01 | 1.56E+01 | 1.5 | 14 | 10 | I | 4 | 4.70E+01 | 1.56E+01 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | Inorganic | Zinc | mg/kg | 4 | 79 | 4 | 5.98E+01 | 2.07E+01 | 1.5 | 14 | 10 | I | 4 | 5.98E+01 | 2.07E+01 | 1.5 | 14 | 10 | I |
| EU-08 | 19.85 | PCBs | Aroclor 1242 | mg/kg | | | 2 | 5.40E-02 | 4.24E-03 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-08 | 19.85 | PCBs | Aroclor 1248 | mg/kg | | | 2 | 5.40E-02 | 4.24E-03 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-08 | 19.85 | PCBs | Aroclor 1254 | mg/kg | | | 2 | 5.40E-02 | 4.24E-03 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-08 | 19.85 | PCBs | Aroclor 1260 | mg/kg | | | 2 | 5.40E-02 | 4.24E-03 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-08 | 19.85 | SVOC | 2-Methylnaphthalene | mg/kg | | | 1 | 3.30E-02 | | 1.5 | 15 | 14 | I | 1 | 3.30E-02 | | 1.5 | 15 | 14 | I |
| EU-08 | 19.85 | SVOC | Acenaphthene | mg/kg | | | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Anthracene | mg/kg | | | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Benzo(a)anthracene | mg/kg | | | 3 | 4.60E-02 | 1.73E-02 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-08 | 19.85 | SVOC | Benzo(a)pyrene | mg/kg | | | 2 | 3.60E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I | 1 | 3.30E-02 | | 1.5 | 15 | 14 | I |
| EU-08 | 19.85 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 3 | 5.70E-02 | 3.64E-02 | 1.5 | 15 | 12 | I | 3 | 5.70E-02 | 3.64E-02 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 3 | 1.90E-01 | 1.21E-01 | 1.5 | 15 | 12 | I | 3 | 1.90E-01 | 1.21E-01 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Chrysene | mg/kg | | | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 3 | 5.70E-02 | 3.64E-02 | 1.5 | 15 | 12 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Diethyl phthalate | mg/kg | | | 3 | 1.90E-01 | 1.21E-01 | 1.5 | 15 | 12 | I | 3 | 1.90E-01 | 1.21E-01 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Di-n-butyl phthalate | mg/kg | | | 3 | 1.90E-01 | 1.21E-01 | 1.5 | 15 | 12 | I | 3 | 1.90E-01 | 1.21E-01 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Fluoranthene | mg/kg | | | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Fluorene | mg/kg | | | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 3 | 6.73E-02 | 5.43E-02 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-08 | 19.85 | SVOC | Naphthalene | mg/kg | | | 4 | 2.68E-02 | 1.66E-02 | 1.5 | 15 | 11 | I | 4 | 2.68E-02 | 1.66E-02 | 1.5 | 15 | 11 | I |
| EU-08 | 19.85 | SVOC | Pyrene | mg/kg | | | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I | 3 | 3.50E-02 | 1.73E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | 1,1-Dichloroethane | mg/kg | | | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | 1,1-Dichloroethene | mg/kg | | | 3 | 5.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 5.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Acetone | mg/kg | | | 3 | 5.67E-02 | 5.77E-03 | 1.5 | 15 | 12 | I | 3 | 5.67E-02 | 5.77E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Benzene | mg/kg | | | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 3 | 4.67E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Ethylbenzene | mg/kg | | | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | m,p-Xylenes | mg/kg | | | 3 | 4.67E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Methyl ethyl ketone | mg/kg | | | 3 | 4.33E-02 | 2.89E-02 | 1.5 | 15 | 12 | I | 3 | 4.33E-02 | 2.89E-02 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Methylene chloride | mg/kg | | | 3 | 2.27E-02 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 2.27E-02 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Tetrachloroethene | mg/kg | | | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Toluene | mg/kg | | | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 3 | 4.67E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Trichloroethene | mg/kg | | | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I | 3 | 4.33E-03 | 2.89E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Vinyl chloride | mg/kg | | | 3 | 8.67E-03 | 5.77E-03 | 1.5 | 15 | 12 | I | 1 | 2.00E-03 | | 1.5 | 15 | 14 | I |
| EU-08 | 19.85 | VOC | Xylenes, Total | mg/kg | | | 1 | 1.00E-03 | | 1.5 | 15 | 14 | I | 1 | 1.00E-03 | | 1.5 | 15 | 14 | I |
| EU-09 | 17.18 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | Inorganic | Aluminum | mg/kg | 3 | 21000 | 3 | 1.49E+04 | 7.00E+03 | 1.5 | 14 | 11 | I | 3 | 1.49E+04 | 7.00E+03 | 1.5 | 14 | 11 | I |
| EU-09 | 17.18 | Inorganic | Antimony | mg/kg | 1 | 0.38 | 4 | 2.50E+00 | 1.41E+00 | 1.5 | 14 | 10 | I | 4 | 2.50E+00 | 1.41E+00 | 1.5 | 14 | 10 | I |
| EU-09 | 17.18 | Inorganic | Arsenic | mg/kg | 3 | 5 | 6 | 4.65E+00 | 9.33E-01 | 1.5 | 14 | 8 | I | 6 | 4.65E+00 | 9.33E-01 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Barium | mg/kg | 5 | 125 | 6 | 8.54E+01 | 4.51E+01 | 1.5 | 14 | 8 | I | 6 | 8.54E+01 | 4.51E+01 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Beryllium | mg/kg | 3 | 0.91 | 6 | 3.85E-01 | 4.06E-01 | 1.5 | 14 | 8 | I | 6 | 3.85E-01 | 4.06E-01 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Boron | mg/kg | 1 | 9.2 | 3 | 5.73E+00 | 3.02E+00 | 1.5 | 14 | 11 | I | 3 | 5.73E+00 | 3.02E+00 | 1.5 | 14 | 11 | I |
| EU-09 | 17.18 | Inorganic | Cadmium | mg/kg | 3 | 1.8 | 6 | 8.05E-01 | 7.50E-01 | 1.5 | 14 | 8 | I | 6 | 8.05E-01 | 7.50E-01 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Chromium | mg/kg | 6 | 27.5 | 6 | 1.92E+01 | 5.29E+00 | 1.5 | 14 | 8 | I | 6 | 1.92E+01 | 5.29E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Cobalt | mg/kg | 6 | 10.1 | 6 | 8.07E+00 | 1.67E+00 | 1.5 | 14 | 8 | I | 6 | 8.07E+00 | 1.67E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Copper | mg/kg | 6 | 16 | 6 | 1.19E+01 | 3.43E+00 | 1.5 | 14 | 8 | I | 6 | 1.19E+01 | 3.43E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Lead | mg/kg | 4 | 17 | 6 | 8.37E+00 | 4.80E+00 | 1.5 | 14 | 8 | I | 6 | 8.37E+00 | 4.80E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Manganese | mg/kg | 3 | 331 | 3 | 2.69E+02 | 5.97E+01 | 1.5 | 14 | 11 | I | 3 | 2.69E+02 | 5.97E+01 | 1.5 | 14 | 11 | I |
| EU-09 | 17.18 | Inorganic | Mercury | mg/kg | 5 | 0.12 | 6 | 5.02E-02 | 3.72E-02 | 1.5 | 14 | 8 | I | 6 | 5.02E-02 | 3.72E-02 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Molybdenum | mg/kg | | | 6 | 4.56E+00 | 6.04E+00 | 1.5 | 14 | 8 | I | 6 | 4.56E+00 | 6.04E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Nickel | mg/kg | 6 | 17 | 6 | 1.24E+01 | 3.56E+00 | 1.5 | 14 | 8 | I | 6 | 1.24E+01 | 3.56E+00 | 1.5 | 14 | 8 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-09 | 17.18 | Inorganic | Selenium | mg/kg | | | 6 | 4.75E+00 | 3.06E+00 | 1.5 | 14 | 8 | I | 6 | 4.75E+00 | 3.06E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Silver | mg/kg | | | 6 | 1.92E+00 | 2.00E+00 | 1.5 | 14 | 8 | I | 6 | 1.92E+00 | 2.00E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Thallium | mg/kg | 1 | 1.9 | 6 | 2.42E+00 | 1.83E+00 | 1.5 | 14 | 8 | I | 6 | 2.42E+00 | 1.83E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Vanadium | mg/kg | 6 | 48.6 | 6 | 3.73E+01 | 7.80E+00 | 1.5 | 14 | 8 | I | 6 | 3.73E+01 | 7.80E+00 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | Inorganic | Zinc | mg/kg | 6 | 210 | 6 | 8.22E+01 | 6.39E+01 | 1.5 | 14 | 8 | I | 6 | 8.22E+01 | 6.39E+01 | 1.5 | 14 | 8 | I |
| EU-09 | 17.18 | PCBs | Aroclor 1242 | mg/kg | | | 13 | 5.61E-02 | 2.43E-03 | 3.0 | 11 | 0 | I | 13 | | | 3.0 | 11 | 0 | I |
| EU-09 | 17.18 | PCBs | Aroclor 1248 | mg/kg | | | 13 | 5.61E-02 | 2.43E-03 | 3.0 | 11 | 0 | I | 13 | | | 3.0 | 11 | 0 | I |
| EU-09 | 17.18 | PCBs | Aroclor 1254 | mg/kg | | | 13 | 5.61E-02 | 2.43E-03 | 3.0 | 11 | 0 | I | 13 | | | 3.0 | 11 | 0 | I |
| EU-09 | 17.18 | PCBs | Aroclor 1260 | mg/kg | 6 | 0.15 | 13 | 7.37E-02 | 2.89E-02 | 3.0 | 11 | 0 | I | 6 | 9.52E-02 | 3.10E-02 | 1.5 | 15 | 9 | I |
| EU-09 | 17.18 | SVOC | 2-Methylnaphthalene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Acenaphthene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Anthracene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Benzo(a)anthracene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Benzo(a)pyrene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | SVOC | Chrysene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Diethyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | SVOC | Di-n-butyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | SVOC | Fluoranthene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Fluorene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Naphthalene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Pyrene | mg/kg | | | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I | 3 | 5.33E-03 | 2.31E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 3 | 1.00E-02 | 1.34E-10 | 1.5 | 15 | 12 | I | 3 | 1.00E-02 | 1.34E-10 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | 1,1-Dichloroethane | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | 1,1-Dichloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | Acetone | mg/kg | | | 3 | 2.00E-02 | 2.69E-10 | 1.5 | 15 | 12 | I | 3 | 2.00E-02 | 2.69E-10 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | Benzene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | Ethylbenzene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | VOC | Methylene chloride | mg/kg | | | 3 | 1.00E-02 | 1.34E-10 | 1.5 | 15 | 12 | I | 3 | 1.00E-02 | 1.34E-10 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | Tetrachloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | Toluene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | Trichloroethene | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | VOC | Vinyl chloride | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | VOC | Xylenes, Total | mg/kg | | | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I | 3 | 5.00E-03 | 6.72E-11 | 1.5 | 15 | 12 | I |
| EU-10 | 17.39 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 2 | 1.71E-06 | 13 | 3.12E-07 | 4.27E-07 | 3.0 | 11 | 0 | I | 11 | 3.06E-07 | 4.66E-07 | 1.5 | 15 | 4 | Y |
| EU-10 | 17.39 | Inorganic | Aluminum | mg/kg | 45 | 25000 | 45 | 1.22E+04 | 3.57E+03 | 3.0 | 8 | 0 | I | 45 | 1.22E+04 | 3.57E+03 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Antimony | mg/kg | 10 | 7.5 | 51 | 2.98E+00 | 4.36E+00 | 3.0 | 8 | 0 | I | 40 | 8.44E-01 | 1.55E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Arsenic | mg/kg | 42 | 7.3 | 53 | 4.17E+00 | 1.38E+00 | 3.0 | 8 | 0 | I | 53 | 4.17E+00 | 1.38E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Barium | mg/kg | 53 | 150 | 53 | 8.29E+01 | 2.24E+01 | 3.0 | 8 | 0 | I | 53 | 8.29E+01 | 2.24E+01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Beryllium | mg/kg | 42 | 1.1 | 53 | 5.29E-01 | 1.70E-01 | 3.0 | 8 | 0 | I | 53 | 5.29E-01 | 1.70E-01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Boron | mg/kg | 11 | 13.4 | 43 | 7.75E+00 | 8.79E+00 | 3.0 | 8 | 0 | I | 43 | 7.75E+00 | 8.79E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Cadmium | mg/kg | 32 | 2 | 56 | 4.76E-01 | 4.06E-01 | 3.0 | 8 | 0 | I | 56 | 4.76E-01 | 4.06E-01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Chromium | mg/kg | 55 | 30 | 56 | 1.55E+01 | 4.10E+00 | 3.0 | 8 | 0 | I | 56 | 1.55E+01 | 4.10E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Cobalt | mg/kg | 53 | 11 | 53 | 5.72E+00 | 1.48E+00 | 3.0 | 8 | 0 | I | 53 | 5.72E+00 | 1.48E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Copper | mg/kg | 56 | 93 | 56 | 1.20E+01 | 1.43E+01 | 3.0 | 8 | 0 | I | 56 | 1.20E+01 | 1.43E+01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Lead | mg/kg | 54 | 2550 | 56 | 5.47E+01 | 3.40E+02 | 0.2 | 542 | 486 | I | 56 | 5.47E+01 | 3.40E+02 | 0.2 | 542 | 486 | I |
| EU-10 | 17.39 | Inorganic | Manganese | mg/kg | 4 | 391 | 4 | 3.08E+02 | 6.41E+01 | 1.5 | 14 | 10 | I | 4 | 3.08E+02 | 6.41E+01 | 1.5 | 14 | 10 | I |
| EU-10 | 17.39 | Inorganic | Mercury | mg/kg | 33 | 0.12 | 56 | 7.76E-02 | 7.49E-02 | 3.0 | 8 | 0 | I | 56 | 7.76E-02 | 7.49E-02 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Molybdenum | mg/kg | 34 | 1.1 | 53 | 2.80E+00 | 4.33E+00 | 3.0 | 8 | 0 | I | 53 | 2.80E+00 | 4.33E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Nickel | mg/kg | 55 | 27 | 56 | 1.06E+01 | 3.78E+00 | 3.0 | 8 | 0 | I | 56 | 1.06E+01 | 3.78E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Selenium | mg/kg | 18 | 5 | 53 | 2.08E+00 | 1.98E+00 | 3.0 | 8 | 0 | I | 53 | 2.08E+00 | 1.98E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Silver | mg/kg | 16 | 0.47 | 53 | 7.54E-01 | 8.69E-01 | 3.0 | 8 | 0 | I | 53 | 7.54E-01 | 8.69E-01 | 3.0 | 8 | 0 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-10 | 17.39 | Inorganic | Thallium | mg/kg | 14 | 0.6 | 52 | 1.60E+00 | 1.81E+00 | 1.4 | 15 | 0 | I | 52 | 1.60E+00 | 1.81E+00 | 1.4 | 15 | 0 | I |
| EU-10 | 17.39 | Inorganic | Vanadium | mg/kg | 53 | 54 | 53 | 3.01E+01 | 6.90E+00 | 3.0 | 8 | 0 | I | 53 | 3.01E+01 | 6.90E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Zinc | mg/kg | 53 | 130 | 53 | 5.69E+01 | 1.99E+01 | 3.0 | 8 | 0 | I | 53 | 5.69E+01 | 1.99E+01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | PCBs | Aroclor 1242 | mg/kg | | | 40 | 5.85E-02 | 2.78E-02 | 3.0 | 11 | 0 | I | 2 | 3.45E-03 | 2.83E-05 | 1.5 | 15 | 13 | I |
| EU-10 | 17.39 | PCBs | Aroclor 1248 | mg/kg | 3 | 0.246 | 39 | 6.89E-02 | 4.39E-02 | 2.5 | 11 | 0 | I | 4 | 1.40E-01 | 1.07E-01 | 1.5 | 15 | 11 | I |
| EU-10 | 17.39 | PCBs | Aroclor 1254 | mg/kg | 4 | 1 | 41 | 8.67E-02 | 1.49E-01 | 0.7 | 40 | 0 | I | 5 | 2.58E-01 | 4.18E-01 | 1.5 | 15 | 10 | I |
| EU-10 | 17.39 | PCBs | Aroclor 1260 | mg/kg | 1 | 0.0327 | 40 | 5.92E-02 | 2.67E-02 | 3.0 | 11 | 0 | I | 2 | 1.81E-02 | 2.07E-02 | 1.5 | 15 | 13 | I |
| EU-10 | 17.39 | SVOC | 2-Methylnaphthalene | mg/kg | 2 | 0.058 | 45 | 5.92E-02 | 4.38E-02 | 3.0 | 11 | 0 | I | 45 | 5.92E-02 | 4.38E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Acenaphthene | mg/kg | 1 | 0.049 | 53 | 6.83E-02 | 7.43E-02 | 3.0 | 11 | 0 | I | 53 | 6.83E-02 | 7.43E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Anthracene | mg/kg | 2 | 0.1 | 53 | 6.77E-02 | 7.44E-02 | 3.0 | 11 | 0 | I | 53 | 6.77E-02 | 7.44E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Benzo(a)anthracene | mg/kg | 3 | 0.96 | 52 | 8.43E-02 | 1.43E-01 | 1.3 | 17 | 0 | I | 32 | 6.29E-02 | 1.76E-01 | 1.5 | 15 | 0 | Y |
| EU-10 | 17.39 | SVOC | Benzo(a)pyrene | mg/kg | 3 | 0.96 | 32 | 6.35E-02 | 1.79E-01 | 1.5 | 15 | 0 | Y | 3 | 4.69E-01 | 4.73E-01 | 1.5 | 15 | 12 | I |
| EU-10 | 17.39 | SVOC | Benzo(b)fluoranthene | mg/kg | 4 | 0.94 | 52 | 8.45E-02 | 1.43E-01 | 1.3 | 17 | 0 | I | 32 | 6.32E-02 | 1.76E-01 | 1.5 | 15 | 0 | Y |
| EU-10 | 17.39 | SVOC | Benzo(k)fluoranthene | mg/kg | 2 | 0.8 | 52 | 8.04E-02 | 1.22E-01 | 1.5 | 15 | 0 | I | 51 | 7.57E-02 | 1.19E-01 | 0.8 | 32 | 0 | I |
| EU-10 | 17.39 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 8 | 0.475 | 28 | 2.06E-01 | 3.32E-01 | 3.0 | 11 | 0 | I | 28 | 2.06E-01 | 3.32E-01 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Chrysene | mg/kg | 7 | 0.94 | 53 | 8.85E-02 | 1.44E-01 | 3.0 | 11 | 0 | I | 53 | 8.85E-02 | 1.44E-01 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Dibenzo(a,h)anthracene | mg/kg | 2 | 0.14 | 49 | 5.42E-02 | 4.24E-02 | 1.3 | 17 | 0 | I | 2 | 9.35E-02 | 6.58E-02 | 1.5 | 15 | 13 | I |
| EU-10 | 17.39 | SVOC | Diethyl phthalate | mg/kg | 3 | 0.017 | 28 | 2.49E-01 | 3.97E-01 | 3.0 | 11 | 0 | I | 28 | 2.49E-01 | 3.97E-01 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Di-n-butyl phthalate | mg/kg | 8 | 0.27 | 28 | 2.69E-01 | 3.89E-01 | 3.0 | 11 | 0 | I | 28 | 2.69E-01 | 3.89E-01 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Fluoranthene | mg/kg | 7 | 2 | 53 | 1.15E-01 | 2.84E-01 | 3.0 | 11 | 0 | I | 53 | 1.15E-01 | 2.84E-01 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Fluorene | mg/kg | 1 | 0.013 | 53 | 6.77E-02 | 7.46E-02 | 3.0 | 11 | 0 | I | 53 | 6.77E-02 | 7.46E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 2 | 0.7 | 52 | 7.66E-02 | 1.07E-01 | 1.8 | 12 | 0 | I | 32 | 5.03E-02 | 1.25E-01 | 1.5 | 15 | 0 | Y |
| EU-10 | 17.39 | SVOC | Naphthalene | mg/kg | 9 | 0.13 | 70 | 4.81E-02 | 6.95E-02 | 3.0 | 11 | 0 | I | 70 | 4.81E-02 | 6.95E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Pyrene | mg/kg | 9 | 1.7 | 53 | 1.08E-01 | 2.45E-01 | 3.0 | 11 | 0 | I | 53 | 1.08E-01 | 2.45E-01 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | 1,1-Dichloroethane | mg/kg | | | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | 1,1-Dichloroethene | mg/kg | | | 29 | 7.95E-03 | 7.64E-03 | 3.0 | 11 | 0 | I | 26 | 5.40E-03 | 6.08E-04 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Acetone | mg/kg | 2 | 5 | 29 | 2.56E-01 | 9.30E-01 | 3.0 | 11 | 0 | I | 29 | 2.56E-01 | 9.30E-01 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Benzene | mg/kg | | | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 26 | 3.39E-03 | 1.89E-03 | 3.0 | 11 | 0 | I | 26 | 3.39E-03 | 1.89E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Ethylbenzene | mg/kg | | | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | m,p-Xylenes | mg/kg | | | 26 | 3.62E-03 | 2.39E-03 | 3.0 | 11 | 0 | I | 26 | 3.62E-03 | 2.39E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Methyl ethyl ketone | mg/kg | | | 26 | 2.45E-02 | 2.18E-02 | 3.0 | 11 | 0 | I | 26 | 2.45E-02 | 2.18E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Methylene chloride | mg/kg | 1 | 0.023 | 29 | 2.19E-02 | 3.93E-03 | 3.0 | 11 | 0 | I | 29 | 2.19E-02 | 3.93E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Tetrachloroethene | mg/kg | | | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I | 26 | 3.39E-03 | 1.89E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Toluene | mg/kg | | | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Trichloroethene | mg/kg | | | 29 | 6.14E-03 | 8.44E-03 | 3.0 | 11 | 0 | I | 29 | 6.14E-03 | 8.44E-03 | 1.9 | 12 | 0 | I |
| EU-10 | 17.39 | VOC | Vinyl chloride | mg/kg | | | 26 | 7.13E-03 | 3.12E-03 | 3.0 | 11 | 0 | I | 29 | | | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Xylenes, Total | mg/kg | | | 1 | 1.60E-02 | | 1.5 | 15 | 14 | I | 1 | 1.60E-02 | | 1.5 | 15 | 14 | I |
| EU-11 | 17.73 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 38 | 5.52E-06 | 110 | 5.77E-07 | 9.63E-07 | 2.3 | 12 | 0 | I | 60 | 5.76E-07 | 1.21E-06 | 1.5 | 15 | 0 | Y |
| EU-11 | 17.73 | Inorganic | Aluminum | mg/kg | 27 | 26900 | 27 | 1.69E+04 | 4.86E+03 | 3.0 | 8 | 0 | I | 27 | 1.69E+04 | 4.86E+03 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Antimony | mg/kg | 18 | 2.7 | 24 | 1.11E+00 | 2.79E+00 | 3.0 | 8 | 0 | I | 22 | 2.99E-01 | 5.52E-01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Arsenic | mg/kg | 34 | 6.2 | 36 | 3.28E+00 | 1.35E+00 | 3.0 | 8 | 0 | I | 36 | 3.28E+00 | 1.35E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Barium | mg/kg | 29 | 163 | 29 | 9.83E+01 | 2.57E+01 | 3.0 | 8 | 0 | I | 29 | 9.83E+01 | 2.57E+01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Beryllium | mg/kg | 29 | 0.95 | 29 | 6.10E-01 | 1.59E-01 | 3.0 | 8 | 0 | I | 29 | 6.10E-01 | 1.59E-01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Boron | mg/kg | 13 | 6 | 25 | 3.70E+00 | 1.96E+00 | 3.0 | 8 | 0 | I | 25 | 3.70E+00 | 1.96E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Cadmium | mg/kg | 27 | 0.59 | 29 | 2.70E-01 | 1.35E-01 | 3.0 | 8 | 0 | I | 29 | 2.70E-01 | 1.35E-01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Chromium | mg/kg | 36 | 39.7 | 36 | 2.13E+01 | 6.10E+00 | 3.0 | 8 | 0 | I | 36 | 2.13E+01 | 6.10E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Cobalt | mg/kg | 29 | 11.5 | 29 | 7.15E+00 | 2.21E+00 | 3.0 | 8 | 0 | I | 29 | 7.15E+00 | 2.21E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Copper | mg/kg | 36 | 24.9 | 36 | 1.24E+01 | 4.12E+00 | 3.0 | 8 | 0 | I | 36 | 1.24E+01 | 4.12E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Lead | mg/kg | 36 | 420 | 36 | 2.11E+01 | 6.86E+01 | 1.1 | 22 | 0 | I | 36 | 2.11E+01 | 6.86E+01 | 1.1 | 22 | 0 | I |
| EU-11 | 17.73 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-11 | 17.73 | Inorganic | Mercury | mg/kg | 56 | 6.1 | 87 | 1.58E-01 | 6.88E-01 | 3.0 | 8 | 0 | I | 87 | 1.58E-01 | 6.88E-01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Molybdenum | mg/kg | 25 | 2.5 | 29 | 5.97E-01 | 5.64E-01 | 3.0 | 8 | 0 | I | 29 | 5.97E-01 | 5.64E-01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Nickel | mg/kg | 36 | 23.4 | 36 | 1.39E+01 | 4.04E+00 | 3.0 | 8 | 0 | I | 36 | 1.39E+01 | 4.04E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Selenium | mg/kg | 16 | 0.54 | 29 | 4.85E-01 | 4.37E-01 | 3.0 | 8 | 0 | I | 29 | 4.85E-01 | 4.37E-01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Silver | mg/kg | 16 | 0.15 | 29 | 1.63E-01 | 2.58E-01 | 3.0 | 8 | 0 | I | 29 | 1.63E-01 | 2.58E-01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Thallium | mg/kg | 25 | 0.39 | 27 | 3.05E-01 | 6.97E-02 | 3.0 | 8 | 0 | I | 27 | 3.05E-01 | 6.97E-02 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Vanadium | mg/kg | 29 | 78 | 29 | 3.82E+01 | 1.24E+01 | 3.0 | 8 | 0 | I | 29 | 3.82E+01 | 1.24E+01 | 3.0 | 8 | 0 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-11 | 17.73 | Inorganic | Zinc | mg/kg | 36 | 87.3 | 36 | 5.58E+01 | 1.21E+01 | 3.0 | 8 | 0 | I | 36 | 5.58E+01 | 1.21E+01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | PCBs | Aroclor 1242 | mg/kg | 1 | 0.0234 | 78 | 4.86E-02 | 2.14E-02 | 3.0 | 11 | 0 | I | 5 | 7.64E-03 | 8.81E-03 | 1.5 | 15 | 10 | I |
| EU-11 | 17.73 | PCBs | Aroclor 1248 | mg/kg | | | 78 | 4.83E-02 | 2.18E-02 | 3.0 | 11 | 0 | I | 5 | 3.67E-03 | 2.19E-04 | 1.5 | 15 | 10 | I |
| EU-11 | 17.73 | PCBs | Aroclor 1254 | mg/kg | 17 | 0.36 | 78 | 5.37E-02 | 4.11E-02 | 2.7 | 11 | 0 | I | 20 | 5.82E-02 | 7.62E-02 | 1.5 | 15 | 0 | Y |
| EU-11 | 17.73 | PCBs | Aroclor 1260 | mg/kg | 7 | 0.33 | 78 | 5.43E-02 | 4.13E-02 | 2.7 | 11 | 0 | I | 10 | 5.04E-02 | 9.95E-02 | 1.5 | 15 | 5 | Y |
| EU-11 | 17.73 | SVOC | 2-Methylnaphthalene | mg/kg | 1 | 0.00042 | 26 | 1.95E-01 | 3.43E-01 | 3.0 | 11 | 0 | I | 26 | 1.95E-01 | 3.43E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Acenaphthene | mg/kg | | | 26 | 7.61E-02 | 1.00E-01 | 3.0 | 11 | 0 | I | 26 | 7.61E-02 | 1.00E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Anthracene | mg/kg | 2 | 0.0042 | 26 | 7.54E-02 | 1.00E-01 | 3.0 | 11 | 0 | I | 26 | 7.54E-02 | 1.00E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Benzo(a)anthracene | mg/kg | 2 | 0.012 | 26 | 7.64E-02 | 9.98E-02 | 1.9 | 12 | 0 | I | 11 | 1.77E-02 | 4.90E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Benzo(a)pyrene | mg/kg | 2 | 0.013 | 15 | 2.15E-02 | 1.04E-02 | 1.8 | 12 | 0 | I | 2 | 9.65E-03 | 4.74E-03 | 1.5 | 15 | 13 | I |
| EU-11 | 17.73 | SVOC | Benzo(b)fluoranthene | mg/kg | 1 | 0.02 | 26 | 8.43E-02 | 1.05E-01 | 1.8 | 12 | 0 | I | 11 | 1.84E-02 | 4.72E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 25 | 8.69E-02 | 1.06E-01 | 1.8 | 12 | 0 | I | 20 | 3.81E-02 | 2.44E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 8 | 0.54 | 24 | 2.34E-01 | 3.56E-01 | 3.0 | 11 | 0 | I | 24 | 2.34E-01 | 3.56E-01 | 2.8 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Chrysene | mg/kg | 3 | 0.014 | 26 | 7.58E-02 | 1.00E-01 | 3.0 | 11 | 0 | I | 26 | 7.58E-02 | 1.00E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Dibenzo(a,h)anthracene | mg/kg | 1 | 0.0035 | 21 | 3.65E-02 | 2.50E-02 | 2.2 | 12 | 0 | I | 1 | 3.50E-03 | | 1.5 | 15 | 14 | I |
| EU-11 | 17.73 | SVOC | Diethyl phthalate | mg/kg | 2 | 0.012 | 24 | 2.64E-01 | 3.48E-01 | 3.0 | 11 | 0 | I | 24 | 2.64E-01 | 3.48E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Di-n-butyl phthalate | mg/kg | 12 | 0.22 | 24 | 2.22E-01 | 3.48E-01 | 3.0 | 11 | 0 | I | 24 | 2.22E-01 | 3.48E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Fluoranthene | mg/kg | 2 | 0.027 | 26 | 7.73E-02 | 9.92E-02 | 3.0 | 11 | 0 | I | 26 | 7.73E-02 | 9.92E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Fluorene | mg/kg | | | 26 | 7.61E-02 | 1.00E-01 | 3.0 | 11 | 0 | I | 26 | 7.61E-02 | 1.00E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 1 | 0.0076 | 26 | 8.39E-02 | 1.05E-01 | 1.8 | 12 | 0 | I | 11 | 1.72E-02 | 5.67E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Naphthalene | mg/kg | | | 37 | 3.71E-02 | 7.84E-02 | 3.0 | 11 | 0 | I | 37 | 3.71E-02 | 7.84E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Pyrene | mg/kg | 2 | 0.03 | 26 | 8.12E-02 | 1.01E-01 | 3.0 | 11 | 0 | I | 26 | 8.12E-02 | 1.01E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | 1,1,1-Trichloroethane | mg/kg | 1 | 2 | 19 | 1.09E-01 | 4.58E-01 | 3.0 | 11 | 0 | I | 19 | 1.09E-01 | 4.58E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | 1,1-Dichloroethane | mg/kg | | | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | 1,1-Dichloroethene | mg/kg | | | 18 | 4.47E-03 | 1.93E-03 | 3.0 | 11 | 0 | I | 18 | 4.47E-03 | 1.93E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Acetone | mg/kg | 2 | 0.00999 | 11 | 1.09E-02 | 5.31E-03 | 3.0 | 11 | 0 | I | 11 | 1.09E-02 | 5.31E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Benzene | mg/kg | 1 | 0.001 | 18 | 3.29E-03 | 2.03E-03 | 3.0 | 11 | 0 | I | 18 | 3.29E-03 | 2.03E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 18 | 3.28E-03 | 1.97E-03 | 3.0 | 11 | 0 | I | 18 | 3.28E-03 | 1.97E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Ethylbenzene | mg/kg | | | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | m,p-Xylenes | mg/kg | | | 18 | 5.57E-03 | 4.35E-03 | 3.0 | 11 | 0 | I | 18 | 5.57E-03 | 4.35E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Methyl ethyl ketone | mg/kg | | | 11 | 1.05E-02 | 5.63E-03 | 3.0 | 11 | 0 | I | 11 | 1.05E-02 | 5.63E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Methylene chloride | mg/kg | 5 | 0.003 | 18 | 8.75E-03 | 8.33E-03 | 3.0 | 11 | 0 | I | 18 | 8.75E-03 | 8.33E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Tetrachloroethene | mg/kg | | | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Toluene | mg/kg | 1 | 0.001 | 18 | 3.29E-03 | 2.03E-03 | 3.0 | 11 | 0 | I | 18 | 3.29E-03 | 2.03E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 18 | 3.28E-03 | 1.97E-03 | 3.0 | 11 | 0 | I | 18 | 3.28E-03 | 1.97E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Trichloroethene | mg/kg | | | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | Vinyl chloride | mg/kg | | | 18 | 3.57E-03 | 2.04E-03 | 3.0 | 11 | 0 | I | 9 | 1.66E-03 | 6.04E-04 | 2.5 | 11 | 2 | I |
| EU-11 | 17.73 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | Inorganic | Aluminum | mg/kg | 2 | 25200 | 2 | 1.98E+04 | 7.71E+03 | 1.5 | 14 | 12 | I | 2 | 1.98E+04 | 7.71E+03 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Antimony | mg/kg | 2 | 1.2 | 2 | 8.35E-01 | 5.16E-01 | 1.5 | 14 | 12 | I | 2 | 8.35E-01 | 5.16E-01 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Arsenic | mg/kg | 2 | 4.9 | 2 | 4.15E+00 | 1.06E+00 | 1.5 | 14 | 12 | I | 2 | 4.15E+00 | 1.06E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Barium | mg/kg | 2 | 86.3 | 2 | 8.41E+01 | 3.18E+00 | 1.5 | 14 | 12 | I | 2 | 8.41E+01 | 3.18E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Beryllium | mg/kg | 2 | 0.66 | 2 | 6.15E-01 | 6.36E-02 | 1.5 | 14 | 12 | I | 2 | 6.15E-01 | 6.36E-02 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Boron | mg/kg | | | 2 | 4.30E+00 | 7.07E-01 | 1.5 | 14 | 12 | I | 2 | 4.30E+00 | 7.07E-01 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Cadmium | mg/kg | | | 2 | 3.30E-01 | 5.66E-02 | 1.5 | 14 | 12 | I | 2 | 3.30E-01 | 5.66E-02 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Chromium | mg/kg | 2 | 23.9 | 2 | 2.06E+01 | 4.74E+00 | 1.5 | 14 | 12 | I | 2 | 2.06E+01 | 4.74E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Cobalt | mg/kg | 2 | 10.4 | 2 | 9.80E+00 | 8.49E-01 | 1.5 | 14 | 12 | I | 2 | 9.80E+00 | 8.49E-01 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Copper | mg/kg | 2 | 21.6 | 2 | 1.86E+01 | 4.31E+00 | 1.5 | 14 | 12 | I | 2 | 1.86E+01 | 4.31E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Lead | mg/kg | 2 | 14.7 | 2 | 1.16E+01 | 4.38E+00 | 1.5 | 14 | 12 | I | 2 | 1.16E+01 | 4.38E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Manganese | mg/kg | 2 | 331 | 2 | 3.30E+02 | 2.12E+00 | 1.5 | 14 | 12 | I | 2 | 3.30E+02 | 2.12E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Mercury | mg/kg | 2 | 0.02 | 2 | 1.50E-02 | 7.07E-03 | 1.5 | 14 | 12 | I | 2 | 1.50E-02 | 7.07E-03 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Molybdenum | mg/kg | 1 | 5.9 | 2 | 7.95E+00 | 2.90E+00 | 1.5 | 14 | 12 | I | 2 | 7.95E+00 | 2.90E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Nickel | mg/kg | 2 | 16 | 2 | 1.44E+01 | 2.33E+00 | 1.5 | 14 | 12 | I | 2 | 1.44E+01 | 2.33E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Selenium | mg/kg | | | 2 | 3.50E+00 | 5.66E-01 | 1.5 | 14 | 12 | I | 2 | 3.50E+00 | 5.66E-01 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Silver | mg/kg | 2 | 5.5 | 2 | 5.00E+00 | 7.07E-01 | 1.5 | 14 | 12 | I | 2 | 5.00E+00 | 7.07E-01 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Thallium | mg/kg | 2 | 0.87 | 2 | 7.15E-01 | 2.19E-01 | 1.5 | 14 | 12 | I | 2 | 7.15E-01 | 2.19E-01 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Vanadium | mg/kg | 2 | 47.8 | 2 | 4.19E+01 | 8.34E+00 | 1.5 | 14 | 12 | I | 2 | 4.19E+01 | 8.34E+00 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | Inorganic | Zinc | mg/kg | 2 | 75.6 | 2 | 6.64E+01 | 1.30E+01 | 1.5 | 14 | 12 | I | 2 | 6.64E+01 | 1.30E+01 | 1.5 | 14 | 12 | I |
| EU-12 | 19.30 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-12 | 19.30 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | SVOC | 2-Methylnaphthalene | mg/kg | | | 2 | 3.50E-03 | 7.07E-04 | 1.5 | 15 | 13 | I | 2 | 3.50E-03 | 7.07E-04 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Acenaphthene | mg/kg | 1 | 0.012 | 2 | 7.50E-03 | 6.36E-03 | 1.5 | 15 | 13 | I | 2 | 7.50E-03 | 6.36E-03 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Anthracene | mg/kg | 1 | 0.025 | 2 | 1.40E-02 | 1.56E-02 | 1.5 | 15 | 13 | I | 2 | 1.40E-02 | 1.56E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Benzo(a)anthracene | mg/kg | 1 | 0.07 | 2 | 3.65E-02 | 4.74E-02 | 1.5 | 15 | 13 | I | 2 | 3.65E-02 | 4.74E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Benzo(a)pyrene | mg/kg | 1 | 0.053 | 2 | 2.80E-02 | 3.54E-02 | 1.5 | 15 | 13 | I | 2 | 2.80E-02 | 3.54E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Benzo(b)fluoranthene | mg/kg | 1 | 0.037 | 2 | 2.00E-02 | 2.40E-02 | 1.5 | 15 | 13 | I | 2 | 2.00E-02 | 2.40E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Benzo(k)fluoranthene | mg/kg | 1 | 0.054 | 2 | 2.85E-02 | 3.61E-02 | 1.5 | 15 | 13 | I | 2 | 2.85E-02 | 3.61E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | SVOC | Chrysene | mg/kg | 1 | 0.072 | 2 | 3.75E-02 | 4.88E-02 | 1.5 | 15 | 13 | I | 2 | 3.75E-02 | 4.88E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Dibenzo(a,h)anthracene | mg/kg | 1 | 0.011 | 2 | 7.00E-03 | 5.66E-03 | 1.5 | 15 | 13 | I | 2 | 7.00E-03 | 5.66E-03 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Diethyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | SVOC | Di-n-butyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | SVOC | Fluoranthene | mg/kg | 1 | 0.13 | 2 | 6.65E-02 | 8.98E-02 | 1.5 | 15 | 13 | I | 2 | 6.65E-02 | 8.98E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Fluorene | mg/kg | 1 | 0.011 | 2 | 7.00E-03 | 5.66E-03 | 1.5 | 15 | 13 | I | 2 | 7.00E-03 | 5.66E-03 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 1 | 0.021 | 2 | 1.20E-02 | 1.27E-02 | 1.5 | 15 | 13 | I | 2 | 1.20E-02 | 1.27E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Naphthalene | mg/kg | | | 2 | 3.50E-03 | 7.07E-04 | 1.5 | 15 | 13 | I | 2 | 3.50E-03 | 7.07E-04 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | SVOC | Pyrene | mg/kg | 1 | 0.13 | 2 | 6.65E-02 | 8.98E-02 | 1.5 | 15 | 13 | I | 2 | 6.65E-02 | 8.98E-02 | 1.5 | 15 | 13 | I |
| EU-12 | 19.30 | VOC | 1,1,1-Trichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | 1,1-Dichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | 1,1-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Acetone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Benzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Ethylbenzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Methylene chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Tetrachloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Toluene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | trans-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Trichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Vinyl chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-13 | 17.12 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 4 | 2.31E-06 | 9 | 9.82E-07 | 7.06E-07 | 3.0 | 11 | 2 | I | 4 | 1.46E-06 | 8.36E-07 | 1.5 | 15 | 11 | I |
| EU-13 | 17.12 | Inorganic | Aluminum | mg/kg | 24 | 31100 | 24 | 1.93E+04 | 5.79E+03 | 3.0 | 8 | 0 | I | 24 | 1.93E+04 | 5.79E+03 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Antimony | mg/kg | 11 | 870 | 12 | 7.60E+01 | 2.50E+02 | 1.5 | 14 | 2 | Y | 11 | 8.20E+01 | 2.61E+02 | 1.5 | 14 | 3 | Y |
| EU-13 | 17.12 | Inorganic | Arsenic | mg/kg | 18 | 350 | 19 | 2.40E+01 | 7.92E+01 | 1.5 | 14 | 0 | Y | 19 | 2.40E+01 | 7.92E+01 | 1.5 | 14 | 0 | Y |
| EU-13 | 17.12 | Inorganic | Barium | mg/kg | 14 | 130 | 14 | 9.14E+01 | 2.11E+01 | 3.0 | 8 | 0 | I | 14 | 9.14E+01 | 2.11E+01 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Beryllium | mg/kg | 14 | 1 | 14 | 7.14E-01 | 1.53E-01 | 3.0 | 8 | 0 | I | 14 | 7.14E-01 | 1.53E-01 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Boron | mg/kg | 6 | 8.1 | 14 | 6.90E+00 | 1.23E+00 | 3.0 | 8 | 0 | I | 14 | 6.90E+00 | 1.23E+00 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Cadmium | mg/kg | 9 | 0.31 | 14 | 2.29E-01 | 2.47E-01 | 3.0 | 8 | 0 | I | 14 | 2.29E-01 | 2.47E-01 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Chromium | mg/kg | 18 | 32.9 | 18 | 2.36E+01 | 5.15E+00 | 3.0 | 8 | 0 | I | 18 | 2.36E+01 | 5.15E+00 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Cobalt | mg/kg | 14 | 11 | 14 | 8.36E+00 | 1.51E+00 | 3.0 | 8 | 0 | I | 14 | 8.36E+00 | 1.51E+00 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Copper | mg/kg | 18 | 16.2 | 18 | 1.25E+01 | 2.25E+00 | 3.0 | 8 | 0 | I | 18 | 1.25E+01 | 2.25E+00 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Lead | mg/kg | 20 | 27000 | 21 | 1.41E+03 | 5.89E+03 | 1.5 | 14 | 0 | Y | 21 | 1.41E+03 | 5.89E+03 | 1.5 | 14 | 0 | Y |
| EU-13 | 17.12 | Inorganic | Manganese | mg/kg | 4 | 394 | 4 | 3.17E+02 | 7.00E+01 | 1.5 | 14 | 10 | I | 4 | 3.17E+02 | 7.00E+01 | 1.5 | 14 | 10 | I |
| EU-13 | 17.12 | Inorganic | Mercury | mg/kg | 19 | 0.27 | 28 | 5.34E-02 | 6.74E-02 | 3.0 | 8 | 0 | I | 28 | 5.34E-02 | 6.74E-02 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Molybdenum | mg/kg | 7 | 0.97 | 14 | 1.28E+00 | 2.53E+00 | 3.0 | 8 | 0 | I | 14 | 1.28E+00 | 2.53E+00 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Nickel | mg/kg | 18 | 19 | 18 | 1.48E+01 | 2.56E+00 | 3.0 | 8 | 0 | I | 18 | 1.48E+01 | 2.56E+00 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Selenium | mg/kg | 11 | 1.2 | 14 | 8.06E-01 | 1.24E+00 | 3.0 | 8 | 0 | I | 14 | 8.06E-01 | 1.24E+00 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Silver | mg/kg | 5 | 0.53 | 14 | 2.97E-01 | 2.79E-01 | 3.0 | 8 | 0 | I | 14 | 2.97E-01 | 2.79E-01 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Thallium | mg/kg | 9 | 0.31 | 10 | 7.46E-01 | 1.49E+00 | 1.7 | 12 | 2 | I | 10 | 7.46E-01 | 1.49E+00 | 1.7 | 12 | 2 | I |
| EU-13 | 17.12 | Inorganic | Vanadium | mg/kg | 14 | 64.8 | 14 | 4.42E+01 | 1.01E+01 | 3.0 | 8 | 0 | I | 14 | 4.42E+01 | 1.01E+01 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Zinc | mg/kg | 18 | 75.6 | 18 | 5.39E+01 | 1.01E+01 | 3.0 | 8 | 0 | I | 18 | 5.39E+01 | 1.01E+01 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | PCBs | Aroclor 1242 | mg/kg | | | 17 | 6.18E-02 | 2.85E-02 | 3.0 | 11 | 0 | I | 17 | | | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | PCBs | Aroclor 1248 | mg/kg | | | 17 | 6.18E-02 | 2.85E-02 | 3.0 | 11 | 0 | I | 17 | | | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | PCBs | Aroclor 1254 | mg/kg | 6 | 0.29 | 17 | 7.51E-02 | 8.05E-02 | 1.4 | 16 | 0 | I | 6 | 1.08E-01 | 1.33E-01 | 1.5 | 15 | 9 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-13 | 17.12 | PCBs | Aroclor 1260 | mg/kg | 3 | 0.021 | 16 | 6.14E-02 | 4.60E-02 | 2.4 | 12 | 0 | I | 3 | 1.48E-02 | 8.33E-03 | 1.5 | 15 | 12 | I |
| EU-13 | 17.12 | SVOC | 2-Methylnaphthalene | mg/kg | 1 | 0.14 | 16 | 1.44E-01 | 1.48E-01 | 3.0 | 11 | 0 | I | 16 | 1.44E-01 | 1.48E-01 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Acenaphthene | mg/kg | | | 19 | 7.94E-02 | 6.67E-02 | 3.0 | 11 | 0 | I | 19 | 7.94E-02 | 6.67E-02 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Anthracene | mg/kg | | | 19 | 7.94E-02 | 6.67E-02 | 3.0 | 11 | 0 | I | 19 | 7.94E-02 | 6.67E-02 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Benzo(a)anthracene | mg/kg | 4 | 0.044 | 19 | 8.04E-02 | 6.60E-02 | 2.9 | 11 | 0 | I | 9 | 2.36E-02 | 1.08E-02 | 1.6 | 14 | 5 | I |
| EU-13 | 17.12 | SVOC | Benzo(a)pyrene | mg/kg | 4 | 0.032 | 9 | 2.06E-02 | 8.82E-03 | 2.1 | 12 | 3 | I | 4 | 1.62E-02 | 1.27E-02 | 1.5 | 15 | 11 | I |
| EU-13 | 17.12 | SVOC | Benzo(b)fluoranthene | mg/kg | 4 | 0.045 | 19 | 8.05E-02 | 6.59E-02 | 2.9 | 11 | 0 | I | 9 | 2.38E-02 | 1.09E-02 | 1.6 | 14 | 5 | I |
| EU-13 | 17.12 | SVOC | Benzo(k)fluoranthene | mg/kg | 3 | 0.019 | 19 | 7.76E-02 | 6.84E-02 | 2.8 | 11 | 0 | I | 19 | 7.76E-02 | 6.84E-02 | 1.4 | 16 | 0 | I |
| EU-13 | 17.12 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 12 | 0.72 | 18 | 1.40E-01 | 1.59E-01 | 3.0 | 11 | 0 | I | 18 | 1.40E-01 | 1.59E-01 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Chrysene | mg/kg | 4 | 0.056 | 19 | 8.14E-02 | 6.53E-02 | 3.0 | 11 | 0 | I | 19 | 8.14E-02 | 6.53E-02 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 13 | 3.76E-02 | 2.58E-02 | 2.1 | 12 | 0 | I | 1 | 2.00E-03 | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | SVOC | Diethyl phthalate | mg/kg | 3 | 0.0094 | 18 | 1.47E-01 | 1.41E-01 | 3.0 | 11 | 0 | I | 18 | 1.47E-01 | 1.41E-01 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Di-n-butyl phthalate | mg/kg | 12 | 0.11 | 18 | 8.99E-02 | 6.30E-02 | 3.0 | 11 | 0 | I | 18 | 8.99E-02 | 6.30E-02 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Fluoranthene | mg/kg | 5 | 0.096 | 19 | 8.39E-02 | 6.51E-02 | 3.0 | 11 | 0 | I | 19 | 8.39E-02 | 6.51E-02 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Fluorene | mg/kg | | | 19 | 7.94E-02 | 6.67E-02 | 3.0 | 11 | 0 | I | 19 | 7.94E-02 | 6.67E-02 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 4 | 0.017 | 19 | 7.68E-02 | 6.92E-02 | 2.7 | 11 | 0 | I | 9 | 1.60E-02 | 8.62E-03 | 2.0 | 12 | 3 | I |
| EU-13 | 17.12 | SVOC | Naphthalene | mg/kg | 2 | 0.12 | 19 | 7.00E-02 | 7.41E-02 | 3.0 | 11 | 0 | I | 19 | 7.00E-02 | 7.41E-02 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | SVOC | Pyrene | mg/kg | 6 | 0.13 | 19 | 8.78E-02 | 6.57E-02 | 3.0 | 11 | 0 | I | 19 | 8.78E-02 | 6.57E-02 | 3.0 | 11 | 0 | I |
| EU-13 | 17.12 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I |
| EU-13 | 17.12 | VOC | 1,1-Dichloroethane | mg/kg | | | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I |
| EU-13 | 17.12 | VOC | 1,1-Dichloroethene | mg/kg | | | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I | 4 | 5.75E-03 | 5.00E-04 | 1.5 | 15 | 11 | I |
| EU-13 | 17.12 | VOC | Acetone | mg/kg | | | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-13 | 17.12 | VOC | Benzene | mg/kg | 1 | 0.001 | 10 | 3.18E-02 | 2.35E-02 | 3.0 | 11 | 1 | I | 10 | 3.18E-02 | 2.35E-02 | 1.9 | 12 | 2 | I |
| EU-13 | 17.12 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 4 | 5.75E-03 | 5.00E-04 | 1.5 | 15 | 11 | I | 4 | 5.75E-03 | 5.00E-04 | 1.5 | 15 | 11 | I |
| EU-13 | 17.12 | VOC | Ethylbenzene | mg/kg | | | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I |
| EU-13 | 17.12 | VOC | m,p-Xylenes | mg/kg | | | 4 | 1.13E-02 | 5.00E-04 | 1.5 | 15 | 11 | I | 4 | 1.13E-02 | 5.00E-04 | 1.5 | 15 | 11 | I |
| EU-13 | 17.12 | VOC | Methyl ethyl ketone | mg/kg | | | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-13 | 17.12 | VOC | Methylene chloride | mg/kg | 2 | 0.003 | 10 | 1.82E-01 | 1.53E-01 | 3.0 | 11 | 1 | I | 10 | 1.82E-01 | 1.53E-01 | 1.7 | 14 | 4 | I |
| EU-13 | 17.12 | VOC | Tetrachloroethene | mg/kg | | | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I | 4 | 5.75E-03 | 5.00E-04 | 1.5 | 15 | 11 | I |
| EU-13 | 17.12 | VOC | Toluene | mg/kg | 3 | 0.003 | 10 | 3.13E-02 | 2.42E-02 | 3.0 | 11 | 1 | I | 10 | 3.13E-02 | 2.42E-02 | 3.0 | 11 | 1 | I |
| EU-13 | 17.12 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I |
| EU-13 | 17.12 | VOC | Trichloroethene | mg/kg | | | 10 | 3.23E-02 | 2.29E-02 | 3.0 | 11 | 1 | I | 4 | 5.75E-03 | 5.00E-04 | 1.5 | 15 | 11 | I |
| EU-13 | 17.12 | VOC | Vinyl chloride | mg/kg | | | 4 | 5.75E-03 | 5.00E-04 | 1.5 | 15 | 11 | I | 10 | | | 3.0 | 11 | 1 | I |
| EU-13 | 17.12 | VOC | Xylenes, Total | mg/kg | | | 3 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-14 | 17.08 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | Inorganic | Aluminum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Antimony | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Arsenic | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Barium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Beryllium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Boron | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Cadmium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Chromium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Cobalt | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Copper | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Lead | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Mercury | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Molybdenum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Nickel | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Selenium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Silver | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Thallium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Vanadium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Zinc | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-14 | 17.08 | SVOC | Acenaphthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Benzo(a)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Benzo(b)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Benzo(k)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Chrysene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Diethyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Di-n-butyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Fluorene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Naphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | 1,1,1-Trichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | 1,1-Dichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | 1,1-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Acetone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Benzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Ethylbenzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Methylene chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Tetrachloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Toluene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | trans-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Trichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Vinyl chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | Inorganic | Aluminum | mg/kg | 1 | 15000 | 1 | 1.50E+04 | | 1.5 | 14 | 13 | I | 1 | 1.50E+04 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Antimony | mg/kg | | | 1 | 1.10E+01 | | 1.5 | 14 | 13 | I | 1 | | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Arsenic | mg/kg | | | 1 | 6.00E+00 | | 1.5 | 14 | 13 | I | 1 | 6.00E+00 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Barium | mg/kg | 1 | 85 | 1 | 8.50E+01 | | 1.5 | 14 | 13 | I | 1 | 8.50E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Beryllium | mg/kg | 1 | 0.8 | 1 | 8.00E-01 | | 1.5 | 14 | 13 | I | 1 | 8.00E-01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Boron | mg/kg | | | 1 | 1.10E+01 | | 1.5 | 14 | 13 | I | 1 | 1.10E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Cadmium | mg/kg | | | 1 | 1.00E+00 | | 1.5 | 14 | 13 | I | 1 | 1.00E+00 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Chromium | mg/kg | 1 | 29 | 1 | 2.90E+01 | | 1.5 | 14 | 13 | I | 1 | 2.90E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Cobalt | mg/kg | 1 | 8 | 1 | 8.00E+00 | | 1.5 | 14 | 13 | I | 1 | 8.00E+00 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Copper | mg/kg | 1 | 11 | 1 | 1.10E+01 | | 1.5 | 14 | 13 | I | 1 | 1.10E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Lead | mg/kg | 1 | 17 | 1 | 1.70E+01 | | 1.5 | 14 | 13 | I | 1 | 1.70E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Mercury | mg/kg | | | 1 | 2.00E-01 | | 1.5 | 14 | 13 | I | 1 | 2.00E-01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Molybdenum | mg/kg | | | 1 | 1.10E+01 | | 1.5 | 14 | 13 | I | 1 | 1.10E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Nickel | mg/kg | 1 | 12 | 1 | 1.20E+01 | | 1.5 | 14 | 13 | I | 1 | 1.20E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Selenium | mg/kg | | | 1 | 6.00E+00 | | 1.5 | 14 | 13 | I | 1 | 6.00E+00 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Silver | mg/kg | | | 1 | 1.00E+00 | | 1.5 | 14 | 13 | I | 1 | 1.00E+00 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Thallium | mg/kg | | | | | | 1.5 | 14 | 14 | I | 1 | | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Vanadium | mg/kg | 1 | 51 | 1 | 5.10E+01 | | 1.5 | 14 | 13 | I | 1 | 5.10E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | Inorganic | Zinc | mg/kg | 1 | 64 | 1 | 6.40E+01 | | 1.5 | 14 | 13 | I | 1 | 6.40E+01 | | 1.5 | 14 | 13 | I |
| EU-15 | 18.68 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Acenaphthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-15 | 18.68 | SVOC | Benzo(a)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Benzo(b)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Benzo(k)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Chrysene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Diethyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Di-n-butyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Fluorene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Naphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | 1,1-Dichloroethane | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | 1,1-Dichloroethene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Acetone | mg/kg | | | 1 | 5.70E-02 | | 1.5 | 15 | 14 | I | 1 | 5.70E-02 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Benzene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Ethylbenzene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | m,p-Xylenes | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Methyl ethyl ketone | mg/kg | | | 1 | 5.70E-02 | | 1.5 | 15 | 14 | I | 1 | 5.70E-02 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Methylene chloride | mg/kg | | | 1 | 2.30E-02 | | 1.5 | 15 | 14 | I | 1 | 2.30E-02 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Tetrachloroethene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Toluene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Trichloroethene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Vinyl chloride | mg/kg | | | 1 | 1.10E-02 | | 1.5 | 15 | 14 | I | 1 | | | 1.5 | 15 | 14 | I |
| EU-15 | 18.68 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-16 | 19.65 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 2 | 5.01E-08 | 4 | 1.78E-07 | 1.78E-07 | 1.5 | 15 | 11 | I | 2 | 2.63E-08 | 3.37E-08 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | Inorganic | Aluminum | mg/kg | 9 | 19000 | 9 | 1.46E+04 | 3.01E+03 | 3.0 | 8 | 0 | I | 9 | 1.46E+04 | 3.01E+03 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Antimony | mg/kg | 1 | 6.7 | 9 | 1.11E+01 | 1.71E+00 | 3.0 | 8 | 0 | I | 1 | 6.70E+00 | | 1.5 | 14 | 13 | I |
| EU-16 | 19.65 | Inorganic | Arsenic | mg/kg | 1 | 3.2 | 9 | 5.47E+00 | 9.54E-01 | 3.0 | 8 | 0 | I | 9 | 5.47E+00 | 9.54E-01 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Barium | mg/kg | 9 | 95 | 9 | 7.71E+01 | 1.57E+01 | 3.0 | 8 | 0 | I | 9 | 7.71E+01 | 1.57E+01 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Beryllium | mg/kg | 9 | 0.8 | 9 | 6.86E-01 | 1.01E-01 | 3.0 | 8 | 0 | I | 9 | 6.86E-01 | 1.01E-01 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Boron | mg/kg | 1 | 13 | 9 | 1.12E+01 | 1.72E+00 | 3.0 | 8 | 0 | I | 9 | 1.12E+01 | 1.72E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Cadmium | mg/kg | | | 9 | 8.96E-01 | 3.13E-01 | 3.0 | 8 | 0 | I | 9 | 8.96E-01 | 3.13E-01 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Chromium | mg/kg | 9 | 36.8 | 9 | 2.46E+01 | 4.71E+00 | 3.0 | 8 | 0 | I | 9 | 2.46E+01 | 4.71E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Cobalt | mg/kg | 9 | 11 | 9 | 8.14E+00 | 1.77E+00 | 3.0 | 8 | 0 | I | 9 | 8.14E+00 | 1.77E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Copper | mg/kg | 9 | 16 | 9 | 1.16E+01 | 4.20E+00 | 3.0 | 8 | 0 | I | 9 | 1.16E+01 | 4.20E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Lead | mg/kg | 9 | 15.4 | 9 | 1.19E+01 | 2.54E+00 | 3.0 | 8 | 0 | I | 9 | 1.19E+01 | 2.54E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Manganese | mg/kg | 1 | 290 | 1 | 2.90E+02 | | 1.5 | 14 | 13 | I | 1 | 2.90E+02 | | 1.5 | 14 | 13 | I |
| EU-16 | 19.65 | Inorganic | Mercury | mg/kg | | | 9 | 1.61E-01 | 6.01E-02 | 3.0 | 8 | 0 | I | 9 | 1.61E-01 | 6.01E-02 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Molybdenum | mg/kg | | | 9 | 1.04E+01 | 3.64E+00 | 3.0 | 8 | 0 | I | 9 | 1.04E+01 | 3.64E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Nickel | mg/kg | 9 | 18 | 9 | 1.41E+01 | 3.47E+00 | 3.0 | 8 | 0 | I | 9 | 1.41E+01 | 3.47E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Selenium | mg/kg | | | 9 | 5.16E+00 | 1.81E+00 | 3.0 | 8 | 0 | I | 9 | 5.16E+00 | 1.81E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Silver | mg/kg | | | 9 | 9.74E-01 | 7.67E-02 | 3.0 | 8 | 0 | I | 9 | 9.74E-01 | 7.67E-02 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Thallium | mg/kg | 1 | 0.3 | 4 | 2.68E+00 | 2.68E+00 | 1.5 | 14 | 10 | I | 4 | 2.68E+00 | 2.68E+00 | 1.5 | 14 | 10 | I |
| EU-16 | 19.65 | Inorganic | Vanadium | mg/kg | 9 | 57.1 | 9 | 4.62E+01 | 5.12E+00 | 3.0 | 8 | 0 | I | 9 | 4.62E+01 | 5.12E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Zinc | mg/kg | 9 | 73 | 9 | 5.99E+01 | 1.02E+01 | 3.0 | 8 | 0 | I | 9 | 5.99E+01 | 1.02E+01 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | PCBs | Aroclor 1242 | mg/kg | | | 2 | 1.20E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | PCBs | Aroclor 1248 | mg/kg | | | 2 | 1.20E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | PCBs | Aroclor 1254 | mg/kg | | | 2 | 1.20E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | PCBs | Aroclor 1260 | mg/kg | | | 2 | 1.20E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | 2-Methylnaphthalene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Acenaphthene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Anthracene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Benzo(a)anthracene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | 2 | | | 1.5 | 15 | 13 | I |

## Table I-5. Chemical Risk Data Gap Analysis (0-2 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-16 | 19.65 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Chrysene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Diethyl phthalate | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Di-n-butyl phthalate | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Fluoranthene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Fluorene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Naphthalene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | SVOC | Pyrene | mg/kg | | | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.70E-01 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-16 | 19.65 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | 1,1-Dichloroethane | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | 1,1-Dichloroethene | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Acetone | mg/kg | | | 8 | 5.79E-02 | 3.04E-03 | 3.0 | 11 | 3 | I | 8 | 5.79E-02 | 3.04E-03 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Benzene | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Ethylbenzene | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | m,p-Xylenes | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Methyl ethyl ketone | mg/kg | | | 8 | 5.79E-02 | 3.04E-03 | 3.0 | 11 | 3 | I | 8 | 5.79E-02 | 3.04E-03 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Methylene chloride | mg/kg | | | 8 | 2.34E-02 | 1.41E-03 | 3.0 | 11 | 3 | I | 8 | 2.34E-02 | 1.41E-03 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Tetrachloroethene | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Toluene | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Trichloroethene | mg/kg | | | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | 5.75E-03 | 4.63E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Vinyl chloride | mg/kg | | | 8 | 1.16E-02 | 5.18E-04 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-01 | 18.82 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 15 | 5.17E-05 | 20 | 6.47E-06 | 1.33E-05 | 1.5 | 15 | 0 | Y | 16 | 7.91E-06 | 1.46E-05 | 1.5 | 15 | 0 | Y |
| EU-01 | 18.82 | Inorganic | Aluminum | mg/kg | 19 | 27000 | 19 | 1.29E+04 | 6.04E+03 | 3.0 | 8 | 0 | I | 19 | 1.29E+04 | 6.04E+03 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Antimony | mg/kg | 7 | 17.5 | 13 | 6.29E+00 | 6.18E+00 | 2.5 | 9 | 0 | I | 10 | 4.98E+00 | 6.52E+00 | 1.3 | 17 | 7 | I |
| EU-01 | 18.82 | Inorganic | Arsenic | mg/kg | 11 | 6.5 | 17 | 4.42E+00 | 1.49E+00 | 3.0 | 8 | 0 | I | 17 | 4.42E+00 | 1.49E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Barium | mg/kg | 17 | 190 | 17 | 9.20E+01 | 4.32E+01 | 3.0 | 8 | 0 | I | 17 | 9.20E+01 | 4.32E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Beryllium | mg/kg | 12 | 0.93 | 17 | 5.49E-01 | 1.99E-01 | 3.0 | 8 | 0 | I | 17 | 5.49E-01 | 1.99E-01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Boron | mg/kg | 6 | 8 | 15 | 6.80E+00 | 2.49E+00 | 3.0 | 8 | 0 | I | 15 | 6.80E+00 | 2.49E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Cadmium | mg/kg | 6 | 3 | 17 | 6.15E-01 | 7.10E-01 | 3.0 | 8 | 0 | I | 17 | 6.15E-01 | 7.10E-01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Chromium | mg/kg | 17 | 44 | 17 | 1.82E+01 | 9.29E+00 | 3.0 | 8 | 0 | I | 17 | 1.82E+01 | 9.29E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Cobalt | mg/kg | 16 | 9.5 | 17 | 5.88E+00 | 1.91E+00 | 3.0 | 8 | 0 | I | 17 | 5.88E+00 | 1.91E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Copper | mg/kg | 16 | 60.4 | 17 | 1.37E+01 | 1.39E+01 | 3.0 | 8 | 0 | I | 17 | 1.37E+01 | 1.39E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Lead | mg/kg | 17 | 143 | 18 | 1.67E+01 | 3.27E+01 | 2.3 | 9 | 0 | I | 18 | 1.67E+01 | 3.27E+01 | 2.3 | 9 | 0 | I |
| EU-01 | 18.82 | Inorganic | Manganese | mg/kg | 8 | 308 | 8 | 1.64E+02 | 9.04E+01 | 3.0 | 8 | 0 | I | 8 | 1.64E+02 | 9.04E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Mercury | mg/kg | 5 | 0.2 | 17 | 8.43E-02 | 8.91E-02 | 3.0 | 8 | 0 | I | 17 | 8.43E-02 | 8.91E-02 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Molybdenum | mg/kg | 2 | 0.83 | 17 | 6.37E+00 | 4.85E+00 | 3.0 | 8 | 0 | I | 17 | 6.37E+00 | 4.85E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Nickel | mg/kg | 13 | 27.9 | 17 | 1.10E+01 | 6.15E+00 | 3.0 | 8 | 0 | I | 17 | 1.10E+01 | 6.15E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Selenium | mg/kg | 2 | 0.47 | 11 | 3.11E+00 | 2.58E+00 | 3.0 | 8 | 0 | I | 11 | 3.11E+00 | 2.58E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Silver | mg/kg | 6 | 10.8 | 18 | 2.72E+00 | 2.96E+00 | 3.0 | 8 | 0 | I | 18 | 2.72E+00 | 2.96E+00 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Thallium | mg/kg | 10 | 2.8 | 17 | 1.80E+00 | 1.98E+00 | 1.3 | 17 | 0 | I | 17 | 1.80E+00 | 1.98E+00 | 1.3 | 17 | 0 | I |
| EU-01 | 18.82 | Inorganic | Vanadium | mg/kg | 17 | 51 | 17 | 3.06E+01 | 1.10E+01 | 3.0 | 8 | 0 | I | 17 | 3.06E+01 | 1.10E+01 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | Inorganic | Zinc | mg/kg | 17 | 729 | 17 | 1.01E+02 | 1.66E+02 | 3.0 | 8 | 0 | I | 17 | 1.01E+02 | 1.66E+02 | 3.0 | 8 | 0 | I |
| EU-01 | 18.82 | PCBs | Aroclor 1242 | mg/kg | | | 27 | 7.89E-02 | 5.93E-02 | 1.9 | 12 | 0 | I | 28 | | | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | PCBs | Aroclor 1248 | mg/kg | 6 | 1.9 | 27 | 2.09E-01 | 4.28E-01 | 0.3 | 185 | 158 | I | 6 | 6.82E-01 | 7.71E-01 | 1.5 | 15 | 9 | I |
| EU-01 | 18.82 | PCBs | Aroclor 1254 | mg/kg | 5 | 0.66 | 27 | 1.11E-01 | 1.44E-01 | 0.8 | 32 | 5 | I | 5 | 2.69E-01 | 2.83E-01 | 1.5 | 15 | 10 | I |
| EU-01 | 18.82 | PCBs | Aroclor 1260 | mg/kg | 5 | 49 | 28 | 1.83E+00 | 9.24E+00 | 1.5 | 15 | 0 | Y | 5 | 9.87E+00 | 2.19E+01 | 1.5 | 15 | 10 | I |
| EU-01 | 18.82 | SVOC | 2-Methylnaphthalene | mg/kg | 1 | 0.005 | 17 | 2.86E-01 | 7.42E-01 | 3.0 | 11 | 0 | I | 17 | 2.86E-01 | 7.42E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Acenaphthene | mg/kg | | | 22 | 4.03E-01 | 8.71E-01 | 3.0 | 11 | 0 | I | 22 | 4.03E-01 | 8.71E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Anthracene | mg/kg | 1 | 0.002 | 22 | 4.03E-01 | 8.71E-01 | 3.0 | 11 | 0 | I | 22 | 4.03E-01 | 8.71E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Benzo(a)anthracene | mg/kg | 4 | 3 | 19 | 2.44E-01 | 6.79E-01 | 0.3 | 185 | 166 | I | 13 | 2.42E-01 | 8.29E-01 | 1.5 | 15 | 2 | Y |
| EU-01 | 18.82 | SVOC | Benzo(a)pyrene | mg/kg | 3 | 1.7 | 13 | 1.42E-01 | 4.68E-01 | 1.5 | 15 | 2 | Y | 7 | 2.47E-01 | 6.41E-01 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | SVOC | Benzo(b)fluoranthene | mg/kg | 4 | 6.2 | 19 | 4.05E-01 | 1.41E+00 | 1.5 | 15 | 0 | Y | 14 | 4.56E-01 | 1.65E+00 | 1.5 | 15 | 1 | Y |
| EU-01 | 18.82 | SVOC | Benzo(k)fluoranthene | mg/kg | 2 | 0.017 | 18 | 1.01E-01 | 1.39E-01 | 1.4 | 16 | 0 | I | 13 | 2.03E-02 | 2.56E-02 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 2 | 0.018 | 11 | 1.01E+00 | 1.10E+00 | 3.0 | 11 | 0 | I | 9 | 5.69E-01 | 5.46E-01 | 1.8 | 12 | 3 | I |
| EU-01 | 18.82 | SVOC | Chrysene | mg/kg | 7 | 8.6 | 23 | 7.19E-01 | 1.91E+00 | 1.0 | 23 | 0 | I | 21 | 5.01E-01 | 1.86E+00 | 0.5 | 71 | 50 | I |
| EU-01 | 18.82 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 13 | 1.92E-02 | 2.60E-02 | 2.1 | 12 | 0 | I | 5 | 3.00E-03 | 3.68E-11 | 1.5 | 15 | 10 | I |
| EU-01 | 18.82 | SVOC | Diethyl phthalate | mg/kg | | | 11 | 1.00E+00 | 1.11E+00 | 3.0 | 11 | 0 | I | 11 | 1.00E+00 | 1.11E+00 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Di-n-butyl phthalate | mg/kg | | | 11 | 1.01E+00 | 1.10E+00 | 3.0 | 11 | 0 | I | 11 | 1.01E+00 | 1.10E+00 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Fluoranthene | mg/kg | 6 | 1.9 | 22 | 4.45E-01 | 9.20E-01 | 3.0 | 11 | 0 | I | 22 | 4.45E-01 | 9.20E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Fluorene | mg/kg | | | 22 | 4.03E-01 | 8.71E-01 | 3.0 | 11 | 0 | I | 22 | 4.03E-01 | 8.71E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 2 | 0.0095 | 17 | 8.53E-02 | 1.27E-01 | 1.5 | 15 | 0 | I | 12 | 1.17E-02 | 9.82E-03 | 1.8 | 12 | 0 | I |
| EU-01 | 18.82 | SVOC | Naphthalene | mg/kg | 1 | 0.008 | 20 | 1.43E-01 | 2.41E-01 | 3.0 | 11 | 0 | I | 20 | 1.43E-01 | 2.41E-01 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | SVOC | Pyrene | mg/kg | 7 | 5.5 | 23 | 5.83E-01 | 1.36E+00 | 3.0 | 11 | 0 | I | 23 | 5.83E-01 | 1.36E+00 | 3.0 | 11 | 0 | I |
| EU-01 | 18.82 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | VOC | 1,1-Dichloroethane | mg/kg | | | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | VOC | 1,1-Dichloroethene | mg/kg | | | 7 | 8.43E-03 | 8.20E-03 | 1.5 | 15 | 8 | I | 6 | 5.33E-03 | 5.16E-04 | 1.5 | 15 | 9 | I |
| EU-01 | 18.82 | VOC | Acetone | mg/kg | 3 | 0.66 | 7 | 1.28E-01 | 2.36E-01 | 1.5 | 15 | 8 | I | 7 | 1.28E-01 | 2.36E-01 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | VOC | Benzene | mg/kg | | | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 5 | 9.20E-03 | 1.01E-02 | 1.5 | 15 | 10 | I | 5 | 9.20E-03 | 1.01E-02 | 1.5 | 15 | 10 | I |
| EU-01 | 18.82 | VOC | Ethylbenzene | mg/kg | | | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | VOC | m,p-Xylenes | mg/kg | | | 5 | 9.20E-03 | 1.01E-02 | 1.5 | 15 | 10 | I | 5 | 9.20E-03 | 1.01E-02 | 1.5 | 15 | 10 | I |
| EU-01 | 18.82 | VOC | Methyl ethyl ketone | mg/kg | | | 6 | 7.40E-02 | 9.86E-02 | 1.5 | 15 | 9 | I | 6 | 7.40E-02 | 9.86E-02 | 1.5 | 15 | 9 | I |
| EU-01 | 18.82 | VOC | Methylene chloride | mg/kg | 3 | 0.062 | 7 | 3.34E-02 | 3.82E-02 | 1.5 | 15 | 8 | I | 7 | 3.34E-02 | 3.82E-02 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | VOC | Tetrachloroethene | mg/kg | | | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I | 6 | 4.67E-03 | 1.86E-03 | 1.5 | 15 | 9 | I |
| EU-01 | 18.82 | VOC | Toluene | mg/kg | | | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 6 | 8.50E-03 | 9.18E-03 | 1.5 | 15 | 9 | I | 6 | 8.50E-03 | 9.18E-03 | 1.5 | 15 | 9 | I |
| EU-01 | 18.82 | VOC | Trichloroethene | mg/kg | | | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I | 7 | 7.86E-03 | 8.61E-03 | 1.5 | 15 | 8 | I |
| EU-01 | 18.82 | VOC | Vinyl chloride | mg/kg | | | 6 | 9.17E-03 | 3.54E-03 | 1.5 | 15 | 9 | I | 1 | 2.00E-03 | | 1.5 | 15 | 14 | I |
| EU-01 | 18.82 | VOC | Xylenes, Total | mg/kg | 2 | 0.006 | 2 | 6.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 6.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-02 | 17.64 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 2 | 1.48E-05 | 4 | 3.94E-06 | 7.26E-06 | 1.5 | 15 | 11 | I | 3 | 5.12E-06 | 8.41E-06 | 1.5 | 15 | 12 | I |
| EU-02 | 17.64 | Inorganic | Aluminum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-02 | 17.64 | Inorganic | Antimony | mg/kg | | | 4 | 1.08E+01 | 5.00E-01 | 1.5 | 14 | 10 | I | | | | 1.5 | 14 | 14 | I |
| EU-02 | 17.64 | Inorganic | Arsenic | mg/kg | | | 4 | 5.50E+00 | 5.77E-01 | 1.5 | 14 | 10 | I | 4 | 5.50E+00 | 5.77E-01 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Barium | mg/kg | 4 | 96 | 4 | 8.78E+01 | 9.00E+00 | 1.5 | 14 | 10 | I | 4 | 8.78E+01 | 9.00E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Beryllium | mg/kg | 4 | 0.8 | 4 | 7.00E-01 | 8.16E-02 | 1.5 | 14 | 10 | I | 4 | 7.00E-01 | 8.16E-02 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Boron | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-02 | 17.64 | Inorganic | Cadmium | mg/kg | | | 4 | 1.00E+00 | 0.00E+00 | 1.5 | 14 | 10 | I | 4 | 1.00E+00 | 0.00E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Chromium | mg/kg | 4 | 20 | 4 | 1.85E+01 | 1.29E+00 | 1.5 | 14 | 10 | I | 4 | 1.85E+01 | 1.29E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Cobalt | mg/kg | 4 | 9 | 4 | 7.00E+00 | 1.83E+00 | 1.5 | 14 | 10 | I | 4 | 7.00E+00 | 1.83E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Copper | mg/kg | 4 | 16 | 4 | 9.75E+00 | 4.19E+00 | 1.5 | 14 | 10 | I | 4 | 9.75E+00 | 4.19E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Lead | mg/kg | 5 | 12 | 5 | 9.80E+00 | 1.30E+00 | 1.5 | 14 | 9 | I | 5 | 9.80E+00 | 1.30E+00 | 1.5 | 14 | 9 | I |
| EU-02 | 17.64 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-02 | 17.64 | Inorganic | Mercury | mg/kg | | | 4 | 2.00E-01 | 0.00E+00 | 1.5 | 14 | 10 | I | 4 | 2.00E-01 | 0.00E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Molybdenum | mg/kg | | | 4 | 1.08E+01 | 5.00E-01 | 1.5 | 14 | 10 | I | 4 | 1.08E+01 | 5.00E-01 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Nickel | mg/kg | 4 | 14 | 4 | 1.18E+01 | 1.71E+00 | 1.5 | 14 | 10 | I | 4 | 1.18E+01 | 1.71E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Selenium | mg/kg | | | 4 | 5.50E+00 | 5.77E-01 | 1.5 | 14 | 10 | I | 4 | 5.50E+00 | 5.77E-01 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Silver | mg/kg | | | 4 | 1.00E+00 | 0.00E+00 | 1.5 | 14 | 10 | I | 4 | 1.00E+00 | 0.00E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Thallium | mg/kg | | | 2 | 5.00E+00 | 0.00E+00 | 1.5 | 14 | 12 | I | 2 | 5.00E+00 | 0.00E+00 | 1.5 | 14 | 12 | I |
| EU-02 | 17.64 | Inorganic | Vanadium | mg/kg | 4 | 39 | 4 | 3.60E+01 | 2.45E+00 | 1.5 | 14 | 10 | I | 4 | 3.60E+01 | 2.45E+00 | 1.5 | 14 | 10 | I |
| EU-02 | 17.64 | Inorganic | Zinc | mg/kg | 5 | 100 | 5 | 5.76E+01 | 2.39E+01 | 1.5 | 14 | 9 | I | 5 | 5.76E+01 | 2.39E+01 | 1.5 | 14 | 9 | I |
| EU-02 | 17.64 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | SVOC | 2-Methylnaphthalene | mg/kg | | | 4 | 1.33E-01 | 7.40E-02 | 1.5 | 15 | 11 | I | 4 | 1.33E-01 | 7.40E-02 | 1.5 | 15 | 11 | I |
| EU-02 | 17.64 | SVOC | Acenaphthene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Anthracene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Benzo(a)anthracene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 1 | 2.20E-02 | | 1.5 | 15 | 14 | I |
| EU-02 | 17.64 | SVOC | Benzo(a)pyrene | mg/kg | | | 1 | 2.20E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 1 | 2.20E-02 | | 1.5 | 15 | 14 | I |
| EU-02 | 17.64 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 6 | 1.70E-01 | 2.72E-09 | 1.5 | 15 | 9 | I | 6 | 1.70E-01 | 2.72E-09 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | SVOC | Chrysene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 1 | 2.20E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | SVOC | Diethyl phthalate | mg/kg | | | 6 | 1.70E-01 | 2.72E-09 | 1.5 | 15 | 9 | I | 6 | 1.70E-01 | 2.72E-09 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | SVOC | Di-n-butyl phthalate | mg/kg | | | 6 | 1.70E-01 | 2.72E-09 | 1.5 | 15 | 9 | I | 6 | 1.70E-01 | 2.72E-09 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | SVOC | Fluoranthene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Fluorene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 1 | 2.20E-02 | | 1.5 | 15 | 14 | I |
| EU-02 | 17.64 | SVOC | Naphthalene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | SVOC | Pyrene | mg/kg | | | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I | 7 | 1.49E-01 | 5.59E-02 | 1.5 | 15 | 8 | I |
| EU-02 | 17.64 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | 1,1-Dichloroethane | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | 1,1-Dichloroethene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | | | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Acetone | mg/kg | | | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-02 | 17.64 | VOC | Benzene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | VOC | Ethylbenzene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-02 | 17.64 | VOC | Methyl ethyl ketone | mg/kg | | | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-02 | 17.64 | VOC | Methylene chloride | mg/kg | | | 6 | 3.00E-01 | 5.44E-09 | 1.5 | 15 | 9 | I | 6 | 3.00E-01 | 5.44E-09 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Tetrachloroethene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | | | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Toluene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Trichloroethene | mg/kg | | | 6 | 5.00E-02 | 9.62E-10 | 1.5 | 15 | 9 | I | 6 | | | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Vinyl chloride | mg/kg | | | 3 | | | 1.5 | 15 | 12 | I | 6 | | | 1.5 | 15 | 9 | I |
| EU-02 | 17.64 | VOC | Xylenes, Total | mg/kg | | | 3 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-03 | 18.12 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 1 | 1.12E-08 | 2 | 4.31E-08 | 4.51E-08 | 1.5 | 15 | 13 | I | 2 | 4.31E-08 | 4.51E-08 | 1.5 | 15 | 13 | I |
| EU-03 | 18.12 | Inorganic | Aluminum | mg/kg | 14 | 22000 | 15 | 1.18E+04 | 4.97E+03 | 3.0 | 8 | 0 | I | 15 | 1.18E+04 | 4.97E+03 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Antimony | mg/kg | 5 | 0.93 | 16 | 3.83E+00 | 4.36E+00 | 3.0 | 8 | 0 | I | 13 | 1.87E+00 | 1.15E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Arsenic | mg/kg | 20 | 4.5 | 23 | 3.27E+00 | 1.45E+00 | 3.0 | 8 | 0 | I | 23 | 3.27E+00 | 1.45E+00 | 3.0 | 8 | 0 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-03 | 18.12 | Inorganic | Barium | mg/kg | 22 | 130 | 23 | 6.83E+01 | 2.93E+01 | 3.0 | 8 | 0 | I | 23 | 6.83E+01 | 2.93E+01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Beryllium | mg/kg | 13 | 0.76 | 23 | 5.28E-01 | 1.49E-01 | 3.0 | 8 | 0 | I | 23 | 5.28E-01 | 1.49E-01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Boron | mg/kg | 5 | 9.1 | 15 | 5.87E+00 | 2.78E+00 | 3.0 | 8 | 0 | I | 15 | 5.87E+00 | 2.78E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Cadmium | mg/kg | 4 | 0.84 | 23 | 3.51E-01 | 3.44E-01 | 3.0 | 8 | 0 | I | 23 | 3.51E-01 | 3.44E-01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Chromium | mg/kg | 22 | 22 | 23 | 1.29E+01 | 5.03E+00 | 3.0 | 8 | 0 | I | 23 | 1.29E+01 | 5.03E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Cobalt | mg/kg | 22 | 7.7 | 23 | 5.20E+00 | 1.73E+00 | 3.0 | 8 | 0 | I | 23 | 5.20E+00 | 1.73E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Copper | mg/kg | 22 | 31.1 | 23 | 1.17E+01 | 6.90E+00 | 3.0 | 8 | 0 | I | 23 | 1.17E+01 | 6.90E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Lead | mg/kg | 23 | 25.4 | 23 | 8.24E+00 | 4.68E+00 | 3.0 | 8 | 0 | I | 23 | 8.24E+00 | 4.68E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Manganese | mg/kg | 11 | 526 | 11 | 2.08E+02 | 1.29E+02 | 3.0 | 8 | 0 | I | 11 | 2.08E+02 | 1.29E+02 | 2.7 | 9 | 0 | I |
| EU-03 | 18.12 | Inorganic | Mercury | mg/kg | 10 | 2.7 | 29 | 3.32E-01 | 5.49E-01 | 3.0 | 8 | 0 | I | 29 | 3.32E-01 | 5.49E-01 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Molybdenum | mg/kg | 4 | 1.2 | 23 | 4.31E+00 | 4.96E+00 | 3.0 | 8 | 0 | I | 23 | 4.31E+00 | 4.96E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Nickel | mg/kg | 17 | 14 | 23 | 7.07E+00 | 2.75E+00 | 3.0 | 8 | 0 | I | 23 | 7.07E+00 | 2.75E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Selenium | mg/kg | 6 | 1 | 19 | 1.91E+00 | 2.06E+00 | 3.0 | 8 | 0 | I | 19 | 1.91E+00 | 2.06E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Silver | mg/kg | 5 | 11.4 | 23 | 2.02E+00 | 2.79E+00 | 3.0 | 8 | 0 | I | 23 | 2.02E+00 | 2.79E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Thallium | mg/kg | 8 | 4 | 19 | 1.45E+00 | 1.23E+00 | 2.1 | 10 | 0 | I | 19 | 1.45E+00 | 1.23E+00 | 2.1 | 10 | 0 | I |
| EU-03 | 18.12 | Inorganic | Vanadium | mg/kg | 22 | 40 | 23 | 2.58E+01 | 9.22E+00 | 3.0 | 8 | 0 | I | 23 | 2.58E+01 | 9.22E+00 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | Inorganic | Zinc | mg/kg | 22 | 826 | 23 | 9.26E+01 | 1.63E+02 | 3.0 | 8 | 0 | I | 23 | 9.26E+01 | 1.63E+02 | 3.0 | 8 | 0 | I |
| EU-03 | 18.12 | PCBs | Aroclor 1242 | mg/kg | | | 1 | 5.60E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |
| EU-03 | 18.12 | PCBs | Aroclor 1248 | mg/kg | | | 1 | 5.60E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |
| EU-03 | 18.12 | PCBs | Aroclor 1254 | mg/kg | | | 1 | 5.60E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |
| EU-03 | 18.12 | PCBs | Aroclor 1260 | mg/kg | 1 | 0.14 | 1 | 1.40E-01 | | 1.5 | 15 | 14 | I | 1 | 1.40E-01 | | 1.5 | 15 | 14 | I |
| EU-03 | 18.12 | SVOC | 2-Methylnaphthalene | mg/kg | 5 | 0.04 | 10 | 4.75E-02 | 1.07E-01 | 3.0 | 11 | 1 | I | 10 | 4.75E-02 | 1.07E-01 | 3.0 | 11 | 1 | I |
| EU-03 | 18.12 | SVOC | Acenaphthene | mg/kg | 7 | 0.9 | 11 | 1.82E-01 | 2.86E-01 | 3.0 | 11 | 0 | I | 11 | 1.82E-01 | 2.86E-01 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | SVOC | Anthracene | mg/kg | 3 | 4 | 11 | 5.37E-01 | 1.27E+00 | 3.0 | 11 | 0 | I | 11 | 5.37E-01 | 1.27E+00 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | SVOC | Benzo(a)anthracene | mg/kg | 6 | 14 | 11 | 2.88E+00 | 4.48E+00 | 1.5 | 15 | 4 | Y | 10 | 3.16E+00 | 4.61E+00 | 1.5 | 15 | 5 | Y |
| EU-03 | 18.12 | SVOC | Benzo(a)pyrene | mg/kg | 6 | 15 | 10 | 3.07E+00 | 4.69E+00 | 1.5 | 15 | 5 | Y | 7 | 4.39E+00 | 5.12E+00 | 1.5 | 15 | 8 | I |
| EU-03 | 18.12 | SVOC | Benzo(b)fluoranthene | mg/kg | 6 | 16 | 11 | 3.52E+00 | 5.67E+00 | 1.5 | 15 | 4 | Y | 10 | 3.87E+00 | 5.85E+00 | 1.5 | 15 | 5 | Y |
| EU-03 | 18.12 | SVOC | Benzo(k)fluoranthene | mg/kg | 6 | 15 | 11 | 3.45E+00 | 5.44E+00 | 1.5 | 15 | 4 | Y | 11 | 3.45E+00 | 5.44E+00 | 1.5 | 15 | 4 | Y |
| EU-03 | 18.12 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 2 | 2.30E-01 | 1.41E-01 | 1.5 | 15 | 13 | I | 2 | 2.30E-01 | 1.41E-01 | 1.5 | 15 | 13 | I |
| EU-03 | 18.12 | SVOC | Chrysene | mg/kg | 3 | 13 | 11 | 1.67E+00 | 4.08E+00 | 0.5 | 71 | 60 | I | 11 | 1.67E+00 | 4.08E+00 | 0.2 | 410 | 399 | I |
| EU-03 | 18.12 | SVOC | Dibenzo(a,h)anthracene | mg/kg | 5 | 2.2 | 10 | 2.95E-01 | 6.78E-01 | 1.5 | 15 | 5 | Y | 6 | 4.83E-01 | 8.50E-01 | 1.5 | 15 | 9 | I |
| EU-03 | 18.12 | SVOC | Diethyl phthalate | mg/kg | | | 2 | 2.30E-01 | 1.41E-01 | 1.5 | 15 | 13 | I | 2 | 2.30E-01 | 1.41E-01 | 1.5 | 15 | 13 | I |
| EU-03 | 18.12 | SVOC | Di-n-butyl phthalate | mg/kg | | | 2 | 2.30E-01 | 1.41E-01 | 1.5 | 15 | 13 | I | 2 | 2.30E-01 | 1.41E-01 | 1.5 | 15 | 13 | I |
| EU-03 | 18.12 | SVOC | Fluoranthene | mg/kg | 6 | 25 | 11 | 4.98E+00 | 7.76E+00 | 3.0 | 11 | 0 | I | 11 | 4.98E+00 | 7.76E+00 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | SVOC | Fluorene | mg/kg | 5 | 0.92 | 11 | 1.81E-01 | 2.84E-01 | 3.0 | 11 | 0 | I | 11 | 1.81E-01 | 2.84E-01 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 5 | 6.4 | 10 | 1.07E+00 | 1.99E+00 | 1.5 | 15 | 5 | Y | 9 | 1.18E+00 | 2.07E+00 | 1.5 | 15 | 6 | Y |
| EU-03 | 18.12 | SVOC | Naphthalene | mg/kg | 5 | 0.14 | 16 | 4.58E-02 | 8.90E-02 | 3.0 | 11 | 0 | I | 16 | 4.58E-02 | 8.90E-02 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | SVOC | Pyrene | mg/kg | 6 | 21 | 11 | 4.29E+00 | 6.71E+00 | 3.0 | 11 | 0 | I | 11 | 4.29E+00 | 6.71E+00 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | 1,1,1-Trichloroethane | mg/kg | 2 | 0.41 | 15 | 6.98E-02 | 1.38E-01 | 3.0 | 11 | 0 | I | 15 | 6.98E-02 | 1.38E-01 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | 1,1-Dichloroethane | mg/kg | 2 | 0.13 | 15 | 3.05E-02 | 3.90E-02 | 3.0 | 11 | 0 | I | 15 | 3.05E-02 | 3.90E-02 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | 1,1-Dichloroethene | mg/kg | | | 15 | 2.31E-02 | 2.28E-02 | 3.0 | 11 | 0 | I | 9 | 5.11E-03 | 3.89E-04 | 3.0 | 11 | 2 | I |
| EU-03 | 18.12 | VOC | Acetone | mg/kg | 6 | 0.036 | 15 | 4.18E-01 | 4.92E-01 | 3.0 | 11 | 0 | I | 15 | 4.18E-01 | 4.92E-01 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | Benzene | mg/kg | | | 15 | 2.25E-02 | 2.33E-02 | 3.0 | 11 | 0 | I | 15 | 2.25E-02 | 2.33E-02 | 2.0 | 12 | 0 | I |
| EU-03 | 18.12 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 9 | 4.11E-03 | 1.62E-03 | 3.0 | 11 | 2 | I | 9 | 4.11E-03 | 1.62E-03 | 3.0 | 11 | 2 | I |
| EU-03 | 18.12 | VOC | Ethylbenzene | mg/kg | 1 | 0.1 | 15 | 2.58E-02 | 3.01E-02 | 3.0 | 11 | 0 | I | 15 | 2.58E-02 | 3.01E-02 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | m,p-Xylenes | mg/kg | 1 | 0.0006 | 9 | 5.29E-03 | 3.90E-03 | 3.0 | 11 | 2 | I | 9 | 5.29E-03 | 3.90E-03 | 3.0 | 11 | 2 | I |
| EU-03 | 18.12 | VOC | Methyl ethyl ketone | mg/kg | 1 | 0.024 | 9 | 2.08E-02 | 2.10E-02 | 3.0 | 11 | 2 | I | 9 | 2.08E-02 | 2.10E-02 | 3.0 | 11 | 2 | I |
| EU-03 | 18.12 | VOC | Methylene chloride | mg/kg | 4 | 4.2 | 15 | 6.16E-01 | 1.36E+00 | 1.6 | 14 | 0 | I | 15 | 6.16E-01 | 1.36E+00 | 1.5 | 15 | 0 | Y |
| EU-03 | 18.12 | VOC | Tetrachloroethene | mg/kg | 2 | 0.33 | 15 | 5.45E-02 | 9.89E-02 | 2.4 | 12 | 0 | I | 11 | 5.61E-02 | 1.17E-01 | 1.5 | 15 | 4 | Y |
| EU-03 | 18.12 | VOC | Toluene | mg/kg | 2 | 3.6 | 15 | 4.69E-01 | 1.16E+00 | 3.0 | 11 | 0 | I | 15 | 4.69E-01 | 1.16E+00 | 3.0 | 11 | 0 | I |
| EU-03 | 18.12 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 9 | 4.11E-03 | 1.62E-03 | 3.0 | 11 | 2 | I | 9 | 4.11E-03 | 1.62E-03 | 3.0 | 11 | 2 | I |
| EU-03 | 18.12 | VOC | Trichloroethene | mg/kg | 2 | 1 | 15 | 1.36E-01 | 3.15E-01 | 3.0 | 11 | 0 | I | 11 | 1.68E-01 | 3.67E-01 | 1.5 | 15 | 4 | Y |
| EU-03 | 18.12 | VOC | Vinyl chloride | mg/kg | | | 9 | 5.44E-03 | 3.71E-03 | 3.0 | 11 | 2 | I | 3 | 2.00E-03 | 2.00E-04 | 1.5 | 15 | 12 | I |
| EU-03 | 18.12 | VOC | Xylenes, Total | mg/kg | 3 | 0.52 | 10 | 1.14E-01 | 1.79E-01 | 3.0 | 11 | 1 | I | 10 | 1.14E-01 | 1.79E-01 | 3.0 | 11 | 1 | I |
| EU-04 | 18.26 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | Inorganic | Aluminum | mg/kg | 1 | 11000 | 1 | 1.10E+04 | | 1.5 | 14 | 13 | I | 1 | 1.10E+04 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Antimony | mg/kg | | | 1 | 7.50E-01 | | 1.5 | 14 | 13 | I | 1 | 7.50E-01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Arsenic | mg/kg | 3 | 4.3 | 3 | 3.37E+00 | 8.14E-01 | 1.5 | 14 | 11 | I | 3 | 3.37E+00 | 8.14E-01 | 1.5 | 14 | 11 | I |
| EU-04 | 18.26 | Inorganic | Barium | mg/kg | 1 | 81 | 1 | 8.10E+01 | | 1.5 | 14 | 13 | I | 1 | 8.10E+01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Beryllium | mg/kg | | | 1 | 5.00E-01 | | 1.5 | 14 | 13 | I | 1 | 5.00E-01 | | 1.5 | 14 | 13 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-04 | 18.26 | Inorganic | Boron | mg/kg | | | 1 | 1.00E+01 | | 1.5 | 14 | 13 | I | 1 | 1.00E+01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Cadmium | mg/kg | | | 1 | 5.00E-01 | | 1.5 | 14 | 13 | I | 1 | 5.00E-01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Chromium | mg/kg | 1 | 12 | 1 | 1.20E+01 | | 1.5 | 14 | 13 | I | 1 | 1.20E+01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Cobalt | mg/kg | 1 | 6.7 | 1 | 6.70E+00 | | 1.5 | 14 | 13 | I | 1 | 6.70E+00 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Copper | mg/kg | 1 | 6.6 | 1 | 6.60E+00 | | 1.5 | 14 | 13 | I | 1 | 6.60E+00 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Lead | mg/kg | 1 | 4.7 | 1 | 4.70E+00 | | 1.5 | 14 | 13 | I | 1 | 4.70E+00 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-04 | 18.26 | Inorganic | Mercury | mg/kg | | | 1 | 1.00E-01 | | 1.5 | 14 | 13 | I | 1 | 1.00E-01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Molybdenum | mg/kg | | | 1 | 5.00E-01 | | 1.5 | 14 | 13 | I | 1 | 5.00E-01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Nickel | mg/kg | 1 | 7.3 | 1 | 7.30E+00 | | 1.5 | 14 | 13 | I | 1 | 7.30E+00 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Selenium | mg/kg | | | 1 | 2.50E+00 | | 1.5 | 14 | 13 | I | 1 | 2.50E+00 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Silver | mg/kg | | | 1 | 6.00E+00 | | 1.5 | 14 | 13 | I | 1 | 6.00E+00 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Thallium | mg/kg | | | 1 | 2.50E+00 | | 1.5 | 14 | 13 | I | 1 | 2.50E+00 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Vanadium | mg/kg | 1 | 27 | 1 | 2.70E+01 | | 1.5 | 14 | 13 | I | 1 | 2.70E+01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | Inorganic | Zinc | mg/kg | 1 | 45 | 1 | 4.50E+01 | | 1.5 | 14 | 13 | I | 1 | 4.50E+01 | | 1.5 | 14 | 13 | I |
| EU-04 | 18.26 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | SVOC | Acenaphthene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Anthracene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Benzo(a)anthracene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Benzo(a)pyrene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Chrysene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Diethyl phthalate | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Di-n-butyl phthalate | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Fluoranthene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Fluorene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Naphthalene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | SVOC | Pyrene | mg/kg | | | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 3.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | 1,1-Dichloroethane | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | 1,1-Dichloroethene | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | Acetone | mg/kg | | | 2 | 2.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 2.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | VOC | Benzene | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | VOC | Ethylbenzene | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-04 | 18.26 | VOC | Methyl ethyl ketone | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-04 | 18.26 | VOC | Methylene chloride | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | Tetrachloroethene | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | Toluene | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | Trichloroethene | mg/kg | | | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | Vinyl chloride | mg/kg | | | 4 | 7.50E-03 | 2.89E-03 | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-04 | 18.26 | VOC | Xylenes, Total | mg/kg | 1 | 0.01 | 3 | 6.67E-03 | 2.89E-03 | 1.5 | 15 | 12 | I | 3 | 6.67E-03 | 2.89E-03 | 1.5 | 15 | 12 | I |
| EU-05 | 18.87 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | Inorganic | Aluminum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Antimony | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Arsenic | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Barium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Beryllium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Boron | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Cadmium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-05 | 18.87 | Inorganic | Chromium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Cobalt | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Copper | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Lead | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Mercury | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Molybdenum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Nickel | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Selenium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Silver | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Thallium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Vanadium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | Inorganic | Zinc | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-05 | 18.87 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | SVOC | Acenaphthene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Anthracene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Benzo(a)anthracene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Benzo(a)pyrene | mg/kg | | | 4 | | | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Chrysene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 4 | | | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Diethyl phthalate | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Di-n-butyl phthalate | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Fluoranthene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Fluorene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Naphthalene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | SVOC | Pyrene | mg/kg | | | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 1.70E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | 1,1-Dichloroethane | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | 1,1-Dichloroethene | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | Acetone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | VOC | Benzene | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | VOC | Ethylbenzene | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-05 | 18.87 | VOC | Methylene chloride | mg/kg | | | 4 | 3.00E-01 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 3.00E-01 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | Tetrachloroethene | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | Toluene | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | Trichloroethene | mg/kg | | | 4 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | Vinyl chloride | mg/kg | | | 4 | | | 1.5 | 15 | 11 | I | 4 | | | 1.5 | 15 | 11 | I |
| EU-05 | 18.87 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | Inorganic | Aluminum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-06 | 18.08 | Inorganic | Antimony | mg/kg | | | 1 | 3.20E+00 | | 1.5 | 14 | 13 | I | 1 | 3.20E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Arsenic | mg/kg | | | 1 | 5.30E+00 | | 1.5 | 14 | 13 | I | 1 | 5.30E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Barium | mg/kg | 1 | 86 | 1 | 8.60E+01 | | 1.5 | 14 | 13 | I | 1 | 8.60E+01 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Beryllium | mg/kg | | | 1 | 3.00E-02 | | 1.5 | 14 | 13 | I | 1 | 3.00E-02 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Boron | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-06 | 18.08 | Inorganic | Cadmium | mg/kg | 1 | 1.9 | 1 | 1.90E+00 | | 1.5 | 14 | 13 | I | 1 | 1.90E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Chromium | mg/kg | 1 | 7.5 | 1 | 7.50E+00 | | 1.5 | 14 | 13 | I | 1 | 7.50E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Cobalt | mg/kg | 1 | 6.5 | 1 | 6.50E+00 | | 1.5 | 14 | 13 | I | 1 | 6.50E+00 | | 1.5 | 14 | 13 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-06 | 18.08 | Inorganic | Copper | mg/kg | 1 | 8 | 1 | 8.00E+00 | | 1.5 | 14 | 13 | I | 1 | 8.00E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Lead | mg/kg | | | 1 | 4.20E+00 | | 1.5 | 14 | 13 | I | 1 | 4.20E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-06 | 18.08 | Inorganic | Mercury | mg/kg | | | 1 | 2.00E-02 | | 1.5 | 14 | 13 | I | 1 | 2.00E-02 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Molybdenum | mg/kg | | | 1 | 8.00E-01 | | 1.5 | 14 | 13 | I | 1 | 8.00E-01 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Nickel | mg/kg | 1 | 9.4 | 1 | 9.40E+00 | | 1.5 | 14 | 13 | I | 1 | 9.40E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Selenium | mg/kg | | | 1 | 7.50E+00 | | 1.5 | 14 | 13 | I | 1 | 7.50E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Silver | mg/kg | | | 2 | 8.50E-01 | 2.12E-01 | 1.5 | 14 | 12 | I | 2 | 8.50E-01 | 2.12E-01 | 1.5 | 14 | 12 | I |
| EU-06 | 18.08 | Inorganic | Thallium | mg/kg | | | 1 | 4.00E+00 | | 1.5 | 14 | 13 | I | 1 | 4.00E+00 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Vanadium | mg/kg | 1 | 25 | 1 | 2.50E+01 | | 1.5 | 14 | 13 | I | 1 | 2.50E+01 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | Inorganic | Zinc | mg/kg | 1 | 45 | 1 | 4.50E+01 | | 1.5 | 14 | 13 | I | 1 | 4.50E+01 | | 1.5 | 14 | 13 | I |
| EU-06 | 18.08 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Acenaphthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Benzo(a)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Benzo(b)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Benzo(k)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Chrysene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Diethyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Di-n-butyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Fluorene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Naphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | SVOC | Pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | 1,1-Dichloroethane | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | 1,1-Dichloroethene | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Acetone | mg/kg | | | 2 | 2.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 2.00E-02 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Benzene | mg/kg | | | 8 | 5.00E-03 | 6.22E-11 | 3.0 | 11 | 3 | I | 8 | 5.00E-03 | 6.22E-11 | 3.0 | 11 | 3 | I |
| EU-06 | 18.08 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Ethylbenzene | mg/kg | | | 8 | 5.00E-03 | 6.22E-11 | 3.0 | 11 | 3 | I | 8 | 5.00E-03 | 6.22E-11 | 3.0 | 11 | 3 | I |
| EU-06 | 18.08 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-06 | 18.08 | VOC | Methyl ethyl ketone | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Methylene chloride | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Tetrachloroethene | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Toluene | mg/kg | | | 8 | 5.00E-03 | 6.22E-11 | 3.0 | 11 | 3 | I | 8 | 5.00E-03 | 6.22E-11 | 3.0 | 11 | 3 | I |
| EU-06 | 18.08 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Trichloroethene | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Vinyl chloride | mg/kg | | | 2 | 5.00E-03 | 0.00E+00 | 1.5 | 15 | 13 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-06 | 18.08 | VOC | Xylenes, Total | mg/kg | | | 8 | 8.75E-03 | 2.31E-03 | 3.0 | 11 | 3 | I | 8 | 8.75E-03 | 2.31E-03 | 3.0 | 11 | 3 | I |
| EU-07 | 16.12 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | Inorganic | Aluminum | mg/kg | 3 | 16200 | 3 | 1.23E+04 | 3.64E+03 | 1.5 | 14 | 11 | I | 3 | 1.23E+04 | 3.64E+03 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Antimony | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-07 | 16.12 | Inorganic | Arsenic | mg/kg | 3 | 6.1 | 3 | 5.10E+00 | 9.54E-01 | 1.5 | 14 | 11 | I | 3 | 5.10E+00 | 9.54E-01 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Barium | mg/kg | 3 | 111 | 3 | 8.18E+01 | 2.99E+01 | 1.5 | 14 | 11 | I | 3 | 8.18E+01 | 2.99E+01 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Beryllium | mg/kg | 3 | 0.83 | 3 | 6.70E-01 | 1.42E-01 | 1.5 | 14 | 11 | I | 3 | 6.70E-01 | 1.42E-01 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Boron | mg/kg | | | 3 | 2.83E+00 | 5.77E-02 | 1.5 | 14 | 11 | I | 3 | 2.83E+00 | 5.77E-02 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Cadmium | mg/kg | | | 3 | 2.00E-02 | 2.69E-10 | 1.5 | 14 | 11 | I | 3 | 2.00E-02 | 2.69E-10 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Chromium | mg/kg | 3 | 26.4 | 3 | 1.97E+01 | 6.42E+00 | 1.5 | 14 | 11 | I | 3 | 1.97E+01 | 6.42E+00 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Cobalt | mg/kg | 3 | 10.6 | 3 | 7.37E+00 | 2.87E+00 | 1.5 | 14 | 11 | I | 3 | 7.37E+00 | 2.87E+00 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Copper | mg/kg | 3 | 11.3 | 3 | 8.93E+00 | 2.35E+00 | 1.5 | 14 | 11 | I | 3 | 8.93E+00 | 2.35E+00 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Lead | mg/kg | 3 | 7.8 | 3 | 6.70E+00 | 1.01E+00 | 1.5 | 14 | 11 | I | 3 | 6.70E+00 | 1.01E+00 | 1.5 | 14 | 11 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-07 | 16.12 | Inorganic | Manganese | mg/kg | 3 | 384 | 3 | 2.66E+02 | 1.06E+02 | 1.5 | 14 | 11 | I | 3 | 2.66E+02 | 1.06E+02 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Mercury | mg/kg | | | 3 | 1.33E-02 | 5.77E-03 | 1.5 | 14 | 11 | I | 3 | 1.33E-02 | 5.77E-03 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Molybdenum | mg/kg | | | 3 | 5.47E-01 | 5.77E-03 | 1.5 | 14 | 11 | I | 3 | 5.47E-01 | 5.77E-03 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Nickel | mg/kg | 3 | 21.1 | 3 | 1.34E+01 | 6.96E+00 | 1.5 | 14 | 11 | I | 3 | 1.34E+01 | 6.96E+00 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Selenium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-07 | 16.12 | Inorganic | Silver | mg/kg | | | 3 | 1.80E+00 | 2.34E+00 | 1.5 | 14 | 11 | I | 3 | 1.80E+00 | 2.34E+00 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Thallium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-07 | 16.12 | Inorganic | Vanadium | mg/kg | 3 | 45.9 | 3 | 3.45E+01 | 1.00E+01 | 1.5 | 14 | 11 | I | 3 | 3.45E+01 | 1.00E+01 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | Inorganic | Zinc | mg/kg | 3 | 57.8 | 3 | 4.68E+01 | 1.22E+01 | 1.5 | 14 | 11 | I | 3 | 4.68E+01 | 1.22E+01 | 1.5 | 14 | 11 | I |
| EU-07 | 16.12 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | SVOC | 2-Methylnaphthalene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Acenaphthene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Anthracene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Benzo(a)anthracene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Benzo(a)pyrene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | SVOC | Chrysene | mg/kg | 1 | 0.012 | 3 | 6.67E-03 | 4.62E-03 | 1.5 | 15 | 12 | I | 3 | 6.67E-03 | 4.62E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | SVOC | Diethyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | SVOC | Di-n-butyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | SVOC | Fluoranthene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Fluorene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Naphthalene | mg/kg | | | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 8.08E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | SVOC | Pyrene | mg/kg | 1 | 0.01 | 3 | 6.00E-03 | 3.46E-03 | 1.5 | 15 | 12 | I | 3 | 6.00E-03 | 3.46E-03 | 1.5 | 15 | 12 | I |
| EU-07 | 16.12 | VOC | 1,1,1-Trichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | 1,1-Dichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | 1,1-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Acetone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Benzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Ethylbenzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Methylene chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Tetrachloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Toluene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | trans-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Trichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Vinyl chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-07 | 16.12 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-08 | 19.85 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-08 | 19.85 | Inorganic | Aluminum | mg/kg | 12 | 12500 | 12 | 9.79E+03 | 1.87E+03 | 3.0 | 8 | 0 | I | 12 | 9.79E+03 | 1.87E+03 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Antimony | mg/kg | 5 | 10.3 | 12 | 1.11E+00 | 2.90E+00 | 3.0 | 8 | 0 | I | 12 | 1.11E+00 | 2.90E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Arsenic | mg/kg | 12 | 5.4 | 12 | 3.03E+00 | 1.10E+00 | 3.0 | 8 | 0 | I | 12 | 3.03E+00 | 1.10E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Barium | mg/kg | 12 | 92 | 12 | 7.76E+01 | 1.17E+01 | 3.0 | 8 | 0 | I | 12 | 7.76E+01 | 1.17E+01 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Beryllium | mg/kg | 11 | 0.7 | 12 | 5.53E-01 | 2.50E-01 | 3.0 | 8 | 0 | I | 11 | 4.85E-01 | 8.77E-02 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Boron | mg/kg | | | 9 | 2.94E+00 | 1.48E+00 | 3.0 | 8 | 0 | I | 9 | 2.94E+00 | 1.48E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Cadmium | mg/kg | 7 | 0.95 | 12 | 3.32E-01 | 4.12E-01 | 3.0 | 8 | 0 | I | 12 | 3.32E-01 | 4.12E-01 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Chromium | mg/kg | 12 | 21.5 | 12 | 1.45E+01 | 2.98E+00 | 3.0 | 8 | 0 | I | 12 | 1.45E+01 | 2.98E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Cobalt | mg/kg | 12 | 10.7 | 12 | 6.76E+00 | 1.69E+00 | 3.0 | 8 | 0 | I | 12 | 6.76E+00 | 1.69E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Copper | mg/kg | 12 | 14.5 | 12 | 8.24E+00 | 2.57E+00 | 3.0 | 8 | 0 | I | 12 | 8.24E+00 | 2.57E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Lead | mg/kg | 12 | 7.5 | 12 | 5.15E+00 | 1.38E+00 | 3.0 | 8 | 0 | I | 12 | 5.15E+00 | 1.38E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Manganese | mg/kg | 9 | 373 | 9 | 2.60E+02 | 5.78E+01 | 3.0 | 8 | 0 | I | 9 | 2.60E+02 | 5.78E+01 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Mercury | mg/kg | 7 | 0.04 | 12 | 2.06E-02 | 9.27E-03 | 3.0 | 8 | 0 | I | 12 | 2.06E-02 | 9.27E-03 | 3.0 | 8 | 0 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-08 | 19.85 | Inorganic | Molybdenum | mg/kg | 3 | 0.35 | 10 | 4.92E+00 | 4.80E+00 | 3.0 | 8 | 0 | I | 10 | 4.92E+00 | 4.80E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Nickel | mg/kg | 12 | 15.2 | 12 | 9.68E+00 | 2.47E+00 | 3.0 | 8 | 0 | I | 12 | 9.68E+00 | 2.47E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Selenium | mg/kg | | | 9 | 9.08E-01 | 1.95E+00 | 3.0 | 8 | 0 | I | 9 | 9.08E-01 | 1.95E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Silver | mg/kg | 1 | 4.5 | 13 | 2.61E+00 | 2.34E+00 | 3.0 | 8 | 0 | I | 13 | 2.61E+00 | 2.34E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Thallium | mg/kg | 7 | 2 | 11 | 5.81E-01 | 5.68E-01 | 3.0 | 8 | 0 | I | 11 | 5.81E-01 | 5.68E-01 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Vanadium | mg/kg | 12 | 40 | 12 | 2.86E+01 | 4.68E+00 | 3.0 | 8 | 0 | I | 12 | 2.86E+01 | 4.68E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | Inorganic | Zinc | mg/kg | 12 | 63.5 | 12 | 4.82E+01 | 8.47E+00 | 3.0 | 8 | 0 | I | 12 | 4.82E+01 | 8.47E+00 | 3.0 | 8 | 0 | I |
| EU-08 | 19.85 | PCBs | Aroclor 1242 | mg/kg | | | 3 | 3.70E-02 | 1.00E-03 | 1.5 | 15 | 12 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | PCBs | Aroclor 1248 | mg/kg | | | 3 | 3.70E-02 | 1.00E-03 | 1.5 | 15 | 12 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | PCBs | Aroclor 1254 | mg/kg | | | 3 | 3.70E-02 | 1.00E-03 | 1.5 | 15 | 12 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | PCBs | Aroclor 1260 | mg/kg | | | 3 | 3.70E-02 | 1.00E-03 | 1.5 | 15 | 12 | I | 3 | | | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | SVOC | 2-Methylnaphthalene | mg/kg | 1 | 0.002 | 5 | 6.60E-03 | 6.99E-03 | 1.5 | 15 | 10 | I | 5 | 6.60E-03 | 6.99E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Acenaphthene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Anthracene | mg/kg | 1 | 0.002 | 5 | 6.60E-03 | 6.99E-03 | 1.5 | 15 | 10 | I | 5 | 6.60E-03 | 6.99E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Benzo(a)anthracene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Benzo(a)pyrene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | | | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 4 | 9.58E-02 | 5.00E-02 | 1.5 | 15 | 11 | I | 4 | 9.58E-02 | 5.00E-02 | 1.5 | 15 | 11 | I |
| EU-08 | 19.85 | SVOC | Chrysene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | | | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Diethyl phthalate | mg/kg | 1 | 0.003 | 4 | 7.50E-03 | 7.68E-03 | 1.5 | 15 | 11 | I | 4 | 7.50E-03 | 7.68E-03 | 1.5 | 15 | 11 | I |
| EU-08 | 19.85 | SVOC | Di-n-butyl phthalate | mg/kg | | | 4 | 3.05E-02 | 1.48E-02 | 1.5 | 15 | 11 | I | 4 | 3.05E-02 | 1.48E-02 | 1.5 | 15 | 11 | I |
| EU-08 | 19.85 | SVOC | Fluoranthene | mg/kg | 2 | 0.007 | 5 | 7.20E-03 | 6.83E-03 | 1.5 | 15 | 10 | I | 5 | 7.20E-03 | 6.83E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Fluorene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I | 5 | 7.00E-03 | 6.71E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Naphthalene | mg/kg | 1 | 0.002 | 5 | 6.60E-03 | 6.99E-03 | 1.5 | 15 | 10 | I | 5 | 6.60E-03 | 6.99E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | SVOC | Pyrene | mg/kg | 2 | 0.006 | 5 | 7.00E-03 | 6.86E-03 | 1.5 | 15 | 10 | I | 5 | 7.00E-03 | 6.86E-03 | 1.5 | 15 | 10 | I |
| EU-08 | 19.85 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | 1,1-Dichloroethane | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | 1,1-Dichloroethene | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Acetone | mg/kg | 1 | 0.014 | 3 | 1.47E-02 | 2.08E-03 | 1.5 | 15 | 12 | I | 3 | 1.47E-02 | 2.08E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Benzene | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Ethylbenzene | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | m,p-Xylenes | mg/kg | | | 3 | 9.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 9.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Methyl ethyl ketone | mg/kg | | | 3 | 9.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 9.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Methylene chloride | mg/kg | | | 3 | 8.67E-03 | 3.79E-03 | 1.5 | 15 | 12 | I | 3 | 8.67E-03 | 3.79E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Tetrachloroethene | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Toluene | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Trichloroethene | mg/kg | 1 | 0.001 | 3 | 3.33E-03 | 2.08E-03 | 1.5 | 15 | 12 | I | 3 | 3.33E-03 | 2.08E-03 | 1.5 | 15 | 12 | I |
| EU-08 | 19.85 | VOC | Vinyl chloride | mg/kg | | | 3 | 4.67E-03 | 5.77E-04 | 1.5 | 15 | 12 | I | | | | 1.5 | 15 | 15 | I |
| EU-08 | 19.85 | VOC | Xylenes, Total | mg/kg | | | 3 | 1.43E-02 | 1.15E-03 | 1.5 | 15 | 12 | I | 3 | 1.43E-02 | 1.15E-03 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | Inorganic | Aluminum | mg/kg | 8 | 23000 | 8 | 1.41E+04 | 6.39E+03 | 3.0 | 8 | 0 | I | 8 | 1.41E+04 | 6.39E+03 | 3.0 | 8 | 0 | I |
| EU-09 | 17.18 | Inorganic | Antimony | mg/kg | 2 | 37 | 7 | 7.06E+00 | 1.33E+01 | 1.5 | 14 | 7 | I | 7 | 7.06E+00 | 1.33E+01 | 1.5 | 14 | 7 | I |
| EU-09 | 17.18 | Inorganic | Arsenic | mg/kg | 8 | 27 | 8 | 1.07E+01 | 8.98E+00 | 1.7 | 12 | 4 | I | 8 | 1.07E+01 | 8.98E+00 | 1.7 | 12 | 4 | I |
| EU-09 | 17.18 | Inorganic | Barium | mg/kg | 8 | 4100 | 8 | 5.93E+02 | 1.42E+03 | 1.9 | 11 | 3 | I | 8 | 5.93E+02 | 1.42E+03 | 0.5 | 90 | 82 | I |
| EU-09 | 17.18 | Inorganic | Beryllium | mg/kg | 6 | 0.89 | 8 | 6.90E-01 | 1.33E-01 | 3.0 | 8 | 0 | I | 8 | 6.90E-01 | 1.33E-01 | 3.0 | 8 | 0 | I |
| EU-09 | 17.18 | Inorganic | Boron | mg/kg | | | 7 | 4.63E+00 | 4.88E+00 | 1.5 | 14 | 7 | I | 7 | 4.63E+00 | 4.88E+00 | 1.5 | 14 | 7 | I |
| EU-09 | 17.18 | Inorganic | Cadmium | mg/kg | 2 | 35 | 8 | 5.04E+00 | 1.21E+01 | 1.6 | 13 | 5 | I | 8 | 5.04E+00 | 1.21E+01 | 0.2 | 542 | 534 | I |
| EU-09 | 17.18 | Inorganic | Chromium | mg/kg | 8 | 2800 | 8 | 4.24E+02 | 9.73E+02 | 1.5 | 14 | 6 | Y | 8 | 4.24E+02 | 9.73E+02 | 1.5 | 14 | 6 | Y |
| EU-09 | 17.18 | Inorganic | Cobalt | mg/kg | 8 | 71 | 8 | 1.75E+01 | 2.21E+01 | 3.0 | 8 | 0 | I | 8 | 1.75E+01 | 2.21E+01 | 3.0 | 8 | 0 | I |
| EU-09 | 17.18 | Inorganic | Copper | mg/kg | 8 | 10000 | 8 | 1.38E+03 | 3.50E+03 | 0.4 | 139 | 131 | I | 8 | 1.38E+03 | 3.50E+03 | 1.5 | 14 | 6 | Y |
| EU-09 | 17.18 | Inorganic | Lead | mg/kg | 8 | 510 | 8 | 9.03E+01 | 1.79E+02 | 0.4 | 139 | 131 | I | 8 | 9.03E+01 | 1.79E+02 | 0.4 | 139 | 131 | I |
| EU-09 | 17.18 | Inorganic | Manganese | mg/kg | 1 | 205 | 1 | 2.05E+02 | | 1.5 | 14 | 13 | I | 1 | 2.05E+02 | | 1.5 | 14 | 13 | I |
| EU-09 | 17.18 | Inorganic | Mercury | mg/kg | 2 | 260 | 8 | 3.68E+01 | 9.10E+01 | 1.5 | 14 | 6 | Y | 8 | 3.68E+01 | 9.10E+01 | 1.5 | 14 | 6 | Y |
| EU-09 | 17.18 | Inorganic | Molybdenum | mg/kg | 2 | 1000 | 8 | 1.63E+02 | 3.53E+02 | 0.6 | 64 | 56 | I | 8 | 1.63E+02 | 3.53E+02 | 1.5 | 14 | 6 | Y |
| EU-09 | 17.18 | Inorganic | Nickel | mg/kg | 8 | 2000 | 8 | 2.70E+02 | 6.99E+02 | 1.1 | 22 | 14 | I | 8 | 2.70E+02 | 6.99E+02 | 1.5 | 14 | 6 | Y |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-09 | 17.18 | Inorganic | Selenium | mg/kg | 3 | 15 | 12 | 3.67E+00 | 3.70E+00 | 3.0 | 8 | 0 | I | 12 | 3.67E+00 | 3.70E+00 | 3.0 | 8 | 0 | I |
| EU-09 | 17.18 | Inorganic | Silver | mg/kg | 2 | 1100 | 8 | 1.59E+02 | 3.84E+02 | 0.5 | 90 | 82 | I | 8 | 1.59E+02 | 3.84E+02 | 1.5 | 14 | 6 | Y |
| EU-09 | 17.18 | Inorganic | Thallium | mg/kg | | | 8 | 2.49E+00 | 1.74E+00 | 1.5 | 14 | 6 | I | 8 | 2.49E+00 | 1.74E+00 | 1.5 | 14 | 6 | I |
| EU-09 | 17.18 | Inorganic | Vanadium | mg/kg | 8 | 51.1 | 8 | 3.44E+01 | 1.07E+01 | 3.0 | 8 | 0 | I | 8 | 3.44E+01 | 1.07E+01 | 3.0 | 8 | 0 | I |
| EU-09 | 17.18 | Inorganic | Zinc | mg/kg | 8 | 6300 | 8 | 8.67E+02 | 2.20E+03 | 3.0 | 8 | 0 | I | 8 | 8.67E+02 | 2.20E+03 | 0.3 | 243 | 235 | I |
| EU-09 | 17.18 | PCBs | Aroclor 1242 | mg/kg | | | 1 | 5.70E-02 | | 1.5 | 15 | 14 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-09 | 17.18 | PCBs | Aroclor 1248 | mg/kg | | | 1 | 5.70E-02 | | 1.5 | 15 | 14 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-09 | 17.18 | PCBs | Aroclor 1254 | mg/kg | | | 1 | 5.70E-02 | | 1.5 | 15 | 14 | I | 2 | | | 1.5 | 15 | 13 | I |
| EU-09 | 17.18 | PCBs | Aroclor 1260 | mg/kg | | | 1 | 5.70E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |
| EU-09 | 17.18 | SVOC | 2-Methylnaphthalene | mg/kg | | | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | SVOC | Acenaphthene | mg/kg | | | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | SVOC | Anthracene | mg/kg | | | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | SVOC | Benzo(a)anthracene | mg/kg | | | 3 | 1.33E-01 | 1.73E-01 | 1.5 | 15 | 12 | I | 1 | 4.00E-03 | | 1.5 | 15 | 14 | I |
| EU-09 | 17.18 | SVOC | Benzo(a)pyrene | mg/kg | | | 1 | 4.00E-03 | | 1.5 | 15 | 14 | I | 5 | | | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I | 2 | 1.85E-02 | 2.05E-02 | 1.5 | 15 | 13 | I |
| EU-09 | 17.18 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 3 | 1.44E-01 | 1.68E-01 | 1.5 | 15 | 12 | I | 2 | 5.15E-02 | 6.72E-02 | 1.5 | 15 | 13 | I |
| EU-09 | 17.18 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 1 | 0.38 | 4 | 1.09E+00 | 1.48E+00 | 1.5 | 15 | 11 | I | 3 | 3.47E-01 | 2.89E-02 | 1.5 | 15 | 12 | I |
| EU-09 | 17.18 | SVOC | Chrysene | mg/kg | | | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 2 | 5.15E-02 | 6.72E-02 | 1.5 | 15 | 13 | I | 5 | | | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | SVOC | Diethyl phthalate | mg/kg | | | 4 | 1.82E+00 | 1.71E+00 | 1.5 | 15 | 11 | I | 4 | 1.82E+00 | 1.71E+00 | 1.5 | 15 | 11 | I |
| EU-09 | 17.18 | SVOC | Di-n-butyl phthalate | mg/kg | | | 4 | 1.82E+00 | 1.71E+00 | 1.5 | 15 | 11 | I | 4 | 1.82E+00 | 1.71E+00 | 1.5 | 15 | 11 | I |
| EU-09 | 17.18 | SVOC | Fluoranthene | mg/kg | | | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | SVOC | Fluorene | mg/kg | | | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 3 | 1.55E-01 | 1.64E-01 | 1.5 | 15 | 12 | I | 1 | 4.00E-03 | | 1.5 | 15 | 14 | I |
| EU-09 | 17.18 | SVOC | Naphthalene | mg/kg | | | 7 | 1.48E-01 | 1.70E-01 | 1.5 | 15 | 8 | I | 7 | 1.48E-01 | 1.70E-01 | 1.5 | 15 | 8 | I |
| EU-09 | 17.18 | SVOC | Pyrene | mg/kg | | | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I | 5 | 2.05E-01 | 1.71E-01 | 1.5 | 15 | 10 | I |
| EU-09 | 17.18 | VOC | 1,1,1-Trichloroethane | mg/kg | 1 | 3 | 9 | 3.38E-01 | 9.98E-01 | 3.0 | 11 | 2 | I | 9 | 3.38E-01 | 9.98E-01 | 3.0 | 11 | 2 | I |
| EU-09 | 17.18 | VOC | 1,1-Dichloroethane | mg/kg | 1 | 3.8 | 9 | 4.27E-01 | 1.27E+00 | 1.1 | 21 | 12 | I | 9 | 4.27E-01 | 1.27E+00 | 1.1 | 21 | 12 | I |
| EU-09 | 17.18 | VOC | 1,1-Dichloroethene | mg/kg | 1 | 0.38 | 9 | 4.71E-02 | 1.25E-01 | 3.0 | 11 | 2 | I | 9 | 4.71E-02 | 1.25E-01 | 1.5 | 15 | 6 | Y |
| EU-09 | 17.18 | VOC | Acetone | mg/kg | 1 | 0.35 | 9 | 8.81E-02 | 9.83E-02 | 3.0 | 11 | 2 | I | 9 | 8.81E-02 | 9.83E-02 | 3.0 | 11 | 2 | I |
| EU-09 | 17.18 | VOC | Benzene | mg/kg | 1 | 0.028 | 11 | 1.12E-02 | 1.47E-02 | 3.0 | 11 | 0 | I | 11 | 1.12E-02 | 1.47E-02 | 3.0 | 11 | 0 | I |
| EU-09 | 17.18 | VOC | cis-1,2-Dichloroethene | mg/kg | 1 | 0.06 | 9 | 1.12E-02 | 1.83E-02 | 3.0 | 11 | 2 | I | 9 | 1.12E-02 | 1.83E-02 | 3.0 | 11 | 2 | I |
| EU-09 | 17.18 | VOC | Ethylbenzene | mg/kg | 3 | 0.52 | 11 | 1.30E-01 | 2.16E-01 | 3.0 | 11 | 0 | I | 11 | 1.30E-01 | 2.16E-01 | 3.0 | 11 | 0 | I |
| EU-09 | 17.18 | VOC | m,p-Xylenes | mg/kg | | | 7 | 5.57E-03 | 5.35E-04 | 1.5 | 15 | 8 | I | 7 | 5.57E-03 | 5.35E-04 | 1.5 | 15 | 8 | I |
| EU-09 | 17.18 | VOC | Methyl ethyl ketone | mg/kg | | | 9 | 4.98E-02 | 1.71E-02 | 3.0 | 11 | 2 | I | 9 | 4.98E-02 | 1.71E-02 | 3.0 | 11 | 2 | I |
| EU-09 | 17.18 | VOC | Methylene chloride | mg/kg | | | 9 | 4.64E-02 | 7.65E-02 | 3.0 | 11 | 2 | I | 9 | 4.64E-02 | 7.65E-02 | 3.0 | 11 | 2 | I |
| EU-09 | 17.18 | VOC | Tetrachloroethene | mg/kg | | | 9 | 5.00E-03 | 1.58E-03 | 3.0 | 11 | 2 | I | 9 | 5.00E-03 | 1.58E-03 | 3.0 | 11 | 2 | I |
| EU-09 | 17.18 | VOC | Toluene | mg/kg | 2 | 0.77 | 11 | 8.04E-02 | 2.29E-01 | 3.0 | 11 | 0 | I | 11 | 8.04E-02 | 2.29E-01 | 3.0 | 11 | 0 | I |
| EU-09 | 17.18 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 9 | 5.67E-03 | 2.06E-03 | 3.0 | 11 | 2 | I | 9 | 5.67E-03 | 2.06E-03 | 3.0 | 11 | 2 | I |
| EU-09 | 17.18 | VOC | Trichloroethene | mg/kg | 1 | 0.42 | 9 | 5.11E-02 | 1.38E-01 | 3.0 | 11 | 2 | I | 9 | 5.11E-02 | 1.38E-01 | 1.5 | 15 | 6 | Y |
| EU-09 | 17.18 | VOC | Vinyl chloride | mg/kg | 1 | 0.07 | 9 | 1.67E-02 | 2.02E-02 | 0.6 | 52 | 43 | I | 2 | 3.60E-02 | 4.81E-02 | 1.5 | 15 | 13 | I |
| EU-09 | 17.18 | VOC | Xylenes, Total | mg/kg | 3 | 1.4 | 4 | 7.80E-01 | 6.42E-01 | 1.5 | 15 | 11 | I | 4 | 7.80E-01 | 6.42E-01 | 1.5 | 15 | 11 | I |
| EU-10 | 17.39 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 6 | 3.33E-06 | 18 | 7.18E-07 | 1.05E-06 | 2.1 | 12 | 0 | I | 10 | 1.09E-06 | 1.32E-06 | 1.5 | 15 | 5 | Y |
| EU-10 | 17.39 | Inorganic | Aluminum | mg/kg | 37 | 20000 | 37 | 1.32E+04 | 3.88E+03 | 3.0 | 8 | 0 | I | 37 | 1.32E+04 | 3.88E+03 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Antimony | mg/kg | 2 | 0.45 | 41 | 1.68E+00 | 3.03E+00 | 3.0 | 8 | 0 | I | 37 | 6.98E-01 | 2.84E-01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Arsenic | mg/kg | 37 | 11 | 41 | 4.86E+00 | 1.56E+00 | 3.0 | 8 | 0 | I | 41 | 4.86E+00 | 1.56E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Barium | mg/kg | 43 | 190 | 43 | 9.74E+01 | 3.07E+01 | 3.0 | 8 | 0 | I | 43 | 9.74E+01 | 3.07E+01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Beryllium | mg/kg | 33 | 1.9 | 43 | 8.39E-01 | 9.64E-01 | 3.0 | 8 | 0 | I | 41 | 6.36E-01 | 2.61E-01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Boron | mg/kg | 4 | 11.8 | 37 | 1.22E+01 | 1.07E+01 | 3.0 | 8 | 0 | I | 37 | 1.22E+01 | 1.07E+01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Cadmium | mg/kg | 13 | 1.3 | 44 | 6.80E-01 | 9.94E-01 | 3.0 | 8 | 0 | I | 44 | 6.80E-01 | 9.94E-01 | 2.7 | 9 | 0 | I |
| EU-10 | 17.39 | Inorganic | Chromium | mg/kg | 42 | 42 | 44 | 1.90E+01 | 9.38E+00 | 3.0 | 8 | 0 | I | 44 | 1.90E+01 | 9.38E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Cobalt | mg/kg | 41 | 11.7 | 43 | 8.44E+00 | 9.52E+00 | 3.0 | 8 | 0 | I | 43 | 8.44E+00 | 9.52E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Copper | mg/kg | 43 | 130 | 44 | 1.64E+01 | 2.38E+01 | 3.0 | 8 | 0 | I | 44 | 1.64E+01 | 2.38E+01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Lead | mg/kg | 42 | 97 | 44 | 1.22E+01 | 1.98E+01 | 3.0 | 8 | 0 | I | 44 | 1.22E+01 | 1.98E+01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Manganese | mg/kg | 3 | 313 | 3 | 2.83E+02 | 4.04E+01 | 1.5 | 14 | 11 | I | 3 | 2.83E+02 | 4.04E+01 | 1.5 | 14 | 11 | I |
| EU-10 | 17.39 | Inorganic | Mercury | mg/kg | 21 | 0.22 | 42 | 7.82E-02 | 6.36E-02 | 3.0 | 8 | 0 | I | 42 | 7.82E-02 | 6.36E-02 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Molybdenum | mg/kg | 20 | 7.5 | 43 | 4.44E+00 | 1.08E+01 | 3.0 | 8 | 0 | I | 41 | 2.21E+00 | 3.65E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Nickel | mg/kg | 41 | 25 | 44 | 1.35E+01 | 9.34E+00 | 3.0 | 8 | 0 | I | 44 | 1.35E+01 | 9.34E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Selenium | mg/kg | 15 | 5.3 | 43 | 2.92E+00 | 1.98E+00 | 3.0 | 8 | 0 | I | 43 | 2.92E+00 | 1.98E+00 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Silver | mg/kg | 3 | 5.6 | 43 | 3.44E+00 | 1.05E+01 | 3.0 | 8 | 0 | I | 41 | 1.17E+00 | 1.18E+00 | 3.0 | 8 | 0 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-10 | 17.39 | Inorganic | Thallium | mg/kg | 1 | 0.53 | 41 | 1.94E+00 | 1.29E+00 | 2.0 | 10 | 0 | I | 41 | 1.94E+00 | 1.29E+00 | 2.0 | 10 | 0 | I |
| EU-10 | 17.39 | Inorganic | Vanadium | mg/kg | 43 | 79 | 43 | 3.46E+01 | 1.25E+01 | 3.0 | 8 | 0 | I | 43 | 3.46E+01 | 1.25E+01 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | Inorganic | Zinc | mg/kg | 43 | 730 | 43 | 7.34E+01 | 1.06E+02 | 3.0 | 8 | 0 | I | 43 | 7.34E+01 | 1.06E+02 | 3.0 | 8 | 0 | I |
| EU-10 | 17.39 | PCBs | Aroclor 1242 | mg/kg | | | 21 | 5.95E-02 | 1.97E-02 | 3.0 | 11 | 0 | I | | | | 1.5 | 15 | 15 | I |
| EU-10 | 17.39 | PCBs | Aroclor 1248 | mg/kg | | | 21 | 5.95E-02 | 1.97E-02 | 3.0 | 11 | 0 | I | | | | 1.5 | 15 | 15 | I |
| EU-10 | 17.39 | PCBs | Aroclor 1254 | mg/kg | 1 | 0.19 | 21 | 6.38E-02 | 3.37E-02 | 3.0 | 11 | 0 | I | 1 | 1.90E-01 | | 1.5 | 15 | 14 | I |
| EU-10 | 17.39 | PCBs | Aroclor 1260 | mg/kg | 1 | 0.2 | 21 | 6.64E-02 | 3.64E-02 | 3.0 | 11 | 0 | I | 1 | 2.00E-01 | | 1.5 | 15 | 14 | I |
| EU-10 | 17.39 | SVOC | 2-Methylnaphthalene | mg/kg | | | 25 | 5.63E-01 | 2.00E+00 | 3.0 | 11 | 0 | I | 25 | 5.63E-01 | 2.00E+00 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Acenaphthene | mg/kg | | | 44 | 3.41E-01 | 1.52E+00 | 3.0 | 11 | 0 | I | 44 | 3.41E-01 | 1.52E+00 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Anthracene | mg/kg | 1 | 0.022 | 44 | 3.39E-01 | 1.52E+00 | 3.0 | 11 | 0 | I | 44 | 3.39E-01 | 1.52E+00 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Benzo(a)anthracene | mg/kg | 3 | 0.057 | 42 | 6.92E-02 | 5.54E-02 | 3.0 | 11 | 0 | I | 21 | 1.84E-02 | 1.33E-02 | 1.3 | 17 | 0 | I |
| EU-10 | 17.39 | SVOC | Benzo(a)pyrene | mg/kg | 3 | 0.11 | 21 | 1.96E-02 | 2.28E-02 | 0.8 | 32 | 11 | I | 4 | 4.60E-02 | 4.75E-02 | 1.5 | 15 | 11 | I |
| EU-10 | 17.39 | SVOC | Benzo(b)fluoranthene | mg/kg | 3 | 0.08 | 42 | 6.96E-02 | 5.54E-02 | 3.0 | 11 | 0 | I | 21 | 1.91E-02 | 1.59E-02 | 1.1 | 21 | 0 | I |
| EU-10 | 17.39 | SVOC | Benzo(k)fluoranthene | mg/kg | 2 | 0.041 | 42 | 7.00E-02 | 5.56E-02 | 3.0 | 11 | 0 | I | 42 | 7.00E-02 | 5.56E-02 | 1.7 | 14 | 0 | I |
| EU-10 | 17.39 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 1 | 0.0113 | 9 | 1.55E+00 | 3.24E+00 | 3.0 | 11 | 2 | I | 7 | 2.73E-01 | 3.69E-01 | 1.5 | 15 | 8 | I |
| EU-10 | 17.39 | SVOC | Chrysene | mg/kg | 3 | 0.13 | 43 | 1.17E-01 | 2.99E-01 | 3.0 | 11 | 0 | I | 42 | 7.17E-02 | 5.56E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 36 | 5.74E-02 | 4.63E-02 | 1.2 | 18 | 0 | I | 1 | 3.00E-03 | | 1.5 | 15 | 14 | I |
| EU-10 | 17.39 | SVOC | Diethyl phthalate | mg/kg | | | 9 | 1.41E+00 | 3.28E+00 | 3.0 | 11 | 2 | I | 9 | 1.41E+00 | 3.28E+00 | 3.0 | 11 | 2 | I |
| EU-10 | 17.39 | SVOC | Di-n-butyl phthalate | mg/kg | 1 | 0.004 | 9 | 5.64E+00 | 1.33E+01 | 3.0 | 11 | 2 | I | 9 | 5.64E+00 | 1.33E+01 | 3.0 | 11 | 2 | I |
| EU-10 | 17.39 | SVOC | Fluoranthene | mg/kg | 5 | 0.11 | 44 | 3.38E-01 | 1.52E+00 | 3.0 | 11 | 0 | I | 44 | 3.38E-01 | 1.52E+00 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Fluorene | mg/kg | | | 44 | 3.41E-01 | 1.52E+00 | 3.0 | 11 | 0 | I | 44 | 3.41E-01 | 1.52E+00 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | 1 | 0.0059 | 42 | 7.13E-02 | 5.61E-02 | 3.0 | 11 | 0 | I | 19 | 1.39E-02 | 5.20E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Naphthalene | mg/kg | 3 | 0.1 | 61 | 4.89E-02 | 5.47E-02 | 3.0 | 11 | 0 | I | 61 | 4.89E-02 | 5.47E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | SVOC | Pyrene | mg/kg | 5 | 0.11 | 44 | 3.38E-01 | 1.52E+00 | 3.0 | 11 | 0 | I | 44 | 3.38E-01 | 1.52E+00 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | 1,1-Dichloroethane | mg/kg | | | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | 1,1-Dichloroethene | mg/kg | | | 29 | 1.24E-02 | 1.60E-02 | 3.0 | 11 | 0 | I | 24 | 5.36E-03 | 5.75E-04 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Acetone | mg/kg | 4 | 0.022 | 25 | 4.18E-02 | 1.17E-01 | 3.0 | 11 | 0 | I | 25 | 4.18E-02 | 1.17E-01 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Benzene | mg/kg | | | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I | 29 | 1.03E-02 | 1.70E-02 | 2.7 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 24 | 2.86E-03 | 1.56E-03 | 3.0 | 11 | 0 | I | 24 | 2.86E-03 | 1.56E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Ethylbenzene | mg/kg | | | 30 | 2.00E-02 | 5.55E-02 | 3.0 | 11 | 0 | I | 30 | 2.00E-02 | 5.55E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | m,p-Xylenes | mg/kg | | | 24 | 3.07E-03 | 2.10E-03 | 3.0 | 11 | 0 | I | 24 | 3.07E-03 | 2.10E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Methyl ethyl ketone | mg/kg | | | 24 | 1.79E-02 | 1.70E-02 | 3.0 | 11 | 0 | I | 24 | 1.79E-02 | 1.70E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Methylene chloride | mg/kg | | | 29 | 5.98E-02 | 9.78E-02 | 3.0 | 11 | 0 | I | 29 | 5.98E-02 | 9.78E-02 | 2.7 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Tetrachloroethene | mg/kg | | | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I | 24 | 2.86E-03 | 1.56E-03 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Toluene | mg/kg | | | 30 | 2.00E-02 | 5.55E-02 | 3.0 | 11 | 0 | I | 30 | 2.00E-02 | 5.55E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Trichloroethene | mg/kg | | | 29 | 1.03E-02 | 1.70E-02 | 3.0 | 11 | 0 | I | 25 | 3.95E-03 | 5.64E-03 | 2.9 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Vinyl chloride | mg/kg | | | 24 | 6.24E-03 | 2.35E-03 | 3.0 | 11 | 0 | I | 29 | | | 3.0 | 11 | 0 | I |
| EU-10 | 17.39 | VOC | Xylenes, Total | mg/kg | | | 2 | 1.58E-01 | 2.01E-01 | 1.5 | 15 | 13 | I | 2 | 1.58E-01 | 2.01E-01 | 1.5 | 15 | 13 | I |
| EU-11 | 17.73 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 13 | 2.04E-06 | 28 | 4.87E-07 | 5.57E-07 | 3.0 | 11 | 0 | I | 16 | 4.25E-07 | 6.91E-07 | 1.5 | 15 | 0 | Y |
| EU-11 | 17.73 | Inorganic | Aluminum | mg/kg | 6 | 28000 | 6 | 2.14E+04 | 5.18E+03 | 1.5 | 14 | 8 | I | 6 | 2.14E+04 | 5.18E+03 | 1.5 | 14 | 8 | I |
| EU-11 | 17.73 | Inorganic | Antimony | mg/kg | 2 | 9.8 | 2 | 8.50E+00 | 1.84E+00 | 1.5 | 14 | 12 | I | 2 | 8.50E+00 | 1.84E+00 | 1.5 | 14 | 12 | I |
| EU-11 | 17.73 | Inorganic | Arsenic | mg/kg | 9 | 5.9 | 9 | 3.94E+00 | 1.09E+00 | 3.0 | 8 | 0 | I | 9 | 3.94E+00 | 1.09E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Barium | mg/kg | 4 | 121 | 4 | 9.31E+01 | 2.21E+01 | 1.5 | 14 | 10 | I | 4 | 9.31E+01 | 2.21E+01 | 1.5 | 14 | 10 | I |
| EU-11 | 17.73 | Inorganic | Beryllium | mg/kg | 4 | 0.86 | 4 | 7.70E-01 | 1.22E-01 | 1.5 | 14 | 10 | I | 4 | 7.70E-01 | 1.22E-01 | 1.5 | 14 | 10 | I |
| EU-11 | 17.73 | Inorganic | Boron | mg/kg | 5 | 3.6 | 6 | 1.68E+00 | 9.76E-01 | 1.5 | 14 | 8 | I | 6 | 1.68E+00 | 9.76E-01 | 1.5 | 14 | 8 | I |
| EU-11 | 17.73 | Inorganic | Cadmium | mg/kg | 2 | 0.41 | 4 | 3.05E-01 | 1.16E-01 | 1.5 | 14 | 10 | I | 4 | 3.05E-01 | 1.16E-01 | 1.5 | 14 | 10 | I |
| EU-11 | 17.73 | Inorganic | Chromium | mg/kg | 8 | 30.7 | 8 | 2.19E+01 | 5.74E+00 | 3.0 | 8 | 0 | I | 8 | 2.19E+01 | 5.74E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Cobalt | mg/kg | 4 | 10.4 | 4 | 6.15E+00 | 2.92E+00 | 1.5 | 14 | 10 | I | 4 | 6.15E+00 | 2.92E+00 | 1.5 | 14 | 10 | I |
| EU-11 | 17.73 | Inorganic | Copper | mg/kg | 7 | 20.3 | 8 | 1.33E+01 | 6.05E+00 | 3.0 | 8 | 0 | I | 8 | 1.33E+01 | 6.05E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Lead | mg/kg | 11 | 11.2 | 11 | 7.08E+00 | 2.05E+00 | 3.0 | 8 | 0 | I | 11 | 7.08E+00 | 2.05E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Manganese | mg/kg | 2 | 158 | 2 | 1.52E+02 | 9.19E+00 | 1.5 | 14 | 12 | I | 2 | 1.52E+02 | 9.19E+00 | 1.5 | 14 | 12 | I |
| EU-11 | 17.73 | Inorganic | Mercury | mg/kg | 13 | 0.53 | 19 | 1.07E-01 | 1.30E-01 | 3.0 | 8 | 0 | I | 19 | 1.07E-01 | 1.30E-01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Molybdenum | mg/kg | 1 | 0.32 | 4 | 4.13E-01 | 2.17E-01 | 1.5 | 14 | 10 | I | 4 | 4.13E-01 | 2.17E-01 | 1.5 | 14 | 10 | I |
| EU-11 | 17.73 | Inorganic | Nickel | mg/kg | 8 | 19.1 | 8 | 1.33E+01 | 4.29E+00 | 3.0 | 8 | 0 | I | 8 | 1.33E+01 | 4.29E+00 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | Inorganic | Selenium | mg/kg | | | 4 | 3.97E-01 | 1.87E-01 | 1.5 | 14 | 10 | I | 4 | 3.97E-01 | 1.87E-01 | 1.5 | 14 | 10 | I |
| EU-11 | 17.73 | Inorganic | Silver | mg/kg | 1 | 0.071 | 4 | 3.38E+00 | 3.84E+00 | 1.5 | 14 | 10 | I | 4 | 3.38E+00 | 3.84E+00 | 1.5 | 14 | 10 | I |
| EU-11 | 17.73 | Inorganic | Thallium | mg/kg | 2 | 0.37 | 2 | 2.95E-01 | 1.06E-01 | 1.5 | 14 | 12 | I | 2 | 2.95E-01 | 1.06E-01 | 1.5 | 14 | 12 | I |
| EU-11 | 17.73 | Inorganic | Vanadium | mg/kg | 4 | 52.4 | 4 | 3.95E+01 | 9.55E+00 | 1.5 | 14 | 10 | I | 4 | 3.95E+01 | 9.55E+00 | 1.5 | 14 | 10 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-11 | 17.73 | Inorganic | Zinc | mg/kg | 8 | 77.6 | 8 | 5.61E+01 | 1.08E+01 | 3.0 | 8 | 0 | I | 8 | 5.61E+01 | 1.08E+01 | 3.0 | 8 | 0 | I |
| EU-11 | 17.73 | PCBs | Aroclor 1242 | mg/kg | | | 22 | 3.51E-02 | 1.63E-02 | 3.0 | 11 | 0 | I | 3 | 3.70E-03 | 1.67E-04 | 1.5 | 15 | 12 | I |
| EU-11 | 17.73 | PCBs | Aroclor 1248 | mg/kg | | | 22 | 3.51E-02 | 1.63E-02 | 3.0 | 11 | 0 | I | 3 | 3.70E-03 | 1.67E-04 | 1.5 | 15 | 12 | I |
| EU-11 | 17.73 | PCBs | Aroclor 1254 | mg/kg | 3 | 0.11 | 22 | 4.14E-02 | 2.19E-02 | 3.0 | 11 | 0 | I | 5 | 2.94E-02 | 4.61E-02 | 1.5 | 15 | 10 | I |
| EU-11 | 17.73 | PCBs | Aroclor 1260 | mg/kg | 2 | 0.0195 | 22 | 3.83E-02 | 1.63E-02 | 3.0 | 11 | 0 | I | 4 | 7.19E-03 | 8.27E-03 | 1.5 | 15 | 11 | I |
| EU-11 | 17.73 | SVOC | 2-Methylnaphthalene | mg/kg | 1 | 0.028 | 12 | 1.41E-01 | 1.72E-01 | 3.0 | 11 | 0 | I | 12 | 1.41E-01 | 1.72E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Acenaphthene | mg/kg | 1 | 0.002 | 12 | 3.91E-02 | 2.84E-02 | 3.0 | 11 | 0 | I | 12 | 3.91E-02 | 2.84E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Anthracene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Benzo(a)anthracene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I | 6 | 1.68E-02 | 1.16E-02 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | SVOC | Benzo(a)pyrene | mg/kg | | | 8 | 2.17E-02 | 1.34E-02 | 1.4 | 16 | 8 | I | | | | 1.5 | 15 | 15 | I |
| EU-11 | 17.73 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I | 6 | 1.68E-02 | 1.16E-02 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 3 | 0.089 | 12 | 1.78E-01 | 2.50E-01 | 3.0 | 11 | 0 | I | 12 | 1.78E-01 | 2.50E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Chrysene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 2.0 | 12 | 0 | I | | | | 1.5 | 15 | 15 | I |
| EU-11 | 17.73 | SVOC | Diethyl phthalate | mg/kg | | | 12 | 2.19E-01 | 1.82E-01 | 3.0 | 11 | 0 | I | 12 | 2.19E-01 | 1.82E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Di-n-butyl phthalate | mg/kg | 5 | 0.047 | 12 | 1.64E-01 | 1.81E-01 | 3.0 | 11 | 0 | I | 12 | 1.64E-01 | 1.81E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Fluoranthene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Fluorene | mg/kg | 1 | 0.003 | 12 | 3.92E-02 | 2.82E-02 | 3.0 | 11 | 0 | I | 12 | 3.92E-02 | 2.82E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I | 6 | 1.68E-02 | 1.16E-02 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | SVOC | Naphthalene | mg/kg | 1 | 0.18 | 14 | 2.68E-02 | 4.60E-02 | 3.0 | 11 | 0 | I | 14 | 2.68E-02 | 4.60E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | SVOC | Pyrene | mg/kg | | | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I | 12 | 3.93E-02 | 2.81E-02 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | VOC | 1,1-Dichloroethane | mg/kg | | | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | VOC | 1,1-Dichloroethene | mg/kg | | | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | VOC | Acetone | mg/kg | | | 2 | 5.01E-03 | 1.63E-04 | 1.5 | 15 | 13 | I | 2 | 5.01E-03 | 1.63E-04 | 1.5 | 15 | 13 | I |
| EU-11 | 17.73 | VOC | Benzene | mg/kg | | | 7 | 4.29E-03 | 2.29E-03 | 1.5 | 15 | 8 | I | 7 | 4.29E-03 | 2.29E-03 | 1.5 | 15 | 8 | I |
| EU-11 | 17.73 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | VOC | Ethylbenzene | mg/kg | | | 12 | 1.27E-01 | 1.52E-01 | 3.0 | 11 | 0 | I | 12 | 1.27E-01 | 1.52E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | m,p-Xylenes | mg/kg | | | 6 | 8.34E-03 | 4.92E-03 | 1.5 | 15 | 9 | I | 6 | 8.34E-03 | 4.92E-03 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | VOC | Methyl ethyl ketone | mg/kg | | | 2 | 5.01E-03 | 1.63E-04 | 1.5 | 15 | 13 | I | 2 | 5.01E-03 | 1.63E-04 | 1.5 | 15 | 13 | I |
| EU-11 | 17.73 | VOC | Methylene chloride | mg/kg | 2 | 0.001 | 6 | 3.84E-03 | 2.23E-03 | 1.5 | 15 | 9 | I | 6 | 3.84E-03 | 2.23E-03 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | VOC | Tetrachloroethene | mg/kg | | | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | VOC | Toluene | mg/kg | | | 12 | 1.27E-01 | 1.52E-01 | 3.0 | 11 | 0 | I | 12 | 1.27E-01 | 1.52E-01 | 3.0 | 11 | 0 | I |
| EU-11 | 17.73 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I |
| EU-11 | 17.73 | VOC | Trichloroethene | mg/kg | 1 | 0.018 | 8 | 5.42E-03 | 5.66E-03 | 3.0 | 11 | 3 | I | 8 | 5.42E-03 | 5.66E-03 | 2.9 | 11 | 3 | I |
| EU-11 | 17.73 | VOC | Vinyl chloride | mg/kg | | | 6 | 4.17E-03 | 2.48E-03 | 1.5 | 15 | 9 | I | 2 | 9.99E-04 | 2.97E-05 | 1.5 | 15 | 13 | I |
| EU-11 | 17.73 | VOC | Xylenes, Total | mg/kg | | | 6 | 2.52E-01 | 1.18E-01 | 1.5 | 15 | 9 | I | 6 | 2.52E-01 | 1.18E-01 | 1.5 | 15 | 9 | I |
| EU-12 | 19.30 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | Inorganic | Aluminum | mg/kg | 8 | 21700 | 8 | 1.59E+04 | 4.08E+03 | 3.0 | 8 | 0 | I | 8 | 1.59E+04 | 4.08E+03 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Antimony | mg/kg | 3 | 1.1 | 7 | 7.22E-01 | 6.88E-01 | 1.5 | 14 | 7 | I | 7 | 7.22E-01 | 6.88E-01 | 1.5 | 14 | 7 | I |
| EU-12 | 19.30 | Inorganic | Arsenic | mg/kg | 10 | 10.4 | 10 | 6.91E+00 | 2.66E+00 | 3.0 | 8 | 0 | I | 10 | 6.91E+00 | 2.66E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Barium | mg/kg | 9 | 124 | 9 | 9.39E+01 | 2.06E+01 | 3.0 | 8 | 0 | I | 9 | 9.39E+01 | 2.06E+01 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Beryllium | mg/kg | 8 | 0.87 | 9 | 6.94E-01 | 1.65E-01 | 3.0 | 8 | 0 | I | 9 | 6.94E-01 | 1.65E-01 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Boron | mg/kg | 3 | 11.7 | 6 | 7.92E+00 | 3.65E+00 | 1.5 | 14 | 8 | I | 6 | 7.92E+00 | 3.65E+00 | 1.5 | 14 | 8 | I |
| EU-12 | 19.30 | Inorganic | Cadmium | mg/kg | 2 | 1.5 | 9 | 5.28E-01 | 5.67E-01 | 3.0 | 8 | 0 | I | 9 | 5.28E-01 | 5.67E-01 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Chromium | mg/kg | 9 | 43.5 | 9 | 2.36E+01 | 8.32E+00 | 3.0 | 8 | 0 | I | 9 | 2.36E+01 | 8.32E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Cobalt | mg/kg | 9 | 12.2 | 9 | 9.01E+00 | 2.14E+00 | 3.0 | 8 | 0 | I | 9 | 9.01E+00 | 2.14E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Copper | mg/kg | 9 | 20.5 | 9 | 1.21E+01 | 4.98E+00 | 3.0 | 8 | 0 | I | 9 | 1.21E+01 | 4.98E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Lead | mg/kg | 10 | 14.4 | 10 | 7.93E+00 | 3.18E+00 | 3.0 | 8 | 0 | I | 10 | 7.93E+00 | 3.18E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Manganese | mg/kg | 8 | 567 | 8 | 3.37E+02 | 1.12E+02 | 3.0 | 8 | 0 | I | 8 | 3.37E+02 | 1.12E+02 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Mercury | mg/kg | 3 | 0.04 | 9 | 5.00E-02 | 4.77E-02 | 3.0 | 8 | 0 | I | 9 | 5.00E-02 | 4.77E-02 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Molybdenum | mg/kg | | | 7 | 4.69E+00 | 4.97E+00 | 1.5 | 14 | 7 | I | 7 | 4.69E+00 | 4.97E+00 | 1.5 | 14 | 7 | I |
| EU-12 | 19.30 | Inorganic | Nickel | mg/kg | 9 | 65.4 | 9 | 2.16E+01 | 1.76E+01 | 3.0 | 8 | 0 | I | 9 | 2.16E+01 | 1.76E+01 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Selenium | mg/kg | 1 | 0.37 | 9 | 2.10E+00 | 1.67E+00 | 3.0 | 8 | 0 | I | 9 | 2.10E+00 | 1.67E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Silver | mg/kg | 3 | 13 | 9 | 3.37E+00 | 4.25E+00 | 3.0 | 8 | 0 | I | 9 | 3.37E+00 | 4.25E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Thallium | mg/kg | 3 | 2 | 9 | 1.59E+00 | 1.37E+00 | 1.9 | 11 | 2 | I | 9 | 1.59E+00 | 1.37E+00 | 1.9 | 11 | 2 | I |
| EU-12 | 19.30 | Inorganic | Vanadium | mg/kg | 9 | 48.2 | 9 | 4.08E+01 | 7.21E+00 | 3.0 | 8 | 0 | I | 9 | 4.08E+01 | 7.21E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | Inorganic | Zinc | mg/kg | 9 | 69.6 | 9 | 5.51E+01 | 9.29E+00 | 3.0 | 8 | 0 | I | 9 | 5.51E+01 | 9.29E+00 | 3.0 | 8 | 0 | I |
| EU-12 | 19.30 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-12 | 19.30 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-12 | 19.30 | SVOC | 2-Methylnaphthalene | mg/kg | | | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I |
| EU-12 | 19.30 | SVOC | Acenaphthene | mg/kg | | | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I |
| EU-12 | 19.30 | SVOC | Anthracene | mg/kg | | | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I |
| EU-12 | 19.30 | SVOC | Benzo(a)anthracene | mg/kg | | | 9 | 1.21E-02 | 2.47E-02 | 3.0 | 11 | 2 | I | 8 | 3.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-12 | 19.30 | SVOC | Benzo(a)pyrene | mg/kg | | | 8 | 3.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 1 | 3.00E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I | 8 | 3.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-12 | 19.30 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 9 | 1.21E-02 | 2.47E-02 | 3.0 | 11 | 2 | I | 9 | 1.21E-02 | 2.47E-02 | 3.0 | 11 | 2 | I |
| EU-12 | 19.30 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 3 | 1.90E-01 | 1.73E-01 | 1.5 | 15 | 12 | I | 3 | 1.90E-01 | 1.73E-01 | 1.5 | 15 | 12 | I |
| EU-12 | 19.30 | SVOC | Chrysene | mg/kg | | | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I |
| EU-12 | 19.30 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 8 | 3.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 1 | 3.00E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | SVOC | Diethyl phthalate | mg/kg | 2 | 0.002 | 3 | 1.31E-01 | 2.24E-01 | 1.5 | 15 | 12 | I | 3 | 1.31E-01 | 2.24E-01 | 1.5 | 15 | 12 | I |
| EU-12 | 19.30 | SVOC | Di-n-butyl phthalate | mg/kg | | | 3 | 1.38E-01 | 2.18E-01 | 1.5 | 15 | 12 | I | 3 | 1.38E-01 | 2.18E-01 | 1.5 | 15 | 12 | I |
| EU-12 | 19.30 | SVOC | Fluoranthene | mg/kg | 2 | 0.002 | 9 | 7.33E-03 | 1.19E-02 | 3.0 | 11 | 2 | I | 9 | 7.33E-03 | 1.19E-02 | 3.0 | 11 | 2 | I |
| EU-12 | 19.30 | SVOC | Fluorene | mg/kg | | | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I | 9 | 7.78E-03 | 1.17E-02 | 3.0 | 11 | 2 | I |
| EU-12 | 19.30 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 9 | 2.12E-02 | 5.20E-02 | 3.0 | 11 | 2 | I | 8 | 3.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-12 | 19.30 | SVOC | Naphthalene | mg/kg | 1 | 0.002 | 10 | 7.04E-03 | 1.13E-02 | 3.0 | 11 | 1 | I | 10 | 7.04E-03 | 1.13E-02 | 3.0 | 11 | 1 | I |
| EU-12 | 19.30 | SVOC | Pyrene | mg/kg | 3 | 0.005 | 9 | 7.56E-03 | 1.18E-02 | 3.0 | 11 | 2 | I | 9 | 7.56E-03 | 1.18E-02 | 3.0 | 11 | 2 | I |
| EU-12 | 19.30 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | 1,1-Dichloroethane | mg/kg | | | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | 1,1-Dichloroethene | mg/kg | | | 1 | 5.90E-03 | | 1.5 | 15 | 14 | I | 1 | 5.90E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Acetone | mg/kg | | | 1 | 5.90E-02 | | 1.5 | 15 | 14 | I | 1 | 5.90E-02 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Benzene | mg/kg | | | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 1 | 2.40E-03 | | 1.5 | 15 | 14 | I | 1 | 2.40E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Ethylbenzene | mg/kg | | | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | m,p-Xylenes | mg/kg | | | 1 | 2.40E-03 | | 1.5 | 15 | 14 | I | 1 | 2.40E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Methyl ethyl ketone | mg/kg | | | 1 | 1.20E-02 | | 1.5 | 15 | 14 | I | 1 | 1.20E-02 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Methylene chloride | mg/kg | | | 1 | 5.90E-02 | | 1.5 | 15 | 14 | I | 1 | 5.90E-02 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Tetrachloroethene | mg/kg | | | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Toluene | mg/kg | 1 | 0.0036 | 1 | 3.60E-03 | | 1.5 | 15 | 14 | I | 1 | 3.60E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 1 | 2.40E-03 | | 1.5 | 15 | 14 | I | 1 | 2.40E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Trichloroethene | mg/kg | | | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I | 1 | 1.20E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Vinyl chloride | mg/kg | | | 1 | 2.40E-03 | | 1.5 | 15 | 14 | I | 1 | 2.40E-03 | | 1.5 | 15 | 14 | I |
| EU-12 | 19.30 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-13 | 17.12 | Dioxins | TCDD-TEQ (Total all) | mg/kg | 1 | 2.24E-08 | 2 | 3.91E-07 | 5.22E-07 | 1.5 | 15 | 13 | I | 1 | 2.24E-08 | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | Inorganic | Aluminum | mg/kg | 18 | 24000 | 18 | 1.67E+04 | 4.62E+03 | 3.0 | 8 | 0 | I | 18 | 1.67E+04 | 4.62E+03 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Antimony | mg/kg | 2 | 22 | 7 | 3.69E+00 | 8.16E+00 | 1.5 | 14 | 7 | I | 7 | 3.69E+00 | 8.16E+00 | 1.5 | 14 | 7 | I |
| EU-13 | 17.12 | Inorganic | Arsenic | mg/kg | 9 | 11 | 9 | 5.64E+00 | 2.18E+00 | 3.0 | 8 | 0 | I | 9 | 5.64E+00 | 2.18E+00 | 3.0 | 8 | 0 | I |
| EU-13 | 17.12 | Inorganic | Barium | mg/kg | 2 | 100 | 2 | 9.70E+01 | 4.24E+00 | 1.5 | 14 | 12 | I | 2 | 9.70E+01 | 4.24E+00 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Beryllium | mg/kg | 2 | 0.64 | 2 | 6.40E-01 | 0.00E+00 | 1.5 | 14 | 12 | I | 2 | 6.40E-01 | 0.00E+00 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Boron | mg/kg | 2 | 14 | 2 | 1.04E+01 | 5.16E+00 | 1.5 | 14 | 12 | I | 2 | 1.04E+01 | 5.16E+00 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Cadmium | mg/kg | 2 | 0.32 | 2 | 3.10E-01 | 1.41E-02 | 1.5 | 14 | 12 | I | 2 | 3.10E-01 | 1.41E-02 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Chromium | mg/kg | 3 | 27 | 3 | 2.30E+01 | 3.61E+00 | 1.5 | 14 | 11 | I | 3 | 2.30E+01 | 3.61E+00 | 1.5 | 14 | 11 | I |
| EU-13 | 17.12 | Inorganic | Cobalt | mg/kg | 2 | 7.9 | 2 | 7.50E+00 | 5.66E-01 | 1.5 | 14 | 12 | I | 2 | 7.50E+00 | 5.66E-01 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Copper | mg/kg | 3 | 12 | 3 | 1.10E+01 | 1.19E+00 | 1.5 | 14 | 11 | I | 3 | 1.10E+01 | 1.19E+00 | 1.5 | 14 | 11 | I |
| EU-13 | 17.12 | Inorganic | Lead | mg/kg | 10 | 1900 | 10 | 2.44E+02 | 5.90E+02 | 1.5 | 14 | 4 | Y | 10 | 2.44E+02 | 5.90E+02 | 1.5 | 14 | 4 | Y |
| EU-13 | 17.12 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-13 | 17.12 | Inorganic | Mercury | mg/kg | 1 | 0.011 | 3 | 4.39E-02 | 6.61E-02 | 1.5 | 14 | 11 | I | 3 | 4.39E-02 | 6.61E-02 | 1.5 | 14 | 11 | I |
| EU-13 | 17.12 | Inorganic | Molybdenum | mg/kg | 2 | 0.51 | 2 | 4.95E-01 | 2.12E-02 | 1.5 | 14 | 12 | I | 2 | 4.95E-01 | 2.12E-02 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Nickel | mg/kg | 3 | 14 | 3 | 1.36E+01 | 5.13E-01 | 1.5 | 14 | 11 | I | 3 | 1.36E+01 | 5.13E-01 | 1.5 | 14 | 11 | I |
| EU-13 | 17.12 | Inorganic | Selenium | mg/kg | 2 | 0.43 | 2 | 3.65E-01 | 9.19E-02 | 1.5 | 14 | 12 | I | 2 | 3.65E-01 | 9.19E-02 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Silver | mg/kg | 2 | 0.094 | 2 | 8.65E-02 | 1.06E-02 | 1.5 | 14 | 12 | I | 2 | 8.65E-02 | 1.06E-02 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Thallium | mg/kg | | | 2 | 5.85E-01 | 7.07E-03 | 1.5 | 14 | 12 | I | 2 | 5.85E-01 | 7.07E-03 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Vanadium | mg/kg | 2 | 45 | 2 | 4.35E+01 | 2.12E+00 | 1.5 | 14 | 12 | I | 2 | 4.35E+01 | 2.12E+00 | 1.5 | 14 | 12 | I |
| EU-13 | 17.12 | Inorganic | Zinc | mg/kg | 3 | 56.1 | 3 | 4.70E+01 | 9.05E+00 | 1.5 | 14 | 11 | I | 3 | 4.70E+01 | 9.05E+00 | 1.5 | 14 | 11 | I |
| EU-13 | 17.12 | PCBs | Aroclor 1242 | mg/kg | | | 1 | 2.30E-02 | | 1.5 | 15 | 14 | I | 1 | | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | PCBs | Aroclor 1248 | mg/kg | | | 1 | 2.30E-02 | | 1.5 | 15 | 14 | I | 1 | | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | PCBs | Aroclor 1254 | mg/kg | | | 1 | 4.60E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-13 | 17.12 | PCBs | Aroclor 1260 | mg/kg | | | 1 | 4.60E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |
| EU-13 | 17.12 | SVOC | 2-Methylnaphthalene | mg/kg | | | 4 | 2.20E-01 | 1.00E-01 | 1.5 | 15 | 11 | I | 4 | 2.20E-01 | 1.00E-01 | 1.5 | 15 | 11 | I |
| EU-13 | 17.12 | SVOC | Acenaphthene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Anthracene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Benzo(a)anthracene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | | | | 1.5 | 15 | 15 | I |
| EU-13 | 17.12 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-13 | 17.12 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | | | | 1.5 | 15 | 15 | I |
| EU-13 | 17.12 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | 1 | 0.072 | 7 | 1.56E-01 | 3.70E-02 | 1.5 | 15 | 8 | I | 7 | 1.56E-01 | 3.70E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Chrysene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | 1 | 7.40E-02 | | 1.5 | 15 | 14 | I | | | | 1.5 | 15 | 15 | I |
| EU-13 | 17.12 | SVOC | Diethyl phthalate | mg/kg | | | 7 | 1.99E-01 | 7.56E-02 | 1.5 | 15 | 8 | I | 7 | 1.99E-01 | 7.56E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Di-n-butyl phthalate | mg/kg | 1 | 0.068 | 7 | 1.55E-01 | 3.86E-02 | 1.5 | 15 | 8 | I | 7 | 1.55E-01 | 3.86E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Fluoranthene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Fluorene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | | | | 1.5 | 15 | 15 | I |
| EU-13 | 17.12 | SVOC | Naphthalene | mg/kg | | | 7 | 1.47E-01 | 6.20E-02 | 1.5 | 15 | 8 | I | 7 | 1.47E-01 | 6.20E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | SVOC | Pyrene | mg/kg | | | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I | 7 | 1.56E-01 | 3.63E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | 1,1-Dichloroethane | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | 1,1-Dichloroethene | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | VOC | Acetone | mg/kg | | | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-13 | 17.12 | VOC | Benzene | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | VOC | Ethylbenzene | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | m,p-Xylenes | mg/kg | | | 1 | 1.10E-02 | | 1.5 | 15 | 14 | I | 1 | 1.10E-02 | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | VOC | Methyl ethyl ketone | mg/kg | | | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-01 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-13 | 17.12 | VOC | Methylene chloride | mg/kg | | | 7 | 2.58E-01 | 1.11E-01 | 1.5 | 15 | 8 | I | 7 | 2.58E-01 | 1.11E-01 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | Tetrachloroethene | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | VOC | Toluene | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | Trichloroethene | mg/kg | | | 7 | 4.37E-02 | 1.66E-02 | 1.5 | 15 | 8 | I | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I |
| EU-13 | 17.12 | VOC | Vinyl chloride | mg/kg | | | 1 | 6.00E-03 | | 1.5 | 15 | 14 | I | 7 | | | 1.5 | 15 | 8 | I |
| EU-13 | 17.12 | VOC | Xylenes, Total | mg/kg | | | 3 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 12 | I | 3 | 5.00E-02 | 0.00E+00 | 1.5 | 15 | 12 | I |
| EU-14 | 17.08 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | Inorganic | Aluminum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Antimony | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Arsenic | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Barium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Beryllium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Boron | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Cadmium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Chromium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Cobalt | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Copper | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Lead | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Mercury | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Molybdenum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Nickel | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Selenium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Silver | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Thallium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Vanadium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | Inorganic | Zinc | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-14 | 17.08 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-14 | 17.08 | SVOC | Acenaphthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Benzo(a)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Benzo(b)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Benzo(k)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Chrysene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Diethyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Di-n-butyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Fluorene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Naphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | SVOC | Pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | 1,1,1-Trichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | 1,1-Dichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | 1,1-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Acetone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Benzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Ethylbenzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Methylene chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Tetrachloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Toluene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | trans-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Trichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Vinyl chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-14 | 17.08 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | Inorganic | Aluminum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Antimony | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Arsenic | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Barium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Beryllium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Boron | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Cadmium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Chromium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Cobalt | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Copper | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Lead | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Mercury | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Molybdenum | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Nickel | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Selenium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Silver | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Thallium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Vanadium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | Inorganic | Zinc | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-15 | 18.68 | PCBs | Aroclor 1242 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | PCBs | Aroclor 1248 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | PCBs | Aroclor 1254 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | PCBs | Aroclor 1260 | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | 2-Methylnaphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Acenaphthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-15 | 18.68 | SVOC | Benzo(a)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Benzo(b)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Benzo(k)fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Chrysene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Diethyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Di-n-butyl phthalate | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Fluoranthene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Fluorene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Naphthalene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | SVOC | Pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | 1,1,1-Trichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | 1,1-Dichloroethane | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | 1,1-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Acetone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Benzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | cis-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Ethylbenzene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | m,p-Xylenes | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Methyl ethyl ketone | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Methylene chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Tetrachloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Toluene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | trans-1,2-Dichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Trichloroethene | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Vinyl chloride | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-15 | 18.68 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |
| EU-16 | 19.65 | Dioxins | TCDD-TEQ (Total all) | mg/kg | | | 8 | 1.73E-07 | 2.87E-08 | 3.0 | 11 | 3 | I | 5 | 1.54E-07 | 1.67E-08 | 1.5 | 15 | 10 | I |
| EU-16 | 19.65 | Inorganic | Aluminum | mg/kg | 8 | 19000 | 8 | 1.60E+04 | 2.20E+03 | 3.0 | 8 | 0 | I | 8 | 1.60E+04 | 2.20E+03 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Antimony | mg/kg | | | 8 | 1.20E+01 | 0.00E+00 | 3.0 | 8 | 0 | I | | | | 1.5 | 14 | 14 | I |
| EU-16 | 19.65 | Inorganic | Arsenic | mg/kg | | | 8 | 6.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I | 8 | 6.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Barium | mg/kg | 8 | 110 | 8 | 8.86E+01 | 1.16E+01 | 3.0 | 8 | 0 | I | 8 | 8.86E+01 | 1.16E+01 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Beryllium | mg/kg | | | 8 | 1.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I | 8 | 1.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Boron | mg/kg | | | 8 | 1.20E+01 | 0.00E+00 | 3.0 | 8 | 0 | I | 8 | 1.20E+01 | 0.00E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Cadmium | mg/kg | | | 8 | 1.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I | 8 | 1.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Chromium | mg/kg | 8 | 27 | 8 | 2.26E+01 | 3.07E+00 | 3.0 | 8 | 0 | I | 8 | 2.26E+01 | 3.07E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Cobalt | mg/kg | 8 | 12 | 8 | 9.25E+00 | 1.49E+00 | 3.0 | 8 | 0 | I | 8 | 9.25E+00 | 1.49E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Copper | mg/kg | 8 | 15 | 8 | 1.34E+01 | 1.41E+00 | 3.0 | 8 | 0 | I | 8 | 1.34E+01 | 1.41E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Lead | mg/kg | 1 | 6 | 8 | 5.88E+00 | 3.54E-01 | 3.0 | 8 | 0 | I | 8 | 5.88E+00 | 3.54E-01 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Manganese | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-16 | 19.65 | Inorganic | Mercury | mg/kg | | | 8 | 2.00E-01 | 3.98E-09 | 3.0 | 8 | 0 | I | 8 | 2.00E-01 | 3.98E-09 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Molybdenum | mg/kg | | | 8 | 1.20E+01 | 0.00E+00 | 3.0 | 8 | 0 | I | 8 | 1.20E+01 | 0.00E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Nickel | mg/kg | 8 | 18 | 8 | 1.65E+01 | 9.26E-01 | 3.0 | 8 | 0 | I | 8 | 1.65E+01 | 9.26E-01 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Selenium | mg/kg | | | 8 | 6.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I | 8 | 6.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Silver | mg/kg | | | 8 | 1.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I | 8 | 1.00E+00 | 0.00E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Thallium | mg/kg | | | | | | 1.5 | 14 | 14 | I | | | | 1.5 | 14 | 14 | I |
| EU-16 | 19.65 | Inorganic | Vanadium | mg/kg | 8 | 61 | 8 | 4.60E+01 | 9.07E+00 | 3.0 | 8 | 0 | I | 8 | 4.60E+01 | 9.07E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | Inorganic | Zinc | mg/kg | 8 | 75 | 8 | 6.09E+01 | 9.06E+00 | 3.0 | 8 | 0 | I | 8 | 6.09E+01 | 9.06E+00 | 3.0 | 8 | 0 | I |
| EU-16 | 19.65 | PCBs | Aroclor 1242 | mg/kg | | | 8 | 1.19E-01 | 3.54E-03 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | PCBs | Aroclor 1248 | mg/kg | | | 8 | 1.19E-01 | 3.54E-03 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | PCBs | Aroclor 1254 | mg/kg | | | 8 | 1.19E-01 | 3.54E-03 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | PCBs | Aroclor 1260 | mg/kg | | | 8 | 1.19E-01 | 3.54E-03 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | 2-Methylnaphthalene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Acenaphthene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Anthracene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Benzo(a)anthracene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Benzo(a)pyrene | mg/kg | | | | | | 1.5 | 15 | 15 | I | 8 | | | 3.0 | 11 | 3 | I |

## Table I-6. Chemical Risk Data Gap Analysis (2-10 ft. Soil Interval)

| | | | | | | | Risk Data Gap - Residential Scenario | | | | | | | Risk Data Gap - Rural Residential Scenario | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU ID | EU Size (acres) | Chemical Group | Analyte | Result Units | Number of Detects | Maximum Detected Result | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? | Number of Valid Samples (n) | Avg. | Std. Dev. (σ) | Relative Shift (Δ/σ) | Required Number of Samples per EU (N) | Risk Data Gap (No. of Additional Samples Needed) | EU Impacted? |
| EU-16 | 19.65 | SVOC | Benzo(b)fluoranthene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Benzo(k)fluoranthene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | bis(2-Ethylhexyl) phthalate | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Chrysene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Dibenzo(a,h)anthracene | mg/kg | | | | | | 1.5 | 15 | 15 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Diethyl phthalate | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Di-n-butyl phthalate | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Fluoranthene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Fluorene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Indeno(1,2,3-cd)pyrene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Naphthalene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | SVOC | Pyrene | mg/kg | | | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I | 8 | 3.46E-01 | 1.19E-02 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | 1,1,1-Trichloroethane | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | 1,1-Dichloroethane | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | 1,1-Dichloroethene | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Acetone | mg/kg | | | 8 | 5.79E-02 | 1.73E-03 | 3.0 | 11 | 3 | I | 8 | 5.79E-02 | 1.73E-03 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Benzene | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | cis-1,2-Dichloroethene | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Ethylbenzene | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | m,p-Xylenes | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Methyl ethyl ketone | mg/kg | | | 8 | 5.79E-02 | 1.73E-03 | 3.0 | 11 | 3 | I | 8 | 5.79E-02 | 1.73E-03 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Methylene chloride | mg/kg | | | 8 | 2.31E-02 | 6.41E-04 | 3.0 | 11 | 3 | I | 8 | 2.31E-02 | 6.41E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Tetrachloroethene | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Toluene | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | trans-1,2-Dichloroethene | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Trichloroethene | mg/kg | | | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I | 8 | 5.88E-03 | 3.54E-04 | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Vinyl chloride | mg/kg | | | 8 | 1.18E-02 | 4.63E-04 | 3.0 | 11 | 3 | I | 8 | | | 3.0 | 11 | 3 | I |
| EU-16 | 19.65 | VOC | Xylenes, Total | mg/kg | | | | | | 1.5 | 15 | 15 | I | | | | 1.5 | 15 | 15 | I |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| | | | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **1** | **Old Conservation Yard** | Former Rocketdyne Conservation Yard | Unknown Drums | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | Additional characterization samples in yard. | 2 |
| | | Former AI Conservation Yard | Unknown Drums | x | 5 | x | 5 | x | 5 | x | 5 | | 0 | x | 5 | | 0 | | 0 | | 0 | | 0 | Delineation of known contamination. No Previous samples for Dioxin. | 5 |
| | | Former North Slope Storage Area | Unknown material storage and drums | x | 8 | x | 8 | x | 8 | x | 8 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | No previous 2- 10 foot samples. Downslope delineation. | 8 |
| | | Former Container Storage Area | Storage containers adjacent to former fuel operations | x | 5 | x | 5 | | 0 | | 0 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | | Former AST 4731 Earthen Berm | General storage, unknown Drums, petroleum products | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Further Characterization | 1 |
| | | Former AST 4732 Earthen Berm | General storage, unknown Drums, petroleum products | x | 3 | x | 3 | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Inorganic COI > DCGL detected. Delineation. | 3 |
| | | Former Fueling Area at Bldg 4320 | Petroleum Products, PCBs, Metals detected | x | 3 | x | 3 | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation | 3 |
| | | Former SRE Pond Discharge Pipeline | Discharge Water (VOCs, SVOCs, Metals, TPH). Sediment contained Dioxin, PCBs | x | 3 | x | 3 | x | 3 | x | 3 | | 0 | x | 3 | | 0 | | 0 | | 0 | | 0 | Delineation. Dioxin and metals greater than DCGL | 3 |
| | | Former Telephone Pole Storage Area | PAHs, fire-related dioxins | | 0 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of SVOC greater than DCGL. Dioxin likely fire-related. | 3 |
| | | Northern Debris Area | Metal, Asbestos, Unknown Containers, Burned Material | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | Characterization. No previous samples in the area. Note: buried debris. | 4 |
| | | Southern Debris Area | Construction debris, empty Containers, Asbestos, Burned Debris | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | Delineation. | 6 |
| | | North Slope Storage Area A | Metallic Debris, Burned Debris, Unknown Containers | x | 8 | x | 8 | x | 8 | x | 8 | | 0 | x | 8 | | 0 | | 0 | | 0 | | 0 | SVOC COI > DCGL detected at top of slope. | 8 |
| | | North Slope Debris Area B | Metallic Debris, Burned Debris, Unknown Containers | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| | | Southeast Transformer Area | PCBs | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation. Note: Transformers removed. | 2 |
| | | Southwest Transformer Area | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization of Transformer Pole Area | 1 |
| | | Transformer Area 737 | PCBs | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization. No previous samples. | 2 |
| | | Transformer Area in South OCY | PCBs | | 0 | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization. | 3 |
| | | Topographic Low Spot, Downslope Area | Runoff from OCY drainage | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | Delineation of DCGL exceedences. | 4 |
| | **Building B204 Waste Oil Tank** | | Oil, Unknown | x | 7 | x | 7 | x | 7 | x | 7 | | 0 | x | 7 | | 0 | | 0 | | 0 | | 0 | Delineation of DCGL exceedences. | 7 |
| | **Undeveloped Area** | Undeveloped Area | None | | 6 | | 6 | | 6 | | 6 | | 0 | | 6 | | 0 | | 0 | | 0 | | 0 | Fully Characterize Area IV | 6 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **EU1 TOTAL** | | | | | **71** | | **76** | | **68** | | **60** | | **0** | | **47** | | **0** | | **0** | | **0** | | **0** | | **82** |
| **2** | **New Conservation Yard** | New Conservation Yard | Equipment Storage, Metals detected, Metals and Dioxins in drainage pathways. | | 0 | | 4 | | 4 | x | 7 | | 0 | x | 7 | | 0 | | 0 | | 0 | | 0 | Delineation of metals DCGL exceedence in yard. Delineation of dioxin within northern and southern drainage. | 7 |
| | | Ash Pile | Metals, Dioxin | | 0 | x | 2 | x | 2 | x | 2 | | 0 | x | 8 | | 0 | | 0 | | 0 | | 0 | Delineation | 8 |
| | **Undeveloped Area** | Undeveloped Area | None | | 17 | | 17 | | 17 | | 17 | | 0 | | 17 | | 0 | | 0 | | 0 | | 0 | Fully Characterize Area IV | 17 |
| **EU2 TOTAL** | | | | | **17** | | **23** | | **23** | | **26** | | **0** | | **32** | | **0** | | **0** | | **0** | | **0** | | **32** |
| **3** | **Sodium Reactor Experiment (SRE) Complex Area** | Sodium Compound Cleaning Area | Sodium, Oils, PCBs, Metals | x | 3 | x | 3 | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | | UST 27 | Diesel/Fuel Oil | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | UST 71 | Gasoline | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | UST 74 | Diesel | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Confirmation samples | 1 |
| | | SRE Pond Influent Channels | No documented uses | | 1 | | 1 | | 1 | | 1 | | 0 | | 1 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Former Industrial Dry Well | Hexavalent Chromium, Chemicals associated with 4003 Leach Field | x | 0 | | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Will be characterized/delineated with samples associated with B003 Leach Field. | 0 |
| | | SRE Pond | Unknown | x | 10 | x | 10 | x | 10 | x | 10 | | 0 | x | 10 | | 0 | | 0 | | 0 | | 0 | Delineation around pond. | 10 |
| | | SRE Pond Discharge Pipeline | Dioxin | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | Define downstream extent of contamination. | 1 |
| | | Downslope Drainage and Pond Areas | Unknown, Dioxin | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | Define downstream extent of contamination | 2 |
| | | SCE Steam Power Plant | Mercury, Petroleum, Solvents, PCBs, Metals | x | 7 | x | 7 | x | 7 | x | 7 | | 0 | x | 7 | | 0 | | 0 | | 0 | | 0 | No previous characterization (except inorganics) | 7 |
| | | Entire Site AS Storage Area | Equipment Containers | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | No previous characterization of flat areas of the site. Freon detected in soil gas. | 4 |
| | | Building 4003 Leach Field | No documented uses. Dioxin detected. | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | Leach field Removed in 2000. Confirmation samples. Delineation at 2-10 ft. | 4 |
| | | Building 4153 SRE Service Bldg | Sodium, Unknown | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4184 | Lead, Acids, Diesel Fuel | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4505 | Storage of Unknown Materials | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4695 | Sodium | | 0 | | 0 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Transformer Area 4693 | PCBs | | 0 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of PCB DCGL exceedence | 4 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **3** | | Transformer Area Southeast of Building 4003 | PCBs | | 0 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of PCB DCGL exceedence | 4 |
| | | Building 4133 Debris Area | Unknown | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| | | Old Stain (Bldg 003) | Oils, Unknown, PCBs detected | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | Delineation | 2 |
| | **Undeveloped Area** | Undeveloped Area | None | | 5 | | 5 | | 5 | | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Fully Characterize Area IV | 5 |
| **EU3 TOTAL** | | | | | **52** | | **60** | | **56** | | **51** | | **0** | | **31** | | **0** | | **0** | | | | **0** | | **61** |
| **4** | **Building 064 Leach Field** | Leach Field | Unknown, metals, VOCs | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Insufficient samples for characterization. NOTE: 2-10' only | 2 |
| | **DOE Leach fields** | Building 4030 Leach Field | Metals | | 0 | | 0 | | 0 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | | Building 4093 Leach Field | No identified chemical use/unknown. Storage. | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4074 | Metals | | 0 | | 0 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Buildings 4030/4035 | Metals, Diesel Fuel | x | 3 | x | 3 | | 0 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | | Building 4641 | Materials Handling/Solvents/Unknown | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4073 | Unknown/Reactor Building | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4083 | Unknown/Reactor Control Building | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4093 | Unknown/Reactor Building | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4103 | Unknown | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4123 | Radiological, Unknown | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4453 | Radiological, Unknown | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4014 | Sodium Storage | | 0 | | 0 | | 0 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | | Transformer Pole | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Substation Near Building 4641 | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | ASTs in Building 4023 | Unknown | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | **Unaffiliated Areas** | Building 4037 | Solvents, 1,4-Dioxane, Diesel, Hydraulic Oil, Waste Oils, Metals | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | **Hazardous Waste Material Facility** | Building 4133 | Hazardous Waste Treatment Management, Alkali Metals Treatment | x | 18 | x | 18 | x | 18 | x | 18 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 18 |
| | | Debris Piles | Unknown | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **4** | | Possible Soil Pile East of Building 4133 | Unknown | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | | Characterization | 6 |
| | | Building 4654 | Unknown, Radiological | x | 5 | x | 5 | x | 5 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | | Stockpile area | Unknown | x | 5 | x | 5 | x | 5 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | | Sink Holes | Unknown | | 0 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 8 | | 8 | | 0 | | 8 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Fully Characterize Area IV | 8 |
| **EU4 TOTAL** | | | | | **72** | | **76** | | **58** | | **83** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **85** |
| **5** | **Building 4029** | Reactive Metal Storage Yard | Unknown | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | **Southeast Drum Storage Yard** | Drum Storage Area | Unknown | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| | **Building 4005 Coal Gasification Process Development Unit (PDU) and Leach Field** | Coal Storage Area | Solvents, PCBs, Metals, debris (asbestos) | x | 5 | x | 5 | x | 5 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 16 | | 16 | | 0 | | 16 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Fully Characterize Area IV | 16 |
| **EU5 TOTAL** | | | | | **13** | | **13** | | **13** | | **13** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **29** |
| **6** | **Radioactive Materials Handling Facility** | Building 4021 Leach Field | Unknown | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Transformer | PCBs | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4075 Debris Area | Mixed Waste | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4664 Debris Area | Unknown | x | 3 | x | 3 | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | | Building 4563 | Unknown | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4133 Debris Area | Unknown | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Drainage and Catch Basins | Unknown | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Note: could not locate on map | 4 |
| | | Stormwater Discharge Pipe | Unknown | | 0 | x | 1 | x | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Mixed Waste Storage Yard | Unknown | x | 12 | x | 12 | x | 12 | x | 12 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 12 |
| | | Miscellaneous Buildings | Unknown | x | 7 | x | 7 | x | 7 | x | 7 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 7 |
| | | ASTs | Diesel | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4021 | mixed waste | x | 5 | x | 5 | x | 5 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | | Building 4022 | mixed waste | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| 6 | | Building 4663 | Material Storage, Unknown | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | x | 4 | | 0 | Characterization | 4 |
| | | Building 4021 Tank | rinse water/unknown | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Buildings 4075/4563 | mixed waste storage | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | | 0 | | 0 | | 0 | x | 6 | | 0 | Characterization | 6 |
| | | Building 4665 | Unknown. Oxidation Facility Supply Storage | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4664 | Incinerator | | 0 | | 0 | | 0 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Waste Receiving Area | Unknown | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | x | 2 | | 0 | Characterization | 2 |
| | | Building 4688 | Acids, Sodium Cleaning Area | | 0 | | 0 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Oil Sump | Hydrocarbons, PCBs | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4621 | Radioactive Waste Storage | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | x | 4 | | 0 | Characterization | 4 |
| | | Building 4029 Gun Club | Non-radioactive Hazardous Waste Storage | x | 3 | x | 3 | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | **Group 7 Unaffiliated Areas** | Building 4028/4811 | Liquid Metals | x | 8 | x | 8 | | 0 | x | 8 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 8 |
| | | UT-19 | Fuel Oil | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Transformer | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | **DOE Leach fields** | Building 4023 | Metals, SVOC, VOC | x | 2 | x | 4 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| | | Building 4025 Tanks | Unknown | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 2 | Characterization | 2 |
| | **Group 5 Unaffiliated Areas** | Building 4625 | Storage, Unknown | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 2 | Characterization | 2 |
| | **Building 4005 Coal Gasification Process Development Unit (PDU) and Leach field** | Building 4005 | TPH, PCP, Metals Dust, Coal Dust, Coke, Cyanide, Green Liquor, Silica, VOCs, SVOCs | x | 16 | x | 16 | x | 16 | x | 16 | x | 16 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 16 |
| | | Former PDU | Aluminum, Caustics, Solvents, Metals, Green Liquor, SVOC, Asbestos, Freon, Lead Paint, Sodium Hydroxide. | x | 20 | x | 20 | x | 20 | x | 20 | x | 20 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization. | 20 |
| | | Building 4027 | Beryllium, Waste Oil, Contaminated Wastes, Batteries, Paint Wastes, Flammable Wastes, Caustics, and Corrosives | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | x | 6 | | 0 | | 0 | Characterization | 6 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | Building 4032 | Kerosene, PCBs, Lead Paint, Asbestos | x | 5 | x | 5 | | 0 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | 1 sample by each UST on east side + 3 additional | 5 |
| **6** | | Building 4042 | Lithium, Alcohol, Unknown Chemicals | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | x | 4 | x | 4 | | 0 | x | 4 | 2 by former ASTs, 2 additional | 4 |
| | | Building 4049 | Aluminum, Caustics, Solvents, Metals, Green Liquor, SVOC, Asbestos, Freon, Lead Paint, Sodium Hydroxide. | x | 2 | x | 2 | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | x | 2 | Characterization | 2 |
| | | Substations 4705, 4742 | PCBs | | 0 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization. 2 at 4705, 1 at 4742, none at 4727. | 4 |
| | | Bag House Including Catch Basin | Calcium Carbonate, Coal, Coke, Cyanide, Green Liquor, Silica, Chloramines, Hexachlorobenzene, Sodium Carbonate, Molten Salt Carbonate, Chromium, Toluene, Xylene, Aromatic Hydrocarbons, Heavy Metals | x | 6 | x | 6 | `` | 6 | x | 6 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| | **HMSA** | Building 4024 | Unknown, PCBs | x | 5 | x | 5 | x | 5 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | **Undeveloped Area** | Undeveloped Area | None | | 15 | | 15 | | 0 | | 15 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Fully Characterize Area IV | 15 |
| **EU6 TOTAL** | | | | | **168** | | **178** | | **136** | | **180** | | **44** | | **4** | | **4** | | **10** | | **16** | | **10** | | **188** |
| **7** | **Building 4005 Coal Gasification Process Development Unit (PDU) and Leach field** | 17th Street Drainage Area | PCB, calcium carbonate, coal, coke, Cyanide, Green Liquor, Silica, Chloramines, hexachlorobenzene, sodium carbonate, molten salt carbonate, chromium, toluene, xylene, aromatic hydrocarbons, heavy metals | | 0 | x | 21 | x | 21 | x | 21 | x | 21 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 21 |
| | **Boeing Leach Fields** | Building 4011 Leach Field | Solvents, Metals | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation | 6 |
| | | Building 4011 | VOCs, Metals, Hydrocarbons | x | 8 | x | 8 | | 0 | x | 8 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 8 |
| | | Building 4007 | Non-radiological Chemical Storage | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4008 | Chemical and flammable Storage | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 2 | Characterization | 2 |
| | | Building 4171 | X-ray Room, Metals | | 0 | | 0 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4172 | Solvents, Metals | x | 1 | | 0 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4611 | Spray Paints | x | 1 | | 0 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | Transformer 4711 | PCBs | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Transformer Pole | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| 7 | | UST | Fuel/Diesel | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | **Environmental Effects Laboratory** | ASTs | Fuel | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | | EEL Cryo Lab and Test cells | VOCs, Metals, Hydraulic Oil | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization, | 6 |
| | | Hazardous Materials Storage Pad | Solvents, Metals, Oil | x | 5 | x | 5 | | 0 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | | Transformers | PCBs | | 0 | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation, including vertical in the 2-10' zone. | 3 |
| | **Compound A** | Observed Contamination North of Compound A | Dioxin, Metals PCB Contamination | | 0 | x | 10 | x | 10 | x | 10 | | 0 | x | 10 | | 0 | | 0 | | 0 | | 0 | Delineation | 10 |
| | **Undeveloped Area** | Undeveloped Area | None | | 6 | | 6 | | 0 | | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 6 |
| **EU7 TOTAL** | | | | | **41** | | **76** | | **41** | | **70** | | **21** | | **10** | | **0** | | **0** | | **0** | | **2** | | **79** |
| **8** | **Building 4005 Coal Gasification Process Development Unit (PDU) and Leach field** | Building 4006 | Mercury, Tetralin, Gasoline, TPH, Metals, Solvents | x | 8 | x | 8 | | 0 | x | 8 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 8 |
| | | Building 4006 tanks | Gasoline | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 4 |
| | | Building 4026 | Asbestos, Hydrocarbons Ammonia, Deworals Sodium, Downanol, | x | 7 | x | 7 | | 0 | x | 7 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 7 |
| | | Building 4826 | Same as Building 4026 | x | 5 | x | 5 | | 0 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | | Building 4426 | Oil, Paint, Gasoline, Transformer and Capacitor Oil, Hydraulic Oil, Alcohol, Solvents, VOCs, Freon | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4358 | Unknown Chemical Storage | x | 2 | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4402 | Solvents | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4616 | Sodium Nitrate | | 0 | | 0 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4615 | Non-radiological. Combustion Testing Facility | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Substations 4706, 4726 | PCBs | | 0 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation/Characterization. | 4 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | Building 4005/4006 Leach field | TPH, PCP, Metals Dust, Coal Dust, Coke, Cyanide, Green Liquor, Silica, VOCs, SVOCs | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| 8 | **Building 4059 Former SNAP Reactor Facility** | Building 4019 | Sodium, Freon, Mercury, Kerosene, Solvents | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4057 | Metals, Paint, Oil, Downanol | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| | | Building 4360 | Acids, Bases | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4358 | Chemical Storage | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4459 | Flammables, Diesel | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Buildings 4626 | Unknown. Equipment Storage | x | 10 | x | 10 | x | 10 | x | 10 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 10 |
| | | Substation, Transformers 4759,4757,4719 | PCBs | | 0 | x | 8 | x | 8 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 8 |
| | | Between Buildings 4626 and 4757 | Metals | | 0 | | 0 | | 0 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of specific metals (Ag, Se, Be) | 3 |
| | **DOE Leach Fields 2** | Building 4010 Leach Field | Metals, TCE, Hydrazine | x | 6 | | 0 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 6 | Characterization | 6 |
| | | Building 4010 | Metals, TCE, Hydrazine | x | 4 | | 0 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 4 | Characterization | 4 |
| | | Building 4012 | Metals | | 0 | | 0 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4013 | TPH, PCBs, Metals | x | 8 | x | 8 | | 0 | x | 8 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 8 |
| | | Substation 4713 | PCB | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Substation 4708A/4708B | PCB | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Substation 4756 | PCB | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Substation West of 4010 | PCB | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Substation East of 4010 | PCB | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Air Compressor Pad and pipeline | Hydrazine | | 0 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 2 | Characterization | 2 |
| | | AST-T-EMG | Diesel | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | AST-EMGEN | Fuel Oil | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | AST T-LO1 | Oil | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | AST T-CF1 | Hydrazine | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 1 | Characterization | 1 |
| | | AST TCF-2 | Morpholine | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | AST TCF-3 | Sulfuric Acid | | 0 | | 0 | | 0 | x | 1 | | 0 | | | | | | | | 0 | | | Characterization | 1 |
| **8** | | AST EMSTG | Oil | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | **Building 4457 Hazardous Materials Storage Area** | Building 4457 and Sumps | Waste Oils, Acids, Bases, Solvents, Lubricants | x | 9 | x | 9 | | 0 | x | 9 | | 0 | | | | 0 | | 0 | | 0 | | 0 | Characterization | 9 |
| | | Building 4357 | Metals, Propellents | | 0 | | 0 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 2 | Characterization | 2 |
| | | Building 4025 | EDTA, Potassium Permanganate, Sodium Bisulfide, Ferrous Sulfate | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4355 | Acids, Bases, Oils | x | 5 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 5 |
| | | Building 4334 | Ammonia, Lubricants, Oils, Greases | x | 7 | x | 7 | | 0 | x | 7 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 7 |
| | | Building 4226 | Hazardous Materials Storage. Hydrocarbons, Ammonia, Deworals Sodium, SVOCs, TPH, Dowanol | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4361 | Chlorine, Hydrazine, Acids, Bases | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 2 | Characterization | 2 |
| | | Building 4335 | Turbine Generator Room | x | 1 | x | 1 | x | 1 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4656 | Hydrazine, Morpholine, Acids, Bases | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 2 | Characterization | 2 |
| | **Boeing Leach fields** | Building 4735 AST | Fuel | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | delineate inorganic contamination | 3 |
| | | SCTI Pump Station | | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | **Unaffiliated** | Building 4356 Sodium Component Test Installation | Fuel Oil, Hydrazine, Morpholine, Diesel, PCBs, Metals, Sulfuric Acid | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 6 | Characterization | 6 |
| | | Building 4502 Parking Lot | Coal Storage | | 0 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 2 | | 2 | | 0 | | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Full Characterization of Area IV | 2 |
| **EU8 TOTAL** | | | | | **134** | | **146** | | **53** | | **126** | | **2** | | **2** | | **0** | | **0** | | **0** | | **25** | | **174** |
| **9** | **Building 4065 Metals Laboratory Clarifier** | Building 4065 Metals Clarifier | Solvents, Kerosene, Metals, Acids, Bases, Mercury | x | 8 | x | 8 | | 0 | x | 8 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization/Delineation of mercury contamination | 8 |
| | | Building 4065 | Solvents, Kerosene, Metals, Acids, Bases | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4066 | Instrument Repair and Calibration | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| | | | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | Building 4062 | Unknown storage | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Transformer 4762 | PCBs | | 0 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of PCB DCGL exceedence | 4 |
| 9 | | USTs | Fuel Oil | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | **Building 4020 Rockwell International Hot Laboratory and Leach field** | Rockwell International Hot Laboratory-Building 4020 and Leach Field | Solvents, Fuels, SVOCs, Metals | x | 14 | x | 14 | | 0 | x | 14 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 14 |
| | | Metals Contamination - Northeast Corner | Metals | | 0 | | 0 | | 0 | x | 10 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of metals contamination. | 10 |
| | | USTs UT10 and UT11 | Solvents, Petroleum | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Substation 4720 | PCB | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | **DOE Leach Fields 3** | Building 4373 & Leach Field | Propellents, Hydrazine, Solvents, TPH, Metals | x | 9 | x | 9 | | 0 | x | 9 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 9 | | 0 | Characterization | 9 |
| | | Building 4383 & Leach Field | Solvents | x | 8 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 8 |
| | | Building 4055 | Solvents, Metals, Adhesives, Coatings | x | 6 | x | 6 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| | | Building 4374 | Support Building for 4373, Solvents and Metals | x | 5 | | 0 | | 0 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 5 | | 0 | Characterization | 5 |
| | | Substation 4755 | PCBs | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Substation 4883A & 4883B | PCBs | | 0 | x | 3 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | | Substation 4707 | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | **Unaffiliated Areas** | Transformer Pole X14 | PCB | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Transformer 4760 A | PCBs | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Transformer 4760 B | PCBs | | 0 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4662 | Parts Cleaning Pad | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4461 | Oils metals | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | ASTs | Unknown | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Location not found | 2 |
| | | Building 4463 | Solvents, Pump Cleaning | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | Building 4462 | Petroleum Hydrocarbons, Metals | x | 4 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 4 |
| | | USTs | Fuel, Diesel, | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 2 | | 2 | | 0 | | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Full Characterization of Area IV | 2 |
| **EU9 TOTAL** | | | | | **87** | | **90** | | **18** | | **83** | | **0** | | **0** | | **0** | | **0** | | **0** | | **14** | | | | **113** |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **10** | **Building 4100 Trench (Buildings 4462/4463)** | Building 4100 Trench | Burned Debris and Unknown Material | x | 9 | x | 9 | x | 9 | x | 9 | | 0 | x | 9 | | 0 | | 0 | | 0 | | 0 | Delineation N and S of the Trenchs. Also to the east (down slope). | 9 |
| | | Building 4100 | Acids, Bases | x | 7 | x | 7 | | 0 | x | 7 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 7 |
| | | Building 4100 Leach Field | Unknown | x | 6 | x | 6 | x | 6 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 6 |
| | | Substation/Transformer 4709 | PCB | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Hummocky Terrain | Unknown | x | 9 | x | 9 | x | 9 | x | 9 | | 0 | x | 9 | | 0 | | 0 | | 0 | | 0 | Characterization | 9 |
| | **Building 4056 Landfill** | B056 Landfill | Unknown | x | 9 | x | 9 | x | 9 | x | 9 | | 0 | x | 9 | | 0 | | 0 | | 0 | | 0 | Confirm extent | 9 |
| | | Southern Debris Area | Unknown | x | 11 | x | 11 | x | 11 | x | 11 | | 0 | x | 11 | | 0 | | 0 | | 0 | | 0 | Confirm extent | 11 |
| | | Roadside Debris Area | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 056 Excavation Debris Area | Unknown | x | 4 | x | 4 | x | 4 | x | 4 | x | 4 | x | 4 | | 0 | | 0 | | 0 | | 0 | Delineation | 4 |
| | | Building 100 Discharge Area | Dioxin | | 0 | | 0 | x | 3 | | 0 | | 0 | x | 3 | | 0 | | 0 | | 0 | | 0 | Delineation | 3 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 3 | | 3 | | 0 | | 3 | | 0 | | 3 | | 0 | | 0 | | 0 | | 0 | Full Characterization of Area IV | 3 |
| **EU10 TOTAL** | | | | | **58** | | **59** | | **52** | | **58** | | **4** | | **48** | | **0** | | **0** | | **0** | | **0** | | **62** |
| **11** | **Building 4886 Former Sodium Disposal Facility (FSDF)** | Bldg 4886 Concrete Pool Area | Sodium, Solvents, Glycols, SVOCs, Terphenyls, PCB | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | x | 2 | | 0 | Downstream extent of dioxin/PCBs in drainages. | 2 |
| | | Steam Lance | Kerosene, Metals | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation | 1 |
| | | Southern Investigation Area | Perchlorate, Unknown | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | x | 2 | x | 1 | | 0 | | 0 | | 0 | Define eastern extent (extra perchlorate?) | 2 |
| | | Former Drum Debris Area | Unknown, Mercury | x | 3 | x | 3 | x | 3 | x | 3 | | 0 | | 0 | x | 3 | | 0 | | 0 | | 0 | Define extent of exceedence | 3 |
| | | FSDF Pistol Range | Lead | | 0 | | 0 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineate Extent | 4 |
| | **Building 4009 Leach Field** | Leach Field and Septic Tank | Solvents, Kerosene, PCBs, Terphenyls, Sodium, Aluminum, Fluoride, Mercury | x | 2 | x | 2 | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | Septic tank and leach field removed. Confirmation samples below fill to verify removal. | 2 |
| | | Building 4009 | Solvents, Kerosene, PCBs, Terphenyls, Sodium, Aluminum, Fluoride, Mercury | x | 3 | x | 3 | x | 3 | x | 3 | | 0 | x | 3 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | | SGR Liquid Waste Hold-up Tank and Pit | Solvents, Kerosene, PCBs, Terphenyls, Sodium, Aluminum, Fluoride, Mercury | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Vertical delineation | 0 |
| | | OMR Waste Hold-up Tank and Pit | Solvents, Kerosene, PCBs, Terphenyls, Sodium, Aluminum, Fluoride, Mercury | x | 1 | x | 1 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **11** | | UT3 (Tank) | Diesel | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | UST removed with soil. Confirmation sample at depth | 1 |
| | | Transformer Pole | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Solar Concentrator Facility | Acids, NaK | | 0 | | 0 | | 0 | x | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Determine extent of inorganic contamination | 6 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 4 | | 4 | | 0 | | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Full Characterization of Area IV | 4 |
| **EU11 TOTAL** | | | | | **19** | | **20** | | **14** | | **29** | | **0** | | **7** | | **4** | | 0 | | **2** | | **0** | | **30** |
| **12** | **Area IV Pond Dredge Area** | Pond Dredge | Unknown | x | 13 | x | 13 | x | 13 | x | 13 | x | 13 | x | 13 | x | 13 | x | 13 | x | 13 | x | 13 | Delineate contamination/characterize pond | 13 |
| | **DOE Leach Fields 3** | Building 4363 & Leach Field | Metals, Solvents, Naphthalene | x | 10 | x | 10 | | 0 | x | 10 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 10 |
| | | Building 4173 | Sodium Storage | | 0 | | 0 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Have not located buildings | 2 |
| | | USTs | Fuel Oil | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Substation 4853 | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | Building 4473 | Hydraulic testing, oils | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4854 | Fuel gauge testing/unknown | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4863 | Hydraulic testing, oils | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Building 4873 | Hydraulic test lab, oils | x | 2 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 2 |
| | | Buildings 4375, 4874, 4875 | Unknown, Drum Storage, | x | 3 | x | 3 | | 0 | x | 3 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 3 |
| | | Building 4353 & Leach Field | Explosives, metals | | 0 | | 0 | | 0 | x | 7 | | 0 | | 0 | | 0 | x | 7 | | 0 | | 0 | Characterize soil at depth in Leach Field | 7 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 6 | | 6 | | 0 | | 6 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Full Characterization of Area IV | 6 |
| **EU12 TOTAL** | | | | | **41** | | **42** | | **14** | | **43** | | **13** | | **13** | | **13** | | **20** | | **13** | | **13** | | **51** |
| **13** | **Empire State Atomic Development Authority (ESADA)** | Former ESADA Storage Yard | Solvents, SVOCs, Dowanol, hydrocarbons, PCBs, Sodium, Metals | x | 8 | x | 8 | x | 8 | x | 8 | | | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of extent | 8 |
| | | Process Development Unit AST Area | Green Liquor | | 0 | x | 5 | | 0 | x | 5 | x | 5 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of extent | 5 |
| | | ESADA Pistol range | Lead | | 0 | | 0 | | 0 | x | 4 | | | | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of extent | 4 |
| | | Transformer Pole X35 | PCBs | | 0 | | 0 | x | 0 | | 0 | | | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 0 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 13 | | 13 | | 0 | | 13 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Full Characterization of Area IV | 13 |
| **EU13 TOTAL** | | | | | **21** | | **26** | | **8** | | **30** | | **5** | | **0** | | **0** | | **0** | | **0** | | **0** | | **30** |

**Table I-7**
**Samples Required for Characterization and Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **14** | **None** | None | None | | 15 | | 15 | | 15 | | 15 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 15 |
| **EU14 TOTAL** | | | | | **15** | | **15** | | **15** | | **15** | | **0** | | **0** | | **0** | | **0** | | | | **0** | | **15** |
| **15** | **Unaffiliated Areas** | Building 4865 | Unknown | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 14 |
| | **Undeveloped Areas** | None | None | | 14 | | 14 | | 0 | | 14 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Full Characterization of Area IV | 14 |
| **EU15 TOTAL** | | | | | **14** | | **14** | | **0** | | **14** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **14** |
| **16** | **None** | None | None | | 15 | | 15 | | 15 | | 15 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 15 |
| **EU16 TOTAL** | | | | | **15** | | **15** | | **15** | | **15** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **15** |
| **TOTAL** | | | | | **838** | | **929** | | **584** | | **896** | | **89** | | **194** | | **21** | | **30** | | **31** | | **64** | **TOTAL SAMPLING LOCATIONS** | **1060** |

**Notes: Unless otherwise noted, all samples to be collected at two depths: 0-2' and 2-10'**

**TOTAL SAMPLES** **2120**

[1] SWMU/AOC and Chemical Use Areas were identified through the RFA and RFI programs performed by others (SAIC1994, MWH 2007, CH2M HILL 2008).

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **1** | **Old Conservation Yard** | Former Rocketdyne Conservation Yard | Unknown Drums | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Former AI Conservation Yard | Unknown Drums | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Former North Slope Storage Area | Unknown material storage and drums | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Former Container Storage Area | Storage containers adjacent to former fuel operations | x | 0 | x | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Former AST 4731 Earthen Berm | General storage, unknown Drums, petroleum products | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Former AST 4732 Earthen Berm | General storage, unknown Drums, petroleum products | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Former Fueling Area at Bldg 4320 | Petroleum Products, PCBs, Metals detected | x | 0 | x | 2 | x | 2 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Vertical delineation SVOC, and PCB DCGL exceedence. | 2 |
| | | Former SRE Pond Discharge Pipeline | Discharge Water (VOCs, SVOCs, Metals, TPH). Sediment contained Dioxin, PCBs | x | 0 | x | 0 | x | 0 | x | 2 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Vertical delineation of metals DCGL exceedence | 2 |
| | | Former Telephone Pole Storage Area | PAHs, fire-related dioxins | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Northern Debris Area | Metal, Asbestos, Unknown Containers, Burned Material | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | Vertical delineation of dioxin DCGL exceedence. | 2 |
| | | Southern Debris Area | Construction debris, empty Containers, Asbestos, Burned Debris | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | North Slope Storage Area A | Metallic Debris, Burned Debris, Unknown Containers | x | 0 | x | 2 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | SVOC COI >DCGL detected at top of slope. | 2 |
| | | North Slope Debris Area B | Metallic Debris, Burned Debris, Unknown Containers | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Southeast Transformer Area | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Southwest Transformer Area | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer Area 737 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer Area in South OCY | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Topographic Low Spot, Downslope Area | Runoff from OCY drainage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Delineation of known exceedence of metals DCGL | 0 |
| | **Building B204 Waste Oil Tank** | | Oil, Unknown | x | 0 | x | 4 | x | 4 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Vertical delineation of PCB and SVOC DCGL exceedence. | 4 |
| | **Undeveloped Area** | | Unknown | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU1 TOTAL** | | | | | **0** | | **8** | | **6** | | **2** | | **0** | | **2** | | **0** | | **0** | | **0** | | **0** | | **12** |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| | | | | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Comments | Number of Sampling Locations |
| **2** | **New Conservation Yard** | New Conservation Yard | Equipment Storage, Metals detected, Metals and Dioxins in drainage pathways. | | 0 | | 0 | | | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Ash Pile | Metals, Dioxin | | 0 | x | 0 | x | | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | | Unknown | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU2 TOTAL** | | | | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** |
| **3** | **Sodium Reactor Experiment (SRE)** | Sodium Compound Cleaning Area | Sodium, Oils, PCBs, Metals | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | UST 27 | Diesel/Fuel Oil | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Confirmation sampling. | 1 |
| | | UST 71 | Gasoline | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | | UST 74 | Diesel | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Confirmation sampling. | 1 |
| | | SRE Pond Influent Channels | No documented uses | | 0 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineate vertical extent of metals and SVOC DCGL exceedence. | 2 |
| | | Former Industrial Dry Well | Hexavalent Chromium, Chemicals associated with 4003 Leach Field | x | 0 | | 0 | x | 0 | x | 1 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Shallow bedrock; collect bedrock sample | 1 |
| | | SRE Pond | Unknown | x | 1 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Vertical extent of VOCs in west end of pond. | 1 |
| | | SRE Pond Discharge Pipeline | Dioxin | x | 0 | x | 2 | x | 0 | x | 2 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Vertical extent of dioxin, metals and SVOCs in drainage ditch. | 2 |
| | | Downslope Drainage and Pond Areas | Unknown, Dioxin | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | SCE Steam Power Plant | Mercury, Petroleum, Solvents, PCBs, Metals | x | 0 | x | 0 | x | 0 | x | 1 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Delineate vertical extent of inorganic DCGL exceedence at Cooling Tower. | 1 |
| | | Entire Site AS Storage Area | Equipment Containers | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4003 Leach Field | No documented uses. Dioxin detected. | x | 0 | x | 2 | x | 0 | x | 2 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 2 |
| | | Building 4153 SRE Service Bldg | Sodium, Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4184 | Lead, Acids, Diesel Fuel | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4505 | Storage of Unknown Materials | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4695 | Sodium | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **3** | | Transformer Area 4693 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| | | | | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Comments | Number of Sampling Locations |
| | | Transformer Area Southeast of Building 4003 | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineate vertical extent of PCB DCGL exceedence. | 1 |
| | | Building 4133 Debris Area | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Old Stain (Bldg 003) | Oils, Unknown, PCBs detected | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | | Unknown | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU3 TOTAL** | | | | | **4** | | **10** | | **1** | | **8** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **13** |
| **4** | **Building 064 Leach Field** | Leach Field | Unknown, metals, VOCs | x | 2 | x | 2 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Insufficient samples for characterization | 2 |
| | **DOE Leach fields** | Building 4030 Leach Field | Metals | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4093 Leach Field | No identified chemical use/unknown. Storage. | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4074 | Metals | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Buildings 4030/4035 | Metals, Diesel Fuel | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4641 | Materials Handling/Solvents/Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4073 | Unknown/Reactor Building | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4083 | Unknown/Reactor Control Building | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4093 | Unknown/Reactor Building | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4103 | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4123 | Radiological, Unknown | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4453 | Radiological, Unknown | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4014 | Sodium Storage | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer Pole | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation Near Building 4641 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | ASTs in Building 4023 | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Unaffiliated Areas** | Building 4037 | Solvents, 1,4-Dioxane, Diesel, Hydraulic Oil, Waste Oils, Metals | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Hazardous Waste Material Facility** | Building 4133 | Hazardous Waste Treatment Management. Alkali Metals Treatment. | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **4** | | Debris Piles | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | Possible Soil Pile East of Building 4133 | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | | | 0 |
| | | Building 4654 | Unknown, Radiological | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Stockpile area | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Sink Holes | Unknown | | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU4 TOTAL** | | | | | **2** | | **2** | | **0** | | **2** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **2** |
| **5** | **Building 4029** | Reactive Metal Storage Yard | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Southeast Drum Storage Yard** | Drum Storage Area | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Building 4005 Coal Gasification Process Development Unit (PDU) and Leach Field** | Coal Storage Area | Solvents, PCBs, Metals, debris (asbestos) | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU5 TOTAL** | | | | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** |
| **6** | **Radioactive Materials Handling Facility** | Building 4021 Leach Field | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4075 Debris Area | Mixed Waste | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4664 Debris Area | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4563 | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4133 Debris Area | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Drainage and Catch Basins | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Stormwater Discharge Pipe | Unknown | | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Mixed Waste Storage Yard | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Miscellaneous Buildings | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | ASTs | Diesel | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4021 | mixed waste | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **6** | | Building 4022 | mixed waste | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4663 | Material Storage, Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| | | | | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Comments | Number of Sampling Locations |
| | | Building 4021 Tank | rinse water/unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Buildings 4075/4563 | mixed waste storage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 |
| | | Building 4665 | Unknown. Oxidation Facility Supply Storage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4664 | Incinerator | | 0 | | 0 | | 0 | x | 0 | | 0 | x | | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Waste Receiving Area | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 |
| | | Building 4688 | Acids, Sodium Cleaning Area | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Oil Sump | Hydrocarbons, PCBs | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4621 | Radioactive Waste Storage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 |
| | | Building 4029 Gun Club | Non-radioactive Hazardous Waste Storage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Group 7 Unaffiliated Areas** | Building 4028/4811 | Liquid Metals | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | UT-19 | Fuel Oil | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **DOE Leach fields** | Building 4023 | Metals, SVOC, VOC | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4025 Tanks | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | **Group 5 Unaffiliated Areas** | Building 4625 | Storage, Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | **Building 4005 Coal Gasification Process Development Unit (PDU) and Leach field** | Building 4005 | TPH, PCP, Metals Dust, Coal Dust, Coke, Cyanide, Green Liquor, Silica, VOCs, SVOCs | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Former PDU | Aluminum, Caustics, Solvents, Metals, Green Liquor, SVOC, Asbestos, Freon, Lead Paint, Sodium Hydroxide. | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **6** | | Building 4027 | Beryllium, Waste Oil, Contaminated Wastes, Batteries, Paint Wastes, Flammable Wastes, Caustics, and Corrosives | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | x | | | 0 | | 0 | | 0 | | 0 |
| | | Building 4032 | Kerosene, PCBs, Lead Paint, Asbestos | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | Building 4042 | Lithium, Alcohol, Unknown Chemicals | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | x | | x | | | 0 | x | 0 | | 0 |
| | | Building 4049 | Aluminum, Caustics, Solvents, Metals, Green Liquor, SVOC, Asbestos, Freon, Lead Paint, Sodium Hydroxide. | x | 0 | x | 0 | | 0 | x | 0 | x | 0 | | 0 | | 0 | | | | 0 | x | 0 | | 0 |
| | | Substations 4705, 4742 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Bag House Including Catch Basin | Calcium Carbonate, Coal, Coke, Cyanide, Green Liquor, Silica, Chloramines, Hexachlorobenezene, Sodium Carbonate, Molten Salt Carbonate, Chromium, Toluene, Xylene, Aromatic Hydrocarbons, Heavy Metals | x | 0 | x | 0 | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **HMSA** | Building 4024 | Unknown, PCBs | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | Undeveloped Area | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU6 TOTAL** | | | | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** |
| **7** | **Building 4005 Coal Gasification Process Development Unit (PDU) and Leach field** | 17th Street Drainage Area | PCB, calcium carbonate, coal, coke, Cyanide, Green Liquor, Silica, Chloramines, hexachlorobenezene, sodium carbonate, molten salt carbonate, chromium, toluene, xylene, aromatic hydrocarbons, heavy metals | | 0 | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Boeing Leach Fields** | Building 4011 Leach Field | Solvents, Metals | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4011 | VOCs, Metals, Hydrocarbons | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4007 | Non-radiological Chemical Storage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4008 | Chemical and flammable Storage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | | | 0 |
| **7** | | Building 4171 | X-ray Room, Metals | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4172 | Solvents, Metals | x | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4611 | Spray Paints | x | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer 4711 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer Pole | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | UST | Fuel/Diesel | x | 1 | x | 1 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Characterization | 1 |
| | **Environmental Effects Laboratory** | ASTs | Fuel | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | EEL Cryo Lab and Test cells | VOCs, Metals, Hydraulic Oil | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Hazardous Materials Storage Pad | Solvents, Metals, Oil | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformers | PCBs | | 0 | x | 1 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 1 |
| | **Compound A** | Observed Contamination North of Compound A | Dioxin, Metals PCB Contamination | | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | Undeveloped Area | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU7 TOTAL** | | | | | **1** | | **2** | | **1** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **2** |
| **8** | **Building 4005 Coal Gasification Process Development Unit (PDU) and Leach field** | Building 4006 | Mercury, Tetralin, Gasoline, TPH, Metals, Solvents | x | 0 | x | 0 | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4006 tanks | Gasoline | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4026 | Asbestos, Hydrocarbons Ammonia, Deworals Sodium, Downanol, | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4826 | Same as Building 4026 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4426 | Oil, Paint, Gasoline, Transformer and Capacitor Oil, Hydraulic Oil, Alcohol, Solvents, VOCs, Freon | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4358 | Unknown Chemical Storage | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4402 | Solvents | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **8** | | Building 4616 | Sodium Nitrate | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4615 | Non-radiological. Combustion Testing Facility | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substations 4706, 4726 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4005/4006 Leach field | TPH, PCP, Metals Dust, Coal Dust, Coke, Cyanide, Green Liquor, Silica, VOCs, SVOCs | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| | | | | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Comments | Number of Sampling Locations |
| | **Building 4059 Former SNAP Reactor Facility** | Building 4019 | Sodium, Freon, Mercury, Kerosene, Solvents | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4057 | Metals, Paint, Oil, Downanol | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4360 | Acids, Bases | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4358 | Chemical Storage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4459 | Flammables, Diesel | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Buildings 4626 | Unknown. Equipment Storage | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation, Transformers 4759,4757,4719 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Between Buildings 4626 and 4757 | Metals | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **DOE Leach Fields 2** | Building 4010 Leach Field | Metals, TCE, Hydrazine | x | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | | Building 4010 | Metals, TCE, Hydrazine | x | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | | Building 4012 | Metals | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4013 | TPH, PCBs, Metals | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation 4713 | PCB | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation 4708A/4708B | PCB | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation 4756 | PCB | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation West of 4010 | PCB | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation East of 4010 | PCB | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Air Compressor Pad and pipeline | Hydrazine | | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | | AST-T-EMG | Diesel | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | AST-EMGEN | Fuel Oil | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **8** | | AST T-LO1 | Oil | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | AST T-CF1 | Hydrazine | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | | AST TCF-2 | Morpholine | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | AST TCF-3 | Sulfuric Acid | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | | | | | 0 | | 0 | | 0 |
| | | AST EMSTG | Oil | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | **Building 4457 Hazardous Materials Storage Area** | Building 4457 and Sumps | Waste Oils, Acids, Bases, Solvents, Lubricants | x | 0 | x | 0 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Vertical delineation of metal DCGL exceedence | 4 |
| | | Building 4357 | Metals, Propellents | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | | Building 4025 | EDTA, Potassium Permanganate, Sodium Bisulfide, Ferrous Sulfate | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4355 | Acids, Bases, Oils | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4334 | Ammonia, Lubricants, Oils, Greases | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4226 | Hazardous Materials Storage. Hydrocarbons, Ammonia, Deworals Sodium, SVOCs, TPH, Dowanol | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4361 | Chlorine, Hydrazine, Acids, Bases | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | | Building 4335 | Turbine Generator Room | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4656 | Hydrazine, Morpholine, Acids, Bases | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | **Boeing Leach fields** | Building 4735 AST | Fuel | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | SCTI Pump Station | | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Unaffiliated** | Building 4356 Sodium Component Test Installation | Fuel Oil, Hydrazine, Morpholine, Diesel, PCBs, Metals, Sulfuric Acid | x | 0 | x | 0 | x | | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | | Building 4502 Parking Lot | Coal Storage | | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU8 TOTAL** | | | | | **0** | | **0** | | **0** | | **4** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **4** |
| **9** | **Building 4065 Metals Laboratory Clarifier** | Building 4065 Metals Clarifier | Solvents, Kerosene, Metals, Acids, Bases, Mercury | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4065 | Solvents, Kerosene, Metals, Acids, Bases | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4066 | Instrument Repair and Calibration | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4062 | Unknown storage | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer 4762 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | USTs | Fuel Oil | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | **Building 4020 Rockwell International Hot Laboratory and Leach field** | Rockwell International Hot Laboratory-Building 4020 and Leach Field | Solvents, Fuels, SVOCs, Metals | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Metals Contamination - Northeast Corner | Metals | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | USTs UT10 and UT11 | Solvents, Petroleum | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation 4720 | PCB | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **DOE Leach Fields 3** | Building 4373 & Leach Field | Propellents, Hydrazine, Solvents, TPH, Metals | x | 0 | x | 0 | | 0 | x | 2 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | Delineate vertical extent of metals DCGL exceedence in leach field. | 2 |
| | | Building 4383 & Leach Field | Solvents | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4055 | Solvents, Metals, Adhesives, Coatings | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4374 | Support Building for 4373, Solvents and Metals | x | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 |
| | | Substation 4755 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation 4883A & 4883B | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation 4707 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Unaffiliated Areas** | Transformer Pole X14 | PCB | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer 4760 A | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Transformer 4760 B | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4662 | Parts Cleaning Pad | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4461 | Oils metals | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | ASTs | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4463 | Solvents, Pump Cleaning | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **9** | | Building 4462 | Petroleum Hydrocarbons, Metals | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | USTs | Fuel, Diesel, | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineate vertical extent of metals and VOC DCGL exceedence. | 1 |
| | **Undeveloped Areas** | Undeveloped Areas | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU9 TOTAL** | | | | | **1** | | **1** | | **0** | | **3** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **3** |
| **10** | **Building 4100 Trench (Buildings 4462/4463)** | Building 4100 Trench | Burned Debris and Unknown Material | x | 0 | x | 4 | x | 0 | x | 4 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | Confirm vertical extent of dioxin, metal and SVOC DCGL exceedence. | 4 |
| | | Building 4100 | Acids, Bases | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | | Building 4100 Leach Field | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation/Transformer 4709 | PCB | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Hummocky Terrain | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Building 4056 Landfill** | B056 Landfill | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Southern Debris Area | Unknown | x | 0 | x | 0 | x | 0 | x | 3 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Delineate vertical extent of metals DCGL exceedence. | 3 |
| | | Roadside Debris Area | Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 056 Excavation Debris Area | Unknown | x | 0 | x | 3 | x | 3 | x | 0 | x | | x | 0 | | 0 | | 0 | | 0 | | 0 | delineate vertical extent of SVOC and PCB DCGL exceedence. | 3 |
| | | Building 100 Discharge Area | Dioxin | | 0 | | 0 | x | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Areas** | Undeveloped Areas | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU10 TOTAL** | | | | | **0** | | **7** | | **3** | | **7** | | **0** | | **4** | | **0** | | **0** | | **0** | | **0** | | **10** |
| **11** | **Building 4886 Former Sodium Disposal Facility (FSDF)** | Bldg 4886 Concrete Pool Area | Sodium, Solvents, Glycols, SVOCs, Terphenyls, PCB | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 |
| | | Steam Lance | Kerosene, Metals | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Southern Investigation Area | Perchlorate, Unknown | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Former Drum Debris Area | Unknown, Mercury | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 |
| | | FSDF Pistol Range | Lead | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Building 4009 Leach Field** | Leach Field and Septic Tank | Solvents, Kerosene, PCBs, Terphenyls, Sodium, Aluminum, Fluoride, Mercury | x | 0 | x | 0 | x | 0 | x | 2 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | Delineate vertical extent of metals DCGL exceedence. | 2 |
| | | Building 4009 | Solvents, Kerosene, PCBs, Terphenyls, Sodium, Aluminum, Fluoride, Mercury | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **11** | | SGR Liquid Waste Hold-up Tank and Pit | Solvents, Kerosene, PCBs, Terphenyls, Sodium, Aluminum, Fluoride, Mercury | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | OMR Waste Hold-up Tank and Pit | Solvents, Kerosene, PCBs, Terphenyls, Sodium, Aluminum, Fluoride, Mercury | x | 0 | x | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | UT3 (Tank) | Diesel | x | 0 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Confirmation sampling. | 1 |
| | | Transformer Pole | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Solar Concentrator Facility | Acids, NaK | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| | **Undeveloped Area** | Undeveloped Areas | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU11 TOTAL** | | | | | **0** | | **1** | | **0** | | **3** | | **0** | | **0** | | **0** | | 0 | | **0** | | **0** | | **3** |
| **12** | **Area IV Pond Dredge Area** | Pond Dredge | Unknown | x | 0 | x | 0 | x | 0 | x | 3 | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | Vertical delineation of metals DCGL exceedence. | 3 |
| | **DOE Leach Fields 3** | Building 4363 & Leach Field | Metals, Solvents, Naphthalene | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4173 | Sodium Storage | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | USTs | Fuel Oil | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Substation 4853 | PCBs | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4473 | Hydraulic testing, oils | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4854 | Fuel gauge testing/unknown | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4863 | Hydraulic testing, oils | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4873 | Hydraulic test lab, oils | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Buildings 4375, 4874, 4875 | Unknown, Drum Storage, | x | 0 | x | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Building 4353 & Leach Field | Explosives, metals | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU12 TOTAL** | | | | | **0** | | **0** | | **0** | | **3** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **3** |

**Table I-8**
**Samples Required for Characterization and Vertical Delineation of Chemical Use Areas**

| Data Gaps Analysis EU | SWMU/AOC/RFI Site [1] | Chemical Use Area [1] | Potential/Reported Chemical Use or Release | VOCs | | SVOCs | | PCBs | | Metals | | Cyanide | | Dioxin | | Perchlorate | | Energetics | | Terphenyls | | Hydrazine/ Propellents | | Comments | Number of Sampling Locations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | Use Indicated | Required Samples | | |
| **13** | **Empire State Atomic Development Authority (ESADA)** | Former ESADA Storage Yard | Solvents, SVOCs, Dowanol, hydrocarbons, PCBs, Sodium, Metals | x | 0 | x | 0 | x | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineate vertical extent of metals DCGL exceedence. | 4 |
| | | Process Development Unit AST Area | Green Liquor | | 0 | x | 0 | | 0 | x | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | ESADA Pistol range | Lead | | 0 | | 0 | | 0 | x | 4 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | Delineate vertical extent of metals DCGL exceedence. | 4 |
| | | Transformer Pole X35 | PCBs | | 0 | | 0 | x | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | **Undeveloped Area** | Undeveloped Areas | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU13 TOTAL** | | | | | **0** | | **0** | | **0** | | **8** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **8** |
| **14** | **None** | None | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU14 TOTAL** | | | | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** |
| **15** | **Unaffiliated Areas** | Building 4865 | Unknown | x | 1 | x | 1 | | 0 | x | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 1 |
| | **Undeveloped Areas** | None | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU15 TOTAL** | | | | | **1** | | **1** | | **0** | | **1** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **1** |
| **16** | **None** | None | None | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **EU16 TOTAL** | | | | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** |
| **TOTAL** | | | | | **9** | | **32** | | **11** | | **41** | | **0** | | **6** | | **0** | | **0** | | **0** | | **0** | **TOTAL SAMPLING LOCATIONS** | **61** |

[1] SWMU/AOC and Chemical Use Areas were identified through the RFA and RFI programs performed by others (SAIC1994, MWH 2007, CH2M HILL 2008).

# Attachment A

# Working Draft RFI Program Groups 5 and 7 Sampling Location Maps

# Attachment A
# Working Draft RFI Program Groups 5 and 7 Sampling Location Maps

This Attachment contains Working Drafts of Sampling Location Maps for the RCRA Facility Investigation (RFI) Program for Groups 5 and 7. These maps were prepared by CH2M Hill (Group 5) and Montgomery Watson Harza (Group 7) for use in that regulatory program. The maps are provided in this Data Gaps Report for informational purposes and to show the distribution of sampling points currently being collected under the RFI program. The RFI collection and analysis program is on-going and data generated from this program may fill some of the data gaps identified in the EIS Data Gaps Analysis. However, the data gap is not considered to be filled until the suitability of these data for the objectives identified in this data gaps report can be verified.

1784000 1785000 1786000

268000 267000 266000 265000 264000

RFI Group 7
RFI Group 8
RFI Group 6
RFI Group 9
RFI Group 5

SRE
HWMF
RMHF
DOE LF 2
HMSA
SNAP
Building 56 Landfil
PDU
DOE LF 1
B29
SE Drum
B100
FSDF
RIHL
DOE LF 3
Boeing LF
EEL
ECL
STP Pond
Compound A
CDFF
ESADA
Pond Dredge
STL-IV
R-2 Ponds

Concrete Pad

## EXPLANATION

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- RFI Group Boundary
- Leachfield
- Roads - Dirt
- Road - Asphalt
- Rocks

## 2008 Sample Locations

- 2008 Sample Locations

WORKING DRAFT

Basemap (05/19/2008)
RFI GROUP 5

0 120 240 480 Feet

\\pathfile2\Drawing\38207\MapFiles\RI_05\MapFiles\RI_GroupSampleLocations\RFIGroup5_GPSandPreviousSamp.mxd 05/19/08

## Base Map Legend

- Administrative Area Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop
- Excavation
- Trenches

## Figure Legend

- RFI Soil (SM) Sample
- RFI Vapor & Soil (SV/SM) Sample
- Closure Plan Samples - Accessible
- Not Collected Due to Shallow Refusal
- RFI Vapor (SV) Sample
- RMHF RFI Site Boundary
- RCRA Permitted Units
- Flammable Storage Unit
- Temporary Storage Bin

## Chemical Use Areas

- Multiple Use
- Solvent
- Petroleum
- Oils / PCBs
- Metal
- Perchlorate
- Hydrazine
- Debris
- Leach Field
- Potential

**DRAFT**

*Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information*

Additional samples to be collected within former debris area and down slope in drainage (locations to be determined)

Additional sample(s) to be collected within footprint of Building 4028 (locations to be determined)

Additional sample to be collected within footprint of Building 4811

Figure Notes:

(a) Accessible proposed closure plan samples were collected during the implementation of this RFI work plan since the data will be used for RFI assessment. Additional sampling at these (or other) locations may be necessary following review of analytical data.

(b) Inaccessible proposed closure plan samples were NOT collected during implementation of Group 7 Sampling and Analysis Plan since they could not be obtained at that time. Following implementation of the approved closure plan, data from these locations will be assessed for the RFI.

(c) T-1, T-2, T-3, T-4, T-5, T-6, RMDF Evaporation Tank, Air Receiver Tank, Building 4021 Sump Tank (UT-16), UT-14, and UT-15 have been removed.

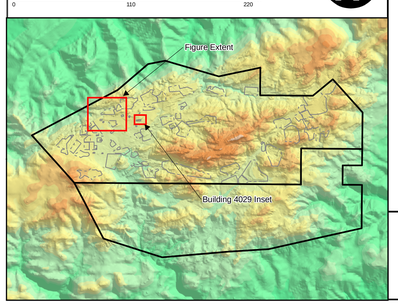
(d.) Chemical Use Area designations and site feature locations will be updated upon additional data and historical document review, as necessary.

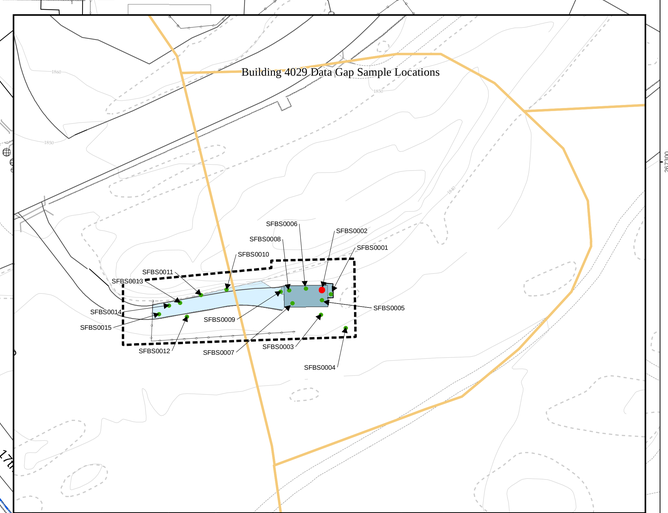
(e.) All locations shown on this figure were sampled from April 16th, 2008 to May 7th, 2008 in support of the Group 7 RFI Area data gap sampling.

Document: Group7-Sampling.mxd Date: May 27, 2008

1 inch equals 55 feet

0 110 220 Feet




# Santa Susana Field Laboratory

**2008 Group 7 Reporting Area**
**Data Gap Sampling Locations**
**Santa Susana Field Laboratory**

MWH