

Pacific Gas and Electric Company

**APPENDIX A O C 14
POST- SOIL NON-TIME CRITICAL
REMOVAL ACTION HUMAN HEALTH
AND ECOLOGICAL RISK
ASSESSMENT FOR A O C 14
EXPOSURE AREA**

Topock Compressor Station
Needles, California

May 2026

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ACRONYMS AND ABBREVIATIONS

2019 HHERA	2019 Soil Human Health and Ecological Risk Assessment Report
4,4-DDE	4,4-dichlorodiphenyldichloroethylene
4,4-DDT	4,4-dichlorodiphenyltrichloroethane
AOC	Area of Concern
Arcadis	Arcadis U.S., Inc.
BAF	bioaccumulation factor
BCW	Bat Cave Wash
bgs	below ground surface
BTAG	Biological Technical Assistance Group
COPC	constituent of potential concern
COPEC	constituent of potential ecological concern
DOI	U.S. Department of the Interior
DTSC	Department of Toxic Substances Control (California)
EC	exposure concentration
EPC	exposure point concentration
ERA	ecological risk assessment
HHERA	human health and ecological risk assessment
HHRA	human health risk assessment
HI	hazard index
HMW	high molecular weight
HQ	hazard quotient
I-40	Interstate 40
ILCR	incremental lifetime cancer risk
LMW	low molecular weight
LOAEL	lowest-observed adverse effects level
LOE	line of evidence
Main report	Post-Soil Non-Time Critical Removal Action Human Health and Ecological Risk Assessment Report
NA	not applicable
NOAEL	no-observed adverse effects level

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NTCRA	non-time-critical removal action
OHV	off-highway vehicle
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
RAWP	Human Health and Ecological Risk Assessment Work Plan
RBRG	risk-based remedial goal
site	Pacific Gas and Electric Company Topock Compressor Station site
SUF	site use factor
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TAA	target action area
TCS	Topock Compressor Station
Technical Memo	Soil Risk Assessment Addendum: Proposed Approach to Update the Human Health and Ecological Risk Assessment after Completion of the 2023 Non-Time-Critical Removal Action
TEQ	toxicity equivalent
TPH	total petroleum hydrocarbon
TRV	toxicity reference value
UA	undesignated area
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WOE	weight of evidence

1 INTRODUCTION

This appendix presents the human health and ecological risk assessment (HHERA) for the Area of Concern (AOC) 14 soil potential exposure area located outside the Topock Compressor Station (TCS) in Needles, California. The risk characterization presented herein evaluates current conditions in AOC 14 following completion of the non-time-critical removal action (NTCRA) completed in 2023 and 2024. Consistent with the approach for the Post-NTCRA HHERA detailed in the January 30, 2024 Technical Memo (Arcadis U.S., Inc. [Arcadis] 2024) to U.S. Department of the Interior (DOI) and Department of Toxic Substances Control (California) (DTSC), the updated risk characterization is presented only for risk-driving receptors.

The AOC14 potential exposure area, shown on Figure AOC14-1.1, is approximately 2.9 acres in total. Table AOC14-1.1 of this HHERA presents historical sample locations evaluated in the 2019 Soil Human Health and Ecological Risk Assessment Report (2019 HHERA; Arcadis 2019) as well as recent samples collected in 2023 and 2024 as part of a NTCRA as described below.

The 2019 HHERA (Arcadis 2019) did not identify potential risk to human or ecological receptors within the AOC14 potential exposure area. However, the NTCRA targeted soil removal in areas where metals (i.e., total chromium, hexavalent chromium, copper, lead, mercury, and zinc) and dioxin toxicity equivalent (TEQ) exceeded removal action goals (RAGs; (Jacobs 2025)). The NTCRA soil removal areas in AOC14 and current in-place sample locations (i.e., historical and NTCRA confirmation samples remaining in place) are shown on Figure AOC14-1.2.

Available soil data from the AOC14 potential exposure area remaining in place after completion of the NTCRA were used to conduct a quantitative forward HHERA as presented herein to update the risk characterization presented in the 2019 HHERA (Arcadis 2019). Details of the NTCRA are presented in Section 2.2.3 of the Post-NTCRA HHERA Report (the “main report”). A summary of the updated human health risk assessment (HHRA) and the ecological risk assessment (ERA) results are presented in Sections 5 and 6, respectively, of the main report. This HHERA refers to “HHRA” when discussing specific information for assessing risks to human health, “ERA” when discussing specific information for assessing risks to ecological receptors, and “HHERA” when discussing topics that are common to both the HHRA and the ERA.

Descriptions of the physical location and characteristics of the AOC14 potential exposure area and the HHERA methodologies are provided in the main report and the final Human Health and Ecological Risk Assessment Work Plan (RAWP) documents (Arcadis 2008, 2009, 2015) and are not repeated in this Post-NTCRA HHERA. Detailed discussions of the historical uses and sampling and analysis are presented in the 2019 HHERA (Arcadis 2019).

This Post-NTCRA HHERA summarizes use of the Pacific Gas and Electric Company (PG&E) TCS site (site), data evaluation, potential receptors, exposure pathways, and the updated results of the HHERA risk characterization for soil in the AOC14 potential exposure area for risk-driving receptors following completion of the NTCRA. Tables and figures specific to the AOC14 Post-NTCRA HHERA are also presented in this appendix.

1.1 Summary of Site Use

AOC 14, also referred to as the Railroad Debris Site is located approximately 1,000 feet north of the TCS and is currently bounded by the Burlington Northern Santa Fe railroad tracks to the north, Interstate 40 (I-40) to the south, Bat Cave Wash (BCW) to the west, and a former access road to the east. The primary plateau of AOC 14 is approximately 100 feet above the bottom of BCW. AOC 14 is located on property owned by the Havasu National Wildlife Refuge, Burlington Northern Santa Fe railroad, U.S. Bureau of Land Management, and California Department of Transportation.

The Railroad Debris Site first appears in an aerial photograph dated 1947, before the establishment of the TCS, showing a mound of soil apparently related to construction of the rail line. In subsequent aerial photographs dated 1955, a white patch and other materials are present on this Railroad Debris Site along with a dirt road that runs from the north end of the TCS to this area. A white patch can be seen on aerial photographs from the same period (mid-1950s) on the ground adjacent to the sludge-drying beds (Solid Waste Management Unit [SWMU] 5). The white material is probably dehydrated lime (water-softening) sludge from the Permutit water-conditioning system. Former employees report that the water-softening sludge was trucked to the Railroad Debris Site and sprayed on the ground (CH2M Hill, Inc. 2006). AOC 14 historically contained miscellaneous construction debris including chunks of asphalt, railroad ties, and piping. An asbestos removal action was completed in 1999, and sampling detected no remaining asbestos.

The DTSC field observations in 2009 identified scattered debris and a potential burn layer (visible in the I-40 road cut) in the southwest corner of AOC 14. During additional employee interviews conducted by PG&E in late 2009 and early 2010, a former PG&E TCS employee reported periodic burning of primarily office garbage on the western edge of the AOC 14 bench area, as shown on Figure AOC 14-1.1 of Appendix AOC 14. The employee reported that AOC 14 was used for dumping and garbage burning until the freeway was built in the 1960s (PG&E 2010). Potential sources of dioxins and furans in the vicinity of the TCS may include historical industrial activities as well as other sources unrelated to TCS activities (i.e., unauthorized dumping and burning; regional wildfires; combustion of diesel and leaded gas; and exhaust from cars, trucks, and trains) (CH2M 2017). This area may also have contributed run-off to BCW.

Because some material is buried, constituents could also have affected shallow and subsurface soils in the immediate vicinity of the debris, water-softening sludge, and/or residual burned material. Constituents released from debris located in the higher (eastern) portion of AOC 14 could also have been transported to the lower portions of the unit through surface runoff. Primary source media therefore consist of surface, shallow, and subsurface soils.

1.2 Summary of NTCRA in AOC 14

As summarized in the NTCRA Completion Report (Jacobs 2025), the DOI selected a removal action of excavation of contaminated soil and debris at target action areas (TAAs) within the site, located in Needles, California (DOI 2021). PG&E commenced the soil NTCRA on July 25, 2022 according to the DOI-approved Soil NTCRA Work Plan (Jacobs 2022), which incorporated comments from stakeholders, including DOI, U.S. Bureau of Land Management, and tribal stakeholders.

The NTCRA consisted of the following activities:

- Soil excavation;

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- Mechanical separation and size separation of rocks, debris, and soil; and
- Disposal of the contaminated soil and debris in approved and permitted landfills.

Work associated with the NTCRA was completed on May 20, 2024.

In AOC 14, removal activities associated with the NTCRA were completed at one TAA. The TAA, extent of the NTCRA removal areas (including step-out locations), and confirmation samples remaining in place are presented on Figure AOC14-1.2. Details of the removal actions, remaining contamination (if any), and confirmation sampling are presented in Section 3 of the NTCRA Completion Report (Jacobs 2025) and summarized briefly for the AOC 14 TAA below.

AOC14 TAA1: AOC14 TAA1 is located on the slope above BCW immediately north of I-40 on the California Department of Transportation right-of-way. The TAA consists of undulating terrain and is sparsely vegetated. AOC 14 historically contained miscellaneous debris related to construction of the railroad, including chunks of asphalt, railroad ties, and piping. Asbestos-containing material and burnt material from PG&E operations have also been disposed of at AOC 14. In addition to waste-burning activities in the area, former TCS employees reported that water-softening (lime) sludge was also disposed of in this area. A thin white layer assumed to be water-softening material can be observed in the I-40 freeway cut. Historical soil sample results indicate soil contaminated with dioxins/furans and metals was present in the TAA, primarily within approximately 5 to 6 feet of the surface. Soil NTCRA removal activities began in February 2023 and concluded in February 2024, resulting in the removal of approximately 1,640 yd³ of contaminated soil, along with debris and friable asbestos (Section 3.13 of the NTCRA Completion Report [Jacobs 2025]). Removal activities continued south until the excavation began to encroach upon the I-40 shoulder at the southern edge of the TAA. While additional debris and copper- and lead-impacted soil exceeding the numerical removal action goals was evident in the southern sidewall, excavation was stopped so that the I-40 shoulder was not undermined. Copper-impacted soil exceeding the numerical removal action goal remains in the southern floor of the TAA as well. Removal of the contaminated soil was not conducted due to the depth of the contamination at 13 feet below ground surface (bgs). Twenty-four confirmation soil samples were collected from the TAA and approved step-out locations in the excavation sidewalls and floor. According to plans approved by California Department of Transportation, the excavation was backfilled at a 2H:1V slope with aggregate base material from Campbell's Quarry in Lake Havasu, Arizona.

Soil exceeding the numerical RAGs or debris remain in a few places associated with Soil NTCRA removals as well as a few isolated locations outside of the Soil NTCRA removal areas, because removing it may have presented a hazard to workers, undermined critical infrastructure or utilities, or encroached upon culturally sensitive areas. At the AOC 14 potential exposure area, depth-weighted location concentrations exceeding RAGs for hexavalent chromium remain in place for one historical location (S2-6). Section 3 of the NTCRA Completion Report (Jacobs 2025) describes the remaining contamination in each target action area. Figure 2-4 and Table 2-1 of the main Report provide the location and concentration, respectively, of the depth-weighted historical sample concentration exceeding the RAG for hexavalent chromium.

2 DATA EVALUATION AND COPC/COPEC SELECTION

This section summarizes the data considered for the AOC 14 potential exposure area Post-NTCRA HHERA and presents the constituents of potential concern (COPCs) for human health and constituents of potential ecological concern (COPECs) identified as risk drivers in the 2019 HHERA (Arcadis 2019) as well as non-risk-driving COPCs/COPECs evaluated for the AOC 14 potential exposure area.

For AOC 14, the 2019 HHERA (Arcadis 2019) did not identify potential risk to human or ecological receptors exposed to any COPCs/COPECs. However, consistent with the approach for the Post-NTCRA HHERA detailed in the January 30, 2024 Technical Memo (Arcadis 2024), the HHERA evaluated current cumulative human exposures for post-NTCRA exposures (i.e., considering NTCRA-related excavation and placement of backfill) to hexavalent chromium, total chromium, copper, and dioxin TEQ, as well as pre-NTCRA exposures for the remaining non-risk-driving COPCs (i.e., using exposure point concentrations [EPCs] from the 2019 HHERA). For AOC 14 potential exposure area, no risk-driving COPECs were identified in the 2019 HHERA. Along with debris, soil and/or white powder in AOC 14 with metals and/or dioxin TEQ exceeded numerical RAGs and were targeted for removal. However, COPCs/COPECs that were identified as potential risk drivers at other site AOCs were evaluated for this Post-NTCRA HHERA, including hexavalent chromium, total chromium, copper, and dioxin TEQ.

The data evaluation steps for these risk-driving and non-risk-driving COPCs/COPECs are described below. Additionally, some additional data for non-risk-driving COPCs/COPECs were collected on a limited basis as part of the NTCRA and were evaluated as described below.

2.1 Data Evaluation for Risk-Driving COPCs and COPECs

No risk-driving COPCs or COPECs were identified for AOC 14 in the 2019 HHERA (Arcadis 2019). For hexavalent chromium, total chromium, copper, and dioxin TEQ (risk-driving COPCs and/or COPECs identified at other site AOCs), all soil sampling locations currently in place (i.e., not excavated as part of the NTCRA) at the AOC 14 potential exposure area were evaluated in this Post-NTCRA HHERA. The Post-NTCRA HHERA dataset for AOC 14 includes results for in-place samples evaluated in the 2019 HHERA and in-place NTCRA confirmation samples. It should be noted that additional NTCRA data for other non-risk-driving constituents are discussed in Section 2.3.

All soil sampling locations currently in place at the AOC 14 potential exposure area are presented on Figure AOC 14-1.1 and in Table AOC 14-1.1. Details of the soil sampling and analysis conducted as part of the NTCRA will be presented in the forthcoming NTCRA Completion Report (Jacobs 2025); details of the soil sampling and analysis for the remaining samples are described in the RAWP documents (Arcadis 2008, 2009, 2015) and 2019 HHERA (Arcadis 2019). Note that although location RR-1 falls outside the potential exposure area boundary for AOC 14, data from this sampling location were included in the AOC 14 potential exposure area dataset because they were collected to support site characterization for this AOC (i.e., assigned to AOC 14 in the RFI/RI Report Volume 3 (Jacobs 2024).

For the baseline scenario, only soil data from 0 to 3 feet bgs were evaluated in this Post-NTCRA HHERA to account for potential soil exposures for risk-driving receptors (i.e., camper, hiker, OHV rider, and desert shrew) which may occur at surface soils (e.g., 0 to 0.5 foot bgs) or shallow soils (e.g., 0 to 3 feet bgs).

Because potential soil contact does not extend below 3 feet bgs for the baseline scenario, deeper soil data (i.e., greater than 3 feet bgs) were excluded from the risk evaluation, as noted in Table AOC14-1.1.

Following the steps outlined in Section 3 of the main report, soil data considered usable for the risk assessment were identified and used in the quantitative Post-NTCRA HHERA. Samples representing soil that was excavated as part of the NTCRA were excluded from the dataset and current sample top and bottom depths (reflecting excavation and/or placement of fill material) were used (Table AOC14-1.1). The post-NTCRA soil data for the AOC 14 potential exposure area are presented in Attachment AOC14-A1 and include the following:

- **Pre-NTCRA Data:** For pre-NTCRA data, the dataset includes results for site risk drivers (i.e., hexavalent chromium, total chromium, copper, and dioxin TEQ) from the 2019 HHERA dataset (Arcadis 2019) where those samples remain in place.
- **NTCRA Confirmation Sampling Data:** The dataset includes results for site risk drivers (i.e., hexavalent chromium, total chromium, copper, and dioxin TEQ) from confirmation samples that currently remain in place.

2.2 Data Evaluation for Non-Risk-Driving COPCs

As noted above, E P Cs for non-risk-driving constituents used in the 2019 HHERA (Arcadis 2019) were also used in this HHERA Addendum, as calculated from the pre-NTCRA soil dataset. As discussed in Section 5.5.2 of the main report, use of pre-NTCRA soil data for non-risk-driving COPCs is a conservative approach that is likely to overestimate post-NTCRA concentrations of these COPCs. Thus, the data evaluation steps are as described in detail in Section 3 of the 2019 HHERA. The soil sampling locations for the 2019 HHERA dataset at AOC 14 are presented on Figure AOC14-1.1 and in Table AOC14-1.1 of the 2019 HHERA. The data were evaluated based on methodology described in the RAWP documents (Arcadis 2008, 2009, 2015). Note that for this Post-NTCRA HHERA, only surface soil (0 to 0.5 foot bgs) and shallow soil (0 to 3 feet bgs) were evaluated.

The process for identifying COPCs and COPECs included in the HHERA is detailed in Section 3.4 of the 2019 HHERA (Arcadis 2019). COPCs and COPECs were selected in the 2019 HHERA for the AOC 14 potential exposure area using soil data encompassing all relevant exposure depths for the HHERA (i.e., 0 to 10 feet bgs for AOC 14) as presented in Attachment AOC14-A1 to the 2019 HHERA. Metals, LMW PAHs, HMW PAHs, and dioxin TEQ were above background levels in AOC 14 soil (0 to 10 feet bgs) and, therefore, are included as COPCs and/or COPECs in the baseline exposure depths evaluated in the 2019 HHERA. All other detected organic constituents in AOC 14 potential exposure area soil in the baseline exposure depths are included as COPCs and/or COPECs in the 2019 HHERA. COPCs and/or COPECs selected for exposure depths and scenarios evaluated in the 2019 HHERA for the AOC 14 potential exposure area and relevant to the applicable depths evaluated in this Post-NTCRA HHERA are summarized in Section 3. Detailed COPC and/or COPEC selection tables are presented in Tables AOC14-2.1a through AOC14-2.1d of the 2019 HHERA.

2.3 Evaluation of Additional Data

In some cases, NTCRA confirmation samples were also analyzed for other constituents, including a few metals (lead, mercury, molybdenum, and zinc). These metals data were not included in the Post-NTCRA HHERA.

RA exposure estimates. Instead, measured concentrations of in-place confirmation samples were compared to the range of concentrations observed in the 2019 HHERA dataset (Arcadis 2019). This evaluation is presented in Table AOC14-2.1 for the baseline scenario. The maximum and mean concentrations for the in-place NTCRA confirmation samples for lead, mercury, molybdenum, and zinc were less than the maximum and mean concentrations for these metals in the 2019 HHERA dataset. This indicates that EPCs evaluated for lead, mercury, molybdenum, and zinc in the HHRA based on values calculated for the 2019 HHERA dataset are likely a conservative estimate of current post-NTCRA exposures in AOC 14. Exclusion of the in-place NTCRA confirmation samples for these constituents is not expected to materially change the risk estimates or conclusions of this Post- NTCRA HHERA.

3 EXPOSURE POINT CONCENTRATIONS

Depth-weighted and area-weighted EPCs for COPCs/COPECs in soil at the AOC 14 potential exposure area were calculated as described in Section 4.2 of the main report. As noted in Section 2, EPCs for hexavalent chromium, total chromium, copper, and dioxin TEQ were calculated from the post-NTCRA dataset. In addition, EPCs from the 2019 HHERA (Arcadis 2019) for remaining non-risk-driving COPCs were used in the HHRA to estimate cumulative risks to human receptors. Consistent with the scenarios evaluated in the 2019 HHERA, one scenario was evaluated for the AOC 14 exposure area: Baseline (no scouring).

The following exposure depths were evaluated:

- Surface soil (0 to 0.5 foot bgs); and
- Shallow soil (0 to 3 feet bgs).

Deeper soil intervals were not evaluated as the risk-driving receptors are potentially exposed only to surface and shallow soil.

The depth-weighted data used in the calculation of depth-weighted EPCs for hexavalent chromium, total chromium, copper, and dioxin TEQ are presented in Attachment AOC 14-A2. The summary statistics for these AOC 14 potential exposure area soil depth-weighted datasets and depth-weighted EPCs were calculated consistent with the RAWP documents (Arcadis 2008, 2009, 2015). Per the RAWP (Arcadis 2008), area-weighted EPCs for the HHRA are evaluated only if depth-weighted EPCs suggest that cumulative cancer risks and/or noncancer hazards may be significant for any given HHRA exposure scenario (cumulative cancer risks exceed a 1×10^{-6} cancer risk level, and/or the noncancer hazard index [HI] exceeds 1). Similarly, for the ERA, area-weighted EPCs are evaluated for consistency with the 2019 HHERA but only discussed if depth-weighted EPCs suggest potential risk to ecological receptors (i.e., hazard quotient [HQ] greater than 1 for any COPEC) or if the area-weighted EPCs are higher than depth-weighted EPCs. The area-weighted data used in the calculation of area-weighted EPCs and the Thiessen polygons figures representing the area-weighted EPCs are presented in Attachment AOC 14-A3.

Soil summary statistics for constituents measured at the AOC 14 potential exposure area and detected at least once and depth- and area-weighted EPCs for COPCs/COPECs calculated using depth-weighted data from the exposure depths listed previously are presented in Table AOC 14-3.1. It should be noted that the list of constituents shown in Table AOC 14-3.1 is based on analytes that were detected at least once at the site (including all potential exposure areas inside or outside the TCS) in the 2019 HHERA (Arcadis 2019) and measured at AOC 14.

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In accordance with the 2019 HHERA (Arcadis 2019), if the soil dataset had fewer than four detected values (i.e., concentrations reported above the detection limit) or fewer than eight total observations, the EPC defaulted to the maximum depth-weighted concentration in that dataset. Table AOC14-3.1 also presents the basis of the calculated depth- and area-weighted EPCs, including if the EPC is based on the maximum detected concentration.

4 HUMAN HEALTH RISK ASSESSMENT

This section briefly summarizes the HHRA approach used for this Post-NTCRA HHERA; presents the COPCs, EPCs, risk and hazard summary tables; and discusses the results of the risk characterization and uncertainties in the risk assessment for the AOC 14 potential exposure area. Details of the overall HHRA approach are presented in Section 5 of the 2019 HHERA (Arcadis 2019). Dose, exposure concentration (EC), risk, and hazard calculation tables for human health receptors at the AOC 14 potential exposure area are presented in Attachment AOC 14-B.

As stated in the 2019 HHERA (Arcadis 2019), risks/hazards estimated for an individual AOC, SWMU, or undesignated area (UA) potential exposure area like AOC 14 are not considered representative of the realistic or likely potential exposures for the human populations that could be present in the areas outside the TCS (such as recreational users). Risks/hazards calculated separately for individual AOCs are conservative and likely overestimate site risks/hazards. As described in the RAWP documents (Arcadis 2008, 2009, 2015), these human populations would more likely be exposed randomly, over the course of a lifetime, to soil present in all individual AOC/SWMU/UA potential exposure areas located outside the TCS, rather than have a lifetime of contact limited to the area of a single potential exposure area. Therefore, estimated risks/hazards presented for individual AOC/SWMU/UA potential exposure areas are not believed to be representative of the potential health risks to humans potentially contacting the soil outside the TCS. As stated previously, the Post-NTCRA HHERA provides updated risk estimates for human health and the environment based on potential exposures to current soil conditions in the NTCRA areas. Therefore, updated risk estimates were not performed for the OCS potential exposure area in the Post-NTCRA HHERA. It is noted that due to NTCRA soil removal, the potential post-NTCRA soil risks for the OCS are likely lower than estimated in the 2019 HHERA. The HHRA results and conclusions of the 2019 HHERA and of this Post-NTCRA HHERA will be considered for making risk-management decisions for the site in the Corrective Measure Study/Feasibility Study to be prepared for the site.

4.1 Human Health Conceptual Site Model

Following the steps outlined in Section 5.5 of the 2019 HHERA (Arcadis 2019), risks were estimated for potentially complete and significant exposure pathways identified in the human health conceptual site model for risk-driving receptors potentially exposed to COPCs in surface or shallow soil present at the AOC 14 potential exposure area, as identified in the 2019 HHERA. These included Incidental ingestion of soil, dermal contact with soil, and inhalation of particulates and volatile organic compound (VOC) vapors in ambient outdoor air from soil for recreational users (child and/or adult campers, hikers, and off-highway vehicle [OHV] riders).

Exposure pathways considered incomplete or insignificant were not quantitatively evaluated and are discussed in Section 5.3.1 of the 2019 HHERA (Arcadis 2019).

4.2 Constituents of Potential Concern

COPCs for the AOC 14 potential exposure area were selected in accordance with the RAWP (Arcadis 2008) and as described in Section 3.4 of the 2019 HHERA (Arcadis 2019). COPCs for the AOC 14 potential exposure area evaluated in this Post-NTCRA HHERA are the same as the COPCs for the AOC 14 potential

exposure area evaluated in the 2019 HHERA. The COPC selection process using soil data encompassing all relevant exposure depths for this Post-NTCRA HHERA (i.e., 0 to 6 feet bgs for the AOC 14 potential exposure area) are presented in Attachment AOC14-A. COPCs for the two exposure depths (surface and shallow soil) and one scenario (baseline) evaluated for the AOC 14 HHERA are summarized in Table AOC14-4.1. COPCs selected for Subsurface II soil in the 2019 HHERA are also shown in Table AOC14-4.1, however, only the EPCs for volatile compounds for these depth intervals are used in the estimates of outdoor vapor concentrations in the quantitative HHERA for the evaluation of the outdoor vapor inhalation pathway. The EPCs for COPCs for Subsurface II soil were not updated in this Post-NTCRA HHERA and are the same as presented in the 2019 HHERA.

COPCs included metals (antimony, hexavalent chromium, copper, lead, mercury, and thallium), inorganics (nitrate and phosphate), semivolatile organic compounds (SVOCs) (4-methylphenol, bis [2-ethylhexyl] phthalate, and butylbenzenephthalate), PAHs, pesticides (4,4-dichlorodiphenyldichloroethylene [4,4-DDE] and 4,4-dichlorodiphenyltrichloroethane [4,4-DDT]), PCBs, total petroleum hydrocarbons (TPHs) as diesel, TPHs as motor oil, and dioxin TEQ in surface and shallow.

4.3 Exposure Point Concentration Summary

For the potentially complete and significant exposure pathways identified in the conceptual site model, EPCs were calculated as described in Section 4.2 of the main report and presented in Section 3 of this appendix. Depth-weighted data used in the calculation of depth-weighted EPCs are presented in Attachment AOC14-A. Depth-weighted EPCs for COPCs in soil and estimated outdoor air concentrations associated with dust and vapors and used to estimate risk in the HHERA are summarized in Tables AOC14-4.2a and AOC14-4.2b, for the two exposure depths.

As described in detail in Section 5.3.3 of the 2019 HHERA (Arcadis 2019), surface and shallow soil exposure depths and corresponding EPC datasets recreational users (child and/or adult campers, hikers, and OHV riders) were used to evaluate potential exposure to COPCs in soil for potential human receptors.

4.4 Estimation of Dose

The EC and chronic daily intake for potential carcinogenic and noncarcinogenic effects were calculated, as described in Section 5.5.1 of the 2019 HHERA (Arcadis 2019), for COPCs in soil for potentially complete exposure pathways. The calculated EC and chronic daily intake values using depth-weighted EPCs are presented in Tables AOC14-B1.1a through AOC14-B1.1c (carcinogenic effects) and Tables AOC14-B1.2a through AOC14-B1.2c (noncarcinogenic effects) in Attachment AOC14-B for the receptors evaluated. Exposure parameters for recreational users used in the dose calculations were presented in Table 5-1 of the 2019 HHERA and are presented in Table 5-1 of the main report.

4.5 Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure to a constituent and the potential for adverse health effects. More specifically, the toxicity assessment identifies agency-promulgated or derived toxicity values that can be used to estimate the likelihood of adverse health effects occurring in humans at different exposure levels. The approach for the toxicity assessment was provided in Section 4.5 of the RAWP (Arcadis 2008) and in Section 4.2 of the Final Human Health and Ecological Risk

Assessment Work Plan Addendum 2 (Arcadis 2015). Consistent with regulatory risk assessment policy, adverse health effects resulting from potential chemical exposures are evaluated in two categories: carcinogenic effects and noncarcinogenic effects. The hierarchy of sources for the toxicity criteria to be used for the Post-NTCRA HHERA have been updated from the 2019 HHERA (Arcadis 2019) and are compliant with the September 4, 2018, "Toxicity Criteria for Human Health Risk Assessments, Screening Levels, and Remediation Goals" rule (Title 22, California Code of Regulations, sections 68400.5, 69020-69022). Toxicity values for carcinogenic and noncarcinogenic effects for COPCs selected and used for the HHRA are described in Section 5.3 of the main report and were used to estimate potential cancer risks and noncancer hazards described in this Post-NTCRA HHERA.

4.6 Human Health Risk Characterization

For human receptors, assuming lifetime soil exposure is limited to AOC 14 potential exposure area, the estimated incremental lifetime cancer risks (ILCRs) and/or noncancer HQs were calculated for each COPC and potentially complete exposure pathway. Estimated cumulative ILCRs (i.e., sum of chemical-specific ILCRs for each exposure depth for a scenario) were calculated and compared to the DTSC point of departure for risk management decision of 1×10^{-6} . Note that risk management decisions may raise this criterion depending on site-specific conditions. As indicated in the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations 300), cancer risks between one in a million and one hundred in a million probability of occurrence (1×10^{-6} and 1×10^{-4}) fall within a risk management range. This is generally referred to as the acceptable risk range. Within this estimated cancer risk range, there is flexibility for risk managers in deciding what action, if any, is necessary and appropriate for the protection of human health. Fish and Wildlife's cancer risk threshold level is ten in a million (1×10^{-5}) for soil deeper than 2 feet below ground surface (February 12, 2021 Topock Soil EE/CA Response to Comment Consultation Meeting Agenda). Estimated cumulative noncancer hazards (i.e., HIs) are calculated and compared to an HI of 1 (DTSC 2015). Chemical exposures that yield HIs of less than or equal to 1 are not expected to result in adverse noncancer health effects (United States Environmental Protection Agency [USEPA] 1989).

4.6.1 Risk Characterization for Exposure to Soil (Baseline Scenario and Depth-Weighted EPCs)

Table AOC 14-4.3 summarizes cumulative ILCRs and HIs estimated for exposure to soil for each potential human receptor at the AOC 14 potential exposure area, calculated using depth-weighted EPCs. The dose, EC, ILCR, and HI equations are presented in detail in Section 5.5 of the 2019 HHERA (Arcadis 2019). The detailed cancer risk estimates (Tables AOC 14-B1.3a through AOC 14-B1.3c) and noncancer hazard calculations (Tables AOC 14-B1.4a through AOC 14-B1.4c) are presented in Attachment AOC 14-B.

Risk/hazard estimates for the AOC 14 potential exposure area are summarized in the tables and discussed in this section. Assuming lifetime soil contact is limited to AOC 14 potential exposure area, the depth-weighted estimated cumulative ILCRs and HIs for camper, hiker, and OHV rider potentially exposed to COPCs in AOC 14 soil at both exposure depths are below the de minimis levels of 1×10^{-6} and 1, respectively.

Exhibit AOC14-4.1 Baseline Depth-Weighted Estimated Cumulative Incremental Lifetime Cancer Risk and Hazard Index AOC14 Potential Exposure Area for Recreational Users

Potential Receptor	Exposure Depth	Cumulative ILCR	ILCR Drivers	HI	HI Drivers
Camper	Surface	2E-07	NA	0.003	NA
Camper	Shallow	2E-07	NA	0.2	NA
Hiker	Surface	4E-07	NA	0.005	NA
Hiker	Shallow	4E-07	NA	0.4	NA
OHV rider	Surface	9E-07	NA	0.001	NA
OHV rider	Shallow	7E-07	NA	0.05	NA

Notes:

1. ILCR and HI drivers are presented only for estimated cumulative ILCRs above 1×10^{-6} and estimated HIs above 1.

NA = not applicable

Assuming that lifetime soil contact is limited to the AOC14 potential exposure area, the depth-weighted estimated cumulative ILCRs for the camper, hiker, and OHV rider (Tables AOC14-B1.3a through AOC14-B1.3c in Attachment AOC14-B) potentially exposed to COPCs in surface and shallow soil are below the de minimis level of 1×10^{-6} , the point of departure for risk management decisions.

Assuming lifetime soil contact is limited to the AOC14 potential exposure area, the depth-weighted estimated cumulative HIs for the camper, hiker, and OHV rider (Tables AOC14-B1.4a through AOC14-B1.4c in Attachment AOC14-B) potentially exposed to COPCs in surface and shallow soil are below an HI of 1. The depth-weighted EPCs for lead in AOC14 potential exposure area surface and shallow soil are not expected to result in an increase in blood lead levels above the Office of Environmental Health Hazard Assessment benchmark value of 1 microgram per deciliter for child recreational users (Tables AOC 14-B1.5a through AOC 14-B1.5f in Attachment AOC14-B).

4.6.2 Uncertainties in the Risk Assessment

The risk assessment includes several uncertainties that warrant discussion. Many of the assumptions used in this risk assessment, regarding the representativeness of the sampling data, potential human exposures, fate and transport modeling, and chemical toxicity are conservative, follow agency guidance and reflect a 90th or 95th percentile value rather than a typical or average value. The use of several conservative exposure assumptions and toxicity estimates can introduce considerable uncertainty into the risk assessment. By using conservative exposure assumptions or toxicity estimates, the assessment can develop a significant conservative bias that may result in the calculation of significantly higher estimates for cancer risks or noncancer hazards than are actually posed by the chemicals present in soil. These uncertainties are discussed in detail Section 5.6 of the 2019 HHERA (Arcadis 2019). Uncertainties applicable only to the risk assessment for the AOC14 potential exposure area are discussed below.

Additional uncertainties for the AOC14 potential exposure area include the use of the maximum depth-weighted soil concentration as the EPC. The maximum depth-weighted soil concentration was used for

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COPCs when the soil dataset contained fewer than four detected values (i.e., concentrations reported above the detection limit) or fewer than eight total observations as shown in Table AOC14-3.1.

For the AOC14 potential exposure area, the maximum depth-weighted concentration was used as the EPC for the following COPCs:

- Surface soil: one metal (mercury), S VOCs (bis[2-ethylhexyl] phthalate and 4-methylphenol), one PAH (phenanthrene), and pesticides (4,4-DDE and 4,4-DDT)
- Shallow soil: metals (antimony, mercury, and thallium), VOCs (bromomethane, chloroform, chloromethane, and methyl acetate), S VOCs (bis[2-ethylhexyl] phthalate and 4-methylphenol), PAHs (acenaphthylene and anthracene), pesticides (4,4-DDE and 4,4-DDT), total PCBs, and inorganics compounds (nitrate and phosphate)

The use of the maximum depth-weighted soil concentration as the EPC for the COPCs listed previously may not appropriately represent exposures and resulting risks/hazards. This approach to estimating EPCs does not materially impact the results of the HHRA because the AOC14 potential exposure area COPCs are not risk drivers at the site due to their low frequency of detection and/or fewer than eight observations.

This baseline risk assessment assumes that contact with soil is not limited by the presence of engineering or institutional controls in the future. The potential health risks estimated for recreational users do not account for potential vegetative covering, unsuitable topography (e.g. steep slopes) and backfill material cover placed during or after completion of NTCRA activities outside the TCS that would reduce exposure below that assumed in this analysis. In addition, as recommended by DOI (Arcadis 2015), it is assumed that each of the recreational activities could take place at any location on federal land. However, specific locations may be preferred for certain activities, while other locations may be less attractive or may have limited recreational options. AOC 14, also referred to as the Railroad Debris Site is located approximately 1,000 feet north of the TCS and is currently bounded by the Burlington Northern Santa Fe railroad tracks to the north, Interstate 40 (I-40) to the south, Bat Cave Wash (BCW) to the west, and a former access road to the east. AOC 14 potential exposure area is located between the railroad tracks and Interstate 40 and may have limited accessibility and may be less attractive or limited for certain recreational activities. As such, the estimated risks are likely overestimated.

5 ECOLOGICAL RISK ASSESSMENT

This section briefly summarizes post-NTCRA ERA approach evaluated in this Post-NTCRA HHERA; presents the COPECs, EPCs, dose, and risk tables for the post-NTCRA AOC 14 ERA Addendum; and characterizes potential risk to desert shrew exposed to COPECs in soil currently present at the AOC 14 potential exposure area. Details of the overall post-NTCRA ERA approach are presented in Section 6 of the main report. Supporting tables for the AOC 14 ERA based on risk calculations conducted using depth-weighted EPCs and area-weighted EPCs are presented in Attachment AOC 14-C and described below.

Ecological risks were not calculated using maximum depth-weighted concentrations. Risks estimated using maximum depth-weighted concentrations are considered overly conservative and generally used for screening level purposes. Maximum concentrations were not used for making risk management decisions for the NTCRA at the AOC 14 potential exposure area and were not evaluated in this ERA.

5.1 Ecological Conceptual Site Model

In the 2019 HHERA (Arcadis 2019), risks were estimated for potentially complete and significant exposure pathways identified for a suite of potential ecological receptors exposed to COPECs in soil at the AOC 14 potential exposure area. These included plants, invertebrates, and small home-range receptors (Merriam's kangaroo rat, desert shrew, cactus wren, and Gambel's quail). Potential large home-range receptors (desert kit fox, red-tailed hawk, and Nelson's desert bighorn sheep) were evaluated for larger potential exposure areas (combined AOCs/investigation areas). For AOC 14, these larger exposure areas included all AOCs outside the TCS and AOCs outside the TCS excluding BCW and AOC 4 (OCSxBCW+AOC 4). Semi-quantitative and qualitative evaluations for special-status species were also conducted, as described in the 2019 HHERA.

The 2019 HHERA (Arcadis 2019) found no potential risk to ecological receptors, including special-status species, in AOC 14 and the larger exposure area relevant to large home-range receptors. However, consistent with the approach for the Post-NTCRA HHERA detailed in the January 30, 2024 Technical Memo (Arcadis 2024) to DOI and DTSC, an updated risk characterization for risk-driving receptors and COPECs for other site AOCs was completed to evaluate post-NTCRA conditions in AOC 14. Therefore, for transparency and consistency, this Post-NTCRA HHERA presents risk estimates for desert shrew and hexavalent chromium, total chromium, copper, and dioxin TEQ in surface soil that reflect current conditions in AOC 14 following soil remediation associated with the NTCRA.

The exposure assumptions for desert shrew, which are consistent with the 2019 HHERA (Arcadis 2019), are as follows: desert shrew—representative of invertivorous small mammal populations—are exposed only to surface soil (incidental and through biota uptake).

5.2 Constituents of Potential Ecological Concern

As stated in Section 5.1, for AOC 14, the 2019 HHERA (Arcadis 2019) found no potential risk to ecological receptors in AOC 14 and the larger exposure area relevant to large home-range receptors. However, consistent with the approach for the Post-NTCRA HHERA detailed in the January 30, 2024 Technical Memo (Arcadis 2024), to DOI and DTSC, updated risk estimates are presented for risk-driving receptors and COPECs found at other site AOCs to evaluate post-NTCRA conditions. Therefore, risk estimates are provided for desert shrew and hexavalent chromium, total chromium, copper, and dioxin TEQ.

5.3 Exposure Point Concentration Summary

Soil EPCs were calculated as described in Section 4.2 of the main report and presented in Section 3 of this Post-NTCRA HHERA. For the AOC 14 potential exposure area, risks to desert shrew were estimated using depth-weighted EPCs and area-weighted EPCs. Depth-weighted data used in the calculation of depth-weighted EPCs are presented in Attachment AOC 14-A2. Area-weighted data used in the calculation of area-weighted EPCs are presented in Attachment AOC 14-A3.

Biota tissue (i.e., terrestrial invertebrate) EPCs were calculated from the soil EPCs using soil-to-biota uptake relationships (i.e., bioaccumulation factors [BAFs]) for invertebrates, as described in Section 6.4.3 of the main report. As described in Section 6.4.2 and shown on Figure 6-1 of the main report, the surface soil (e.g., 0 to 0.5 foot bgs) depth interval was selected to represent exposure to soil and biota tissue for the risk calculations for desert shrew. For dioxin TEQ, the BAFs selected in the RAWP (Arcadis 2008) are based on uptake of a single congener: 2,3,7,8-tetrachlorodibenzo-p-dioxin and are likely to overestimate uptake of dioxin TEQ, as discussed in the Section 6.4.3.2 of the main report.

Depth-weighted soil EPCs and biota tissue EPCs calculated from depth-weighted soil EPCs are presented in Table AOC 14-5.1 for the baseline scenario. Similarly, area-weighted soil EPCs and biota tissue EPCs calculated from area-weighted soil EPCs are presented in Table AOC 14-5.2 for the baseline scenario.

Risk calculations based on depth-weighted upper confidence limits and area-weighted upper confidence limits for each COPEC are provided. As mentioned earlier, use of the maximum depth-weighted concentrations results in overly conservative risks and is not appropriate for evaluation of post-NTCRA potential exposures.

5.4 Estimation of Exposure Dose

Potential exposures for wildlife (i.e., desert shrew) are quantified as doses (e.g., in units of milligram per kilogram body weight per day). Exposure doses for COPECs in soil and potentially complete pathways were calculated as described, including equations, in Section 6.4.3 of the main report. The exposure parameters selected to evaluate wildlife in this ERA include upper bound values from literature (e.g., ingestion rates) or are assumed (e.g., 100% of one type of diet), which may result in conservative estimates of exposure dose and potential overestimation of actual exposure at the site.

For desert shrew, doses were calculated using the exposure parameters and equations presented in Section 6.4.3 of the main report. Exposure doses were calculated using depth-weighted soil and biota tissue EPCs presented in Table AOC 14-5.1 for the depth-weighted risk evaluations, and area-weighted soil and biota tissue EPCs as presented in Table AOC 14-5.2 for the area-weighted risk evaluations.

Dose calculations using depth-weighted EPCs for desert shrew potentially exposed to COPECs via ingestion of soil and biota tissue for the baseline scenario are presented in Attachment AOC 14-C. Dose calculations using area-weighted EPCs for wildlife potentially exposed to COPECs via ingestion of soil and biota tissue for the baseline scenario are also presented in Attachment AOC 14-C.

5.5 Effects Assessment

Dose-based toxicity reference values (TRVs) for wildlife for COPECs were used to estimate risks to desert shrew potentially exposed to COPECs in soil and biota tissue at the AOC 14 potential exposure area.

A range of risks to desert shrew was estimated using the TRVs based on a no-observed adverse effects level (NOAEL) and based on a lowest-observed adverse effects level (LOAEL). For hexavalent chromium, total

chromium, and copper, the NOAEL- and LOAEL-based TRVs used in this Post-NTCRA HHERA are the selected TRVs from the RAWP documents (Arcadis 2008, 2009, 2015).

For dioxin TEQ, the selected mammalian TRVs in the RAWP documents (Arcadis 2008, 2009, 2015) are from Toxicological Benchmarks for Wildlife from Oak Ridge National Laboratory (Sample et al. 1996). However, as described in Section 6.5 of the main report, an alternate set of mammalian TRVs were evaluated, consistent with the 2019 HHERA (Arcadis 2019). Following the approach used by USEPA in developing TRVs for the ecological soil screening levels (USEPA 2008), alternate dioxin TEQ TRVs were developed for mammals based the geometric mean of the reproduction and growth endpoints for the NOAEL and LOAEL, respectively. These alternate TRVs for dioxin TEQ, presented in Section 6.5 of the main report, were used to estimate potential risk to desert shrew in this Post-NTCRA HHERA.

The LOAEL-based TRVs used in this Post-NTCRA HHERA are the same as the TRVs used to develop ecological risk-based remedial goals (RBRGs) in the 2019 HHERA (Arcadis 2019); RAGs selected based on RBRGs were then used to define the extent of NTCRA soil removals.

Although other additional sets of TRVs (i.e., Navy/Biological Technical Assistance Group [BTAG] TRVs [DTSC 2002, 2009]) were also evaluated in the 2019 HHERA (Arcadis 2019), BTAG TRVs are not available for hexavalent chromium, total chromium, or dioxin TEQ, and they were ultimately not used for making remedial decisions. BTAG TRVs were not evaluated in this Post-NTCRA HHERA.

Wildlife TRVs used for RBRG development are presented in Table 6-4 of the main report.

5.6 Ecological Risk Characterization

The risk characterization integrates the results of the exposure assessment and effects assessment and is subject to uncertainties in both of those efforts. Risk characterization includes two major components: risk estimation and risk description. As presented in tables and discussed below, risk estimates (HQs) involved integrating exposure profiles with the exposure-effects information. For each receptor and COPEC, risk descriptions including various lines of evidence (LOEs) and uncertainties, including HQs, supporting statistical and site use information, and the direction of uncertainty in the risk estimates, are discussed below for interpreting the risk results and identifying potential unacceptable risk to desert shrew. Uncertainties specific to the AOC 14 potential exposure area are discussed in context with the risk characterization results presented below. Generic uncertainties in the ERA are discussed in Section 6.7 of the main report.

The 2019 HHERA (Arcadis 2019) found no potential risk to ecological receptors, including special-status species, in AOC 14 and the larger exposure areas relevant to large home-range receptors. However, consistent with the approach for the Post-NTCRA HHERA detailed in the January 30, 2024 Technical Memo (Arcadis 2024) to DOI and DTSC, this Post-NTCRA HHERA presents the risk characterization for desert shrew and risk-driving COPECs for other site AOCs (i.e., hexavalent chromium, total chromium, copper, and dioxin TEQ) to evaluate current conditions in the AOC 14 potential exposure area following soil remediation associated with the NTCRA.

For desert shrew, a range of HQs was calculated using NOAEL- and LOAEL-based TRVs that were used in this Post-NTCRA HHERA (see Section 5.5). The HQs based on LOAEL-based TRVs are referred to as "LOAEL-based HQs." HQs based on NOAEL-based TRVs are referred to as "NOAEL-based HQs." As noted above, the 2019 HHERA (Arcadis 2019) did not identify potential for unacceptable risk to sensitive species and therefore protection of individual invertivorous small mammals is not warranted. This Post-NTCRA

HHERA presents NOAEL-based HQs for completeness, however, LOAEL-based HQs were used to evaluate population-level protection of invertivorous small mammals.

Risk conclusions for populations of desert shrew used the following criteria:

- COPECs with NOAEL-based HQs less than or equal to 1 pose de minimis risk to individuals and populations of wildlife receptors.
- COPECs with NOAEL-based HQs greater than 1, but LOAEL-based HQs less than or equal to 1 pose no unacceptable risks to wildlife populations. As described in the RAWP (Arcadis 2008), unacceptable risk to individuals is uncertain because the NOAEL-based TRVs are thresholds with an interval that is an artifact of the dosing study and the nature and magnitude of the effects, if any, that may occur at exposures between these values is unknown. Because protection at the individual level is not warranted for desert shrew, COPECs with NOAEL-based HQs greater than 1 and LOAEL-based HQs less than 1 were not further evaluated using a weight-of-evidence (WOE) approach.
- COPECs with LOAEL-based HQs greater than 1 indicate unacceptable risk is possible for populations of wildlife receptors. However, these LOAEL-based HQs are based on individual-level effects thresholds and only account for a single LOE. In such cases, a WOE approach was used in reducing uncertainty for characterizing potential risk to wildlife populations at the AOC 14 exposure area.

Ultimately, three risk outcomes for desert shrew are possible based on the LOAEL-based HQs greater than 1 and WOE: (1) unacceptable risk to wildlife populations is possible (i.e., indicated by sufficient and strong supporting LOEs); (2) unacceptable risk to wildlife populations is unlikely (i.e., indicated by sufficient and strong LOEs supporting a conclusion of no unacceptable risk); or (3) unacceptable risk to wildlife populations is uncertain (i.e., indicated by insufficient LOEs). The results of individual LOE evaluations were evaluated collectively to derive an overall WOE conclusion. Key uncertainties were considered along with the strength, relevance, and other qualities of the LOEs in reaching the WOE conclusions. In this post-NTCRA ERA, the additional LOEs were evaluated and discussed when LOAEL-based HQs greater than 1 were estimated.

For the AOC 14 potential exposure area, evaluations were completed for the following scenarios and discussed in this section:

- Baseline scenario using depth-weighted EPCs; and
- Baseline scenario using area-weighted EPCs.

In these evaluations, risk calculations were completed for hexavalent chromium, total chromium, copper, and dioxin TEQ, as presented in Tables AOC 14-5.3 using depth-weighted EPCs and Table AOC 14-5.4 using area-weighted EPCs.

At the conclusion of the baseline scenario evaluation, risk conclusions were based on whether COPECs remain for which unacceptable population-level risk was predicted using LOAEL-based HQs calculated from the most refined exposure and effects assumptions and LOEs supporting the conclusion of unacceptable risk.

5.6.1 Desert Shrew Risk Characterization Using Depth-Weighted EPCs

Desert shrew is an invertivorous small mammal that could potentially be exposed to COPECs in surface soil (0 to 0.5 foot bgs) directly and through its diet. Risk estimates for desert shrew for the baseline scenario using depth-weighted EPCs, a site use factor (SUF) of 1, and TRVs used for RBRG development are summarized in this section and presented in Table AOC 14-5.3.

Site-specific SUFs were not evaluated for desert shrew. Based on the AOC 14 potential exposure area and home ranges for desert shrew, the site-specific SUF was estimated as 1 (i.e., home range is less than or equal to the size of the potential exposure area). Therefore, the risk results would be the same as when calculated using a generic SUF of 1. Detailed dose and risk calculations for desert shrew are presented in Attachment AOC 14-C. Hexavalent chromium, total chromium, copper, and dioxin TEQ in soil were evaluated to determine potential risks associated with post-NTCRA conditions.

The NOAEL- and LOAEL-based HQs for desert shrew are less than 1 for hexavalent chromium, total chromium, copper, and dioxin TEQ, indicating de minimis risk to individuals and populations of invertivorous small mammals.

Based on the risk estimates associated with the depth-weighted EPCs for the baseline risk to invertivorous small mammals from exposure to hexavalent chromium, total chromium, copper, and dioxin TEQ, area-weighted EPCs are not considered necessary. However, to evaluate the area-weighted EPCs that are greater than depth-weighted EPCs (i.e., copper) in the surface soil dataset and for completeness, the area-weighted HQs are presented in Table AOC 14-5.4.

5.6.2 Desert Shrew Risk Characterization Using Area-Weighted EPCs

The risk estimates associated with the depth-weighted EPCs for the baseline risk to invertivorous small mammals from exposure to hexavalent chromium, total chromium, copper, and dioxin TEQ indicated de minimis risk to individuals and populations of invertivorous small mammals. However, to address area-weighted EPCs greater than the depth-weighted EPCs (i.e., copper), risk estimates for desert shrew for the baseline scenario using area-weighted EPCs, a SUF of 1, and TRVs used for RBRG development are presented in Table AOC 14-5.4. The NOAEL- and LOAEL-based HQs for desert shrew are less than 1 for copper, indicating de minimis risk to individuals and populations of invertivorous small mammals. Based on the risk estimates for desert shrew using area-weighted EPCs, further refinements to risk characterization for desert shrew (e.g., use of congener-specific BAFs for dioxin TEQ, as discussed in Section 6.4.3.2 of the main report) were not warranted. Detailed dose and risk calculations for desert shrew for all COPECs are presented in Attachment AOC 14-C.

5.6.3 Risk Conclusions for Desert Shrew

The 2019 HHERA (Arcadis 2019) found no potential risk to ecological receptors, including special-status species, in AOC 14 and the larger potential exposure areas relevant to large home-range receptors. However, consistent with the approach for the Post-NTCRA HHERA detailed in the January 30, 2024 Technical Memo (Arcadis 2024) to DOI and DTSC, this Post-NTCRA HHERA presents the risk characterization for desert shrew and risk-driving COPECs for other site AOCs (i.e., hexavalent chromium, total chromium, copper, and dioxin TEQ) to evaluate current conditions in the AOC 14 potential exposure area following soil remediation associated with the NTCRA. This Post-NTCRA HHERA presents risk estimates for desert shrew and hexavalent chromium, total chromium, copper, and dioxin TEQ in surface soil that reflect current conditions in the AOC 14 potential exposure area following soil remediation associated with the NTCRA. Risk conclusions for desert shrew populations are presented below.

Risk conclusions are based on LOAEL-based HQs estimated in the most refined exposure scenario applicable to this AOC (Section 5.6.2) using an SUF of 1, selected BAFs, and TRVs used for RBRG development and area-weighted EPCs. NOAEL-based HQs and LOAEL-based HQs for desert shrew are

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less than 1 for hexavalent chromium, total chromium, copper, and dioxin TEQ indicating de minimis risk to individuals and populations of invertivorous small mammals at the AOC 14 potential exposure area.

In conclusion, no unacceptable risk to wildlife receptor populations is identified at the AOC 14 potential exposure area. For desert shrew, the conclusions are based on post-NTCRA conditions as evaluated in this Post-NTCRA HHERA and summarized above. For remaining ecological receptors, the conclusions are based on pre-NTCRA conditions as evaluated in the 2019 HHERA (Arcadis 2019).

6 SUMMARY AND CONCLUSIONS FOR THE HHERA

Potential cumulative cancer risks and noncancer hazards for human receptors were estimated, as presented previously in Section 4. For ecological receptors, potential risks were estimated as presented previously in Section 5. Uncertainties related to the HHRA and ERAs at the site in general are discussed in detail in Sections 5.6 and 6.7 of the 2019 HHERA (Arcadis 2019) and are summarized in Section 5.5 and 6.7 of the main report. Uncertainties specific to the evaluation of post-NTCRA conditions in AOC 14 potential exposure area are discussed in this appendix. The approach for the Post-NTCRA HHERA was detailed in the January 30, 2024 Technical Memo (Arcadis 2024) to DOI and DTSC which specified that updated risk characterization would be presented only for risk-driving receptors.

One potential exposure scenario (baseline, i.e., no scouring) was evaluated, consistent with the scenario evaluated in the 2019 HHERA (Arcadis 2019). Risks were estimated for various receptors using depth-weighted EPCs and area-weighted EPCs. For desert shrew, additional refinements to the soil-to-invertebrate uptake factors consistent with the approach used for RBRG development in the 2019 HHERA (Arcadis 2019) were not warranted based on the risk estimates and were not evaluated.

At the AOC 14 potential exposure area, the COPCs evaluated for the Post-NTCRA HHERA include metals (antimony, hexavalent chromium, copper, lead, mercury, and thallium), inorganics (nitrate and phosphate), SVOCs (4-methylphenol, bis[2-ethylhexyl] phthalate, and butylbenzylphthalate), LMW PAHs, HMW PAHs, PAHs, pesticides (4,4-DDE and 4,4-DDT), PCBs, TPHs as diesel, TPHs as motor oil, and dioxins and furans. Although the 2019 HHERA (Arcadis 2019) did not identify risk-driving COPECs for AOC 14, hexavalent chromium, total chromium, copper, and dioxin TEQ were evaluated for the Post-NTCRA HHERA based on unacceptable risk estimated for desert shrew in the 2019 HHERA for other site AOCs. A summary of these results and conclusions regarding potential risk associated with exposure to these COPCs/COPECs in soil at the AOC 14 potential exposure area based on the risk/hazard estimates and uncertainties inherent in the risk assessment process are presented in this section.

6.1 Summary and Conclusions for the HHRA

The cumulative ILCRs and HIs associated with potential exposure to COPCs in soil at the AOC 14 potential exposure area using depth-weighted EPCs under the baseline scenario were estimated. Assuming that lifetime soil contact is limited to the AOC 14 potential exposure area for the receptors evaluated, the estimated potential ILCR and HI results are summarized in Exhibit AOC 14-6.1 and in the following text.

Exhibit AOC 14-6.1 Baseline Scenario Estimated Cumulative Incremental Lifetime Cancer Risk and Hazard Index for the AOC 14 Potential Exposure Area

Potential Receptor	Exposure Depth	Cumulative ILCR Depth-Weighted	Cumulative ILCR Area-Weighted	HI—Depth-Weighted	HI—Area-Weighted
Camper	Surface	Less than or equal to 1×10^{-6}	Not calculated	Less than or equal to 1	Not calculated
Camper	Shallow	Less than or equal to 1×10^{-6}	Not calculated	Less than or equal to 1	Not calculated

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Potential Receptor	Exposure Depth	Cumulative ILCR Depth-Weighted	Cumulative ILCR Area-Weighted	HI—Depth-Weighted	HI—Area-Weighted
Hiker	Surface	Less than or equal to 1×10^{-6}	Not calculated	Less than or equal to 1	Not calculated
Hiker	Shallow	Less than or equal to 1×10^{-6}	Not calculated	Less than or equal to 1	Not calculated
OHV rider	Surface	Less than or equal to 1×10^{-6}	Not calculated	Less than or equal to 1	Not calculated
OHV rider	Shallow	Less than or equal to 1×10^{-6}	Not calculated	Less than or equal to 1	Not calculated

Note:

not calculated = area-weighted estimate was not calculated because the depth-weighted estimates for the receptor were below de minimis levels

Depth-weighted potential exposures that are at or below de minimis levels include the following:

- **HI less than or equal to 1 for all soil depths**—camper, hiker, and OHV rider; and
- **ILCR less than or equal to 1×10^{-6} for all soil depths**—camper, hiker, and OHV rider.

OVERALL SUMMARY

Assuming that lifetime soil contact is limited to the AOC 14 potential exposure area, the estimated cumulative ILCRs and HIs associated with potential exposure to COPCs in post-N T C R A soil using depth-weighted EPCs for the camper, hiker, and OHV rider are below 1×10^{-6} and 1, respectively.

The depth-weighted EPCs for lead in AOC 14 potential exposure area soil at all exposure depths are not expected to result in an increase in blood lead levels above the Office of Environmental Health Hazard Assessment benchmark value of 1 microgram per deciliter in the child recreational user.

Risks/hazards estimated for an individual potential exposure area like AOC 14 potential exposure area are not considered representative of the realistic or likely potential exposures for the human populations that could be present in the areas outside the TCS (such as recreational users). Risks/hazards calculated separately for individual AOCs are conservative and likely overestimate site risks/hazards. As described in the RAWP documents (Arcadis 2008, 2009, 2015), these human populations would more likely be exposed randomly, over the course of a lifetime, to soil present in all potential exposure areas located outside the TCS, rather than have a lifetime of contact limited to the area of a single potential exposure area. Therefore, estimated risks/hazards presented for individual potential exposure areas are not believed to be representative of the potential health risks to humans potentially contacting the soil outside the TCS. As stated previously, the Post-NTCRA HHERA provides updated risk estimates for human health and the environment based on potential exposures to current soil conditions in the N T C R A areas. Therefore, updated risk estimates were not performed for the OCS potential exposure area in the Post-NTCRA HHERA. It is noted that due to N T C R A soil removal, the potential post-N T C R A soil risks for the OCS are likely lower than estimated in the 2019 HHERA. The HHERA results and conclusions of the 2019 HHERA and of this Post-NTCRA HHERA will be considered for making risk-management decisions for the site in the Corrective Measure Study/Feasibility Study to be prepared for the site.

6.2 Summary and Conclusions for the ERA

At the AOC 14 potential exposure area, hexavalent chromium, total chromium, copper, and dioxin TEQ were evaluated in this Post-NTCRA HHERA to evaluate post-NTCRA conditions. Updated risk estimates for hexavalent chromium, total chromium, copper, and dioxin TEQ are presented only for desert shrew. The 2019 HHERA (Arcadis 2019) did not identify potential for unacceptable risk to sensitive species and therefore protection of individual invertivorous small mammals is not warranted. This Post-NTCRA HHERA presents NOAEL-based HQs for completeness, however, only the LOAEL-based HQs were used to evaluate population-level protection of invertivorous small mammals.

Risks were estimated using depth-weighted and area-weighted EPCs. HQs are summarized in Table AOC 14-6.1. Risk conclusions for desert shrew populations were based on the following criteria:

- COPECs with NOAEL-based HQs less than or equal to 1 pose de minimis risk to potential wildlife receptors.
- COPECs with NOAEL-based HQs greater than 1 but LOAEL-based HQs less than or equal to 1 pose no unacceptable risks to wildlife populations; however, potential for unacceptable risk to individuals is uncertain based on the HQ. Because protection at the individual level is not warranted for desert shrew, COPECs with NOAEL-based HQs greater than 1 and LOAEL-based HQs less than 1 were not further evaluated using a WOE approach.
- COPECs with LOAEL-based HQs greater than 1 pose possible unacceptable risk to populations of potential wildlife receptors based on the HQ. In such cases, a WOE approach was used in reducing uncertainty for characterizing potential risk to wildlife populations at the AOC 11 potential exposure area.

The risk estimates (HQs) represent only one LOE for risk characterization. A qualitative WOE approach, incorporating other LOEs and uncertainties, was used to characterize possible risk to wildlife populations at the AOC 14 potential exposure area. For COPECs with LOAEL-based HQs greater than 1 using the most refined exposure and effects assumptions, a WOE assessment was used to draw risk conclusions for the AOC 14 potential exposure area.

Overall, no unacceptable risks are expected for populations of invertivorous small mammals (i.e., desert shrew) exposed to hexavalent chromium, total chromium, copper, and dioxin TEQ in post-NTCRA soil at AOC 14 potential exposure area. Conclusions in the baseline scenario evaluations are presented in Section 5.6.3 and summarized below in the text and in Exhibit AOC 14-6.2.

- For hexavalent chromium, total chromium, copper, and dioxin TEQ, the NOAEL-based and LOAEL-based HQs based on depth-weighted EPCs and area-weighted EPCs were less than 1 s, indicating de minimis risk to individuals and populations of invertivorous small mammals.

Exhibit AOC 14-6.2 Potential for Unacceptable Risk to Desert Shrew at the AOC 14 Potential Exposure Area

Scenario	Dioxin TEQ	Total Chromium	Hexavalent Chromium	Copper
Baseline	None for wildlife populations	None for wildlife populations	None for wildlife populations	None for wildlife populations

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TABLES

Table AOC14-1.1
 Samples and Sampling Locations Included in the AOC 14 Potential Exposure Area

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

SampleID	Sample Date	Location ID	RFI Area	Original Upper Depth (ft bgs)	Original Lower Depth (ft bgs)	Used for EPCs (2019 H H E R A)?	Original Baseline (ft bgs)	Excavation Status	Excavation Depth (ft)	Backfill Depth (ft)	Current Upper Depth (ft bgs)	Current Lower Depth (ft bgs)	Current Baseline (ft bgs)	Sample Source (2019 H H E R A, N T C R A, or R F I Addition)	Used for Post-N T C R A H H E R A EPCs? ^b
AOC14-1-8001	9/30/2008	AOC14-1	AOC14	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-1-8002	9/30/2008	AOC14-1	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-1-8003	9/30/2008	AOC14-1	AOC14	5	6	Yes	0-06	In Place	3	3	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-1-8004	9/30/2008	AOC14-1	AOC14	9	10	Yes	0-10	In Place	3	3	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-10-8050	10/1/2008	AOC14-10	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-10-8051	10/1/2008	AOC14-10	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-10-8052	10/1/2008	AOC14-10	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-10-8053	10/1/2008	AOC14-10	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-10-8054	10/1/2008	AOC14-10	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-11-8056	10/1/2008	AOC14-11	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-11-8057	10/1/2008	AOC14-11	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-12-8059	9/30/2008	AOC14-12	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-12-8060	9/30/2008	AOC14-12	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-13-8062	9/30/2008	AOC14-13	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-13-8063	9/30/2008	AOC14-13	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-14E-8127	2/18/2016	AOC14-14E	AOC14	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-14E-8128	2/18/2016	AOC14-14E	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-14E-8129	2/18/2016	AOC14-14E	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-14E-8130	2/18/2016	AOC14-14E	AOC14	5	5.5	Yes	0-06	In Place	3	3	5	5.5	NE	2019 H H E R A	No, Depth NA
AOC14-14E-8131	2/18/2016	AOC14-14E	AOC14	6	7	Yes	0-10	In Place	3	3	6	7	NE	2019 H H E R A	No, Depth NA
AOC14-14E-8132	2/18/2016	AOC14-14E	AOC14	9	10	Yes	0-10	In Place	3	3	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-14W-8100	2/16/2016	AOC14-14W	AOC14	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-14W-8101	2/16/2016	AOC14-14W	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-14W-8102	2/16/2016	AOC14-14W	AOC14	5	5.5	Yes	0-06	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-14W-8103	2/16/2016	AOC14-14W	AOC14	6	7	Yes	0-10	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-14W-8104	2/16/2016	AOC14-14W	AOC14	9	10	Yes	0-10	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-15-8105	2/18/2016	AOC14-15	AOC14	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-15-8106	2/18/2016	AOC14-15	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-15-8108	2/18/2016	AOC14-15	AOC14	5	6	Yes	0-06	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-15-8109	2/18/2016	AOC14-15	AOC14	7	8	Yes	0-10	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-16E-8133	2/23/2016	AOC14-16E	AOC14	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-16E-8134	2/23/2016	AOC14-16E	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-16E-8135	2/23/2016	AOC14-16E	AOC14	5	6	Yes	0-06	In Place	3	3	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-16E-8136	2/23/2016	AOC14-16E	AOC14	9	10	Yes	0-10	In Place	3	3	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-16W-8111	2/22/2016	AOC14-16W	AOC14	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-16W-8112	2/22/2016	AOC14-16W	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-16W-8113	2/22/2016	AOC14-16W	AOC14	5	6	Yes	0-06	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-16W-8114	2/22/2016	AOC14-16W	AOC14	7	8	Yes	0-10	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-16W-8115	2/22/2016	AOC14-16W	AOC14	9	10	Yes	0-10	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-17E-8137	2/24/2016	AOC14-17E	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-17W-8117	2/24/2016	AOC14-17W	AOC14	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-17W-8118	2/24/2016	AOC14-17W	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-17W-8119	2/24/2016	AOC14-17W	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-17W-8120	2/24/2016	AOC14-17W	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-17W-8121	2/24/2016	AOC14-17W	AOC14	1	2	Yes	0-03	In Place	0	0	1	2	0-03 ft	2019 H H E R A	Yes
AOC14-18-8122	2/17/2016	AOC14-18	AOC14	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-18-8123	2/17/2016	AOC14-18	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-18-8124	2/17/2016	AOC14-18	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA

Table AOC14-1.1
 Samples and Sampling Locations Included in the AOC 14 Potential Exposure Area

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

SampleID	Sample Date	Location ID	RFI Area	Original Upper Depth (ft bgs)	Original Lower Depth (ft bgs)	Used for EPCs (2019 H H E R A)?	Original Baseline (ft bgs)	Excavation Status	Excavation Depth (ft)	Backfill Depth (ft)	Current Upper Depth (ft bgs)	Current Lower Depth (ft bgs)	Current Baseline (ft bgs)	Sample Source (2019 H H E R A, N T C R A, or R F I Addition)	Used for Post-N T C R A H H E R A EPCs? ^b
AOC14-19-8125	2/17/2016	AOC14-19	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-19-8126	2/17/2016	AOC14-19	AOC14	3	4	Yes	0-06	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-2-8006	9/30/2008	AOC14-2	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-2-8007	9/30/2008	AOC14-2	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-2-8008	9/30/2008	AOC14-2	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-2-8009	9/30/2008	AOC14-2	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-2-8010	9/30/2008	AOC14-2	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-2-8088	10/1/2008	AOC14-2	AOC14	3	3.25	Yes	0-06	In Place	0	0	3	3.25	NE	2019 H H E R A	No, Depth NA
AOC14-20-8138	4/26/2017	AOC14-20	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-20-8139	4/26/2017	AOC14-20	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-20-8140	4/26/2017	AOC14-20	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	R F I Addition	No, Depth NA
AOC14-20-8141	4/26/2017	AOC14-20	AOC14	8	9	Yes	0-10	In Place	0	0	8	9	NE	R F I Addition	No, Depth NA
AOC14-21-8142	4/26/2017	AOC14-21	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-21-8143	4/26/2017	AOC14-21	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-21-8144	4/26/2017	AOC14-21	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-21-8145	4/26/2017	AOC14-21	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	R F I Addition	No, Depth NA
AOC14-21-8146	4/26/2017	AOC14-21	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	R F I Addition	No, Depth NA
AOC14-3-8012	10/1/2008	AOC14-3	AOC14	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-3-8013	10/1/2008	AOC14-3	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-3-8014	10/1/2008	AOC14-3	AOC14	5	6	Yes	0-06	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-3-8015	10/1/2008	AOC14-3	AOC14	9	10	Yes	0-10	In Place	7	7	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-4-8017	10/1/2008	AOC14-4	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-4-8018	10/1/2008	AOC14-4	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-4-8019	10/1/2008	AOC14-4	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-4-8020	10/1/2008	AOC14-4	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-5-8023	10/2/2008	AOC14-5	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-5-8024	10/2/2008	AOC14-5	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-5-8025	10/2/2008	AOC14-5	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-5-8026	10/2/2008	AOC14-5	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-6-8028	10/2/2008	AOC14-6	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-6-8029	10/2/2008	AOC14-6	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-6-8030	10/2/2008	AOC14-6	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-6-8031	10/2/2008	AOC14-6	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-6-8032	10/2/2008	AOC14-6	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-7-8034	10/2/2008	AOC14-7	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-7-8035	10/2/2008	AOC14-7	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-7-8036	10/2/2008	AOC14-7	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-7-8037	10/2/2008	AOC14-7	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-8-8039	10/2/2008	AOC14-8	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-8-8040	10/2/2008	AOC14-8	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-8-8041	10/2/2008	AOC14-8	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-8-8042	10/2/2008	AOC14-8	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-9-8045	10/1/2008	AOC14-9	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-9-8046	10/1/2008	AOC14-9	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-9-8047	10/1/2008	AOC14-9	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-9-8048	10/1/2008	AOC14-9	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-SS-1-8066	10/1/2008	AOC14-SS-1	AOC14	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-SS-1-8067	10/1/2008	AOC14-SS-1	AOC14	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-SS-1-8068	10/1/2008	AOC14-SS-1	AOC14	5	6	Yes	0-06	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-SS-1-8069	10/1/2008	AOC14-SS-1	AOC14	9	10	Yes	0-10	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
AOC14-SS-2-8071	10/1/2008	AOC14-SS-2	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-SS-2-8072	10/1/2008	AOC14-SS-2	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-SS-2-8073	10/1/2008	AOC14-SS-2	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-SS-2-8074	10/1/2008	AOC14-SS-2	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14-SS-3-8077	10/2/2008	AOC14-SS-3	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-SS-3-8078	10/2/2008	AOC14-SS-3	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-SS-3-8079	10/2/2008	AOC14-SS-3	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-SS-3-8080	10/2/2008	AOC14-SS-3	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA

Table AOC14-1.1
Samples and Sampling Locations Included in the AOC 14 Potential Exposure Area

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

SampleID	Sample Date	Location ID	RFI Area	Original Upper Depth (ft bgs)	Original Lower Depth (ft bgs)	Used for EPCs (2019 H H E R A)?	Original Baseline (ft bgs)	Excavation Status	Excavation Depth (ft)	Backfill Depth (ft)	Current Upper Depth (ft bgs)	Current Lower Depth (ft bgs)	Current Baseline (ft bgs)	Sample Source (2019 H H E R A, N T C R A, or R F I Addition)	Used for Post-N T C R A H H E R A EPCs? ^b
AOC14-SS-4-8082	10/2/2008	AOC14-SS-4	AOC14	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 H H E R A	Yes
AOC14-SS-4-8083	10/2/2008	AOC14-SS-4	AOC14	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 H H E R A	Yes
AOC14-SS-4-8084	10/2/2008	AOC14-SS-4	AOC14	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 H H E R A	No, Depth NA
AOC14-SS-4-8085	10/2/2008	AOC14-SS-4	AOC14	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 H H E R A	No, Depth NA
AOC14TAA1-CW1a-1	11/17/2023	AOC14TAA1-CW1a	AOC14	1	1.5	No	--	In Place	1	1	1	1.5	0-03 ft	NTCRA	Yes
GS-1	11/1/1998	GS-1	AOC14	0	0	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
GS-2	11/1/1998	GS-2	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
RR-1	2/2/2000	RR-1	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
RR-10	2/2/2000	RR-10	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
RR-11	2/2/2000	RR-11	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
RR-12	2/2/2000	RR-12	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
RR-2	2/2/2000	RR-2	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
RR-3	2/2/2000	RR-3	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
RR-4	2/2/2000	RR-4	AOC14	0	0	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
RR-5	2/2/2000	RR-5	AOC14	0	0	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
RR-6	2/2/2000	RR-6	AOC14	0	0	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
RR-7	2/2/2000	RR-7	AOC14	0	0	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
RR-8	2/2/2000	RR-8	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
RR-9	2/2/2000	RR-9	AOC14	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 H H E R A	Yes
S1-20-3	11/1/1998	S1-20	AOC14	3	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 H H E R A	No, Excavated
S2-130-1	11/1/1998	S2-130	AOC14	1	1	Yes	0-0.5	In Place	0	0	1	1	0-005, 0-03 ft	2019 H H E R A	Yes
S2-6-3	11/1/1998	S2-6	AOC14	3	3	Yes	0-03	In Place	0	0	3	3	0-03 ft	2019 H H E R A	Yes
S2-6-5	11/1/1998	S2-6	AOC14	5	5	Yes	0-06	In Place	0	0	5	5	NE	2019 H H E R A	No, Depth NA
S2-62-2	11/1/1998	S2-62	AOC14	2	2	Yes	0-03	In Place	0	0	2	2	0-03 ft	2019 H H E R A	Yes
S2-62-4	11/1/1998	S2-62	AOC14	4	4	Yes	0-06	In Place	0	0	4	4	NE	2019 H H E R A	No, Depth NA
S3-120-1	11/1/1998	S3-120	AOC14	1	1	Yes	0-0.5	In Place	0	0	1	1	0-005, 0-03 ft	2019 H H E R A	Yes
S3-15-2	11/1/1998	S3-15	AOC14	2	2	Yes	0-03	In Place	0	0	2	2	0-03 ft	2019 H H E R A	Yes
S3-15-4	11/1/1998	S3-15	AOC14	4	4	Yes	0-06	In Place	0	0	4	4	NE	2019 H H E R A	No, Depth NA
S3-72-1	11/1/1998	S3-72	AOC14	1	1	Yes	0-0.5	In Place	0	0	1	1	0-005, 0-03 ft	2019 H H E R A	Yes
S3-72-2	11/1/1998	S3-72	AOC14	2	2	Yes	0-03	In Place	0	0	2	2	0-03 ft	2019 H H E R A	Yes
S4-160-2	11/1/1998	S4-160	AOC14	2	2	Yes	0-03	In Place	0	0	2	2	0-03 ft	2019 H H E R A	Yes
S4-4-4	11/1/1998	S4-4	AOC14	4	4	Yes	0-06	In Place	0	0	4	4	NE	2019 H H E R A	No, Depth NA
S4-4-6	11/1/1998	S4-4	AOC14	6	6	Yes	0-06	In Place	0	0	6	6	NE	2019 H H E R A	No, Depth NA
S4-95-2	11/1/1998	S4-95	AOC14	2	2	Yes	0-03	In Place	0	0	2	2	0-03 ft	2019 H H E R A	Yes
S4-95-3	11/1/1998	S4-95	AOC14	3	3	Yes	0-03	In Place	0	0	3	3	0-03 ft	2019 H H E R A	Yes
S8-30-3	11/1/1998	S8-30	AOC14	3	3	Yes	0-03	In Place	0	0	3	3	0-03 ft	2019 H H E R A	Yes

Notes:

^a Samples evaluated in the 2019 HHERA for the 0 to 10 foot bgs interval for the baseline scenario are presented in this table.

^b Sample locations represent data evaluated in the Post-NTCRA HHERA for the 0 to 3 foot bgs interval in the baseline scenario.

Abbreviations:

"--" = not applicable

< = less than

> = greater than

A O C = area of concern

bgs = below ground surface

ft = foot

H H E R A = human health and ecological risk assessment

Depth NA = depth not applicable to the dataset

N E = not evaluated (i.e., sample was excavated or depth interval not applicable to the dataset)

N T C R A = non time critical removal action

R F I = RCRA Facility Investigation

Table AOC14-2.1

Comparison of Soil Data for Non-Risk-Driving Constituents in the 2019 HHERA and NTCRA/RFI Additions for the Baseline (No Scouring) Scenario for AOC 14 (0 to 0.5 foot bgs and 0 to 3 feet bgs)

**Soil Human Health and Ecological Risk Assessment Addendum
PG&E Topock Compressor Station
Needles, California**

Category	Constituent ^a	Units	Soil Depth Interval (ft bgs)	Detects	Total Samples	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation
HHERA	Lead	mg/kg	0-3	48	48	100	2.2	1600	N/A	N/A	42.19	42.19	6.05	52969	230.2
HHERA	Mercury	mg/kg	0-3	3	48	6	0.25	180	0.099	0.11	60.22	3.857	0.41	10760	103.7
HHERA	Molybdenum	mg/kg	0-3	7	48	15	1.1	63	1	11	12.4	2.673	1.6	527	22.96
HHERA	Zinc	mg/kg	0-3	74	74	100	4.3	2000	N/A	N/A	63.99	63.99	34	52849	229.9
NTCRA	Lead	mg/kg	0-3	1	1	100	8.1	8.1	N/A	N/A	8.1	N/A	8.1	N/A	N/A
NTCRA	Mercury	mg/kg	0-3	0	1	0	N/A	N/A	0.1	0.1	N/A	N/A	N/A	N/A	N/A
NTCRA	Molybdenum	mg/kg	0-3	0	1	0	N/A	N/A	1	1	N/A	N/A	N/A	N/A	N/A
NTCRA	Zinc	mg/kg	0-3	1	1	100	42	42	N/A	N/A	42	N/A	42	N/A	N/A

Notes:

^a The HHERA dataset is consistent with the 2019 HHERA (Arcadis 2019). The NTCRA dataset consists of 1) data collected as part of the NTCRA and 2) data collected after the submittal of the 2019 HHERA to support the RFI.

Abbreviations:

"--" = not applicable	N/A = not applicable
AOC = area of concern	PG&E = Pacific Gas and Electric Company
ft bgs = feet below ground surface	NTCRA = non time critical removal action
HHERA = human health and ecological risk assessment	RFI = RCRA Facility Investigation
mg/kg = milligrams per kilogram	

References:

Arcadis. 2019. Final Soil Human Health and Ecological Risk Assessment Report, Topock Compressor Station, Needles, California.

Table AOC14-3.1
 Summary Statistics for Depth-Weighted Soil Data and Exposure Point Concentrations for the Baseline (No Scouring) Scenario for
 AOC 14: (0 to 0.5 foot bgs and 0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

Category	Constituent ^a	Units	Soil Depth Interval (ft bgs)	Detects	Total Samples	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation	C O P C / C O P E C ? _b	EPC (Depth-Weighted UCL) ^{c,d}	EPC Basis (Depth-Weighted UCL)	EPC (Area-Weighted UCL) ^{c,d}	EPC Basis (Area-Weighted UCL)
Inorganics	Aluminum	mg/kg	0-0.5	9	9	100	3000	9000	NA	NA	7156	7156	7700	3937778	1984	--	--	--	--	--
Inorganics	Antimony	mg/kg	0-0.5	0	23	0	NA	NA	1	1	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Arsenic	mg/kg	0-0.5	22	23	96	1.5	6.8	0.5	0.5	4.245	4.083	4.65	2.178	1.476	--	--	--	--	--
Inorganics	Barium	mg/kg	0-0.5	23	23	100	66	300	NA	NA	151	151	140	2736	52.31	--	--	--	--	--
Inorganics	Beryllium	mg/kg	0-0.5	0	23	0	NA	NA	0.5	1	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Cadmium	mg/kg	0-0.5	1	23	4	1.4	1.4	0.5	0.5	1.4	0.539	1.4	NA	NA	--	--	--	--	--
Inorganics	Chromium, hexavalent	mg/kg	0-0.5	2	27	7	0.77	2.7	0.1	0.255	1.735	0.221	1.735	1.862	1.365	X	2.7	Max Detect	2.70	Max Detect
Inorganics	Chromium, total	mg/kg	0-0.5	27	27	100	9	28.9	N/A	N/A	16.69	16.69	15	24.65	4.964	--	--	--	--	--
Inorganics	Cobalt	mg/kg	0-0.5	23	23	100	2.4	7.8	NA	NA	5.952	5.952	6.7	2.327	1.526	--	--	--	--	--
Inorganics	Copper	mg/kg	0-0.5	27	27	100	3.5	44	N/A	N/A	11.24	11.24	9	69.56	8.34	X	13.95	95% Adjusted Gamma UCL	14.52	Bootstrap BCA 95UCL
Inorganics	Cyanide	mg/kg	0-0.5	0	9	0	NA	NA	0.05	0.5	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Iron	mg/kg	0-0.5	9	9	100	6800	20000	NA	NA	15200	15200	16000	19860000	4456	--	--	--	--	--
Inorganics	Lead	mg/kg	0-0.5	23	23	100	2.2	18	NA	NA	7.57	7.57	6.1	20.8	4.561	X	9.48	95% Adjusted Gamma UCL	8.86	Bootstrap BCA 95UCL
Inorganics	Manganese	mg/kg	0-0.5	9	9	100	120	290	NA	NA	235.6	235.6	260	3053	55.25	--	--	--	--	--
Inorganics	Mercury	mg/kg	0-0.5	1	23	4	0.41	0.41	0.0495	0.05	0.41	0.0652	0.41	NA	NA	X	0.41	Max Detect	0.41	Max Detect
Inorganics	Molybdenum	mg/kg	0-0.5	3	23	13	1.1	1.6	0.5	1	1.3	0.604	1.2	0.07	0.265	--	--	--	--	--
Inorganics	Nickel	mg/kg	0-0.5	40	40	100	0.28	15.8	NA	NA	8.293	8.293	9.55	15.7	3.963	--	--	--	--	--
Inorganics	Selenium	mg/kg	0-0.5	0	23	0	NA	NA	0.5	0.5	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Silver	mg/kg	0-0.5	0	23	0	NA	NA	0.5	1	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Thallium	mg/kg	0-0.5	0	23	0	NA	NA	1	2.05	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Vanadium	mg/kg	0-0.5	23	23	100	13	32	NA	NA	25.61	25.61	27	22.16	4.707	--	--	--	--	--
Inorganics	Zinc	mg/kg	0-0.5	40	40	100	11.3	243	NA	NA	40.39	40.39	34.75	1234	35.13	--	--	--	--	--
Volatile Organic Compounds	1,2,4-Trimethylbenzene	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	1,3,5-Trimethylbenzene	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Acetone	µg/kg	0-0.5	0	6	0	NA	NA	23	35	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Bromomethane	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Chloro methane	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Chloroform	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Ethyl- benzene	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Isopropylbenzene	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methyl acetate	µg/kg	0-0.5	0	1	0	NA	NA	3.5	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methyl ethyl ketone	µg/kg	0-0.5	0	6	0	NA	NA	23	35	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methylene chloride	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	N-Butylbenzene	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	N-Propylbenzene	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	sec-Butylbenzene	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Toluene	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylene, m,p-	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylene, o-	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylenes, total	µg/kg	0-0.5	0	6	0	NA	NA	2.3	3.5	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	4-Methylphenol	µg/kg	0-0.5	1	21	5	430	430	165	1650	430	178.3	430	NA	NA	X	430	Max Detect	430	Max Detect
Semi-Volatile Organic Compounds	Bis (2-ethylhexyl) phthalate	µg/kg	0-0.5	1	21	5	640	640	165	1650	640	188.8	640	NA	NA	X	640	Max Detect	640	Max Detect
Semi-Volatile Organic Compounds	Butylbenzylphthalate	µg/kg	0-0.5	0	21	0	NA	NA	165	1650	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Di-n-butyl phthalate	µg/kg	0-0.5	0	21	0	NA	NA	165	1650	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Isophorone	µg/kg	0-0.5	0	21	0	NA	NA	165	1650	NA	NA	NA	NA	NA	--	--	--	--	--

Table AOC14-3.1
Summary Statistics for Depth-Weighted Soil Data and Exposure Point Concentrations for the Baseline (No Scouring) Scenario for
AOC 14: (0 to 0.5 foot bgs and 0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topcock Compressor Station
 Needles, California

Category	Constituent ^a	Units	Soil Depth Interval (ft bgs)	Detects	Total Samples	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation	C O P C / C O P E C ? ^b	EPC (Depth-Weighted UCL) ^{c,d}	EPC Basis (Depth-Weighted UCL)	EPC (Area-Weighted UCL) ^{c,d}	EPC Basis (Area-Weighted UCL)
Polycyclic Aromatic Hydrocarbons	PAH low molecular weight	µg/kg	0-0.5	3	21	14	5.2	380	0	0	130.4	18.63	6	46725	216.2	X	380	Max Detect	380	Max Detect
Polycyclic Aromatic Hydrocarbons	PAH high molecular weight	µg/kg	0-0.5	10	21	48	7.7	8070	0	0	856.5	407.9	62	6425316	2535	X	4330	99% KM (Chebyshev) UCL	1171	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	1-Methyl naphthalene	µg/kg	0-0.5	0	20	0	NA	NA	2.5	12.5	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	2-Methyl naphthalene	µg/kg	0-0.5	0	21	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Acenaphthene	µg/kg	0-0.5	0	21	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Acenaphthylene	µg/kg	0-0.5	0	21	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Anthracene	µg/kg	0-0.5	0	21	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Benzo (a) anthracene	µg/kg	0-0.5	5	21	24	5.8	1000	2.5	165	209.2	51.93	15	195461	442.1	X	375	97.5% KM (Chebyshev) UCL	162	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (a) pyrene	µg/kg	0-0.5	4	21	19	6.1	550	2.5	165	143.5	29.55	8.9	73453	271	X	213	97.5% KM (Chebyshev) UCL	93.7	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (b) fluoranthene	µg/kg	0-0.5	6	21	29	5.9	840	2.5	165	149.2	44.84	13	114548	338.4	X	230	95% KM (Chebyshev) UCL	132	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (ghi) perylene	µg/kg	0-0.5	6	21	29	5.3	11	2.5	165	8.517	4.624	8.85	4.414	2.101	X	6.04	95% KM (t) UCL	43.1	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (k) fluoranthene	µg/kg	0-0.5	6	21	29	5.9	360	2.5	165	67.03	21.29	8.95	20604	143.5	X	100	95% KM (Chebyshev) UCL	70.9	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Chrysene	µg/kg	0-0.5	9	21	43	5.2	1100	2.5	165	133.5	59.01	11	131407	362.5	X	294	95% KM (Chebyshev) UCL	177	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Fluoranthene (a,h) anthracene	µg/kg	0-0.5	0	21	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Fluoranthene	µg/kg	0-0.5	8	21	38	5.9	2100	2.5	165	273.3	105.9	11.1	544854	738.1	X	559	95% KM (Chebyshev) UCL	327	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Fluorene	µg/kg	0-0.5	0	21	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Indeno (1,2,3-cd) pyrene	µg/kg	0-0.5	4	21	19	5.3	8.2	2.5	165	6.425	3.424	6.1	1.543	1.242	X	4.27	95% KM (t) UCL	42.1	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Naphthalene	µg/kg	0-0.5	0	21	0	NA	NA	2.3	12.5	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Phenanthrene	µg/kg	0-0.5	3	21	14	5.2	380	2.5	165	130.4	20.8	6	46725	216.2	X	380	Max Detect	380	Max Detect
Polycyclic Aromatic Hydrocarbons	Pyrene	µg/kg	0-0.5	8	21	38	5.3	2100	2.5	165	272.7	105.7	11.7	545174	738.4	X	559	95% KM (Chebyshev) UCL	326	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	B(a)P equivalent	µg/kg	0-0.5	10	21	48	5.9	740	5.8	380	89.28	46.08	12.5	52536	229.2	--	--	--	--	--
Pesticides	4,4-DDE	µg/kg	0-0.5	1	15	7	2.9	2.9	1	1	2.9	1.127	2.9	NA	NA	X	2.9	Max Detect	2.9	Max Detect
Pesticides	4,4-DDT	µg/kg	0-0.5	1	15	7	3	3	1	1	3	1.133	3	NA	NA	X	3	Max Detect	3	Max Detect
Pesticides	Alpha-Chlordane	µg/kg	0-0.5	0	15	0	NA	NA	0.5	0.5	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Dieldrin	µg/kg	0-0.5	0	15	0	NA	NA	1	1	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Gamma-Chlordane	µg/kg	0-0.5	0	15	0	NA	NA	0.5	0.5	NA	NA	NA	NA	NA	--	--	--	--	--
Polychlorinated Biphenyls	Total PCBs	µg/kg	0-0.5	0	14	0	NA	NA	8.5	8.5	NA	NA	NA	NA	NA	--	--	--	--	--
Dioxins	TEQ Human	ng/kg	0-0.5	3	3	100	0.36	0.85	N/A	N/A	0.55	0.55	0.44	0.0691	0.263	X	0.85	Max Detect	0.85	Max Detect
Dioxins	TEQ Avian	ng/kg	0-0.5	3	3	100	0.34	1.1	N/A	N/A	0.603	0.603	0.37	0.185	0.43	X	1.1	Max Detect	1.10	Max Detect
Dioxins	TEQ Mammals	ng/kg	0-0.5	3	3	100	0.36	0.85	N/A	N/A	0.55	0.55	0.44	0.0691	0.263	X	0.85	Max Detect	0.85	Max Detect
Dioxins	2,3,7,8-TCDD	ng/kg	0-0.5	1	8	13	0.18	0.18	0.011	0.08	0.18	0.0321	0.18	NA	NA	X	0.18	Max Detect	0.18	Max Detect
Total Petroleum Hydrocarbons	TPH as diesel	mg/kg	0-0.5	5	20	25	10	34.1	5	5	20.5	8.875	17	123.9	11.13	X	12.5	95% KM (t) UCL	11.9	Bootstrap BCA 95UCL
Total Petroleum Hydrocarbons	TPH as motor oil	mg/kg	0-0.5	10	20	50	10.9	252	5	5	77.9	41.45	44.15	6699	81.84	X	68.3	95% KM (t) UCL	72	Bootstrap BCA 95UCL
Inorganics	Aluminum	mg/kg	0-3	9	9	100	3000	9000	NA	NA	7156	7156	7700	3937778	1984	--	--	--	--	--
Inorganics	Antimony	mg/kg	0-3	2	24	8	1.77	19	1	1.02	10.39	1.782	10.39	148.4	12.18	X	19	Max Detect	19	Max Detect
Inorganics	Arsenic	mg/kg	0-3	24	24	100	0.833	14	NA	NA	4.882	4.882	4.865	7.331	2.708	--	--	--	--	--
Inorganics	Barium	mg/kg	0-3	24	24	100	67.7	410	NA	NA	162	162	150	4996	70.68	--	--	--	--	--
Inorganics	Beryllium	mg/kg	0-3	0	24	0	NA	NA	0.5	2.5	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Cadmium	mg/kg	0-3	3	24	13	1.1	7.1	0.5	0.517	3.31	0.851	1.73	10.87	3.297	--	--	--	--	--
Inorganics	Chromium, hexavalent	mg/kg	0-3	7	34	21	0.22	12	0.1	0.255	2.538	0.605	0.847	18.08	4.252	X	2.129	95% KM Adjusted Gamma UCL	1.39	Bootstrap BCA 95UCL
Inorganics	Chromium, total	mg/kg	0-3	34	34	100	10.3	45.5	N/A	N/A	18.14	18.14	15.85	54.93	7.411	--	--	--	--	--
Inorganics	Cobalt	mg/kg	0-3	24	24	100	2.4	17	NA	NA	6.623	6.623	6.485	6.832	2.614	--	--	--	--	--
Inorganics	Copper	mg/kg	0-3	34	34	100	1.8	32.8	N/A	N/A	10.37	10.37	8.9	40.85	6.392	X	12.43	95% Adjusted Gamma UCL	10.48	Bootstrap BCA 95UCL
Inorganics	Cyanide	mg/kg	0-3	0	9	0	NA	NA	0.05	0.5	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Iron	mg/kg	0-3	10	10	100	6800	23100	NA	NA	15990	15990	16500	23894333	4888	--	--	--	--	--
Inorganics	Lead	mg/kg	0-3	24	24	100	3	1600	NA	NA	74.93	74.93	6.48	105570	324.9	X	364	95% Chebyshev (Mean, Sd) UCL	208	Bootstrap BCA 95UCL
Inorganics	Manganese	mg/kg	0-3	9	9	100	120	290	NA	NA	235.6	235.6	260	3053	55.25	--	--	--	--	--
Inorganics	Mercury	mg/kg	0-3	2	24	8	0.117	60.3	0.0497	0.0517	30.21	2.563	30.21	1811	42.56	X	60.3	Max Detect	60.3	Max Detect
Inorganics	Molybdenum	mg/kg	0-3	6	24	25	0.833	21.3	0.5	2.5	7.006	2.135	1.415	84.23	9.178	--	--	--	--	--
Inorganics	Nickel	mg/kg	0-3	48	48	100	0.28	270	NA	NA	14.83	14.83	9.535	1492	38.63	--	--	--	--	--
Inorganics	Selenium	mg/kg	0-3	0	24	0	NA	NA	0.5	0.517	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Silver	mg/kg	0-3	0	24	0	NA	NA	0.5	2.5	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Thallium	mg/kg	0-3	2	24	8	1.37	1.43	1	4.87	1.4	1.04	1.4	0.0018	0.0424	X	1.43	Max Detect	1.43	Max Detect
Inorganics	Vanadium	mg/kg	0-3	24	24	100	12.3	32	NA	NA	25.95	25.95	25.85	20.2	4.495	--	--	--	--	--
Inorganics	Zinc	mg/kg	0-3	48	48	100	8.08	2000	NA	NA	79.07	79.07	35	81237	285	--	--	--	--	--

Table AOC14-3.1
 Summary Statistics for Depth-Weighted Soil Data and Exposure Point Concentrations for the Baseline (No Scouring) Scenario for
 AOC 14: (0 to 0.5 foot bgs and 0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

Category	Constituent ^a	Units	Soil Depth Interval (ft bgs)	Detects	Total Samples	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation	C O P C / C O P E C ? _b	EPC (Depth-Weighted UCL) ^{c,d}	EPC Basis (Depth-Weighted UCL)	EPC (Area-Weighted UCL) ^{c,d}	EPC Basis (Area-Weighted UCL)
Volatile Organic Compounds	1,2,4-Trimethylbenzene	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	1,3,5-Trimethylbenzene	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Acetone	µg/kg	0-3	0	16	0	NA	NA	20.5	50	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Bromomethane	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Chloro methane	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Chloroform	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Ethyl- benzene	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Isopropylbenzene	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methyl acetate	µg/kg	0-3	0	9	0	NA	NA	2.05	4.45	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methyl ethyl ketone	µg/kg	0-3	0	22	0	NA	NA	20.5	50	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methylene chloride	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	N-Butylbenzene	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	N-Propylbenzene	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	sec-Butylbenzene	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Toluene	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylene, m,p-	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylene, o-	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylenes, total	µg/kg	0-3	0	22	0	NA	NA	2.05	5	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	4-Methylphenol	µg/kg	0-3	1	22	5	345	345	165	1530	345	174.5	345	NA	NA	X	345	Max Detect	345	Max Detect
Semi-Volatile Organic Compounds	Bis (2-ethylhexyl) phthalate	µg/kg	0-3	1	22	5	482	482	165	14300	482	180.9	482	NA	NA	X	482	Max Detect	482	Max Detect
Semi-Volatile Organic Compounds	Butylbenzylphthalate	µg/kg	0-3	0	22	0	NA	NA	165	14300	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Di-n-butyl phthalate	µg/kg	0-3	0	22	0	NA	NA	165	1530	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Isophorone	µg/kg	0-3	0	22	0	NA	NA	165	1530	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	PAH low molecular weight	µg/kg	0-3	7	22	32	2.37	253	0	0	39.55	12.59	3.67	8862	94.14	X	133	99% KM (Chebyshev) UCL	35.7	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	PAH high molecular weight	µg/kg	0-3	13	22	59	15.2	5380	0	0	459.6	271.6	55.3	2186355	1479	X	2734	99% KM (Chebyshev) UCL	754	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	1-Methyl naphthalene	µg/kg	0-3	0	21	0	NA	NA	2.5	9.18	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	2-Methyl naphthalene	µg/kg	0-3	0	22	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Acenaphthene	µg/kg	0-3	0	22	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Acenaphthylene	µg/kg	0-3	1	22	5	3.97	3.97	2.5	165	3.97	2.577	3.97	NA	NA	X	3.97	Max Detect	3.97	Max Detect
Polycyclic Aromatic Hydrocarbons	Anthracene	µg/kg	0-3	1	22	5	7.37	7.37	2.5	165	7.37	2.744	7.37	NA	NA	X	7.37	Max Detect	7.37	Max Detect
Polycyclic Aromatic Hydrocarbons	Benzo (a) anthracene	µg/kg	0-3	8	22	36	3.53	668	2.5	165	91.33	35.07	9.585	54309	233	X	172	95% KM (Chebyshev) UCL	86.2	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (a) pyrene	µg/kg	0-3	8	22	36	3.67	368	2.5	165	52.71	21.09	6.21	16258	127.5	X	96.4	95% KM (Chebyshev) UCL	58	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (b) fluoranthene	µg/kg	0-3	10	22	45	4.77	561	2.5	165	65.46	31.73	10.45	30341	174.2	X	145	95% KM (Chebyshev) UCL	72.8	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (ghi) perylene	µg/kg	0-3	10	22	45	4.38	19.8	2.5	165	7.753	5.374	6.79	19.42	4.407	X	5.87	KM Student's t	46.5	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (k) fluoranthene	µg/kg	0-3	10	22	45	4.77	241	2.5	165	31.51	16.19	7.04	5441	73.76	X	64.5	95% KM (Chebyshev) UCL	51.5	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Chrysene	µg/kg	0-3	12	22	55	4.3	734	2.5	165	70.87	40.22	9.185	43628	208.9	X	187	95% KM (Chebyshev) UCL	88	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Dibenzo (a,h) anthracene	µg/kg	0-3	0	22	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Fluoranthene	µg/kg	0-3	12	22	55	3.9	1400	2.5	165	126.8	70.59	10.11	160813	401	X	352	95% KM (Chebyshev) UCL	203	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Fluorene	µg/kg	0-3	0	22	0	NA	NA	2.5	165	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Indeno (1,2,3-cd) pyrene	µg/kg	0-3	8	22	36	4.38	19.1	2.5	165	6.84	4.383	4.975	24.95	4.995	X	6.1	95% KM (BCA) UCL	47.5	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Naphthalene	µg/kg	0-3	0	22	0	NA	NA	2.38	9.18	NA	NA	NA	NA	NA	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons	Phenanthrene	µg/kg	0-3	6	22	27	4.07	254	2.5	165	46.12	14.47	4.6	10371	101.8	X	67.7	95% KM (Chebyshev) UCL	56.8	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Pyrene	µg/kg	0-3	12	22	55	3.9	1400	2.5	165	126.2	70.29	9.435	160951	401.2	X	352	95% KM (Chebyshev) UCL	217	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	B(a)P equivalent	µg/kg	0-3	13	22	59	6	495	5.8	380	53.84	34.83	11.3	17834	133.5	--	--	--	--	--
Pesticides	4,4-DDE	µg/kg	0-3	2	16	13	2.9	4.4	1	1.02	3.65	1.331	3.65	1.125	1.061	X	4.4	Max Detect	4.4	Max Detect
Pesticides	4,4-DDT	µg/kg	0-3	1	16	6	3	3	1	1.05	3	1.125	3	NA	NA	X	3	Max Detect	3	Max Detect
Pesticides	Alpha-Chlordane	µg/kg	0-3	0	16	0	NA	NA	0.5	NA	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Dieldrin	µg/kg	0-3	0	16	0	NA	NA	1	1.05	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Gamma-Chlordane	µg/kg	0-3	0	16	0	NA	NA	0.5	0.5	NA	NA	NA	NA	NA	--	--	--	--	--
Polychlorinated Biphenyls	Total PCBs	µg/kg	0-3	1	15	7	35	35	8.5	8.5	35	10.27	35	NA	NA	X	35	Max Detect	35	Max Detect
Dioxins	TEQ Human	ng/kg	0-3	4	4	100	0.337	4.8	N/A	N/A	1.843	1.843	1.117	4.198	2.049	X	4.8	Max Detect	4.80	Max Detect
Dioxins	TEQ Avian	ng/kg	0-3	4	4	100	0.357	4.3	N/A	N/A	1.637	1.637	0.945	3.413	1.847	X	4.3	Max Detect	4.30	Max Detect
Dioxins	TEQ Mammals	ng/kg	0-3	4	4	100	0.337	4.8	N/A	N/A	1.843	1.843	1.117	4.198	2.049	X	4.8	Max Detect	4.80	Max Detect
Dioxins	2,3,7,8-TCDD	ng/kg	0-3	2	9	22	0.125	17	0.0213	0.258	8.563	1.921	8.563	142.4	11.93	X	17	Max Detect	17	Max Detect

Table AOC14-3.1
Summary Statistics for Depth-Weighted Soil Data and Exposure Point Concentrations for the Baseline (No Scouring) Scenario for
AOC 14: (0 to 0.5 foot bgs and 0 to 3 feet bgs)

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Category	Constituent ^a	Units	Soil Depth Interval (ft bgs)	Detects	Total Samples	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation	C O P C / C O P E C ? ^b	EPC (Depth-Weighted UCL) ^{c,d}	EPC Basis (Depth-Weighted UCL)	EPC (Area-Weighted UCL) ^{c,d}	EPC Basis (Area-Weighted UCL)
Total Petroleum Hydrocarbons	TPH as diesel	mg/kg	0-3	7	21	33	9	213	5	5	44.14	18.05	13	5593	74.78	X	63.3	95% KM (Chebyshev) UCL	37.8	Bootstrap BCA 95UCL
Total Petroleum Hydrocarbons	TPH as gasoline	mg/kg	0-3	0	21	0	NA	NA	0.395	0.95	NA	NA	NA	NA	NA	--	--	--	--	--
Total Petroleum Hydrocarbons	TPH as motor oil	mg/kg	0-3	15	21	71	6.77	1500	5	5	146.5	106.1	25	142896	378	X	479	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	252	Bootstrap BCA 95UCL
Miscellaneous	Chloride	mg/kg	0-3	1	1	100	223	223	NA	NA	223	NA	223	NA	NA	X	223	Max Detect	223	Max Detect
Miscellaneous	Nitrate	mg/kg	0-3	1	1	100	17	17	NA	NA	17	NA	17	NA	NA	X	17	Max Detect	17	Max Detect
Miscellaneous	Phosphate	mg/kg	0-3	1	1	100	64.2	64.2	NA	NA	64.2	NA	64.2	NA	NA	X	64.2	Max Detect	64.2	Max Detect
Miscellaneous	Sulfate	mg/kg	0-3	1	1	100	585	585	NA	NA	585	NA	585	NA	NA	X	585	Max Detect	585	Max Detect

Notes:

^a The constituents presented consists of analytes detected at least once at the Topock Compressor Station site and measured in soil in this exposure area. The datasets for chromium (total and hexavalent), copper, and dioxins (TEQ Human, TEQ Mammal, and TEQ Avian) were updated to reflect the non-time critical removal actions outlined in Arcadis (2024).

^b COPCs selected in the 2019 Soil Risk Assessment (Arcadis 2019) were also evaluated in this Post-NTCRA HHERA. However, no COPECs were identified in this AOC.

^c If fewer than eight total locations and four total detected concentrations, the maximum depth-weighted concentration was selected as the EPC. Otherwise, the UCL was selected as the EPC.

^d EPCs and summary statistics were not calculated for some constituents (i.e., dioxin congeners and essential nutrients). Those data, if available, are presented in Attachment A1 of each exposure area-specific appendix in the Soil Human Health and Ecological Risk Assessment Report (Arcadis 2019).

Abbreviations:

"--" = not applicable	mg/kg = milligrams per kilogram
AOC = area of concern	NA = not applicable
B(a)P equivalent = benzo(a)pyrene equivalent	ND = not detected
BCA = Bias-corrected accelerated bootstrap method	ng/kg = nanograms per kilogram
COPC = constituent of potential concern	PAH = polycyclic aromatic hydrocarbons
COPEC = constituent of potential ecological concern	PCB = polychlorinated biphenyls
DDE = Dichlorodiphenyldichloroethylene	PG&E = Pacific Gas and Electric Company
DDT = Dichlorodiphenyltrichloroethane	TCDD = Tetrachlorodibenzo-p-dioxin
EPC = exposure point concentration	TEQ = toxic equivalent
FOD = frequency of detection	TPH = total petroleum hydrocarbons
ft bgs = feet below ground surface	UCL = upper confidence limit
KM = Kaplan-Meier	X = COPC/COPEC in the exposure depth interval
µg/kg = micrograms per kilogram	

References:

Arcadis. 2019. Final Soil Human Health and Ecological Risk Assessment Report, Topock Compressor Station, Needles, California.
 Arcadis. 2024. Soil Risk Assessment Addendum: Proposed Approach to Update the Human Health and Ecological Risk Assessment after Completion of the 2023 Non-Time Critical Removal Action. January 30.

Table AOC14-4.1

Summary of C O P Cs Evaluated in the HHRA for AOC 14: Baseline Scenario

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

C O P C	C O P Cs in Surface Soil (0 to 0.5 foot bgs)	C O P Cs in Shallow Soil (0 to 3 feet bgs)	C O P Cs in Subsurface II Soil (0 to 10 feet bgs)
Inorganics			
Antimony	--	X	X
Chromium, Hexavalent	X	X	X
Copper	X	X	X
Lead	X	X	X
Mercury (inorganic)	X	X	X
Nitrate	--	X	X
Phosphate	--	X	X
Thallium	--	X	X
Semi-Volatile Organic Compounds			
4-Methylphenol	X	X	X
bis (2-ethylhexyl) phthalate	X	X	X
Butylbenzylphthalate	--	--	X
Polycyclic Aromatic Hydrocarbons			
Acenaphthylene	--	X	X
Anthracene	--	X	X
Benzo (ghi) perylene	X	X	X
Fluoranthene	X	X	X
Phenanthrene	X	X	X
Pyrene	X	X	X
Pesticides			
4,4-DDE	X	X	X
4,4-DDT	X	X	X

Table AOC14-4.1

Summary of C O P Cs Evaluated in the HHRA for AOC 14: Baseline Scenario

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	C O P Cs in Surface Soil (0 to 0.5 foot bgs)	C O P Cs in Shallow Soil (0 to 3 feet bgs)	C O P Cs in Subsurface II Soil (0 to 10 feet bgs)
Polychlorinated Biphenyls			
Total PCBs	--	x	x
Total Petroleum Hydrocarbons			
TPH as diesel	x	x	x
TPH as motor oil	x	x	x
Dioxins/Furans			
TEQ Human	x	x	x

Abbreviations:

bgs = below ground surface.

C O P C = Constituent of Potential Concern.

-- = not detected or not analyzed.

x = Chemical included as C O P C in human health risk assessment.

PCB = Polychlorinated biphenyls.

TPH = Total Petroleum Hydrocarbons.

TEQ = Toxic Equivalent.

Table AOC14-4.2a

Baseline Scenario Depth-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:

C O P Cs in AOC 14 Surface Soil (0 to 0.5 foot bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Exposure Point Concentration for Surface Soil: 0 to 0.5 foot bgs (mg/kg) ^a	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) ^b	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m ³) ^c	Recreational User - Camper Outdoor Vapor Concentration (mg/m ³) ^d	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m ³) ^c	Recreational User - Hiker Outdoor Vapor Concentration (mg/m ³) ^d	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m ³) ^e	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m ³) ^d
Inorganics								
Antimony	ND	6.4E+00	NA	NV	NA	NV	NA	NV
Chromium, Hexavalent	2.7E+00	1.0E+00	2.0E-09	NV	2.0E-09	NV	3.2E-06	NV
Copper	1.4E+01	8.4E+01	1.0E-08	NV	1.0E-08	NV	1.6E-05	NV
Lead	9.5E+00	9.9E+01	7.0E-09	NV	7.0E-09	NV	1.1E-05	NV
Mercury (inorganic)	4.1E-01	7.2E+01	3.0E-10	NV	3.0E-10	NV	4.8E-07	NV
Nitrate	NS	2.9E+01	NA	NV	NA	NV	NA	NV
Phosphate	NS	6.4E+01	NA	NV	NA	NV	NA	NV
Thallium	ND	2.0E+00	NA	NV	NA	NV	NA	NV
Semi-Volatile Organic Compounds								
4-Methylphenol	4.3E-01	2.3E-01	3.2E-10	NV	3.2E-10	NV	5.1E-07	NV
bis (2-ethylhexyl) phthalate	6.4E-01	2.6E-01	4.7E-10	NV	4.7E-10	NV	7.6E-07	NV
Butylbenzylphthalate	ND	1.3E+01	NA	NV	NA	NV	NA	NV
Polycyclic Aromatic Hydrocarbons								
Acenaphthylene	ND	3.8E-03	NA	NV	NA	NV	NA	NV
Anthracene	ND	2.0E-02	NA	3.1E-08	NA	3.1E-08	NA	3.1E-08
Benzo (ghi) perylene	6.0E-03	6.3E-03	4.4E-12	NV	4.4E-12	NV	7.1E-09	NV
Fluoranthene	5.6E-01	1.4E-01	4.1E-10	NV	4.1E-10	NV	6.6E-07	NV
Phenanthrene	3.8E-01	3.3E-02	2.8E-10	NV	2.8E-10	NV	4.5E-07	NV
Pyrene	5.6E-01	1.2E-01	4.1E-10	3.7E-08	4.1E-10	3.7E-08	6.6E-07	3.7E-08
Pesticides								
4,4-DDE	2.9E-03	2.9E-03	2.1E-12	1.4E-09	2.1E-12	1.4E-09	3.4E-09	1.4E-09
4,4-DDT	3.0E-03	3.0E-03	2.2E-12	NV	2.2E-12	NV	3.5E-09	NV

Table AOC14-4.2a

Baseline Scenario Depth-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P C s in AOC 14 Surface Soil (0 to 0.5 foot bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Exposure Point Concentration for Surface Soil: 0 to 0.5 foot bgs (mg/kg) ^a	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) ^b	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m ³) ^c	Recreational User - Camper Outdoor Vapor Concentration (mg/m ³) ^d	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m ³) ^c	Recreational User - Hiker Outdoor Vapor Concentration (mg/m ³) ^d	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m ³) ^e	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m ³) ^d
Polychlorinated Biphenyls								
Total PCBs	ND	2.0E-02	NA	3.1E-08	NA	3.1E-08	NA	3.1E-08
Total Petroleum Hydrocarbons								
TPH as diesel	1.3E+01	1.6E+01	9.2E-09	6.5E-03	9.2E-09	6.5E-03	1.5E-05	6.5E-03
TPH as motor oil	6.8E+01	1.4E+02	5.0E-08	NV	5.0E-08	NV	8.1E-05	NV
Dioxins/Furans								
TEQ Human	8.5E-07	4.9E-05	6.3E-16	2.0E-11	6.3E-16	2.0E-11	1.0E-12	2.0E-11

Notes:

- ^a Exposure point concentrations (EPCs) for surface soil (0 to 0.5 feet bgs) are used to evaluate inhalation of particulates in outdoor air.
- ^b EPCs for subsurface II soil (0 to 10 feet bgs) are used to evaluate inhalation of volatiles in outdoor air.
- ^c Outdoor airborne particulate concentration is calculated by dividing the soil EPCs by the particulate emission factor (PEF). Default PEF of 1.4×10⁹ m³/kg was used for recreational users (campers and hikers) as recommended by Department of Toxic Substances Control (2014).
- ^d Chemical-specific volatilization factors (VFs) were estimated as discussed in Section 4.0, Exposure Assessment, of the main report. Outdoor vapor concentration is calculated by dividing the soil EPC by the VF.
- ^e PEF of 8.5×10⁵ m³/kg was used for recreational users (off-highway vehicle rider) as calculated in United States Environmental Protection Agency (2008, 2009) and recommended in "Revised Technical Memorandum, Recreational Visitor Exposure Scenario for Federal Land, PG&E Topock Compressor Station Remediation Project, California," prepared by the Department of the Interior (DOI).

Abbreviations:

- bgs = below ground surface.
- C O P C = Constituent of Potential Concern.
- mg/kg = milligrams per kilogram.
- mg/m³ = milligrams per cubic meter.
- NA = not applicable.
- ND = Not detected.
- NS = Not sampled.
- NV = Not volatile.
- PCB = Polychlorinated biphenyls.
- TPH = Total Petroleum Hydrocarbons.
- TEQ = Toxic Equivalent.

References:

- Department of Toxic Substances Control (DTSC). 2014. DTSC/HERO Human Health Risk Assessment (HHRA) Note Number 1: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and Permitted Facilities. September 30.
- United States Environmental Protection Agency (U S E P A). 2008. Clear Creek Management Areas Asbestos Exposure and Human Health Risk Assessment. Region 9. May. Available at: <http://www.epa.gov/region09/toxic/noa/clearcreek/pdf/CCMARiskDoc24Apr08-withoutAppxG.pdf>
- U S E P A. 2009. Baseline Human Health Risk Assessment for the Standard Mine Site, Gunnison County, CO; Addendum. Prepared by SRC for U S E P A Region 8. November 24. Available at: http://www2.epa.gov/sites/production/files/documents/SM_HHRA_Addendum.pdf

Table AOC14-4.2b

Baseline Scenario Depth-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:

C O P Cs in AOC 14 Shallow Soil (0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Exposure Point Concentration for Shallow Soil: 0 to 3 feet bgs (mg/kg) ^a	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) ^b	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m ³) ^c	Recreational User - Camper Outdoor Vapor Concentration (mg/m ³) ^d	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m ³) ^c	Recreational User - Hiker Outdoor Vapor Concentration (mg/m ³) ^d	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m ³) ^e	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m ³) ^d
Inorganics								
Antimony	1.9E+01	6.4E+00	1.4E-08	NV	1.4E-08	NV	2.2E-05	NV
Chromium, Hexavalent	2.1E+00	1.0E+00	1.6E-09	NV	1.6E-09	NV	2.5E-06	NV
Copper	1.2E+01	8.4E+01	9.1E-09	NV	9.1E-09	NV	1.5E-05	NV
Lead	3.6E+02	9.9E+01	2.7E-07	NV	2.7E-07	NV	4.3E-04	NV
Mercury (inorganic)	6.0E+01	7.2E+01	4.4E-08	NV	4.4E-08	NV	7.1E-05	NV
Nitrate	1.7E+01	2.9E+01	1.3E-08	NV	1.3E-08	NV	2.0E-05	NV
Phosphate	6.4E+01	6.4E+01	4.7E-08	NV	4.7E-08	NV	7.6E-05	NV
Thallium	1.4E+00	2.0E+00	1.1E-09	NV	1.1E-09	NV	1.7E-06	NV
Semi-Volatile Organic Compounds								
4-Methylphenol	3.5E-01	2.3E-01	2.5E-10	NV	2.5E-10	NV	4.1E-07	NV
bis (2-ethylhexyl) phthalate	4.8E-01	2.6E-01	3.5E-10	NV	3.5E-10	NV	5.7E-07	NV
Butylbenzylphthalate	ND	1.3E+01	NA	NV	NA	NV	NA	NV
Polycyclic Aromatic Hydrocarbons								
Acenaphthylene	4.0E-03	3.8E-03	2.9E-12	NV	2.9E-12	NV	4.7E-09	NV
Anthracene	7.4E-03	2.0E-02	5.4E-12	3.1E-08	5.4E-12	3.1E-08	8.7E-09	3.1E-08
Benzo (ghi) perylene	5.9E-03	6.3E-03	4.3E-12	NV	4.3E-12	NV	6.9E-09	NV
Fluoranthene	3.5E-01	1.4E-01	2.6E-10	NV	2.6E-10	NV	4.2E-07	NV
Phenanthrene	6.8E-02	3.3E-02	5.0E-11	NV	5.0E-11	NV	8.0E-08	NV
Pyrene	3.5E-01	1.2E-01	2.6E-10	3.7E-08	2.6E-10	3.7E-08	4.2E-07	3.7E-08
Pesticides								
4,4-DDE	4.4E-03	2.9E-03	3.2E-12	1.4E-09	3.2E-12	1.4E-09	5.2E-09	1.4E-09
4,4-DDT	3.0E-03	3.0E-03	2.2E-12	NV	2.2E-12	NV	3.5E-09	NV

Table AOC14-4.2b

Baseline Scenario Depth-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P C s in AOC 14 Shallow Soil (0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Exposure Point Concentration for Shallow Soil: 0 to 3 feet bgs (mg/kg) ^a	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) ^b	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m ³) ^c	Recreational User - Camper Outdoor Vapor Concentration (mg/m ³) ^d	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m ³) ^c	Recreational User - Hiker Outdoor Vapor Concentration (mg/m ³) ^d	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m ³) ^e	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m ³) ^d
Polychlorinated Biphenyls								
Total PCBs	3.5E-02	2.0E-02	2.6E-11	3.1E-08	2.6E-11	3.1E-08	4.1E-08	3.1E-08
Total Petroleum Hydrocarbons								
TPH as diesel	6.3E+01	1.6E+01	4.7E-08	6.5E-03	4.7E-08	6.5E-03	7.5E-05	6.5E-03
TPH as motor oil	4.8E+02	1.4E+02	3.5E-07	NV	3.5E-07	NV	5.7E-04	NV
Dioxins/Furans								
TEQ Human	4.8E-06	4.9E-05	3.5E-15	2.0E-11	3.5E-15	2.0E-11	5.7E-12	2.0E-11

Notes:

- ^a Exposure point concentrations (EPCs) for shallow soil (0 to 3 feet bgs) are used to evaluate inhalation of particulates in outdoor air.
- ^b EPCs for subsurface II soil (0 to 10 feet bgs) are used to evaluate inhalation of volatiles in outdoor air.
- ^c Outdoor airborne particulate concentration is calculated by dividing the soil EPCs by the particulate emission factor (PEF). Default PEF of 1.4×10⁹ m³/kg was used for recreational users (campers and hikers) as recommended by Department of Toxic Substances Control (2014).
- ^d Chemical-specific volatilization factors (VFs) were estimated as discussed in Section 4.0, Exposure Assessment, of the main report. Outdoor vapor concentration is calculated by dividing the soil EPC by the VF.
- ^e PEF of 8.5×10⁵ m³/kg was used for recreational users (off-highway vehicle rider) as calculated in United States Environmental Protection Agency (2008, 2009) and recommended in "Revised Technical Memorandum, Recreational Visitor Exposure Scenario for Federal Land, PG&E Topock Compressor Station Remediation Project, California," prepared by the Department of the Interior (DOI).

Abbreviations:

- bgs = below ground surface.
- C O P C = Constituent of Potential Concern.
- mg/kg = milligrams per kilogram.
- mg/m³ = milligrams per cubic meter.
- NA = not applicable.
- ND = Not detected.
- NV = Not volatile.
- PCB = Polychlorinated biphenyls.
- TPH = Total Petroleum Hydrocarbons.
- TEQ = Toxic Equivalent.

References:

- Department of Toxic Substances Control (DTSC). 2014. DTSC/HERO Human Health Risk Assessment (HHRA) Note Number 1: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and Permitted Facilities. September 30.
- United States Environmental Protection Agency (U S E P A). 2008. Clear Creek Management Areas Asbestos Exposure and Human Health Risk Assessment. Region 9. May. Available at: <http://www.epa.gov/region09/toxic/noa/clearcreek/pdf/CCMARiskDoc24Apr08-withoutAppxG.pdf>
- U S E P A. 2009. Baseline Human Health Risk Assessment for the Standard Mine Site, Gunnison County, CO; Addendum. Prepared by SRC for U S E P A Region 8. November 24. Available at: http://www2.epa.gov/sites/production/files/documents/SM_HHRA_Addendum.pdf

Table AOC14-4.3

Human Health Risk and Hazard Estimate Summary at AOC 14 for the Baseline Scenario Using Depth-Weighted Exposure Point Concentrations

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

Receptor	Depth Interval	ILCR	H I
Recreational User - Camper	Surface	2E-07	3E-03
Recreational User - Camper	Shallow	2E-07	2E-01
Recreational User - Hiker	Surface	4E-07	5E-03
Recreational User - Hiker	Shallow	4E-07	4E-01
Recreational User - OHV Rider	Surface	9E-07	1E-03
Recreational User - OHV Rider	Shallow	7E-07	5E-02

Abbreviations:

ILCR = Incremental Lifetime Cancer Risk

H I = Hazard Index

**Table AOC14-5.1
Depth-Weighted Exposure Point Concentrations for Soil and Biota for AOC 14**

**Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California**

Category	C O P E C	Units	Soil EPC (0-0.5 ft bgs)	Biota EPC (0-0.5 ft bgs) ^a
Inorganics	Chromium, hexavalent	mg/kg	2.70E+00	8.26E-01
Inorganics	Chromium, total	mg/kg	1.83E+01	5.60E+00
Inorganics	Copper	mg/kg	1.40E+01	7.18E+00
Dioxins	TEQ Mammals	ng/kg	8.50E-01	2.29E+00

Notes:

^a Calculated using selected soil EPC and uptake model. See Section 6 of the main report.

Abbreviations:

C O P E C = constituent of potential ecological concern

EPC = exposure point concentration

ft bgs = feet below ground surface

mg/kg = milligrams per kilogram

ng/kg = nanograms per kilogram

TEQ = toxicity equivalent

Table AOC14-5.2
Area-Weighted Exposure Point Concentrations for Soil and Biota for AOC 14

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Category	C O P E C	Units	Soil EPC (0-0.5 ft bgs)	Biota EPC (0-0.5 ft bgs) ^a
Inorganics	Chromium, hexavalent	mg/kg	2.70E+00	8.26E-01
Inorganics	Chromium, total	mg/kg	1.73E+01	5.28E+00
Inorganics	Copper	mg/kg	1.45E+01	7.48E+00
Dioxins	TEQ Mammals	ng/kg	8.50E-01	2.29E+00

Notes:

^a Calculated using selected soil EPC and uptake model. See Section 6 of the main report.

Abbreviations:

C O P E C = constituent of potential ecological concern

EPC = exposure point concentration

ft bgs = feet below ground surface

mg/kg = milligrams per kilogram

ng/kg = nanograms per kilogram

TEQ = toxicity equivalent

Table AOC14-5.3

Desert Shrew Risk Estimate Summary Using Depth-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 14

**Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California**

Scenario	Category	COPEC	Desert Shrew NOAEL HQ TRV Used for RBRG Development SUF = 1	NOAEL HQ TRV Basis ^a	NOAEL HQ Notes	Desert Shrew LOAEL HQ TRV Used for RBRG Development SUF = 1	LOAEL HQ TRV Basis ^a	LOAEL HQ Notes
Baseline	Inorganics	Chromium, hexavalent	2E-02	Selected TRV	None	5E-03	Selected TRV	None
Baseline	Inorganics	Chromium, total	5E-01	Selected TRV	None	1E-01	Selected TRV	None
Baseline	Inorganics	Copper	2E-01	Selected TRV	None	1E-01	Selected TRV	None
Baseline	Dioxins	TEQ Mammals	1E-01	Alternate TRV	None	2E-02	Alternate TRV	None

Notes:

^a Selected TRVs for metals are based on the TRVs used to develop the U S E P A Ecological Soil Screening Levels (U S E P A 2005). Alternate TRVs for dioxin TEQ were developed for mammals based the geometric mean of the reproduction and growth endpoints for the NOAEL and LOAEL effect levels, respectively.

Note 1	NOAEL HQ greater than 1
Note 2	LOAEL HQ greater than 1
Note 3	LOAEL HQ greater than 10
Note 4	LOAEL HQ greater than 100

Abbreviations:

- BAF = bioaccumulation factor
- COPEC = constituent of potential ecological concern
- HQ = hazard quotient
- LOAEL = lowest observed adverse effect level
- NOAEL = no-observed adverse effect level
- RBRG = risk-based remedial goal
- SUF = site use factor
- TEQ = toxicity equivalent
- TRV = toxicity reference value
- U S E P A = United States Environmental Protection Agency

Table AOC14-5.4

Desert Shrew Risk Estimate Summary Using Area-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 14

**Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California**

Scenario	Category	COPEC	Desert Shrew NOAEL HQ TRV Used for RBRG Development SUF = 1	NOAEL HQ TRV Basis ^a	NOAEL HQ Notes	Desert Shrew LOAEL HQ TRV Used for RBRG Development SUF = 1	LOAEL HQ TRV Basis ^a	LOAEL HQ Notes
Baseline	Inorganics	Chromium, hexavalent	2E-02	Selected TRV	None	5E-03	Selected TRV	None
Baseline	Inorganics	Chromium, total	5E-01	Selected TRV	None	1E-01	Selected TRV	None
Baseline	Inorganics	Copper	2E-01	Selected TRV	None	1E-01	Selected TRV	None
Baseline	Dioxins	TEQ Mammals	1E-01	Alternate TRV	None	2E-02	Alternate TRV	None

Notes:

^a Selected TRVs for metals are based on the TRVs used to develop the U S E P A Ecological Soil Screening Levels (U S E P A 2005). Alternate TRVs for dioxin TEQ were developed for mammals based the geometric mean of the reproduction and growth endpoints for the NOAEL and LOAEL effect levels, respectively.

Note 1	NOAEL HQ greater than 1
Note 2	LOAEL HQ greater than 1
Note 3	LOAEL HQ greater than 10
Note 4	LOAEL HQ greater than 100

Abbreviations:

BAF = bioaccumulation factor
COPEC = constituent of potential ecological concern
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
NOAEL = no-observed adverse effect level
RBRG = risk-based remedial goal
SUF = site use factor
TEQ = toxicity equivalent
TRV = toxicity reference value
U S E P A = United States Environmental Protection Agency

**Table AOC14-6.1
Desert Shrew Risk Estimate Summary Using Depth-Weighted and Area-Weighted Exposure Point Concentrations for AOC 14**

**Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
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Needles, California**

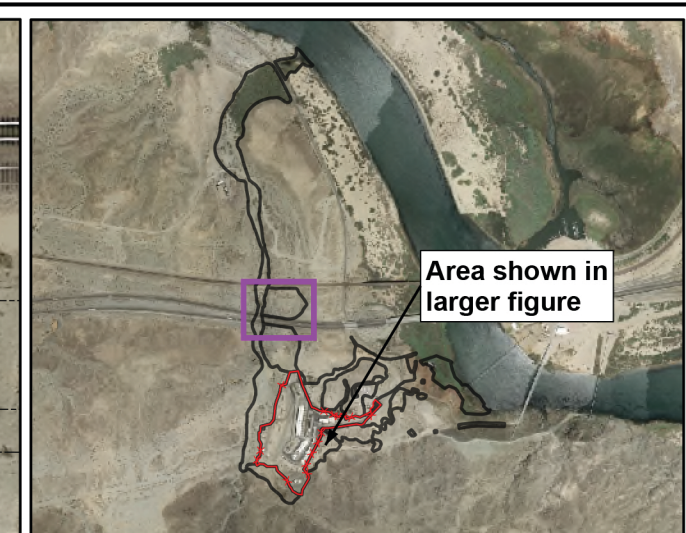
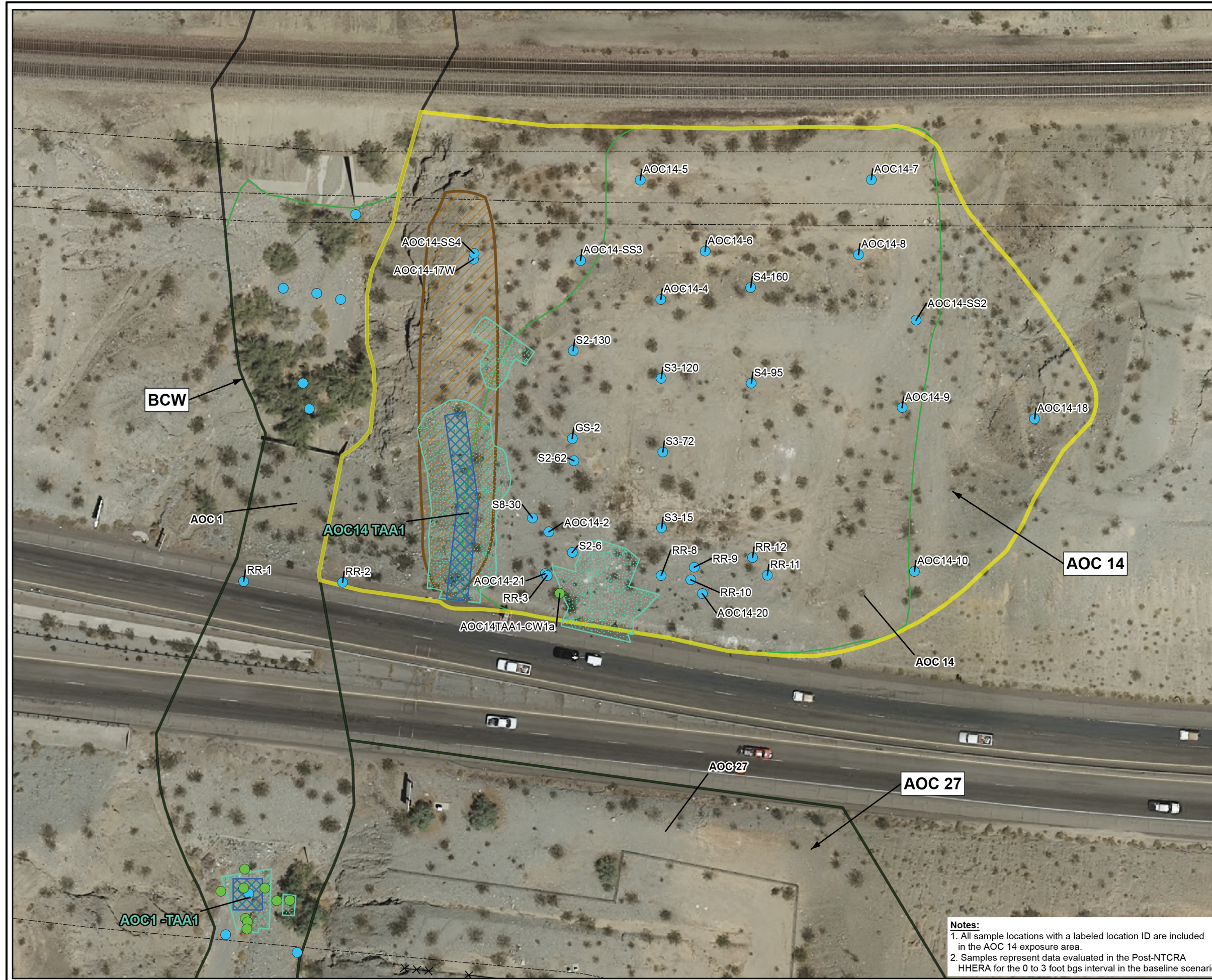
Scenario	Category	C O P E C	Desert Shrew Depth-Weighted N O A E L HQ TRV Used for RBRG Development SUF = 1	Depth- Weighted NOAEL HQ Notes	Desert Shrew Depth-Weighted L O A E L HQ TRV Used for RBRG Development SUF = 1	Depth- Weighted LOAEL HQ Notes	Desert Shrew Area-Weighted N O A E L HQ TRV Used for RBRG Development SUF = 1	Area- Weighted NOAEL HQ Notes	Desert Shrew Area-Weighted L O A E L HQ TRV Used for RBRG Development SUF = 1	Area- Weighted LOAEL HQ Notes	W O E Result ^a
Baseline	Inorganics	Chromium, hexavalent	2E-02	None	5E-03	None	2E-02	None	5E-03	None	HQ less than or equal to 1
Baseline	Inorganics	Chromium, total	5E-01	None	1E-01	None	5E-01	None	1E-01	None	HQ less than or equal to 1
Baseline	Inorganics	Copper	2E-01	None	1E-01	None	2E-01	None	1E-01	None	HQ less than or equal to 1
Baseline	Dioxins	TEQ Mammals	1E-01	None	2E-02	None	1E-01	None	2E-02	None	HQ less than or equal to 1

Notes:
^a W O E result for dioxin TEQ is risk conclusion based on 1) L O A E L HQ based on area-weighted EPCs and assumptions used for RBRG development (i.e., a SUF of 1, selected BAFs, and alternate TRVs), and 2) supporting L O E s. W O E result for metals is risk conclusion based on 1) L O A E L HQ based on area-weighted EPCs and assumptions used for RBRG development (i.e., a SUF of 1 and selected BAFs and TRVs), and 2) supporting L O E s.

- Note 1 N O A E L HQ greater than 1
- Note 2 L O A E L HQ greater than 1
- Note 3 L O A E L HQ greater than 10
- Note 4 L O A E L HQ greater than 100

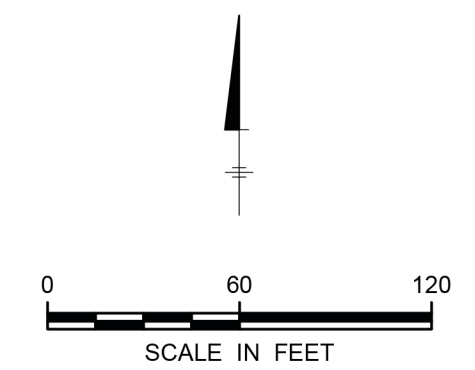
Abbreviations:
 "--" = not applicable
 B A F = bioaccumulation factor
 C O P E C = constituent of potential ecological concern
 E P C = exposure point concentration
 H Q = hazard quotient
 L O A E L = lowest observed adverse effect level
 L O E = line of evidence
 N O A E L = no-observed adverse effect level
 R B R G = risk-based remedial goal
 S U F = site use factor
 T E Q = toxicity equivalent
 T R V = toxicity reference value
 U S E P A = United States Environmental Protection Agency
 W O E = weight of evidence, considering multiple L O E s. If HQs/L O A E L HQs are greater than 1, W O E Result is either 1) not expected, 2) unlikely, or 3) possible.

FIGURES



Area shown in larger figure

- Legend:**
- Soil Sampling Location
 - NTCRA Confirmation Samples
 - Area of Concern
 - Potential Burning Related Location
 - AOC 14 Exposure Area
 - Exposure Area
 - Property Boundaries
 - xxx Fencing
 - Inside the Topock Compressor Station boundary, as defined by current fenceline
 - Target Action Area
 - NTCRA Removal Area
 - BCW** Label for Exposure Area
 - AOC 1** Label for Area of Concern
 - AOC14 TAA1** Target Action Area (TAA)



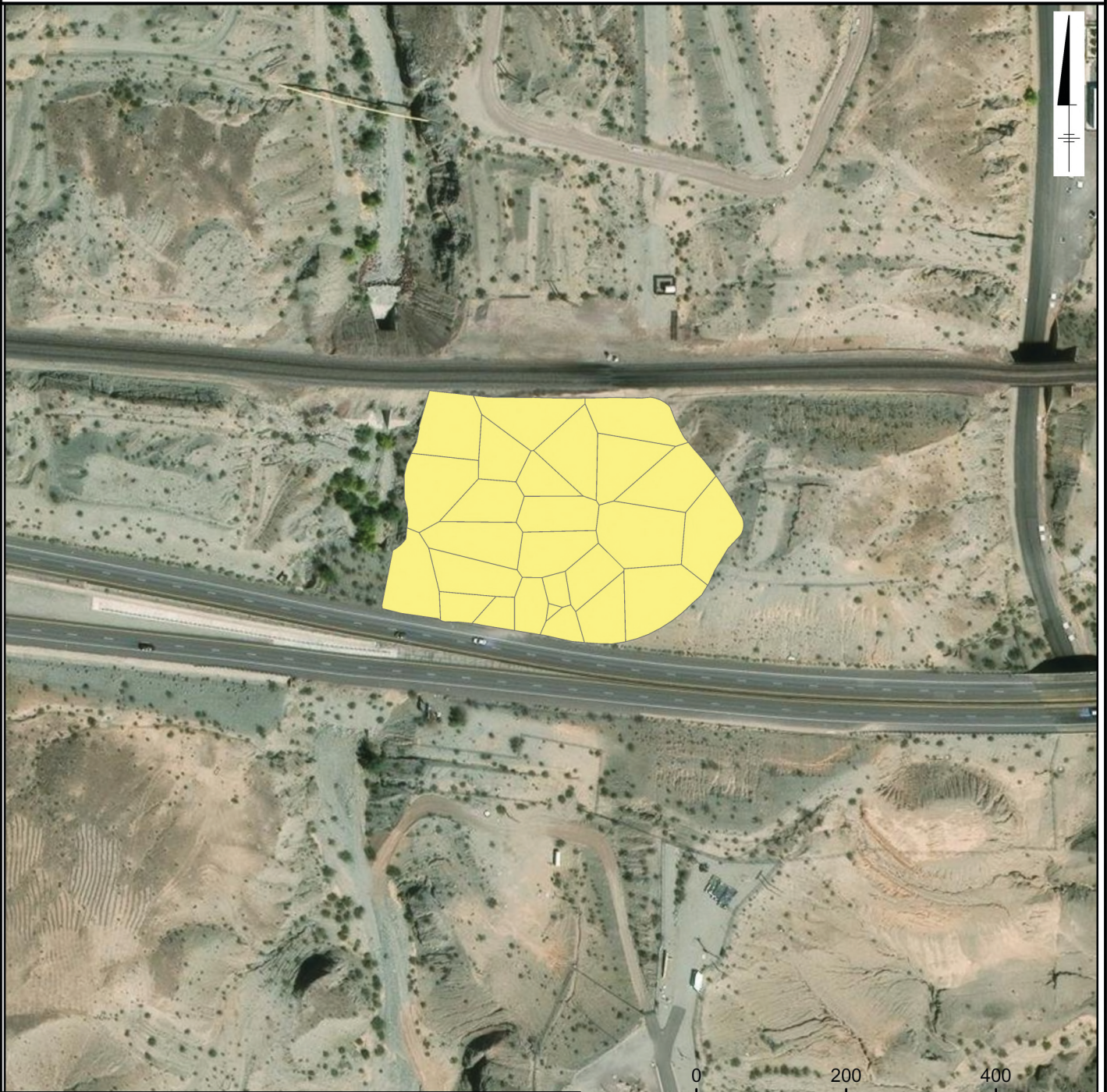
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
**POST-SOIL NTCRA HUMAN HEALTH
AND ECOLOGICAL RISK ASSESSMENT REPORT**
CURRENT SOIL SAMPLING LOCATIONS AND
NTCRA AREAS FOR AOC 14 EXPOSURE AREA

Notes:
1. All sample locations with a labeled location ID are included in the AOC 14 exposure area.
2. Samples represent data evaluated in the Post-NTCRA HHERA for the 0 to 3 foot bgs interval in the baseline scenario.

ATTACHMENT A

**Dataset and Exposure Point Concentration Calculations for the
AOC14 HHERA**

AOC 14
0 - 0.5 FEET BELOW GROUND SURFACE
CHROMIUM, TOTAL

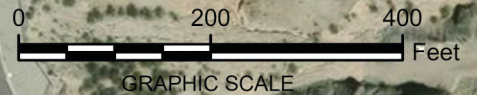


LEGEND:
CHROMIUM, TOTAL
(MG/KG)

- 0 - 39.8
- >39.8 - 145
- >145

NOTES:

1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC14-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. MG/KG = MILLIGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL



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 ECOLOGICAL RISK ASSESSMENT**

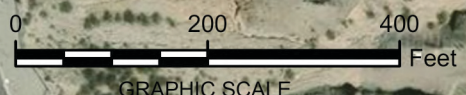
**THIESSEN POLYGONS FOR
 AREA WEIGHTING**

Chromium, total	Units	Value	Basis
Background	mg/kg	39.8	Site-specific Soil Background Value
Ecological RBRG	mg/kg	145	Soil Removal Action Goal (Desert shrew)



FIGURE
AOC14-A3.1

AOC 14 0 - 0.5 FEET BELOW GROUND SURFACE COPPER



LEGEND:

**COPPER
(MG/KG)**

- 0 - 16.8
- >16.8 - 145
- >145

NOTES:

1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC14-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. MG/KG = MILLIGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL

Copper	Units	Value	Basis
Background	mg/kg	16.8	Site-specific Soil Background Value
Ecological RBRG	mg/kg	145	Soil Removal Action Goal (Desert shrew)

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ECOLOGICAL RISK ASSESSMENT**

**THIESSEN POLYGONS FOR
AREA WEIGHTING**

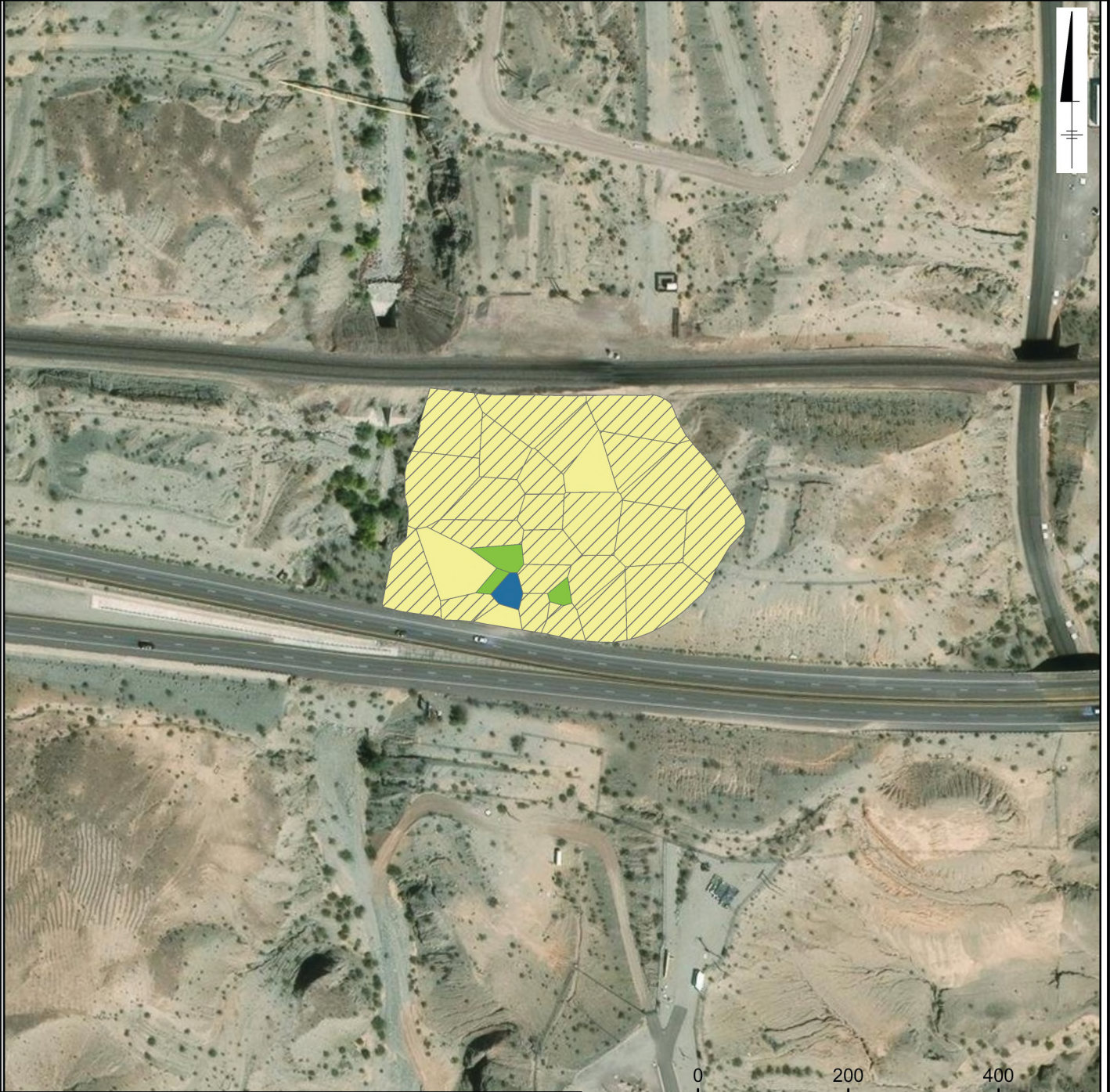


FIGURE
AOC14-A3.2

AOC 14

0 - 3 FEET BELOW GROUND SURFACE

CHROMIUM, HEXAVALENT

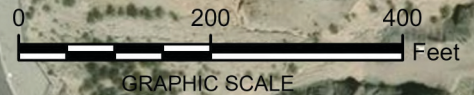


LEGEND:
CHROMIUM, HEXAVALENT
(MG/KG)

- 0 - 0.83
- >0.83 - 3.1
- >3.1 - 31
- >31
- NOT DETECTED

- NOTES:**
1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC14-1.2.
 2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
 3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
 4. MG/KG = MILLIGRAMS PER KILOGRAM
 5. RBRG = RISK-BASED REMEDIAL GOAL
 6. THIESSEN POLYGONS WITH A NON-DETECT CONCENTRATION ARE REPRESENTED BY THE REPORTING LIMIT.

Chromium, hexavalent	Units	Value	Basis
Background	mg/kg	0.83	Site-specific Soil Background Value
Human Health RBRG	mg/kg	3.1	Soil Removal Action Goal (Off-highway vehicle rider at 10-6 excess risk)
Human Health RBRG	mg/kg	31	Soil Removal Action Goal (Off-highway vehicle rider at 10-5 excess risk)



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THIESSEN POLYGONS FOR AREA WEIGHTING



FIGURE
AOC14-A3.3

AOC 14

0 - 3 FEET BELOW GROUND SURFACE

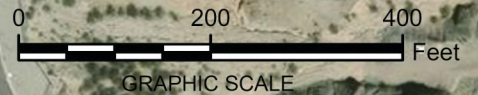
CHROMIUM, TOTAL



LEGEND:
CHROMIUM, TOTAL
(MG/KG)

- 0 - 39.8
- >39.8 - 145
- >145

- NOTES:**
1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC14-1.2.
 2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
 3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
 4. MG/KG = MILLIGRAMS PER KILOGRAM
 5. RBRG = RISK-BASED REMEDIAL GOAL



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THIESSEN POLYGONS FOR AREA WEIGHTING

Chromium, total	Units	Value	Basis
Background	mg/kg	39.8	Site-specific Soil Background Value
Ecological RBRG	mg/kg	145	Soil Removal Action Goal (Desert shrew)



FIGURE
AOC14-A3.4

AOC 14 0 - 3 FEET BELOW GROUND SURFACE COPPER



LEGEND:
COPPER
(MG/KG)

- 0 - 16.8
- >16.8 - 145
- >145

- NOTES:**
1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC14-1.2.
 2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
 3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
 4. MG/KG = MILLIGRAMS PER KILOGRAM
 5. RBRG = RISK-BASED REMEDIAL GOAL

Copper	Units	Value	Basis
Background	mg/kg	16.8	Site-specific Soil Background Value
Ecological RBRG	mg/kg	145	Soil Removal Action Goal (Desert shrew)

0 200 400
Feet
GRAPHIC SCALE

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**POST-NTCRA HUMAN HEALTH AND
ECOLOGICAL RISK ASSESSMENT**

**THIESSEN POLYGONS FOR
AREA WEIGHTING**



FIGURE
AOC14-A3.5

ATTACHMENT B

Dose, Exposure Concentration, Risk, and Hazard Calculations for Human Health Receptors at AOC 14 Using Depth-Weighted EPCs and Area-Weighted EPCs

For additional help with the information provided in Attachment B, please contact Susan Shiu, Haley and Aldrich Associate Risk Assessor, at 1-510-879-4549.

Table AOC14-B1.1a

Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	ND	NV	ND	ND	NC	NV	NC	NC
Chromium, Hexavalent	4.5E-11	NV	NA	4.0E-07	3.5E-11	NV	NA	3.2E-07
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate	NS	NV	NS	NS	NC	NV	NC	NC
Phosphate	NS	NV	NS	NS	NC	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Semi-Volatile Organic Compounds								
4-Methylphenol	NC	NV	NC	NC	NC	NV	NC	NC
bis (2-ethylhexyl) phthalate	3.8E-12	NV	6.8E-09	2.1E-08	2.9E-12	NV	5.1E-09	1.6E-08
Butylbenzylphthalate	ND	NV	ND	ND	ND	NV	ND	ND
Polycyclic Aromatic Hydrocarbons								
Acenaphthylene	ND	NV	ND	ND	NC	NV	NC	NC
Anthracene	ND	NV	ND	ND	NC	NV	NC	NC
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
Pesticides								
4,4-DDE	1.7E-14	1.1E-11	1.5E-11	9.5E-11	2.6E-14	1.1E-11	2.3E-11	1.4E-10
4,4-DDT	1.8E-14	NV	1.6E-11	9.9E-11	1.8E-14	NV	1.6E-11	9.9E-11

Table AOC14-B1.1a

Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

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Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	ND	2.5E-10	ND	ND	2.1E-13	2.5E-10	5.5E-10	1.2E-09
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	5.1E-18	1.6E-13	2.7E-15	2.8E-14	2.9E-17	1.6E-13	1.5E-14	1.6E-13

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

bgs = below ground surface.

CDI = Chronic Daily Intake.

C O P C = Constituent of Potential Concern.

EC = Exposure Concentration.

mg/kg-day = milligrams per kilogram per day.

mg/m³ = milligrams per cubic meter.

na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.

NC = Not considered a carcinogen.

ND = Not detected.

NS = Not sampled.

NV = Not volatile.

PCB = Polychlorinated biphenyls.

TPH = Total Petroleum Hydrocarbons.

TEQ = Toxic Equivalent.

Table AOC14-B1.1b

Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	ND	NV	ND	ND	NC	NV	NC	NC
Chromium, Hexavalent	9.0E-11	NV	NA	8.1E-07	7.1E-11	NV	NA	6.4E-07
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate	NS	NV	NS	NS	NC	NV	NC	NC
Phosphate	NS	NV	NS	NS	NC	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Semi-Volatile Organic Compounds								
4-Methylphenol	NC	NV	NC	NC	NC	NV	NC	NC
bis (2-ethylhexyl) phthalate	7.7E-12	NV	1.4E-08	4.2E-08	5.8E-12	NV	1.0E-08	3.2E-08
Butylbenzylphthalate	ND	NV	ND	ND	ND	NV	ND	ND
Polycyclic Aromatic Hydrocarbons								
Acenaphthylene	ND	NV	ND	ND	NC	NV	NC	NC
Anthracene	ND	NV	ND	ND	NC	NV	NC	NC
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
Pesticides								
4,4-DDE	3.5E-14	2.3E-11	3.1E-11	1.9E-10	5.3E-14	2.3E-11	4.7E-11	2.9E-10
4,4-DDT	3.6E-14	NV	3.2E-11	2.0E-10	3.6E-14	NV	3.2E-11	2.0E-10

Table AOC14-B1.1b

Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	ND	5.0E-10	ND	ND	4.2E-13	5.0E-10	1.1E-09	2.3E-09
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	1.0E-17	3.3E-13	5.4E-15	5.6E-14	5.7E-17	3.3E-13	3.0E-14	3.2E-13

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

bgs = below ground surface.

CDI = Chronic Daily Intake.

C O P C = Constituent of Potential Concern.

EC = Exposure Concentration.

mg/kg-day = milligrams per kilogram per day.

mg/m³ = milligrams per cubic meter.

na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.

NC = Not considered a carcinogen.

ND = Not detected.

NS = Not sampled.

NV = Not volatile.

PCB = Polychlorinated biphenyls.

TPH = Total Petroleum Hydrocarbons.

TEQ = Toxic Equivalent.

Table AOC14-B1.1c

Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway
	EC: Particulate Inhalation (mg/m ³)	EC: Outdoor Vapor Inhalation (mg/m ³)	CDI: Dermal Contact (mg/kg-day)	CDI: Ingestion (mg/kg-day)	EC: Particulate Inhalation (mg/m ³)	EC: Outdoor Vapor Inhalation (mg/m ³)	CDI: Dermal Contact (mg/kg-day)	CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	ND	NV	ND	ND	NC	NV	NC	NC
Chromium, Hexavalent	5.7E-09	NV	NA	4.7E-08	4.5E-09	NV	NA	3.7E-08
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate	NS	NV	NS	NS	NC	NV	NC	NC
Phosphate	NS	NV	NS	NS	NC	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Semi-Volatile Organic Compounds								
4-Methylphenol	NC	NV	NC	NC	NC	NV	NC	NC
bis (2-ethylhexyl) phthalate	7.7E-10	NV	6.5E-08	5.4E-09	5.8E-10	NV	4.9E-08	4.0E-09
Butylbenzylphthalate	ND	NV	ND	ND	ND	NV	ND	ND
Polycyclic Aromatic Hydrocarbons								
Acenaphthylene	ND	NV	ND	ND	NC	NV	NC	NC
Anthracene	ND	NV	ND	ND	NC	NV	NC	NC
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
Pesticides								
4,4-DDE	3.5E-12	1.4E-12	1.5E-10	2.4E-11	5.3E-12	1.4E-12	2.2E-10	3.7E-11
4,4-DDT	3.6E-12	NV	1.5E-10	2.5E-11	3.6E-12	NV	1.5E-10	2.5E-11

Table AOC14-B1.1c

Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	ND	3.1E-11	ND	ND	4.2E-11	3.1E-11	5.4E-09	2.9E-10
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	1.0E-15	2.1E-14	2.6E-14	7.1E-15	5.8E-15	2.1E-14	1.5E-13	4.0E-14

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

bgs = below ground surface.

CDI = Chronic Daily Intake.

C O P C = Constituent of Potential Concern.

EC = Exposure Concentration.

mg/kg-day = milligrams per kilogram per day.

mg/m³ = milligrams per cubic meter.

na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.

NC = Not considered a carcinogen.

ND = Not detected.

NS = Not sampled.

NV = Not volatile.

PCB = Polychlorinated biphenyls.

TPH = Total Petroleum Hydrocarbons.

TEQ = Toxic Equivalent.

Table AOC14-B1.2a
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Camper
Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Child Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	ND	NV	ND	ND	ND	NV	ND	ND	3.1E-10	NV	1.6E-07	5.6E-06	3.1E-10	NV	2.2E-08	5.2E-07
Chromium, Hexavalent	4.4E-11	NV	NA	7.9E-07	4.4E-11	NV	NA	7.4E-08	3.4E-11	NV	NA	6.2E-07	3.4E-11	NV	NA	5.8E-08
Copper	2.2E-10	NV	1.2E-07	4.1E-06	2.2E-10	NV	1.6E-08	3.8E-07	2.0E-10	NV	1.1E-07	3.6E-06	2.0E-10	NV	1.4E-08	3.4E-07
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	6.6E-12	NV	3.5E-09	1.2E-07	6.6E-12	NV	4.7E-10	1.1E-08	9.7E-10	NV	5.1E-07	1.8E-05	9.7E-10	NV	7.0E-08	1.7E-06
Nitrate	NS	NV	NS	NS	NS	NV	NS	NS	2.7E-10	NV	1.4E-07	5.0E-06	2.7E-10	NV	2.0E-08	4.7E-07
Phosphate	NS	NV	NS	NS	NS	NV	NS	NS	1.0E-09	NV	5.4E-07	1.9E-05	1.0E-09	NV	7.4E-08	1.8E-06
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	2.3E-11	NV	1.2E-08	4.2E-07	2.3E-11	NV	1.7E-09	3.9E-08
Semi-Volatile Organic Compounds																
4-Methylphenol	6.9E-12	NV	3.6E-08	1.3E-07	6.9E-12	NV	5.0E-09	1.2E-08	5.6E-12	NV	2.9E-08	1.0E-07	5.6E-12	NV	4.0E-09	9.5E-09
bis (2-ethylhexyl) phthalate	1.0E-11	NV	5.4E-08	1.9E-07	1.0E-11	NV	7.4E-09	1.8E-08	7.8E-12	NV	4.1E-08	1.4E-07	7.8E-12	NV	5.6E-09	1.3E-08
Butylbenzylphthalate	ND	NV	ND	ND	ND	NV	ND	ND	ND	NV	ND	ND	ND	NV	ND	ND
Polycyclic Aromatic Hydrocarbons																
Acenaphthylene	ND	NV	ND	ND	ND	NV	ND	ND	6.4E-14	NV	5.0E-10	1.2E-09	6.4E-14	NV	6.9E-11	1.1E-10
Anthracene	ND	6.8E-10	ND	ND	ND	6.8E-10	ND	ND	1.2E-13	6.8E-10	9.4E-10	2.2E-09	1.2E-13	6.8E-10	1.3E-10	2.0E-10
Benzo (ghi) perylene	9.7E-14	NV	7.7E-10	1.8E-09	9.7E-14	NV	1.0E-10	1.7E-10	9.5E-14	NV	7.5E-10	1.7E-09	9.5E-14	NV	1.0E-10	1.6E-10
Fluoranthene	9.0E-12	NV	7.1E-08	1.6E-07	9.0E-12	NV	9.7E-09	1.5E-08	5.7E-12	NV	4.5E-08	1.0E-07	5.7E-12	NV	6.1E-09	9.6E-09
Phenanthrene	6.1E-12	NV	4.8E-08	1.1E-07	6.1E-12	NV	6.6E-09	1.0E-08	1.1E-12	NV	8.6E-09	2.0E-08	1.1E-12	NV	1.2E-09	1.9E-09
Pyrene	9.0E-12	8.2E-10	7.1E-08	1.6E-07	9.0E-12	8.2E-10	9.7E-09	1.5E-08	5.7E-12	8.2E-10	4.5E-08	1.0E-07	5.7E-12	8.2E-10	6.1E-09	9.6E-09
Pesticides																
4,4-DDE	4.7E-14	3.1E-11	1.2E-10	8.5E-10	4.7E-14	3.1E-11	1.7E-11	7.9E-11	7.1E-14	3.1E-11	1.9E-10	1.3E-09	7.1E-14	3.1E-11	2.5E-11	1.2E-10
4,4-DDT	4.8E-14	NV	1.3E-10	8.8E-10	4.8E-14	NV	1.7E-11	8.2E-11	4.8E-14	NV	1.3E-10	8.8E-10	4.8E-14	NV	1.7E-11	8.2E-11

Table AOC14-B1.2a
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Child Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult Camper (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls																
Total PCBs	ND	6.8E-10	ND	ND	ND	6.8E-10	ND	ND	5.6E-13	6.8E-10	4.4E-09	1.0E-08	5.6E-13	6.8E-10	6.1E-10	9.6E-10
Total Petroleum Hydrocarbons																
TPH as diesel	2.0E-10	1.4E-04	1.1E-06	3.7E-06	2.0E-10	1.4E-04	1.4E-07	3.4E-07	1.0E-09	1.4E-04	5.4E-06	1.8E-05	1.0E-09	1.4E-04	7.3E-07	1.7E-06
TPH as motor oil	1.1E-09	NV	5.8E-06	2.0E-05	1.1E-09	NV	7.9E-07	1.9E-06	7.7E-09	NV	4.1E-05	1.4E-04	7.7E-09	NV	5.5E-06	1.3E-05
Dioxins/Furans																
TEQ Human	1.4E-17	4.4E-13	2.2E-14	2.5E-13	1.4E-17	4.4E-13	2.9E-15	2.3E-14	7.7E-17	4.4E-13	1.2E-13	1.4E-12	7.7E-17	4.4E-13	1.7E-14	1.3E-13

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

- bgs = below ground surface.
- CDI = Chronic Daily Intake.
- C O P C = Constituent of Potential Concern.
- EC = Exposure Concentration.
- mg/kg-day = milligrams per kilogram per day.
- mg/m³ = milligrams per cubic meter.
- na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
- NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.
- ND = Not detected.
- NS = Not sampled.
- NV = Not volatile.
- PCB = Polychlorinated biphenyls.
- TPH = Total Petroleum Hydrocarbons.
- TEQ = Toxic Equivalent.

Table AOC14-B1.2b

Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Child Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	ND	NV	ND	ND	ND	NV	ND	ND	6.1E-10	NV	3.2E-07	1.1E-05	6.1E-10	NV	4.4E-08	1.0E-06
Chromium, Hexavalent	8.7E-11	NV	NA	1.6E-06	8.7E-11	NV	NA	1.5E-07	6.9E-11	NV	NA	1.2E-06	6.9E-11	NV	NA	1.2E-07
Copper	4.5E-10	NV	2.4E-07	8.2E-06	4.5E-10	NV	3.2E-08	7.6E-07	4.0E-10	NV	2.1E-07	7.3E-06	4.0E-10	NV	2.9E-08	6.8E-07
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	1.3E-11	NV	6.9E-09	2.4E-07	1.3E-11	NV	9.5E-10	2.2E-08	1.9E-09	NV	1.0E-06	3.5E-05	1.9E-09	NV	1.4E-07	3.3E-06
Nitrate	NS	NV	NS	NS	NS	NV	NS	NS	5.5E-10	NV	2.9E-07	9.9E-06	5.5E-10	NV	3.9E-08	9.3E-07
Phosphate	NS	NV	NS	NS	NS	NV	NS	NS	2.1E-09	NV	1.1E-06	3.8E-05	2.1E-09	NV	1.5E-07	3.5E-06
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	4.6E-11	NV	2.4E-08	8.4E-07	4.6E-11	NV	3.3E-09	7.8E-08
Semi-Volatile Organic Compounds																
4-Methylphenol	1.4E-11	NV	7.3E-08	2.5E-07	1.4E-11	NV	9.9E-09	2.4E-08	1.1E-11	NV	5.8E-08	2.0E-07	1.1E-11	NV	8.0E-09	1.9E-08
bis (2-ethylhexyl) phthalate	2.1E-11	NV	1.1E-07	3.7E-07	2.1E-11	NV	1.5E-08	3.5E-08	1.6E-11	NV	8.2E-08	2.8E-07	1.6E-11	NV	1.1E-08	2.6E-08
Butylbenzylphthalate	ND	NV	ND	ND	ND	NV	ND	ND	ND	NV	ND	ND	ND	NV	ND	ND
Polycyclic Aromatic Hydrocarbons																
Acenaphthylene	ND	NV	ND	ND	ND	NV	ND	ND	1.3E-13	NV	1.0E-09	2.3E-09	1.3E-13	NV	1.4E-10	2.2E-10
Anthracene	ND	1.4E-09	ND	ND	ND	1.4E-09	ND	ND	2.4E-13	1.4E-09	1.9E-09	4.3E-09	2.4E-13	1.4E-09	2.6E-10	4.0E-10
Benzo (ghi) perylene	1.9E-13	NV	1.5E-09	3.5E-09	1.9E-13	NV	2.1E-10	3.3E-10	1.9E-13	NV	1.5E-09	3.4E-09	1.9E-13	NV	2.0E-10	3.2E-10
Fluoranthene	1.8E-11	NV	1.4E-07	3.3E-07	1.8E-11	NV	1.9E-08	3.1E-08	1.1E-11	NV	8.9E-08	2.1E-07	1.1E-11	NV	1.2E-08	1.9E-08
Phenanthrene	1.2E-11	NV	9.7E-08	2.2E-07	1.2E-11	NV	1.3E-08	2.1E-08	2.2E-12	NV	1.7E-08	4.0E-08	2.2E-12	NV	2.3E-09	3.7E-09
Pyrene	1.8E-11	1.6E-09	1.4E-07	3.3E-07	1.8E-11	1.6E-09	1.9E-08	3.1E-08	1.1E-11	1.6E-09	8.9E-08	2.1E-07	1.1E-11	1.6E-09	1.2E-08	1.9E-08
Pesticides																
4,4-DDE	9.3E-14	6.1E-11	2.5E-10	1.7E-09	9.3E-14	6.1E-11	3.4E-11	1.6E-10	1.4E-13	6.1E-11	3.7E-10	2.6E-09	1.4E-13	6.1E-11	5.1E-11	2.4E-10
4,4-DDT	9.7E-14	NV	2.5E-10	1.8E-09	9.7E-14	NV	3.5E-11	1.6E-10	9.7E-14	NV	2.5E-10	1.8E-09	9.7E-14	NV	3.5E-11	1.6E-10

Table AOC14-B1.2b
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Child Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls																
Total PCBs	ND	1.4E-09	ND	ND	ND	1.4E-09	ND	ND	1.1E-12	1.4E-09	8.9E-09	2.0E-08	1.1E-12	1.4E-09	1.2E-09	1.9E-09
Total Petroleum Hydrocarbons																
TPH as diesel	4.0E-10	2.8E-04	2.1E-06	7.3E-06	4.0E-10	2.8E-04	2.9E-07	6.8E-07	2.0E-09	2.8E-04	1.1E-05	3.7E-05	2.0E-09	2.8E-04	1.5E-06	3.5E-06
TPH as motor oil	2.2E-09	NV	1.2E-05	4.0E-05	2.2E-09	NV	1.6E-06	3.7E-06	1.5E-08	NV	8.1E-05	2.8E-04	1.5E-08	NV	1.1E-05	2.6E-05
Dioxins/Furans																
TEQ Human	2.7E-17	8.9E-13	4.3E-14	5.0E-13	2.7E-17	8.9E-13	5.9E-15	4.7E-14	1.5E-16	8.9E-13	2.4E-13	2.8E-12	1.5E-16	8.9E-13	3.3E-14	2.6E-13

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

- bgs = below ground surface.
- CDI = Chronic Daily Intake.
- C O P C = Constituent of Potential Concern.
- EC = Exposure Concentration.
- mg/kg-day = milligrams per kilogram per day.
- mg/m³ = milligrams per cubic meter.
- na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
- NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.
- ND = Not detected.
- NS = Not sampled.
- NV = Not volatile.
- PCB = Polychlorinated biphenyls.
- TPH = Total Petroleum Hydrocarbons.
- TEQ = Toxic Equivalent.

Table AOC14-B1.2c

Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs:
Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	ND	NV	ND	ND	ND	NV	ND	ND	6.1E-08	NV	5.9E-07	7.8E-07	6.1E-08	NV	5.0E-07	3.2E-07
Chromium, Hexavalent	8.7E-09	NV	NA	1.1E-07	8.7E-09	NV	NA	4.6E-08	6.9E-09	NV	NA	8.7E-08	6.9E-09	NV	NA	3.6E-08
Copper	4.5E-08	NV	4.3E-07	5.7E-07	4.5E-08	NV	3.7E-07	2.4E-07	4.0E-08	NV	3.8E-07	5.1E-07	4.0E-08	NV	3.3E-07	2.1E-07
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	1.3E-09	NV	1.3E-08	1.7E-08	1.3E-09	NV	1.1E-08	7.0E-09	2.0E-07	NV	1.9E-06	2.5E-06	2.0E-07	NV	1.6E-06	1.0E-06
Nitrate	NS	NV	NS	NS	NS	NV	NS	NS	5.5E-08	NV	5.2E-07	7.0E-07	5.5E-08	NV	4.5E-07	2.9E-07
Phosphate	NS	NV	NS	NS	NS	NV	NS	NS	2.1E-07	NV	2.0E-06	2.6E-06	2.1E-07	NV	1.7E-06	1.1E-06
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	4.6E-09	NV	4.4E-08	5.9E-08	4.6E-09	NV	3.8E-08	2.4E-08
Semi-Volatile Organic Compounds																
4-Methylphenol	1.4E-09	NV	1.3E-07	1.8E-08	1.4E-09	NV	1.1E-07	7.3E-09	1.1E-09	NV	1.1E-07	1.4E-08	1.1E-09	NV	9.1E-08	5.8E-09
bis (2-ethylhexyl) phthalate	2.1E-09	NV	2.0E-07	2.6E-08	2.1E-09	NV	1.7E-07	1.1E-08	1.6E-09	NV	1.5E-07	2.0E-08	1.6E-09	NV	1.3E-07	8.2E-09
Butylbenzylphthalate	ND	NV	ND	ND	ND	NV	ND	ND	ND	NV	ND	ND	ND	NV	ND	ND
Polycyclic Aromatic Hydrocarbons																
Acenaphthylene	ND	NV	ND	ND	ND	NV	ND	ND	1.3E-11	NV	1.8E-09	1.6E-10	1.3E-11	NV	1.6E-09	6.7E-11
Anthracene	ND	8.5E-11	ND	ND	ND	8.5E-11	ND	ND	2.4E-11	8.5E-11	3.4E-09	3.0E-10	2.4E-11	8.5E-11	2.9E-09	1.2E-10
Benzo (ghi) perylene	2.0E-11	NV	2.8E-09	2.5E-10	2.0E-11	NV	2.4E-09	1.0E-10	1.9E-11	NV	2.7E-09	2.4E-10	1.9E-11	NV	2.3E-09	1.0E-10
Fluoranthene	1.8E-09	NV	2.6E-07	2.3E-08	1.8E-09	NV	2.2E-07	9.5E-09	1.1E-09	NV	1.6E-07	1.4E-08	1.1E-09	NV	1.4E-07	6.0E-09
Phenanthrene	1.2E-09	NV	1.8E-07	1.6E-08	1.2E-09	NV	1.5E-07	6.4E-09	2.2E-10	NV	3.1E-08	2.8E-09	2.2E-10	NV	2.7E-08	1.1E-09
Pyrene	1.8E-09	1.0E-10	2.6E-07	2.3E-08	1.8E-09	1.0E-10	2.2E-07	9.5E-09	1.1E-09	1.0E-10	1.6E-07	1.4E-08	1.1E-09	1.0E-10	1.4E-07	6.0E-09
Pesticides																
4,4-DDE	9.4E-12	3.8E-12	4.5E-10	1.2E-10	9.4E-12	3.8E-12	3.8E-10	4.9E-11	1.4E-11	3.8E-12	6.8E-10	1.8E-10	1.4E-11	3.8E-12	5.8E-10	7.5E-11
4,4-DDT	9.7E-12	NV	4.6E-10	1.2E-10	9.7E-12	NV	4.0E-10	5.1E-11	9.7E-12	NV	4.6E-10	1.2E-10	9.7E-12	NV	4.0E-10	5.1E-11

Table AOC14-B1.2c

Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs:
Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Particulate Inhalation (mg/m ³)	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m ³)	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls																
Total PCBs	ND	8.4E-11	ND	ND	ND	8.4E-11	ND	ND	1.1E-10	8.4E-11	1.6E-08	1.4E-09	1.1E-10	8.4E-11	1.4E-08	5.9E-10
Total Petroleum Hydrocarbons																
TPH as diesel	4.0E-08	1.8E-05	3.9E-06	5.1E-07	4.0E-08	1.8E-05	3.3E-06	2.1E-07	2.0E-07	1.8E-05	2.0E-05	2.6E-06	2.0E-07	1.8E-05	1.7E-05	1.1E-06
TPH as motor oil	2.2E-07	NV	2.1E-05	2.8E-06	2.2E-07	NV	1.8E-05	1.2E-06	1.5E-06	NV	1.5E-04	2.0E-05	1.5E-06	NV	1.3E-04	8.1E-06
Dioxins/Furans																
TEQ Human	2.7E-15	5.5E-14	7.9E-14	3.5E-14	2.7E-15	5.5E-14	6.7E-14	1.4E-14	1.6E-14	5.5E-14	4.4E-13	2.0E-13	1.6E-14	5.5E-14	3.8E-13	8.1E-14

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

- bgs = below ground surface.
- CDI = Chronic Daily Intake.
- C O P C = Constituent of Potential Concern.
- EC = Exposure Concentration.
- mg/kg-day = milligrams per kilogram per day.
- mg/m³ = milligrams per cubic meter.
- na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
- NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.
- ND = Not detected.
- NS = Not sampled.
- NV = Not volatile.
- PCB = Polychlorinated biphenyls.
- TPH = Total Petroleum Hydrocarbons.
- TEQ = Toxic Equivalent.

Table AOC14-B1.3a

Baseline Scenario ILCRs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User- Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Total Cancer Risk	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Total Cancer Risk
Inorganics										
Antimony	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Chromium, Hexavalent	6.7E-09	NV	NA	2.0E-07	2.1E-07	5.3E-09	NV	NA	1.6E-07	1.6E-07
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nitrate	NS	NC	NS	NS	--	NC	NC	NC	NC	--
Phosphate	NS	NC	NS	NS	--	NC	NC	NC	NC	--
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Semi-Volatile Organic Compounds										
4-Methylphenol	NC	NC	NC	NC	--	NC	NC	NC	NC	--
bis (2-ethylhexyl) phthalate	9.2E-15	NV	9.5E-11	2.9E-10	3.9E-10	6.9E-15	NV	7.1E-11	2.2E-10	2.9E-10
Butylbenzylphthalate	ND	NC	ND	ND	--	ND	NC	ND	ND	--
Polycyclic Aromatic Hydrocarbons										
Acenaphthylene	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Anthracene	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pesticides										
4,4-DDE	1.7E-15	1.1E-12	5.2E-12	3.2E-11	3.9E-11	2.6E-15	1.1E-12	7.9E-12	4.9E-11	5.8E-11
4,4-DDT	1.7E-15	NV	5.4E-12	3.4E-11	3.9E-11	1.7E-15	NV	5.4E-12	3.4E-11	3.9E-11

Table AOC14-B1.3a

Baseline Scenario ILCRs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User- Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 0.5 foot bgs) ^a Soil Pathway Total Cancer Risk	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 3 feet bgs) ^a Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	ND	2.5E-11	ND	ND	2.5E-11	2.1E-14	2.5E-11	1.1E-09	2.3E-09	3.4E-09
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	1.9E-13	6.2E-09	3.5E-10	3.6E-09	1.0E-08	1.1E-12	6.2E-09	2.0E-09	2.1E-08	2.9E-08
Cumulative ILCR	7E-09	6E-09	5E-10	2E-07	2E-07	5E-09	6E-09	3E-09	2E-07	2E-07

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

-- = not calculated.

bgs = below ground surface.

C O P C = Constituent of Potential Concern.

ILCR = Incremental Lifetime Cancer Risk.

mg/m³ = milligrams per cubic meter.

na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.

NC = Not considered a carcinogen.

ND = Not detected.

NS = Not sampled.

NV = Not volatile.

PCB = Polychlorinated biphenyls.

TPH = Total Petroleum Hydrocarbons.

TEQ = Toxic Equivalent.

Table AOC14-B1.3b

Baseline Scenario ILCRs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Total Cancer Risk	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Total Cancer Risk
Inorganics										
Antimony	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Chromium, Hexavalent	1.3E-08	NV	NA	4.0E-07	4.2E-07	1.1E-08	NV	NA	3.2E-07	3.3E-07
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nitrate	NS	NC	NS	NS	--	NC	NC	NC	NC	--
Phosphate	NS	NC	NS	NS	--	NC	NC	NC	NC	--
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Semi-Volatile Organic Compounds										
4-Methylphenol	NC	NC	NC	NC	--	NC	NC	NC	NC	--
bis (2-ethylhexyl) phthalate	1.8E-14	NV	1.9E-10	5.9E-10	7.8E-10	1.4E-14	NV	1.4E-10	4.4E-10	5.9E-10
Butylbenzylphthalate	ND	NC	ND	ND	--	ND	NC	ND	ND	--
Polycyclic Aromatic Hydrocarbons										
Acenaphthylene	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Anthracene	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pesticides										
4,4-DDE	3.4E-15	2.2E-12	1.0E-11	6.5E-11	7.7E-11	5.1E-15	2.2E-12	1.6E-11	9.8E-11	1.2E-10
4,4-DDT	3.5E-15	NV	1.1E-11	6.7E-11	7.8E-11	3.5E-15	NV	1.1E-11	6.7E-11	7.8E-11

Table AOC14-B1.3b

Baseline Scenario ILCRs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs) ^a Soil Pathway Total Cancer Risk	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 3 feet bgs) ^a Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	ND	5.0E-11	ND	ND	5.0E-11	4.2E-14	5.0E-11	2.2E-09	4.6E-09	6.9E-09
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	3.9E-13	1.2E-08	7.0E-10	7.3E-09	2.0E-08	2.2E-12	1.2E-08	4.0E-09	4.1E-08	5.7E-08
Cumulative ILCR	1E-08	1E-08	9E-10	4E-07	4E-07	1E-08	1E-08	6E-09	4E-07	4E-07

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

-- = not calculated.

bgs = below ground surface.

C O P C = Constituent of Potential Concern.

ILCR = Incremental Lifetime Cancer Risk.

mg/m³ = milligrams per cubic meter.

na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.

NC = Not considered a carcinogen.

ND = Not detected.

NS = Not sampled.

NV = Not volatile.

PCB = Polychlorinated biphenyls.

TPH = Total Petroleum Hydrocarbons.

TEQ = Toxic Equivalent.

Table AOC14-B1.3c

Baseline Scenario ILCRs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway
	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Cancer Risk	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Cancer Risk
Inorganics										
Antimony	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Chromium, Hexavalent	8.6E-07	NV	NA	2.3E-08	8.8E-07	6.8E-07	NV	NA	1.8E-08	7.0E-07
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nitrate	NS	NC	NS	NS	--	NC	NC	NC	NC	--
Phosphate	NS	NC	NS	NS	--	NC	NC	NC	NC	--
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Semi-Volatile Organic Compounds										
4-Methylphenol	NC	NC	NC	NC	--	NC	NC	NC	NC	--
bis (2-ethylhexyl) phthalate	1.8E-12	NV	9.1E-10	7.5E-11	9.9E-10	1.4E-12	NV	6.9E-10	5.6E-11	7.5E-10
Butylbenzylphthalate	ND	NC	ND	ND	--	ND	NC	ND	ND	--
Polycyclic Aromatic Hydrocarbons										
Acenaphthylene	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Anthracene	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pesticides										
4,4-DDE	3.4E-13	1.4E-13	5.0E-11	8.2E-12	5.9E-11	5.1E-13	1.4E-13	7.6E-11	1.3E-11	8.9E-11
4,4-DDT	3.5E-13	NV	5.2E-11	8.5E-12	6.1E-11	3.5E-13	NV	5.2E-11	8.5E-12	6.1E-11

Table AOC14-B1.3c

Baseline Scenario ILCRs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report

PG&E Topock Compressor Station

Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway Total Cancer Risk	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	ND	3.1E-12	ND	ND	3.1E-12	4.2E-12	3.1E-12	1.1E-08	5.9E-10	1.1E-08
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	3.9E-11	7.8E-10	3.4E-09	9.2E-10	5.1E-09	2.2E-10	7.8E-10	1.9E-08	5.2E-09	2.5E-08
Cumulative ILCR	9E-07	8E-10	4E-09	2E-08	9E-07	7E-07	8E-10	3E-08	2E-08	7E-07

Notes:

^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:

-- = not calculated.

bgs = below ground surface.

C O P C = Constituent of Potential Concern.

ILCR = Incremental Lifetime Cancer Risk.

mg/m³ = milligrams per cubic meter.

na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.

NC = Not considered a carcinogen.

ND = Not detected.

NS = Not sampled.

NV = Not volatile.

PCB = Polychlorinated biphenyls.

TPH = Total Petroleum Hydrocarbons.

TEQ = Toxic Equivalent.

Table AOC14-B1.4a
 Baseline Scenario HIs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Camper
 Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	
	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway
	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	
Inorganics																					
Antimony	ND	NV	ND	ND	--	ND	NV	ND	ND	--	1.0E-06	NV	4.0E-04	1.4E-02	1.4E-02	1.0E-06	NV	5.5E-05	1.3E-03	1.4E-03	
Chromium, Hexavalent	4.4E-07	NV	NA	2.6E-04	2.6E-04	4.4E-07	NV	NA	2.5E-05	2.5E-05	3.4E-07	NV	NA	2.1E-04	2.1E-04	3.4E-07	NV	NA	1.9E-05	2.0E-05	
Copper	1.4E-09	NV	3.0E-06	1.0E-04	1.0E-04	1.4E-09	NV	4.0E-07	9.6E-06	1.0E-05	1.3E-09	NV	2.6E-06	9.1E-05	9.3E-05	1.3E-09	NV	3.6E-07	8.5E-06	8.9E-06	
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	2.2E-07	NV	2.2E-05	7.5E-04	7.7E-04	2.2E-07	NV	3.0E-06	7.0E-05	7.3E-05	3.2E-05	NV	3.2E-03	1.1E-01	1.1E-01	3.2E-05	NV	4.4E-04	1.0E-02	1.1E-02	
Nitrate	NS	NV	NS	NS	--	NS	NV	NS	NS	--	4.3E-11	NV	9.0E-08	3.1E-06	3.2E-06	4.3E-11	NV	1.2E-08	2.9E-07	3.0E-07	
Phosphate	NS	NV	NS	NS	--	NS	NV	NS	NS	--	8.8E-11	NV	1.9E-07	6.4E-06	6.6E-06	8.8E-11	NV	2.5E-08	6.0E-07	6.3E-07	
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	5.8E-07	NV	1.2E-03	4.2E-02	4.3E-02	5.8E-07	NV	1.7E-04	3.9E-03	4.1E-03	
Semi-Volatile Organic Compounds																					
4-Methylphenol	3.5E-10	NV	7.3E-06	2.5E-05	3.2E-05	3.5E-10	NV	9.9E-07	2.4E-06	3.4E-06	2.8E-10	NV	5.8E-06	2.0E-05	2.6E-05	2.8E-10	NV	8.0E-07	1.9E-06	2.7E-06	
bis (2-ethylhexyl) phthalate	1.3E-10	NV	2.7E-06	9.4E-06	1.2E-05	1.3E-10	NV	3.7E-07	8.8E-07	1.2E-06	9.7E-11	NV	2.0E-06	7.0E-06	9.1E-06	9.7E-11	NV	2.8E-07	6.6E-07	9.4E-07	
Butylbenzylphthalate	ND	NV	ND	ND	--	ND	NV	ND	ND	--	ND	NV	ND	ND	--	ND	NV	ND	ND	--	
Polycyclic Aromatic Hydrocarbons																					
Acenaphthylene	ND	NV	ND	ND	--	ND	NV	ND	ND	--	2.7E-13	NV	8.4E-09	1.9E-08	2.8E-08	2.7E-13	NV	1.1E-09	1.8E-09	3.0E-09	
Anthracene	ND	5.7E-10	ND	ND	5.7E-10	ND	5.7E-10	ND	ND	5.7E-10	9.9E-14	5.7E-10	3.1E-09	7.2E-09	1.1E-08	9.9E-14	5.7E-10	4.3E-10	6.7E-10	1.7E-09	
Benzo (ghi) perylene	8.1E-13	NV	2.6E-08	5.9E-08	8.4E-08	8.1E-13	NV	3.5E-09	5.5E-09	9.0E-09	7.9E-13	NV	2.5E-08	5.7E-08	8.2E-08	7.9E-13	NV	3.4E-09	5.4E-09	8.8E-09	
Fluoranthene	5.6E-11	NV	1.8E-06	4.1E-06	5.9E-06	5.6E-11	NV	2.4E-07	3.8E-07	6.3E-07	3.5E-11	NV	1.1E-06	2.6E-06	3.7E-06	3.5E-11	NV	1.5E-07	2.4E-07	3.9E-07	
Phenanthrene	5.1E-12	NV	1.6E-07	3.7E-07	5.3E-07	5.1E-12	NV	2.2E-08	3.5E-08	5.7E-08	9.1E-13	NV	2.9E-08	6.6E-08	9.5E-08	9.1E-13	NV	3.9E-09	6.2E-09	1.0E-08	
Pyrene	7.5E-11	6.8E-09	2.4E-06	5.4E-06	7.8E-06	7.5E-11	6.8E-09	3.2E-07	5.1E-07	8.4E-07	4.7E-11	6.8E-09	1.5E-06	3.4E-06	4.9E-06	4.7E-11	6.8E-09	2.0E-07	3.2E-07	5.3E-07	
Pesticides																					
4,4-DDE	2.3E-11	1.5E-08	2.5E-07	1.7E-06	2.0E-06	2.3E-11	1.5E-08	3.4E-08	1.6E-07	2.1E-07	3.5E-11	1.5E-08	3.7E-07	2.6E-06	3.0E-06	3.5E-11	1.5E-08	5.1E-08	2.4E-07	3.1E-07	
4,4-DDT	2.4E-11	NV	2.5E-07	1.8E-06	2.0E-06	2.4E-11	NV	3.5E-08	1.6E-07	2.0E-07	2.4E-11	NV	2.5E-07	1.8E-06	2.0E-06	2.4E-11	NV	3.5E-08	1.6E-07	2.0E-07	

Table AOC14-B1.4a
Baseline Scenario HIs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Adult Camper (0 to 0.5 foot bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Child Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	Adult Camper (0 to 3 feet bgs) ^a	
	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway
	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	
Polychlorinated Biphenyls																					
Total PCBs	ND	8.4E-06	ND	ND	8.4E-06	ND	8.4E-06	ND	ND	8.4E-06	7.1E-09	8.4E-06	2.2E-04	5.1E-04	7.4E-04	7.1E-09	8.4E-06	3.0E-05	4.8E-05	8.7E-05	
Total Petroleum Hydrocarbons																					
TPH as diesel	7.7E-10	5.5E-04	5.6E-05	1.9E-04	7.9E-04	7.7E-10	5.5E-04	7.6E-06	1.8E-05	5.7E-04	3.9E-09	5.5E-04	2.8E-04	9.7E-04	1.8E-03	3.9E-09	5.5E-04	3.9E-05	9.1E-05	6.7E-04	
TPH as motor oil	1.8E-09	NV	3.9E-05	1.3E-04	1.7E-04	1.8E-09	NV	5.3E-06	1.2E-05	1.8E-05	1.3E-08	NV	2.7E-04	9.3E-04	1.2E-03	1.3E-08	NV	3.7E-05	8.7E-05	1.2E-04	
Dioxins/Furans																					
TEQ Human	3.4E-10	1.1E-05	3.1E-05	3.5E-04	4.0E-04	3.4E-10	1.1E-05	4.2E-06	3.3E-05	4.9E-05	1.9E-09	1.1E-05	1.7E-04	2.0E-03	2.2E-03	1.9E-09	1.1E-05	2.4E-05	1.9E-04	2.2E-04	
Total Hazard Index	7E-07	6E-04	2E-04	2E-03	3E-03	7E-07	6E-04	2E-05	2E-04	8E-04	3E-05	6E-04	6E-03	2E-01	2E-01	3E-05	6E-04	8E-04	2E-02	2E-02	

Notes:
^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
 -- = not calculated.
 bgs = below ground surface.
 C O P C = Constituent of Potential Concern.
 H I = Hazard Index
 mg/m³ = milligrams per cubic meter.
 na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
 NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.
 ND = Not detected.
 NS = Not sampled.
 NV = Not volatile.
 PCB = Polychlorinated biphenyls.
 TPH = Total Petroleum Hydrocarbons.
 TEQ = Toxic Equivalent.

Table AOC14-B1.4b
Baseline Scenario HIs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Hiker
Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a
	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway
	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index
Inorganics																				
Antimony	ND	NV	ND	ND	--	ND	NV	ND	ND	--	2.0E-06	NV	8.1E-04	2.8E-02	2.9E-02	2.0E-06	NV	1.1E-04	2.6E-03	2.7E-03
Chromium, Hexavalent	8.7E-07	NV	NA	5.3E-04	5.3E-04	8.7E-07	NV	NA	4.9E-05	5.0E-05	6.9E-07	NV	NA	4.1E-04	4.2E-04	6.9E-07	NV	NA	3.9E-05	4.0E-05
Copper	2.8E-09	NV	5.9E-06	2.0E-04	2.1E-04	2.8E-09	NV	8.1E-07	1.9E-05	2.0E-05	2.5E-09	NV	5.3E-06	1.8E-04	1.9E-04	2.5E-09	NV	7.2E-07	1.7E-05	1.8E-05
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	4.4E-07	NV	4.3E-05	1.5E-03	1.5E-03	4.4E-07	NV	5.9E-06	1.4E-04	1.5E-04	6.5E-05	NV	6.4E-03	2.2E-01	2.3E-01	6.5E-05	NV	8.7E-04	2.1E-02	2.2E-02
Nitrate	NS	NV	NS	NS	--	NS	NV	NS	NS	--	8.6E-11	NV	1.8E-07	6.2E-06	6.4E-06	8.6E-11	NV	2.5E-08	5.8E-07	6.1E-07
Phosphate	NS	NV	NS	NS	--	NS	NV	NS	NS	--	1.8E-10	NV	3.7E-07	1.3E-05	1.3E-05	1.8E-10	NV	5.1E-08	1.2E-06	1.3E-06
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	1.2E-06	NV	2.4E-03	8.4E-02	8.6E-02	1.2E-06	NV	3.3E-04	7.8E-03	8.2E-03
Semi-Volatile Organic Compounds																				
4-Methylphenol	6.9E-10	NV	1.5E-05	5.0E-05	6.5E-05	6.9E-10	NV	2.0E-06	4.7E-06	6.7E-06	5.6E-10	NV	1.2E-05	4.0E-05	5.2E-05	5.6E-10	NV	1.6E-06	3.8E-06	5.4E-06
bis (2-ethylhexyl) phthalate	2.6E-10	NV	5.4E-06	1.9E-05	2.4E-05	2.6E-10	NV	7.4E-07	1.8E-06	2.5E-06	1.9E-10	NV	4.1E-06	1.4E-05	1.8E-05	1.9E-10	NV	5.6E-07	1.3E-06	1.9E-06
Butylbenzylphthalate	ND	NV	ND	ND	--	ND	NV	ND	ND	--	ND	NV	ND	ND	--	ND	NV	ND	ND	--
Polycyclic Aromatic Hydrocarbons																				
Acenaphthylene	ND	NV	ND	ND	--	ND	NV	ND	ND	--	5.3E-13	NV	1.7E-08	3.9E-08	5.5E-08	5.3E-13	NV	2.3E-09	3.6E-09	5.9E-09
Anthracene	ND	1.1E-09	ND	ND	1.1E-09	ND	1.1E-09	ND	ND	1.1E-09	2.0E-13	1.1E-09	6.2E-09	1.4E-08	2.2E-08	2.0E-13	1.1E-09	8.5E-10	1.3E-09	3.3E-09
Benzo (ghi) perylene	1.6E-12	NV	5.1E-08	1.2E-07	1.7E-07	1.6E-12	NV	7.0E-09	1.1E-08	1.8E-08	1.6E-12	NV	5.0E-08	1.1E-07	1.6E-07	1.6E-12	NV	6.8E-09	1.1E-08	1.8E-08
Fluoranthene	1.1E-10	NV	3.6E-06	8.2E-06	1.2E-05	1.1E-10	NV	4.8E-07	7.7E-07	1.3E-06	7.1E-11	NV	2.2E-06	5.1E-06	7.4E-06	7.1E-11	NV	3.1E-07	4.8E-07	7.9E-07
Phenanthrene	1.0E-11	NV	3.2E-07	7.4E-07	1.1E-06	1.0E-11	NV	4.4E-08	6.9E-08	1.1E-07	1.8E-12	NV	5.7E-08	1.3E-07	1.9E-07	1.8E-12	NV	7.8E-09	1.2E-08	2.0E-08
Pyrene	1.5E-10	1.4E-08	4.7E-06	1.1E-05	1.6E-05	1.5E-10	1.4E-08	6.5E-07	1.0E-06	1.7E-06	9.5E-11	1.4E-08	3.0E-06	6.9E-06	9.9E-06	9.5E-11	1.4E-08	4.1E-07	6.4E-07	1.1E-06
Pesticides																				
4,4-DDE	4.7E-11	3.1E-08	4.9E-07	3.4E-06	3.9E-06	4.7E-11	3.1E-08	6.7E-08	3.2E-07	4.2E-07	7.1E-11	3.1E-08	7.5E-07	5.1E-06	5.9E-06	7.1E-11	3.1E-08	1.0E-07	4.8E-07	6.1E-07
4,4-DDT	4.8E-11	NV	5.1E-07	3.5E-06	4.0E-06	4.8E-11	NV	6.9E-08	3.3E-07	4.0E-07	4.8E-11	NV	5.1E-07	3.5E-06	4.0E-06	4.8E-11	NV	6.9E-08	3.3E-07	4.0E-07

Table AOC14-B1.4b
Baseline Scenario HIs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Hiker
Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Adult Hiker (0 to 0.5 foot bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Child Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a	Adult Hiker (0 to 3 feet bgs) ^a
	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway	Soil Pathway
	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index
Polychlorinated Biphenyls																				
Total PCBs	ND	1.7E-05	ND	ND	1.7E-05	ND	1.7E-05	ND	ND	1.7E-05	1.4E-08	1.7E-05	4.4E-04	1.0E-03	1.5E-03	1.4E-08	1.7E-05	6.1E-05	9.6E-05	1.7E-04
Total Petroleum Hydrocarbons																				
TPH as diesel	1.5E-09	1.1E-03	1.1E-04	3.8E-04	1.6E-03	1.5E-09	1.1E-03	1.5E-05	3.6E-05	1.1E-03	7.8E-09	1.1E-03	5.6E-04	1.9E-03	3.6E-03	7.8E-09	1.1E-03	7.7E-05	1.8E-04	1.3E-03
TPH as motor oil	3.7E-09	NV	7.7E-05	2.7E-04	3.4E-04	3.7E-09	NV	1.1E-05	2.5E-05	3.5E-05	2.6E-08	NV	5.4E-04	1.9E-03	2.4E-03	2.6E-08	NV	7.4E-05	1.7E-04	2.5E-04
Dioxins/Furans																				
TEQ Human	6.8E-10	2.2E-05	6.2E-05	7.1E-04	7.9E-04	6.8E-10	2.2E-05	8.4E-06	6.7E-05	9.7E-05	3.9E-09	2.2E-05	3.5E-04	4.0E-03	4.4E-03	3.9E-09	2.2E-05	4.8E-05	3.8E-04	4.5E-04
Total Hazard Index	1E-06	1E-03	3E-04	4E-03	5E-03	1E-06	1E-03	4E-05	3E-04	2E-03	7E-05	1E-03	1E-02	3E-01	4E-01	7E-05	1E-03	2E-03	3E-02	3E-02

Notes:
^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
H I = Hazard Index
mg/m³ = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.
ND = Not detected.
NS = Not sampled.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC14-B1.4c
 Baseline Scenario HIs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway
	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index
Inorganics																				
Antimony	ND	NV	ND	ND	--	ND	NV	ND	ND	--	2.0E-04	NV	1.5E-03	2.0E-03	3.6E-03	2.0E-04	NV	1.3E-03	8.1E-04	2.3E-03
Chromium, Hexavalent	8.7E-05	NV	NA	3.7E-05	1.2E-04	8.7E-05	NV	NA	1.5E-05	1.0E-04	6.9E-05	NV	NA	2.9E-05	9.8E-05	6.9E-05	NV	NA	1.2E-05	8.1E-05
Copper	2.8E-07	NV	1.1E-05	1.4E-05	2.5E-05	2.8E-07	NV	9.2E-06	5.9E-06	1.5E-05	2.5E-07	NV	9.6E-06	1.3E-05	2.3E-05	2.5E-07	NV	8.2E-06	5.3E-06	1.4E-05
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	4.4E-05	NV	7.9E-05	1.1E-04	2.3E-04	4.4E-05	NV	6.8E-05	4.3E-05	1.6E-04	6.5E-03	NV	1.2E-02	1.5E-02	3.4E-02	6.5E-03	NV	1.0E-02	6.4E-03	2.3E-02
Nitrate	NS	NV	NS	NS	--	NS	NV	NS	NS	--	8.6E-09	NV	3.3E-07	4.4E-07	7.7E-07	8.6E-09	NV	2.8E-07	1.8E-07	4.7E-07
Phosphate	NS	NV	NS	NS	--	NS	NV	NS	NS	--	1.8E-08	NV	6.8E-07	9.0E-07	1.6E-06	1.8E-08	NV	5.8E-07	3.7E-07	9.7E-07
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	1.2E-04	NV	4.4E-03	5.9E-03	1.0E-02	1.2E-04	NV	3.8E-03	2.4E-03	6.3E-03
Semi-Volatile Organic Compounds																				
4-Methylphenol	7.0E-08	NV	2.7E-05	3.5E-06	3.0E-05	7.0E-08	NV	2.3E-05	1.5E-06	2.4E-05	5.6E-08	NV	2.1E-05	2.8E-06	2.4E-05	5.6E-08	NV	1.8E-05	1.2E-06	1.9E-05
bis (2-ethylhexyl) phthalate	2.6E-08	NV	9.9E-06	1.3E-06	1.1E-05	2.6E-08	NV	8.5E-06	5.4E-07	9.0E-06	1.9E-08	NV	7.4E-06	9.9E-07	8.4E-06	1.9E-08	NV	6.4E-06	4.1E-07	6.8E-06
Butylbenzylphthalate	ND	NV	ND	ND	--	ND	NV	ND	ND	--	ND	NV	ND	ND	--	ND	NV	ND	ND	--
Polycyclic Aromatic Hydrocarbons																				
Acenaphthylene	ND	NV	ND	ND	--	ND	NV	ND	ND	--	5.4E-11	NV	3.1E-08	2.7E-09	3.3E-08	5.4E-11	NV	2.6E-08	1.1E-09	2.7E-08
Anthracene	ND	7.1E-11	ND	ND	7.1E-11	ND	7.1E-11	ND	ND	7.1E-11	2.0E-11	7.1E-11	1.1E-08	1.0E-09	1.2E-08	2.0E-11	7.1E-11	9.7E-09	4.2E-10	1.0E-08
Benzo (ghi) perylene	1.6E-10	NV	9.3E-08	8.3E-09	1.0E-07	1.6E-10	NV	8.0E-08	3.4E-09	8.3E-08	1.6E-10	NV	9.0E-08	8.0E-09	9.9E-08	1.6E-10	NV	7.8E-08	3.3E-09	8.1E-08
Fluoranthene	1.1E-08	NV	6.5E-06	5.7E-07	7.0E-06	1.1E-08	NV	5.5E-06	2.4E-07	5.8E-06	7.1E-09	NV	4.1E-06	3.6E-07	4.4E-06	7.1E-09	NV	3.5E-06	1.5E-07	3.6E-06
Phenanthrene	1.0E-09	NV	5.9E-07	5.2E-08	6.4E-07	1.0E-09	NV	5.0E-07	2.1E-08	5.2E-07	1.8E-10	NV	1.0E-07	9.3E-09	1.1E-07	1.8E-10	NV	9.0E-08	3.8E-09	9.4E-08
Pyrene	1.5E-08	8.5E-10	8.6E-06	7.7E-07	9.4E-06	1.5E-08	8.5E-10	7.4E-06	3.2E-07	7.7E-06	9.5E-09	8.5E-10	5.4E-06	4.8E-07	5.9E-06	9.5E-09	8.5E-10	4.7E-06	2.0E-07	4.9E-06
Pesticides																				
4,4-DDE	4.7E-09	1.9E-09	8.9E-07	2.4E-07	1.1E-06	4.7E-09	1.9E-09	7.7E-07	9.8E-08	8.7E-07	7.1E-09	1.9E-09	1.4E-06	3.6E-07	1.7E-06	7.1E-09	1.9E-09	1.2E-06	1.5E-07	1.3E-06
4,4-DDT	4.9E-09	NV	9.2E-07	2.5E-07	1.2E-06	4.9E-09	NV	7.9E-07	1.0E-07	9.0E-07	4.9E-09	NV	9.2E-07	2.5E-07	1.2E-06	4.9E-09	NV	7.9E-07	1.0E-07	9.0E-07

Table AOC14-B1.4c
Baseline Scenario HIs for C O P Cs in AOC 14 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Adult OHV Rider (0 to 0.5 foot bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Child OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway	Adult OHV Rider (0 to 3 feet bgs) ^a Soil Pathway
	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index	Particulate Inhalation	Vapor Inhalation	Dermal Contact	Ingestion	Total Hazard Index
Polychlorinated Biphenyls																				
Total PCBs	ND	1.1E-06	ND	ND	1.1E-06	ND	1.1E-06	ND	ND	1.1E-06	1.4E-06	1.1E-06	8.1E-04	7.2E-05	8.8E-04	1.4E-06	1.1E-06	6.9E-04	3.0E-05	7.3E-04
Total Petroleum Hydrocarbons																				
TPH as diesel	1.6E-07	6.8E-05	2.0E-04	2.7E-05	3.0E-04	1.6E-07	6.8E-05	1.7E-04	1.1E-05	2.5E-04	7.9E-07	6.8E-05	1.0E-03	1.4E-04	1.2E-03	7.9E-07	6.8E-05	8.8E-04	5.6E-05	1.0E-03
TPH as motor oil	3.7E-07	NV	1.4E-04	1.9E-05	1.6E-04	3.7E-07	NV	1.2E-04	7.7E-06	1.3E-04	2.6E-06	NV	9.8E-04	1.3E-04	1.1E-03	2.6E-06	NV	8.4E-04	5.4E-05	9.0E-04
Dioxins/Furans																				
TEQ Human	6.9E-08	1.4E-06	1.1E-04	5.0E-05	1.6E-04	6.9E-08	1.4E-06	9.6E-05	2.1E-05	1.2E-04	3.9E-07	1.4E-06	6.3E-04	2.8E-04	9.2E-04	3.9E-07	1.4E-06	5.4E-04	1.2E-04	6.6E-04
Total Hazard Index	1E-04	7E-05	6E-04	3E-04	1E-03	1E-04	7E-05	5E-04	1E-04	8E-04	7E-03	7E-05	2E-02	2E-02	5E-02	7E-03	7E-05	2E-02	1E-02	3E-02

Notes:
^a EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
 -- = not calculated.
 bgs = below ground surface.
 C O P C = Constituent of Potential Concern.
 H I = Hazard Index
 mg/m³ = milligrams per cubic meter.
 na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
 NA = Not applicable. Hexavalent chromium is not absorbed via dermal contact.
 ND = Not detected.
 NS = Not sampled.
 NV = Not volatile.
 PCB = Polychlorinated biphenyls.
 TPH = Total Petroleum Hydrocarbons.
 TEQ = Toxic Equivalent.

Table AOC14-B1.5a

Baseline Scenario Risk Evaluation for Lead in AOC 14 Surface Soil (0 to 0.5 foot bgs) Using Depth-Weighted EPCs:
Recreational User (Camper)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

LEAD RISK ASSESSMENT SPREADSHEET 8
CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

[Click here for ABBREVIATED INSTRUCTIONS FOR LEADSPREAD 8](#)

INPUT MEDIUM	INPUT LEVEL
Lead in Soil/Dust (ug/g)	9.5
Respirable Dust (ug/m ³)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.002	0.004	0.01	0.01	0.01	2159
BLOOD Pb, PICA CHILD	0.005	0.01	0.01	0.01	0.01	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 ^a
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm ²	2900
Soil adherence	ug/cm ²	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m ³ /day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	2.0E-05	1%	--	2.0E-05	0.4%
Soil Ingestion	2.5E-4	2.4E-03	99%	5.0E-4	4.8E-03	100%
Inhalation	7.0E-8	6.6E-07	0.03%	--	6.6E-07	0.01%

Notes:

^a Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC14-B1.5b

Baseline Scenario Risk Evaluation for Lead in AOC 14 Shallow Soil (0 to 3 feet bgs) Using Depth-Weighted EPCs:
Recreational User (Camper)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

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INPUT MEDIUM	INPUT LEVEL
Lead in Soil/Dust (ug/g)	364.0
Respirable Dust (ug/m ³)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.092	0.169	0.20	0.24	0.28	2159
BLOOD Pb, PICA CHILD	0.184	0.34	0.40	0.48	0.55	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 ^a
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm ²	2900
Soil adherence	ug/cm ²	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m ³ /day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	7.5E-04	1%	--	7.5E-04	0.4%
Soil Ingestion	2.5E-4	9.2E-02	99%	5.0E-4	1.8E-01	100%
Inhalation	7.0E-8	2.5E-05	0.03%	--	2.5E-05	0.01%

Notes:

^a Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC14-B1.5c

Baseline Scenario Risk Evaluation for Lead in AOC 14 Surface Soil (0 to 0.5 foot bgs) Using Depth-Weighted EPCs:
Recreational User (Hiker)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

LEAD RISK ASSESSMENT SPREADSHEET 8
CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

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INPUT MEDIUM	INPUT LEVEL
Lead in Soil/Dust (ug/g)	9.5
Respirable Dust (ug/m ³)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.005	0.009	0.01	0.01	0.01	1079
BLOOD Pb, PICA CHILD	0.010	0.02	0.02	0.03	0.03	542

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.5 ^a
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm ²	2900
Soil adherence	ug/cm ²	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m ³ /day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	4.1E-6	3.9E-05	1%	--	3.9E-05	0.4%
Soil Ingestion	5.0E-4	4.8E-03	99%	1.0E-3	9.5E-03	100%
Inhalation	1.4E-7	1.3E-06	0.03%	--	1.3E-06	0.01%

Notes:

^a Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC14-B1.5d

Baseline Scenario Risk Evaluation for Lead in AOC 14 Shallow Soil (0 to 3 feet bgs) Using Depth-Weighted EPCs:
Recreational User (Hiker)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

LEAD RISK ASSESSMENT SPREADSHEET 8
CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

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INPUT MEDIUM	INPUT LEVEL
Lead in Soil/Dust (ug/g)	364.0
Respirable Dust (ug/m ³)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.185	0.337	0.40	0.48	0.55	1079
BLOOD Pb, PICA CHILD	0.368	0.67	0.79	0.97	1.10	542

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.5 ^a
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm ²	2900
Soil adherence	ug/cm ²	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m ³ /day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	4.1E-6	1.5E-03	1%	--	1.5E-03	0.4%
Soil Ingestion	5.0E-4	1.8E-01	99%	1.0E-3	3.7E-01	100%
Inhalation	1.4E-7	5.1E-05	0.03%	--	5.1E-05	0.01%

Notes:

^a Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC14-B1.5e

Baseline Scenario Risk Evaluation for Lead in AOC 14 Surface Soil (0 to 0.5 foot bgs) Using Depth-Weighted EPCs:
Recreational User (Off-Highway Vehicle Rider)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	INPUT LEVEL
Lead in Soil/Dust (ug/g)	9.5
Respirable Dust (ug/m ³)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.002	0.003	0.00	0.00	0.00	3180
BLOOD Pb, PICA CHILD	0.010	0.02	0.02	0.03	0.03	535

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.5 ^a
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm ²	2900
Soil adherence	ug/cm ²	800
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	31
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m ³ /day	0.425
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	1.7E-5	1.6E-04	10%	--	1.6E-04	1.6%
Soil Ingestion	1.6E-4	1.5E-03	90%	1.0E-3	9.5E-03	98%
Inhalation	8.7E-9	8.3E-08	0.01%	--	8.3E-08	0.00%

Notes:

^a Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC14-B1.5f

Baseline Scenario Risk Evaluation for Lead in AOC 14 Shallow Soil (0 to 3 feet bgs) Using Depth-Weighted EPCs:
Recreational User (Off-Highway Vehicle Rider)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

LEAD RISK ASSESSMENT SPREADSHEET 8
CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

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INPUT MEDIUM	INPUT LEVEL
Lead in Soil/Dust (ug/g)	364.0
Respirable Dust (ug/m ³)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.063	0.114	0.14	0.16	0.19	3180
BLOOD Pb, PICA CHILD	0.372	0.68	0.80	0.98	1.11	535

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.5 ^a
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm ²	2900
Soil adherence	ug/cm ²	800
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	31
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m ³ /day	0.425
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	1.7E-5	6.0E-03	10%	--	6.0E-03	1.6%
Soil Ingestion	1.6E-4	5.7E-02	90%	1.0E-3	3.7E-01	98%
Inhalation	8.7E-9	3.2E-06	0.01%	--	3.2E-06	0.00%

Notes:

^a Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

ATTACHMENT C

Dose and Risk Calculations for Ecological Receptors at AOC 14 Using Depth-Weighted EPCs and Area-Weighted EPCs

For additional help with the information provided in Attachment C, please contact Erin Osborn, Arcadis Principal Toxicologist, at 1-510-684-6760.

Table AOC14-C.1

Desert Shrew Risk Calculations Using Depth-Weighted and Area-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 14

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

Scenario	Category	COPEC	Terrestrial Receptors	TRV Type	Soil EPC (mg/kg or ng/kg) ^a	Diet Composition (Biota)	Diet Composition (Soil Fraction)	Tissue EPCs (mg/kg dw)	Body Weight (kg)	Intake Estimates (F I R) (kg dw/kg-day)	Intake Estimates (S I R) (kg dw/kg-day)	Site Use Factor (unitless)
Baseline (Depth-Weighted)	Inorganics	Chromium, hexavalent	Desert Shrew	Selected	2.7E+00	100% Insects	2.0E-02	8.3E-01	5.0E-03	2.0E-01	4.1E-03	1.0E+00
Baseline (Depth-Weighted)	Inorganics	Chromium, total	Desert Shrew	Selected	1.8E+01	100% Insects	2.0E-02	5.6E+00	5.0E-03	2.0E-01	4.1E-03	1.0E+00
Baseline (Depth-Weighted)	Inorganics	Copper	Desert Shrew	Selected	1.4E+01	100% Insects	2.0E-02	7.2E+00	5.0E-03	2.0E-01	4.1E-03	1.0E+00
Baseline (Depth-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	Alternate	8.5E-01	100% Insects	2.0E-02	2.3E+00	5.0E-03	2.0E-01	4.1E-03	1.0E+00
Baseline (Area-Weighted)	Inorganics	Chromium, hexavalent	Desert Shrew	Selected	2.7E+00	100% Insects	2.0E-02	8.3E-01	5.0E-03	2.0E-01	4.1E-03	1.0E+00
Baseline (Area-Weighted)	Inorganics	Chromium, total	Desert Shrew	Selected	1.7E+01	100% Insects	2.0E-02	5.3E+00	5.0E-03	2.0E-01	4.1E-03	1.0E+00
Baseline (Area-Weighted)	Inorganics	Copper	Desert Shrew	Selected	1.5E+01	100% Insects	2.0E-02	7.5E+00	5.0E-03	2.0E-01	4.1E-03	1.0E+00
Baseline (Area-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	Alternate	8.5E-01	100% Insects	2.0E-02	2.3E+00	5.0E-03	2.0E-01	4.1E-03	1.0E+00

Table AOC14-C.1

Desert Shrew Risk Calculations Using Depth-Weighted and Area-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 14

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
 PG&E Topock Compressor Station
 Needles, California

Scenario	Category	COPEC	Terrestrial Receptors	Dose (Terrestrial Insects) (mg/kg-day)	Dose (Soil) (mg/kg-day)	Total Dose (mg/kg-day)	NOAEL TRV (mg/kg-day)	LOAEL TRV (mg/kg-day)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	HQ Notes
Baseline (Depth-Weighted)	Inorganics	Chromium, hexavalent	Desert Shrew	1.7E-01	1.1E-02	1.8E-01	9.2E+00	3.8E+01	2E-02	5E-03	None
Baseline (Depth-Weighted)	Inorganics	Chromium, total	Desert Shrew	1.1E+00	7.4E-02	1.2E+00	2.4E+00	9.6E+00	5E-01	1E-01	None
Baseline (Depth-Weighted)	Inorganics	Copper	Desert Shrew	1.5E+00	5.7E-02	1.5E+00	9.4E+00	1.6E+01	2E-01	1E-01	None
Baseline (Depth-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	4.6E-01	3.5E-03	4.7E-01	4.9E+00	3.0E+01	1E-01	2E-02	None
Baseline (Area-Weighted)	Inorganics	Chromium, hexavalent	Desert Shrew	1.7E-01	1.1E-02	1.8E-01	9.2E+00	3.8E+01	2E-02	5E-03	None
Baseline (Area-Weighted)	Inorganics	Chromium, total	Desert Shrew	1.1E+00	7.0E-02	1.1E+00	2.4E+00	9.6E+00	5E-01	1E-01	None
Baseline (Area-Weighted)	Inorganics	Copper	Desert Shrew	1.5E+00	5.9E-02	1.6E+00	9.4E+00	1.6E+01	2E-01	1E-01	None
Baseline (Area-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	4.6E-01	3.5E-03	4.7E-01	4.9E+00	3.0E+01	1E-01	2E-02	None

Table AOC14-C.1

Desert Shrew Risk Calculations Using Depth-Weighted and Area-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 14

**Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California**

Notes:

^a Inorganics presented in mg/kg; dioxin presented in ng/kg.

^b Total dose equation is presented below:

$$\text{Total Dose (mg/kg-day)} = [(EPC_{\text{soil}} \times SIR) + (C_{\text{plants}} \times FIR \times F_{\text{plants}}) + (C_{\text{insects}} \times FIR \times F_{\text{insects}}) + (C_{\text{mammals}} \times FIR \times F_{\text{mammals}})] \times \text{SUF}$$

^c HQ = Total Dose / TRV

Note 1	NOAEL HQ greater than 1
Note 2	LOAEL HQ greater than 1
Note 3	LOAEL HQ greater than 10
Note 4	LOAEL HQ greater than 100

Abbreviations:

AOC = area of concern

BAF = bioaccumulation factor

COPEC = constituent of potential ecological concern

dw = dry weight

EPC_{soil} = exposure point concentration in soil (mg/kg dw)

EPC_{plants} = exposure point concentration in plants (mg/kg dw)

EPC_{insects} = exposure point concentration in insects (mg/kg dw)

EPC_{mammals} = exposure point concentration in mammals (mg/kg dw)

F_{plants} = fraction of plants in diet

F_{insects} = fraction of insects in diet

F_{mammals} = fraction of mammals in diet

FIR = food ingestion rate (kg dw/kg bw-day)

HQ = hazard quotient (unitless)

kg = kilogram

kg dw/kg bw-day = kilograms per kilogram of body weight per day

LOAEL = lowest observed adverse effect level (mg/kg-day)

mg/kg = milligrams per kilogram

mg/kg-day = milligrams per kilogram per day

ND = not detected

ng/kg = nanograms per kilogram

NOAEL = no observed adverse effect level (mg/kg-day)

RBRG = risk-based remedial goal

SIR = soil ingestion rate (kg dw/kg bw-day)

SUF = site use factor (fraction)

TRV = toxicity reference value (mg/kg-day)

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