Attachment C4-1
East Ravine Sediment and Pore Water Sampling Work Plan

Attachment 1

East Ravine Sediment and Pore Water Sampling Work Plan

PG&E Topock Compressor Station, Needles, California

Prepared for

Pacific Gas and Electric Company

August 2012

CH2MHILL®

155 Grand Ave.
Suite 800
Oakland, CA 94612

Contents

Attachment

Acronyms and Abbreviations

µg/kg	micrograms per kilogram
µg/L	micrograms per unit
µmoles/g	micromoles per gram
AOC	Area of Concern
AVS	acid volatile sulfide
bss	below sediment surface
CMS	Corrective Measures Study
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
Cr(VI)	hexavalent chromium
DOI	United States Department of the Interior
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EPC	exposure point concentration
FS	Feasibility Study
HNWR	Havasu National Wildlife Refuge
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NA	not applicable
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEC	probable-effects concentration
PG&E	Pacific Gas and Electric Company
QAPP	*PG&E Program Quality Assurance Project Plan, Revision 1*
RAWP	*Human Health and Ecological Risk Assessment Work Plan, Topock Compressor Station, Needles, California*
RL	reporting limit
SBS	Soggy Bottom Sampler
SEM	simultaneously extracted metals

SVOC	semivolatile organic compound
TEC	threshold-effect concentration
USFWS	United States Fish and Wildlife Service
work plan	*East Ravine Sediment and Pore Water Sampling Work Plan*

ATTACHMENT 1

East Ravine Sediment and Pore Water Sampling Work Plan

1.0 Introduction and Background

This attachment to the *Area of Concern 10 Data Gaps Evaluation Results*, Appendix C4 to the *Soil RCRA Facility Investigation/Remedial Investigation Work Plan, PG&E Topock Compressor Station, Needles, California* (RFI/RI Work Plan) (CH2M HILL, 2012) presents the East Ravine Sediment and Pore Water Sampling Work Plan (work plan) for sampling sediment and pore water near the East Ravine and the Colorado River east of the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. This work plan was prepared in response to comments from the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and United States Department of the Interior (DOI) on the *RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan, Part A, PG&E Topock Compressor Station, Needles, California* (CH2M HILL, 2006a). The comments relating to the sediment and pore water sampling in this area were discussed with agencies, Tribes, and stakeholders during various meetings, including the Technical Working Group meeting on September 1, 2011, at the Topock Compressor Station; during the comment resolution WebEx meeting on October 27, 2011; and during the May 4, 2012, WebEx meeting. The conceptual approach discussed in the various meetings and through other correspondence (e.g., DOI, 2012) has been further detailed in this work plan.

1.1 Background

East Ravine is a small ravine located on the southeast side of the compressor station, as shown on Figure 1. The ravine runs eastward toward the Colorado River. Portions of the East Ravine are on PG&E property outside the facility fence line, and other portions of the ravine are located on property owned by the Bureau of Reclamation and managed by the United States Fish and Wildlife Service (USFWS) Havasu National Wildlife Refuge (HNWR).

The East Ravine is approximately 1,600 feet long and is bisected by three constructed berms: one constructed berm and two berms resulting from roads crossing East Ravine. The constructed berm was built circa early 1960s, the Southern California Gas Pipeline road was built in the 1950s, and the lower dirt road was built in 1916 and is associated with Historic Route 66. The lower dirt road is the only berm that contains a culvert. Due to the berms, surface flow from most of the length of this ravine (west of the lower dirt road) does not flow over the berms and therefore does not reach the Colorado River. The drainage for this ravine includes runoff from the compressor station access road (a curb was installed along the access road in 2006), runoff from the mountains to the south, and runoff from the compressor station itself.

1.2 Conceptual Site Model

The East Ravine was designated as Area of Concern (AOC) 10 as part of the RFI/RI due to potential historical discharges even though historical activities in this area are not well documented. Figure 2 is a conceptual site model used to illustrate potential contaminant migration pathways for both surface flow and groundwater in the East Ravine area. Aerial photographs from the 1960s (Figures 3 through 21) indicate that fluids were present in the East Ravine behind the westernmost constructed berm/impoundment. Potential sources of contamination within East Ravine are (1) fluids and potential waste fluids collected behind the westernmost constructed berm/impoundment and potentially down wash of it (2) runoff from the compressor station, the access road to the compressor station, AOC 9, UA2 and drip legs (AOC-28); (3) discharge from stormwater drain pipes; (4) surface debris disposed of on the slopes of the ravine; and (5) incidental overflows of wastewater via the former trench drain at the top of the station access road. Potential releases would primarily have been in liquid form and would have affected surface soil, but larger releases into the wash could have migrated into the subsurface. The soils investigation is still underway in the East Ravine area including AOC-9, 10, and 28. Any releases from debris, whether solid particles or dissolved constituents, may have affected surface soil.

Surface soil is the primary source medium. However, contaminants could have migrated to shallow and deeper soils and then to groundwater. Periodic rainfall events and runoffs to the East Ravine would have pooled in the drainage depressions behind the berms. In these subareas, contaminants could potentially be driven deeper and could potentially reach groundwater. Bedrock groundwater contamination has been documented in the East Ravine area. Groundwater flow is primarily toward the north and northeast. If released, volatile organic compounds in surface soils would be expected to have been degraded by heat and light and are likely no longer present.

A secondary source of contamination in the East Ravine may also include contaminated windblown dust. Windblown dust contamination could have been deposited in the ravine or on shallow portions of the banks of the ravine. Windblown contamination, if any, is expected to be limited to surface soils.

Due to the berms within the East Ravine wash, surface flow to the Colorado River is not currently considered a significant potential migration pathway. However, there is less certainty regarding waste fluid discharge practices and potential surface flow to the river, because historical activities are not well documented in this area. The easternmost berm was constructed prior to the development of the station, and the other was constructed around the time the station was built. Although a culvert exists in the lower dirt road berm, chemicals of potential concern (COPCs) concentrations east of this road are low, and stormwater does not usually flow through the lower culvert. Hexavalent chromium (Cr[VI]) was not detected, and total chromium was below background in a soil sample immediately east of the lower dirt road berm.

This sub appendix has been prepared to investigate COPC concentrations in sediment and pore water along the shoreline near the East Ravine and Colorado River interface. Soils within AOC 9, AOC 10, AOC 11, AOC 28, and UA-2 are addressed in the RFI/RIWP sub appendices C3, C4, C5, C12, and C9, respectively.

1.3 Objectives

The following sediment and pore water sampling objectives have been developed in consultation with DTSC and DOI:

- Evaluate potential subsurface transport of COPCs and chemicals of potential ecological concern (COPECs) in groundwater towards the Colorado River near the East Ravine area.
- Assess COPC/COPEC concentrations in pore water along the western shore of the Colorado River near the East Ravine.
- Assess the geochemical conditions in sediment and pore water along the western shore of the Colorado River near the East Ravine.
    - Evaluate potential surface runoff transport of COPCs/COPECs from shallow soil in East Ravine to sediment within the East Ravine area. Assess nature and extent of COPCs/COPECs in sediment near Colorado River depositional areas near East Ravine drainages.
- Determine the exposure point concentrations (EPCs) for subsequent use in the risk assessment.
- Collect additional information to aid in refining the conceptual site model for this area. Specifically, to the extent possible, the thickness and width of sediment present along the shoreline will be assessed.

The following data quality objectives developed for the Soil Part A investigation are also relevant and appropriate for this investigation:

- **Decision 1** – Determine the nature and extent of residual soil and/or sediment concentrations resulting from historical compressor station practices.
- **Decision 2 –** Determine representative EPCs for residual soil and/or sediment contamination resulting from historical compressor station practices that may pose unacceptable risks to current or future human or ecological receptors.
- **Decision 4 –** Determine the site-specific soil property and contaminant distribution information necessary to support the corrective measures study (CMS)/feasibility study (FS) decisions and remedial action design.

Soil Part A Decision 3, related to assessment of the threat to groundwater from soil concentrations, will be addressed by the sediment and pore water objectives defined above.

If fulfillment of these objectives is not feasible, uncertainties will be addressed in the risk assessment or CMS/FS.

Sediment COPCs/COPECs for this area are initially defined by those compounds that are detected in soil above background or the selected interim risk-based screening levels in AOC 9, AOC 10, and AOC 11. COPCs for sediment include 18 metals (aluminum, arsenic, barium, calcium, total chromium, Cr(VI), cobalt, copper, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, thallium, and zinc), 6 polycyclic aromatic hydrocarbons (PAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz (a,h) anthracene, and indeno (1,2,3-cd)pyrene), one polychlorinated biphenyl (PCB) isomer (Aroclor-1260), and 3 calculated quantities (benzo(a)pyrene equivalents, total high molecular weight PAHs, and total PCBs). Limited soil data have been collected for drip legs (AOC 28), and because surface contamination used to reside at UA-2, the following analytes have been added to sediment samples in appropriate areas: PAHs, PCBs, and semivolatile organic compounds (SVOCs).

COPCs for pore water are limited to Cr(VI), total chromium, and molybdenum, as they are detected above background groundwater concentrations in wells near this area.

2.0 Review of Historical Aerial Photographs

As requested by DTSC, a review of aerial photographs was conducted to better understand the changes in sediment depositional areas over time. Historical aerial photographs (Figures 3 through 21), which span from 1936 to 2005, were reviewed, and the aerials that best showed the East Ravine and Colorado River interface were included in this evaluation.

Table 1 presents a summary of the information observed in each of the applicable aerial photographs reviewed. The aerial photographs are presented in Figures 3 through 21, and the approximate area of the sediment and pore water sampling is shown on these figures.

The aerial photographs indicate that from 1936 to approximately 1969, sediment was being deposited on the California (southwest) side of the Colorado River in an area from the approximate investigation area and north approximately 4,000 feet. From approximately 1969 to the present, the aerial photographs suggest that sediment in the approximate investigation area has been relatively stable.

3.0 Sampling and Analysis

The sampling procedures presented below are consistent to the procedures used during the 2005-2006 sediment and pore water sampling (CH2M HILL, 2006b). The procedures from the 2005-2006 investigation were modified as needed to meet the specific site conditions and objectives of this work plan.

3.1 Sampling Locations

Proposed sample locations are shown on Figure 1. A summary of the sampling and analyses is provided in Table 2 and the analytical methods and reporting limits are provided in Table 3. The proposed sample locations were defined in collaboration with DTSC and DOI, and were optimized during a site reconnaissance on July 15, 2012.

3.2 Access Constraints

In general, access to all the sampling locations will be difficult, and access to several locations will require access using water craft (for example, small boat or canoe). It is anticipated that access to all locations may be affected by the water level of the river, which fluctuates seasonally. Water levels tend to be lower in winter months, which may be more favorable for access to some locations. Furthermore, riparian vegetation is dense in some areas and may need trimming to provide adequate access for sampling equipment and to clear a work area. The programmatic biological assessment classifies the pore water and sediment sampling area as suitable habitat for various migratory nesting birds, including the Southwest Willow Flycatcher and the Yuma Clapper Rail. Therefore, work will be avoided from March 15 through September 30, consistent with the existing U.S. Bureau of Land Management mitigation measures, as summarized in the *Programmatic Biological Assessment* (CH2M HILL, 2007). The anticipated access routes for each location are shown on Figure 1.

The following observations were made regarding access to each of the sampling locations during the July 15, 2012, reconnaissance:

- **ERPW-1:** Access can be achieved down a steep hill and a narrow path. The path is relatively solid and tends to have adequate footing.
- **ERPW-2:** During the site reconnaissance, this location was accessed from the east by parking a small boat adjacent to the vegetation along the river and trekking in on foot from there. The vegetation was extremely thick and would require more trimming than is feasible. Access over part of the area was achieved by laying narrow planks along the top of the vegetation to serve as a stable walking platform generally over the top of the vegetation. It is anticipated that a combination of temporary walking planks and limited trimming would be the most effective means of access and would be the least disruptive to the habitat.
- **ERPW-3:** Access can be achieved down a steep hill and through a grove of mesquite trees. The path down the hill is over unconsolidated material and poor footing, which will make access more challenging. The grove of mesquite trees is quite thick, and some branches may need to be trimmed to allow access with equipment.
- **ERPW-4:** Access to this location will be achieved in a similar way as described for location ERPW-2.
- **ERPW-5:** Access to this location will be achieved using the general access route for surface water sampling location SW2.
- **ERPW-6:** During the reconnaissance, access to this location was achieved by using a canoe to get within approximately 50 feet of the proposed sampling location. The final 50 feet was traversed on foot with staff wearing waders. Water levels were deep enough that sampling on foot at that time would have been challenging. Sediment in this area is also extremely soft. Site conditions will likely be more favorable for sampling during winter months with lower water levels.
- **ERPW-7:** This location was accessed during the site reconnaissance using a canoe, and water levels at that time were likely too deep to adequately conduct sampling on foot using waders. It is likely a small boat could also access this location, which would provide a sampling platform more stable than a canoe. Lower water levels during winter months may allow sampling to be conducted on foot using waders.
- **ERPW-8:** Access to this location will be similar to location ERPW-7.
- **ERPW-9:** A canoe was used during the site reconnaissance to access this location. The water levels at the time of reconnaissance were favorable for sampling on foot using waders.
- **ERPW-**10: This location was proposed by DTSC after the site reconnaissance had occurred; therefore, access to this location was not specifically evaluated during the

initial reconnaissance. It is anticipated that access can be achieved using a canoe, similar to locations ERPW-7 and ERPW-9, to access the shoreline and then trek in by foot from there. This location is uphill from the shoreline, and pore water may not be present at the depths specified for sampling in this work plan, in which case only sediment samples will be collected.

In general, for better access to many of the sampling locations, it is recommended that the proposed sampling be performed during the winter months when water levels in the river tend to be lower. This would also avoid work from occurring during migratory bird nesting seasons. However, by performing this work during a period of lower water levels in the river, there is the possibility that some locations, may be moved from the proposed locations presented in this work plan so that there is surface water present. Additionally, some sampling locations may need to be moved if the sediment thickness is not adequate to collect samples from the proposed depths. The method for investigating the thickness of sediment is described in Section 3.3. If sampling locations are adjusted from the proposed locations as a result of current field conditions, it is anticipated they will be relocated as minimal a distance as possible and to locations where the results will still accomplish the objectives presented above.

3.3 Sediment Sampling and Analysis

All sampling will be performed by hand. Prior to collecting sediment samples, the thickness of the sediment will be investigated by advancing an approximately 0.5- to 1.5-inch-diameter rod with a pointed tip into the sediment using a slide hammer. It is anticipated that a portable mechanical jack may need to be used to retrieve the rod used to probe the thickness of sediment. To minimize the potential for advancing the rod to a depth where it will not be possible to remove the rod using portable hand equipment, after each five feet the probe is advanced, the field crew will determine if it will be possible to remove the rod, by back-hammering or using the jack. The probe will be advanced to refusal or a maximum depth of approximately 20 feet below sediment surface (bss). If the probe is able to be advanced to at least 6 feet bss, the sediment and pore water sampling will be performed. If the probe encounters refusal at a depth shallower than 6 feet bss, the location will be moved, up to 3 attempts will be made.

The proposed method for sediment sampling is to use a manually driven sampler capable of collecting depth-discrete samples of soft sediment, such as the AMS Inc. Soggy Bottom Sampler (SBS) or equivalent. The SBS is capable of collecting up to 4-foot continuous samples from discrete intervals. A hand auger may be used if sediment does not collapse back into the boreholes.

Sampling will involve collecting continuous sediment cores for logging and sample collection. To get sufficient sediment quantity to fill the containers required for the analytical analyses, more than one boring may be required at each location to constrain the vertical sample interval to a 0.5-foot zone. Sediment samples will be collected from 0.0 to 0.5 foot bss, 1 to 1.5 feet bss, and 1.5 to 2 feet bss at each location. Additionally, sediment samples will be collected from 5.5. to 6 feet bss from location ERPW-7 and ERPW-1, ERPW-3, or ERPW-5. The sample depths and analyses are presented in Table 2, and the analytical methods and reporting limits are presented in Table 3. Sample containers, appropriate methods of preservation, and hold times for each analysis are provided in the

PG&E Program Quality Assurance Project Plan, Revision 1, Topock Compressor Station, Needles, California (QAPP; CH2M HILL, 2008) and the *Addendum to PG&E Program Quality Assurance Plan for the RCRA Facility Investigation/Remedial Investigation, Revision 1, Topock Compressor Station, Needles, California* (CH2M HILL, 2010). The latest version of the QAPP (or subsequent versions) will be used for this project.

Sediment sampling using an SBS will generally be conducted using the following procedures:

1. A plastic liner will be installed in the sampler.
2. An internal drive tip attached to inner rods will be installed.
3. The sampling device will be lowered through any surface water to the top of the sediment.
4. After the sampler is in contact with the sediment, the internal drive tip will be retracted, and the inner rods will be removed.
5. The slide hammer will be attached to the sampler, and the sampler will be driven to the desired depth, not to exceed the length of the sampler (for example, a 2-foot-long sampler can only be driven 2 feet into the sediment).
6. After the sampler has been driven to depth, the slide hammer will be used to back-hammer the sampler out of the bore hole.
7. The sample liner, with sediment core inside, will then be removed from the sampler.
8. For locations requiring the sampler to be advanced to depths greater than the sampler can achieve with one run, new liners will be installed in the sampler, the interval drive tip attached to inner rods will be installed, and the slide hammer will be attached.
9. The sampler will be driven through the same bore hole to the top of the next sample interval, at which point the inner rod and internal drive tip will be removed, and the sampler will be driven to the desired depth, not to exceed the length of the sampler.
10. The sample liner, with sediment core inside, will be removed from the sampler.

After the sediment cores are brought to the surface, the plastic liners may be cut open to collect the sediment and place it in the appropriate sample containers. Alternatively, the plastic liners with sediment core inside may be cut to isolate the desired interval. A Teflon sheet would be placed over the ends of the core, and a cap would be placed over the Teflon sheet. Upon completion of a sediment sample boring, the bore hole will be allowed to collapse. Any excess sediment that is collected and decontamination fluid will be managed appropriately following displaced soil protocols provided in this work plan.

3.4 Pore Water Sampling and Analysis

It is anticipated that the most effective means of collecting pore water samples is to use a drive-point piezometer, such as the Solinst Model 615 N or equivalent. Shielded drive-point piezometers are available to prevent the screen of the piezometer from getting clogged while driving through sediment, and the shield is left in the subsurface after sample collection. Pore water sampling will first be attempted without using the shield; however, if clogging of the sampler screen becomes problematic the shield may need to be employed. It is anticipated that the drive-point piezometer will be driven to the desired sampling depth using a slide hammer. A power hammer could also be used to drive the piezometer, although with access constraints for most sampling locations, discussed below, it is unlikely that a power hammer will be used. A data sheet for the Solinst drive point piezometers and general instructions for installing a drive point piezometer are provided as Attachment 1-1.

Pore water will be collected from two depths at each sampling location: 0.0 to 1.0 foot bss and 5 to 6 feet bss. Sample depths and analyses are presented in Table 2, and the analytical methods and reporting limits are presented in Table 3. After the sampling depth has been reached, a polyethylene tube will be inserted into the piezometer, and three sampler volumes of pore water will be extracted using a peristaltic pump. The purged pore water will be measured for the following water quality parameters: temperature, specific conductance, oxidation-reduction potential, and dissolved oxygen. Samples for dissolved metals analysis will be field filtered with a 0.45-micron filter. The sampling containers, appropriate methods of preservation, and hold times for each analysis are provided in the QAPP.

Upon completion of pore water sampling, the depth to pore water will be measured from the top of the piezometer. Water levels will be measured until three successive measurements, with each measurement approximately 3 minutes apart, have stabilized to within 0.01 foot. The depth to surface water, if present, will also be measured from the top of the piezometer.

After the sampling and water level measurements are completed, the piezometer will be removed, and the bore hole will be allowed to collapse. Accumulated purge water and decontamination fluid will be contained for proper disposal.

4.0 Evaluation

After implementation of the sediment and pore water investigation, the data will be validated and evaluation of the data and identification of data gaps will be performed in collaboration with DTSC and DOI.

Detected COPC/COPECs in surface sediment (0 to 0.5 foot bss) will be screened against available sediment screening levels. In accordance with the *Human Health and Ecological Risk Assessment Work Plan, Topock Compressor Station, Needles, California* (RAWP) (ARCADIS, 2008), threshold-effect concentrations (TECs) and probable-effects concentrations (PECs) from MacDonald, et al. (2000) will be used to screen detected bulk sediment data. TECs and PECs are available for most metals and polycyclic aromatic hydrocarbons but are not available for Cr(VI) (see Table 3.2 of *Soil RCRA Facility Investigation/Remedial Investigation Work Plan, PG&E Topock Compressor Station, Needles, California* [CH2M HILL, 2012]). Screening values for Cr(VI) and other COPCs that do not have TECs/PECs can be developed and, upon agency approval, those comparison values can be used to evaluate sediment data. Due to lack of pore water screening levels, surface water screening levels presented in the RAWP (ARCADIS, 2008) will be updated as necessary and used for comparison.

Assessment of EPCs associated with sediment and/or pore water constituents will follow the procedures and methods included in the RAWP and relevant addendums. If sediment and pore water EPCs at the surface exposure interval do not exceed the selected screening levels, it can be predicted that risks to ecological and human receptors are unlikely, and further evaluation is not likely needed. If sediment and pore water EPCs at the surface exposure interval exceed the selected screening levels, further evaluation may be warranted. To evaluate potential exposure based on a hypothetical scouring scenario, sediment samples collected from 1 to 1.5 feet bss and 1.5 to 2 feet bss will be evaluated using the same approach, as described above, for surface sediment.

Results from this investigation will be presented in the Soil RCRA Facility Investigation/Remedial Investigation Volume 3 Report.

5.0 References

ARCADIS. 2008. *Human and Ecological Risk Assessment Work Plan, Topock Compressor Station, Needles, California.* August.

CH2M HILL. 2006a. *RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan, Part A, PG&E Topock Compressor Station, Needles, California*. November 16.

__________. 2006b. *Pore Water and Seepage Study Report, PG&E Topock Compressor Station, Needles, California*. March 13.

__________. 2007. *Programmatic Biological Assessment, PG&E Topock Compressor Station, Needles, California*. January.

__________. 2008. *PG&E Program Quality Assurance Project Plan, Revision 1, Topock Compressor Station, Needles, California*. December.

__________. 2010. Addendum to PG&E Program Quality Assurance Plan for the RCRA Facility Investigation/Remedial Investigation, Revision 1, Topock Compressor Station, Needles, California. January.

__________. 2012. *Soil RCRA Facility Investigation/Remedial Investigation Work Plan, PG&E Topock Compressor Station, Needles, California*. September.

MacDonald, D.D., C.G. Ingersoll, and T.A. Berger (MacDonald et al.). 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. *Archives of Environmental Contamination and Toxicology* 39:20-31.

United States Department of Interior (DOI). 2012. Personal communication from Pamela Innis/DOI to Christina Hong/CH2M HILL, Jamie Eby/CH2M HILL, Keith Sheets/CH2M HILL, and other project participants. “Pore water and sediment sampling RTCs.” May 10.

Tables

TABLE 1
Summary of Aerial Photographs, 1936 to 2005
East Ravine Sediment and Pore Water Sampling Work Plan, PG&E Topock Compressor Station, Needles, California

Year	Description
1936 (Figure 3)	The western bank of the Colorado River in the vicinity of the study area appears to follow the red rock and basement outcrops. Sediment and vegetation that exists today in the study area was not present at this time, especially by the route 66 sign. There does not appear to be any significant vegetation or sediment along the shoreline. Two river crossings are visible, one to the north (railroad) and one to the south (Route 66 Old Trail Arch Bridge) of the approximate sediment and pore water investigation area.
1942 (Figure 4)	Similar to 1936.
1944 (Figure 5)	The shoreline appears similar to that in1936. There is a sediment bar to the northeast of the study area within the river. A new railroad to the north of the existing railroad is under construction on both sides of the river. The new railroad bridge has not been installed, but supports for it are visible within the river.
1947 (Figure 6)	There appears to be visible sediment on this aerial adjacent to the north side of the approximate investigation area. A smaller amount of sediment appears to have been formed southeast of the red rock outcrop where well MW-63 is located. A new railroad river crossing to the north of the approximate sediment and pore water investigation area is visible.
1953 (Figure 7)	Sediment is visible in the river east/northeast of the study area. The sediment located south of the cantilever bridge appears to be located where the western shoreline occurs today. A smaller amount of sediment also appears to have been present southeast of the red rock outcrop where well MW-63 is located. Vegetation/sediment might be present at two reentrants from the shoreline near sample locations ERPW-3 and ERPW-5. The Topock compressor station is now present.
1955 (Figure 8)	The exposed river sediment visible in the 1953 photograph is not present, but the 1955 photograph apparently shows submerged sediment fans within the western portion of the river in and near the study area. Vegetation at the two reentrants seems more pronounced than in 1953 photograph. There may also be vegetation along the shoreline bend near well MW-72.
1961 (Figure 9)	There is sediment visible within the northern margin of the approximate investigation area. There is significantly more sediment visible on this aerial on the southwest side of the Colorado River to the north of the approximate investigation area, relative to previous photos. The shoreline location from the railroad bridge south to the first pipeline bridge is very similar to the current shoreline. A slender backwater inlet begins near the pipeline bridge and continues to the north well past the cantilever bridge. This inlet follows the old red rock outcrop shoreline of the past. Two pipeline crossings visible on this aerial, which were not visible on the 1953 aerial.
1962 (Figure 10)	On this aerial there appears to be less visible sediment and vegetation in the approximate investigation area than what was visible on the 1961 aerial. However, the quality of the aerial does make it difficult to discern features in a small area and some of the dark area in the approximate investigation area could be vegetation. The backwater inlet is more pronounced in this figure, probably due to higher river stage, and continues north to the railroad bridge.
1964 (Figure 11)	On this aerial, it appears that sediment may be visible within large extent of the approximate investigation area. There are some darker areas on the aerial within the approximate investigation area, which is likely to be surface water and/or vegetation. A large sand bar is noted east beyond the shoreline from 1962 and stretches from south of the cantilever bridge towards the R-63 surface water sample location. Beneath the pipeline bridge, a small sand spit closes much of the entrance to the backwater inlet.

TABLE 1
Summary of Aerial Photographs, 1936 to 2005
East Ravine Sediment and Pore Water Sampling Work Plan, PG&E Topock Compressor Station, Needles, California

Year	Description
1967 (Figure 12)	The extent of sediment visible on this aerial within and near the approximate investigation area appears to be generally similar to the 1964 aerial; however, the clarity of this aerial is better. The large easternmost sand bar stretches from the cantilever bridge towards R-63. An additional road crossing (I-40) is visible on this aerial, which was not visible on the 1964 aerial.
1969 (Figure 13)	The easternmost sand bar from 1967 is gone and the shoreline looks similar to present day conditions. However, the backwater inlet persists to north of the route 66 sign.
1970, 1973, 1976,1983, 1994, 1997, 2004, 2005 (Figures 14 through 21)	The visible extent of sediment and vegetation in the approximate investigation area appear to be similar to that of present day conditions, as visible on Figure 1. On the 1970 and 1973 aerial there appears to be more surface water visible in the backwater inlet than in later aerials as the inlet becomes progressively vegetated over time. The 1976 aerial shows the railroad crossing visible in the 1936 aerial adjacent to the north side of the approximate sediment and pore water investigation area being dismantled and it was not visible in the 1983 aerial photograph.

TABLE 2
Sampling Summary Table
East Ravine Sediment and Pore Water Sampling Work Plan, PG&E Topock Compressor Station, Needles, California

Locations	Sample Depth	Analytical Suite
1 through 9	**Sediment:** • 0.0 to 0.5 foot bss • 1.0 to 1.5 feet bss • 1.5 to 2.0 feet bss	**Sediment:** • Title 22 metals • Cr(VI) • Total organic carbon • Acid volatile sulfides (AVS) • AVS/simultaneously extracted metals (SEM) • PAHs • SVOCs • PCBs • Ammonia • Sieve analysis
1 or 3 or 5 and 2	**Sediment:** • 5.5 to 6.0 feet bss	**Sediment:** • Chromium, total • Cr(VI) • Molybdenum • PAHs • SVOCs • PCBs
1 through 9	**Pore Water:** • Sampler screened from 0.0 to 1.0 foot bss • Sampler screened from 5.0 to 6.0 feet bss	**Pore water:** • Cr(VI) • Chromium, total • Molybdenum • Title 22 metals (0.0 to 1.0 foot bss samples only) • General chemistry - Iron - Manganese - Arsenic - Calcium - Magnesium - Potassium - Sodium - Alkalinity - Dissolved organic carbon - Chloride - Sulfate - Fluoride - Nitrate - Ammonia - Sulfide

TABLE 2
Sampling Summary Table
East Ravine Sediment and Pore Water Sampling Work Plan, PG&E Topock Compressor Station, Needles, California

Locations	Sample Depth	Analytical Suite
		• Field parameters - Oxidation-reduction potential - Dissolved oxygen - Specific conductance - pH

TABLE 3
Analytical Methods and Reporting Limits
East Ravine Sediment and Pore Water Sampling Work Plan

Analyte	Media	Method	CAS No.	RL	Units
Antimony[a]	Sediment	SW6010B/6020A	7440-36-0	2	mg/kg
Arsenic[a]	Sediment	SW6010B/6020A	7440-38-2	0.5	mg/kg
Barium[a]	Sediment	SW6010B/6020A	7440-39-3	1	mg/kg
Beryllium[a]	Sediment	SW6010B/6020A	7440-41-7	0.5	mg/kg
Cadmium[a]	Sediment	SW6010B/6020A	7440-43-9	0.5	mg/kg
Chromium, total	Sediment	SW6010B/6020A	7440-47-3	1	mg/kg
Chromium, hexavalent	Sediment	SW7199/3060A	18540-29-9	0.4	mg/kg
Cobalt[a]	Sediment	SW6010B/6020A	7440-48-4	1	mg/kg
Copper[a]	Sediment	SW6010B/6020A	7440-50-8	1	mg/kg
Lead[a]	Sediment	SW6010B/6020A	7439-92-1	1	mg/kg
Mercury[a]	Sediment	SW7471	7439-97-6	0.1	mg/kg
Molybdenum	Sediment	SW6010B/6020A	7439-98-7	1	mg/kg
Nickel[a]	Sediment	SW6010B/6020A	7440-02-0	1	mg/kg
Selenium[a]	Sediment	SW6010B/6020A	7782-49-2	1	mg/kg
Silver[a]	Sediment	SW6010B/6020A	7440-22-4	1	mg/kg
Thallium[a]	Sediment	SW6010B/6020A	7440-28-0	2	mg/kg
Vanadium[a]	Sediment	SW6010B/6020A	7440-62-2	1	mg/kg
Zinc[a]	Sediment	SW6010B/6020A	7440-66-6	2	mg/kg
Total organic carbon[a]	Sediment	Walkley-Black or SW9060	TOC	50	mg/kg
AVS[a]	Sediment	E821R-91-100	18496-25-8	1.6	mg/kg
Simultaneously extracted metals (AVS/SEM)[a]	Sediment			Various	µmoles/g
Ammonia[a]	Sediment	SM4500-NH3 KCl extraction method	7664-41-7	0.5	mg/kg
Sieve analysis[a]	Sediment	ASTM D-422	NA	NA	NA
1-methylnaphthalene	Sediment	SW8270-SIM	90-12-0	5	µg/kg
2-methylnaphthalene	Sediment	SW8270-SIM	91-57-6	5	µg/kg
Acenaphthene	Sediment	SW8270-SIM	83-32-9	5	µg/kg
Acenaphthylene	Sediment	SW8270-SIM	208-96-8	5	µg/kg
Anthracene	Sediment	SW8270-SIM	120-12-7	5	µg/kg
Benzo(a)anthracene	Sediment	SW8270-SIM	56-55-3	5	µg/kg

TABLE 3
Analytical Methods and Reporting Limits
East Ravine Sediment and Pore Water Sampling Work Plan

Analyte	Media	Method	CAS No.	RL	Units
Benzo (a) pyrene	Sediment	SW8270-SIM	50-32-8	5	µg/kg
Benzo (b) fluoranthene	Sediment	SW8270-SIM	205-99-2	5	µg/kg
Benzo (g,h,i) perylene	Sediment	SW8270-SIM	191-24-2	5	µg/kg
Benzo (k) fluoranthene	Sediment	SW8270-SIM	207-08-9	5	µg/kg
Chrysene	Sediment	SW8270-SIM	218-01-9	5	µg/kg
Dibenzo (a,h) anthracene	Sediment	SW8270-SIM	53-70-3	5	µg/kg
Fluoranthene	Sediment	SW8270-SIM	206-44-0	5	µg/kg
Fluorene	Sediment	SW8270-SIM	86-73-7	5	µg/kg
Indeno (1,2,3-c,d) pyrene	Sediment	SW8270-SIM	193-39-5	5	µg/kg
Naphthalene	Sediment	SW8270-SIM	91-20-3	5	µg/kg
Phenanthrene	Sediment	SW8270-SIM	85-01-8	5	µg/kg
Pyrene	Sediment	SW8270-SIM	129-00-0	5	µg/kg
Aroclor-1016	Sediment	SW8082	12674-11-2	50	µg/kg
Aroclor-1221	Sediment	SW8082	11104-28-2	50	µg/kg
Aroclor-1232	Sediment	SW8082	11141-16-5	50	µg/kg
Aroclor-1242	Sediment	SW8082	53469-21-9	50	µg/kg
Aroclor-1248	Sediment	SW8082	12672-29-6	50	µg/kg
Aroclor-1254	Sediment	SW8082	11097-69-1	50	µg/kg
Aroclor-1260	Sediment	SW8082	11096-82-5	50	µg/kg
1,2,4-Trichlorobenzene	Sediment	SW8270C	120-82-1	330	µg/kg
1,2-Dichlorobenzene	Sediment	SW8270C	95-50-1	330	µg/kg
1,3-Dichlorobenzene	Sediment	SW8270C	541-73-1	330	µg/kg
1,4-Dichlorobenzene	Sediment	SW8270C	106-46-7	330	µg/kg
2,4,5-Trichlorophenol	Sediment	SW8270C	95-95-4	700	µg/kg
2,4,6-Trichlorophenol	Sediment	SW8270C	88-06-2	330	µg/kg
2,4-Dichlorophenol	Sediment	SW8270C	120-83-2	330	µg/kg
2,4-Dimethylphenol	Sediment	SW8270C	105-67-9	330	µg/kg
2,4-Dinitrophenol	Sediment	SW8270C	51-28-5	700	µg/kg
2,4-Dinitrotoluene	Sediment	SW8270C	121-14-2	330	µg/kg
2,6-Dinitrotoluene	Sediment	SW8270C	606-20-2	330	µg/kg
2-Chloronaphthalene	Sediment	SW8270C	91-58-7	330	µg/kg

TABLE 3
Analytical Methods and Reporting Limits
East Ravine Sediment and Pore Water Sampling Work Plan

Analyte	Media	Method	CAS No.	RL	Units
2-Chlorophenol	Sediment	SW8270C	95-57-8	330	µg/kg
2-Methylnaphthalene	Sediment	SW8270C	91-57-6	330	µg/kg
2-Methylphenol (o-Cresol)	Sediment	SW8270C	95-48-7	330	µg/kg
2-Nitroaniline	Sediment	SW8270C	88-74-4	700	µg/kg
2-Nitrophenol	Sediment	SW8270C	88-75-5	700	µg/kg
3,3'-Dichlorobenzidine	Sediment	SW8270C	91-94-1	1,300	µg/kg
3-Nitroaniline	Sediment	SW8270C	99-09-2	700	µg/kg
4,6-Dinitro-2-methylphenol	Sediment	SW8270C	534-52-1	1600	µg/kg
4-Bromophenyl phenyl ether	Sediment	SW8270C	101-55-3	330	µg/kg
4-Chloro-3-methylphenol	Sediment	SW8270C	59-50-7	600	µg/kg
4-Chloroaniline	Sediment	SW8270C	106-47-8	700	µg/kg
4-Chlorophenyl phenyl ether	Sediment	SW8270C	7005-72-3	330	µg/kg
4-Methylphenol (p-Cresol)	Sediment	SW8270C	106-44-5	330	µg/kg
4-Nitroaniline	Sediment	SW8270C	100-01-6	700	µg/kg
4-Nitrophenol	Sediment	SW8270C	100-02-7	700	µg/kg
Acenaphthene	Sediment	SW8270C	83-32-9	330	µg/kg
Acenaphthylene	Sediment	SW8270C	208-96-8	330	µg/kg
Anthracene	Sediment	SW8270C	120-12-7	330	µg/kg
Benzo (a) anthracene	Sediment	SW8270C	56-55-3	330	µg/kg
Benzo (a) pyrene	Sediment	SW8270C	50-32-8	330	µg/kg
Benzo (b) fluoranthene	Sediment	SW8270C	205-99-2	330	µg/kg
Benzo (g,h,i) perylene	Sediment	SW8270C	191-24-2	330	µg/kg
Benzo (k) fluoranthene	Sediment	SW8270C	207-08-9	330	µg/kg
Benzoic acid	Sediment	SW8270C	65-85-0	5,000	µg/kg
Benzyl alcohol	Sediment	SW8270C	100-51-6	330	µg/kg
bis (2-chloroethoxy) methane	Sediment	SW8270C	111-91-1	330	µg/kg
bis (2-chloroethyl) ether	Sediment	SW8270C	111-44-4	330	µg/kg
bis (2-chloroisopropyl) ether	Sediment	SW8270C	108-60-1	330	µg/kg
bis (2-ethylhexyl) phthalate	Sediment	SW8270C	117-81-7	330	µg/kg
Butyl benzylphthalate	Sediment	SW8270C	85-68-7	1000	µg/kg
Chrysene	Sediment	SW8270C	218-01-9	330	µg/kg

TABLE 3
Analytical Methods and Reporting Limits
East Ravine Sediment and Pore Water Sampling Work Plan

Analyte	Media	Method	CAS No.	RL	Units
Dibenzo (a,h) anthracene	Sediment	SW8270C	53-70-3	330	µg/kg
Dibenzofuran	Sediment	SW8270C	132-64-9	330	µg/kg
Diethyl phthalate	Sediment	SW8270C	84-66-2	330	µg/kg
Dimethyl phthalate	Sediment	SW8270C	131-11-3	330	µg/kg
Di-n-butylphthalate	Sediment	SW8270C	84-74-2	330	µg/kg
Di-n-octylphthalate	Sediment	SW8270C	117-84-0	1000	µg/kg
Fluoranthene	Sediment	SW8270C	206-44-0	330	µg/kg
Fluorene	Sediment	SW8270C	86-73-7	330	µg/kg
Hexachlorobenzene	Sediment	SW8270C	118-74-1	330	µg/kg
Hexachlorobutadiene	Sediment	SW8270C	87-68-3	330	µg/kg
Hexachloroethane	Sediment	SW8270C	67-72-1	330	µg/kg
Indeno (1,2,3-c,d) pyrene	Sediment	SW8270C	193-39-5	330	µg/kg
Isophorone	Sediment	SW8270C	78-59-1	330	µg/kg
Naphthalene	Sediment	SW8270C	91-20-3	330	µg/kg
Nitrobenzene	Sediment	SW8270C	98-95-3	330	µg/kg
n-Nitrosodi-n-propylamine	Sediment	SW8270C	621-64-7	330	µg/kg
n-Nitrosodiphenylamine	Sediment	SW8270C	86-30-6	330	µg/kg
Pentachlorophenol	Sediment	SW8270C	87-86-5	700	µg/kg
Phenanthrene	Sediment	SW8270C	85-01-8	330	µg/kg
Phenol	Sediment	SW8270C	108-95-2	330	µg/kg
Pyrene	Sediment	SW8270C	129-00-0	330	µg/kg
Arsenic	Pore Water	SW6020A	7440-38-2	0.1	µg/L
Calcium	Pore Water	SW6010B	7440-70-2	100	µg/L
Chromium	Pore Water	SW6020A	7440-47-3	1	µg/L
Chromium, hexavalent	Pore Water	E218.6	18540-29-9	0.2	µg/L
Iron	Pore Water	SW6010B	7439-89-6	20	µg/L
Magnesium	Pore Water	SW6010B	7439-95-4	100	µg/L
Manganese	Pore Water	SW6020A	7439-96-5	10	µg/L
Molybdenum	Pore Water	SW6020A	7439-98-7	10	µg/L
Potassium	Pore Water	SW6010B	7440-09-7	500	µg/L
Sodium	Pore Water	SW6010B	7440-23-5	500	µg/L

TABLE 3
Analytical Methods and Reporting Limits
East Ravine Sediment and Pore Water Sampling Work Plan

Analyte	Media	Method	CAS No.	RL	Units
Antimony	Pore Water	SW6020A	7440-36-0	2	µg/L
Barium	Pore Water	SW6020A	7440-39-3	5	µg/L
Beryllium	Pore Water	SW6020A	7440-41-7	0.5	µg/L
Cadmium	Pore Water	SW6020A	7440-43-9	1	µg/L
Cobalt	Pore Water	SW6010B/SW6020A	7440-48-4	5	µg/L
Copper	Pore Water	SW6010B/SW6020A	7440-50-8	5	µg/L
Lead	Pore Water	SW6010B/SW6020A	7439-92-1	1	µg/L
Mercury	Pore Water	SW7070A/E245.1	7439-97-6	0.2	µg/L
Nickel	Pore Water	SW6020A	7440-02-0	2	µg/L
Selenium	Pore Water	SW6020A	7782-49-2	10	µg/L
Silver	Pore Water	SW6020A	7440-22-4	5	µg/L
Thallium	Pore Water	SW6020A	7440-28-0	1	µg/L
Vanadium	Pore Water	SW6020A	7440-62-2	5	µg/L
Zinc	Pore Water	SW6010B/SW6020A	7440-66-6	10	µg/L
Alkalinity	Pore Water	SM2320B	Alkalinity	0.5	mg/L
Dissolved Organic Carbon (DOC)	Pore Water	SM5310	DOC	0.3	mg/L
Chloride	Pore Water	E300.0	Chloride	0.5	mg/L
Sulfate	Pore Water	E300.0	Sulfate	0.5	mg/L
Nitrate	Pore Water	E300.0	Nitrate	0.5	mg/L
Fluoride	Pore Water	E300.0	Fluoride	0.5	mg/L
Ammonia	Pore Water	E350.2/SM4500-NH3	7664-41-7	0.5	mg/L
Sulfide	Pore Water	SM4500-S[b] D	Sulfide	0.05	mg/L

[a]Analyzed in sediment samples from 0.0 to 0.5 foot bss, 1.0 to 1.5 feet bss, and 1.5 to 2.0 feet bss only.
[b]Analyzed in sediment samples from 5.5 to 6 feet bss only. Notes:

µg/kg = micrograms per kilogram
µg/L = micrograms per unit
µmoles/g = micromoles per gram
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
NA = not applicable
RL = reporting limit

Figures

FIGURE 1
PROPOSED SEDIMENT AND POREWATER SAMPLE LOCATIONS
EAST RAVINE PORE WATER AND SEDIMENT SAMPLING WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\ERGI\ERGI_Porewater_Location_Map.mxd

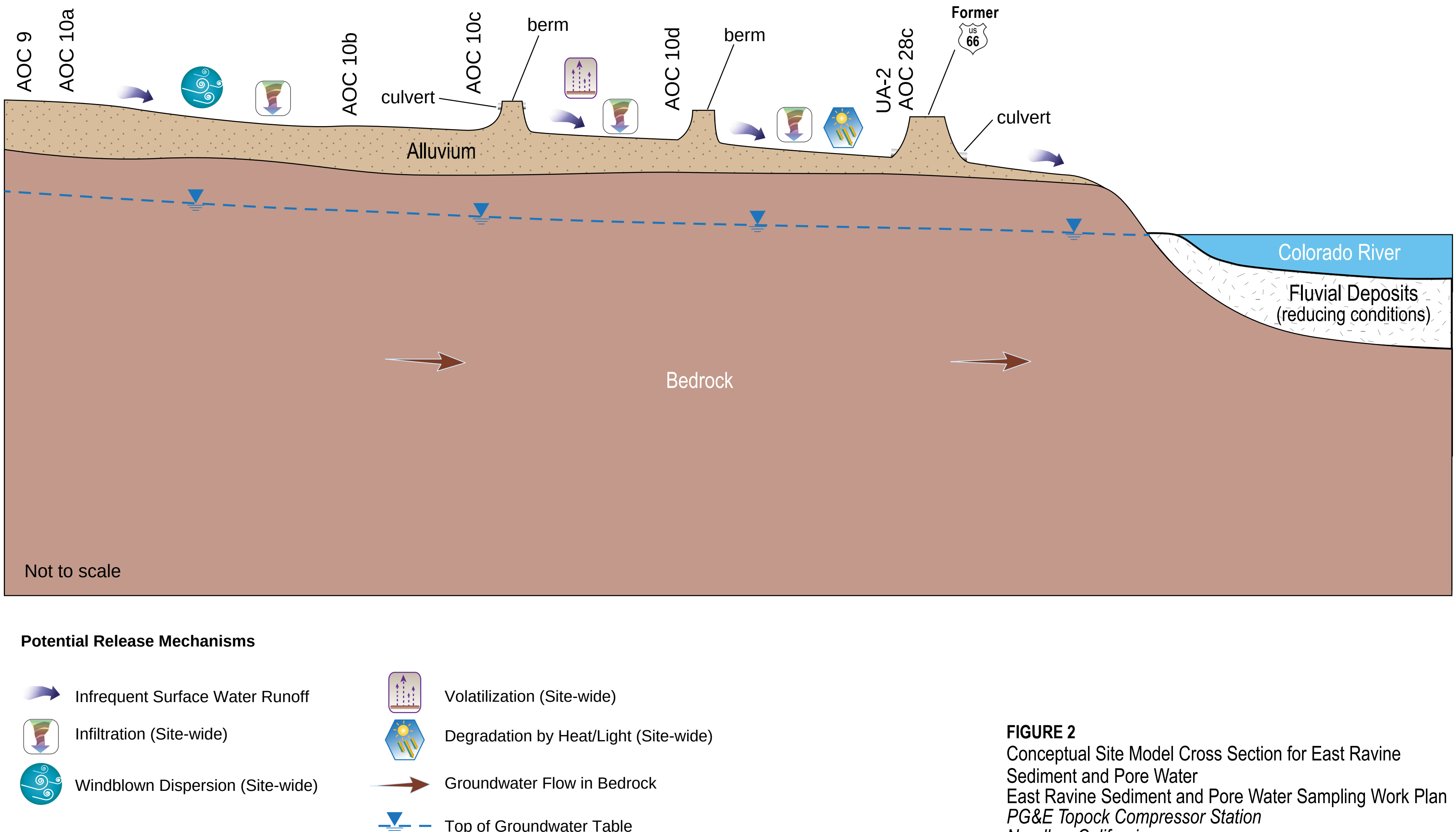


FIGURE 2
Conceptual Site Model Cross Section for East Ravine Sediment and Pore Water
East Ravine Sediment and Pore Water Sampling Work Plan
PG&E Topock Compressor Station
Needles, California

CH2MHILL

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

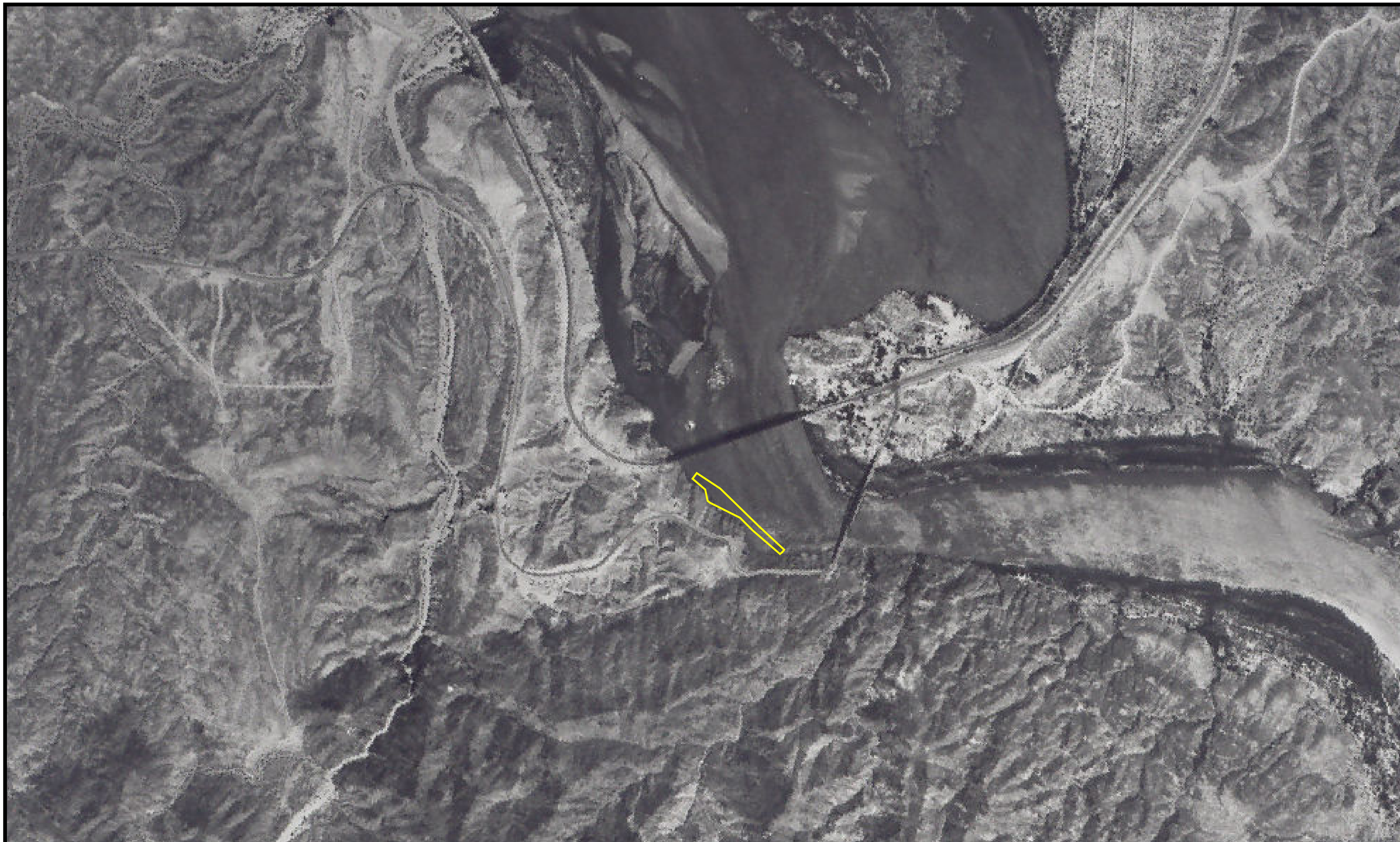
Date: 01/12/36
Flight/Frame(s): C-3821/75
Source: Fairchild Aerial Photography Collection
Whittier College
Whittier, CA 90608

FIGURE 3
AERIAL PHOTOGRAPH
JANUARY 12, 1936

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1936.mxd



LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

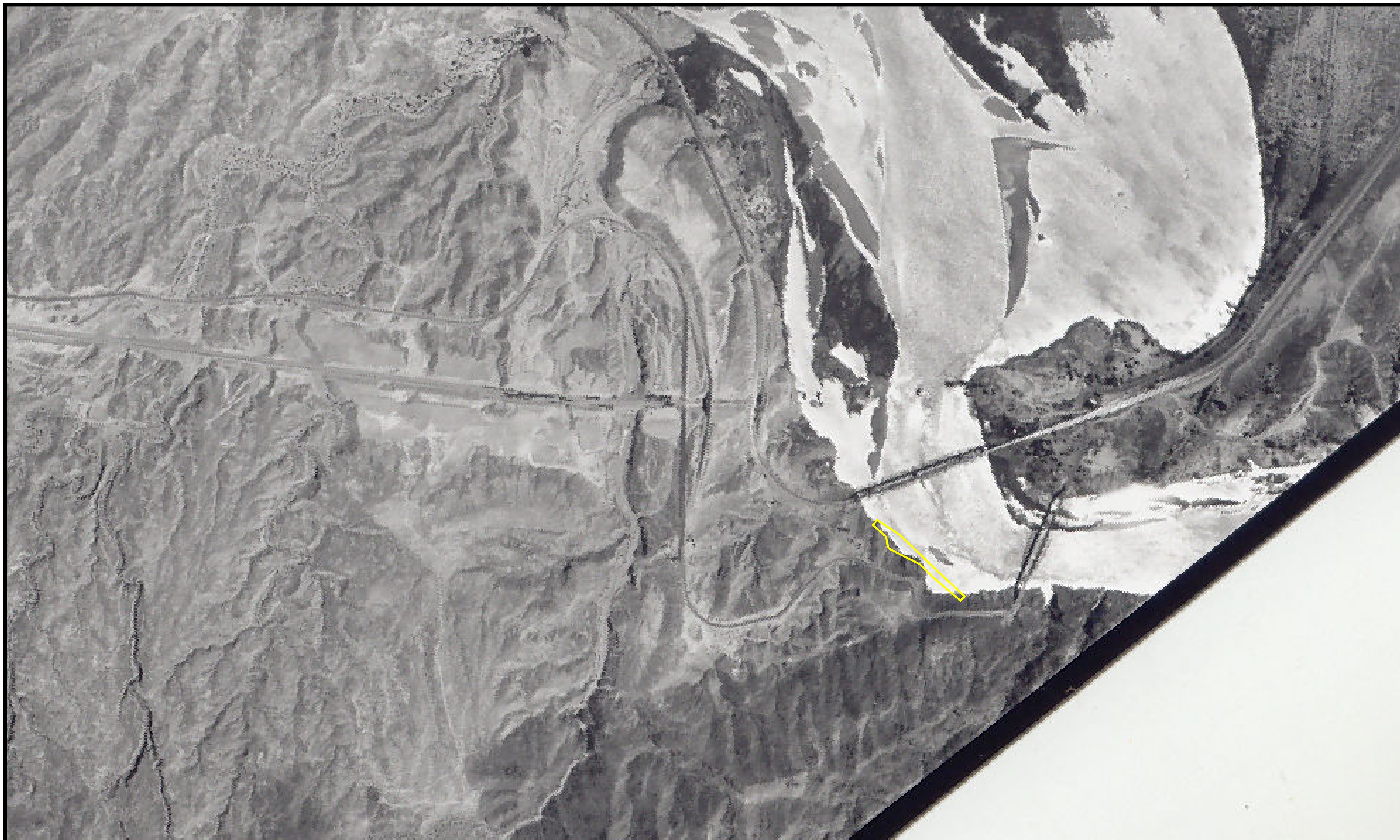
Date: 04/24/42
Flight/Frame(s): C-7800/4:113
Source: Fairchild Aerial Photography Collection
Whittier College
Whittier, CA 90608

FIGURE 4
AERIAL PHOTOGRAPH
APRIL 24, 1942

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1942.mxd



LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 05/11/44
Flight/Frame(s): C-8924/Section A:46
Source: Fairchild Aerial Photography Collection
Whittier College
Whittier, CA 90608

FIGURE 5
AERIAL PHOTOGRAPH
MAY 11, 1944

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1944.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 09/30/47
Flight/Frame(s): GS-EU 1-5
Source: USGS Rocky Mountain Mapping Center
Earth Science Information Center
Box 25046, Stop 504, DFC
Denver, CO 80225

FIGURE 6
AERIAL PHOTOGRAPH
SEPTEMBER 30, 1947

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1947.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 05/07/53
Flight/Frame(s): AXL-5M-48, AXL-5M-49
Source: USDA photo via
County of San Bernardino Flood Control District
825 E. Third Street
San Bernardino, CA 92415-0835

FIGURE 7
AERIAL PHOTOGRAPH
MAY 7, 1953

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1953.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 05/24/55
Roll/Frame(s): 55W 8015, 8016
Source: NOAA National Geodetic Survey, SSMC#3
Information Services Branch, N/NGS12
1315 East West Highway
Silver Spring, MD 20910

FIGURE 8
AERIAL PHOTOGRAPH
MAY 24, 1955

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1955a.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

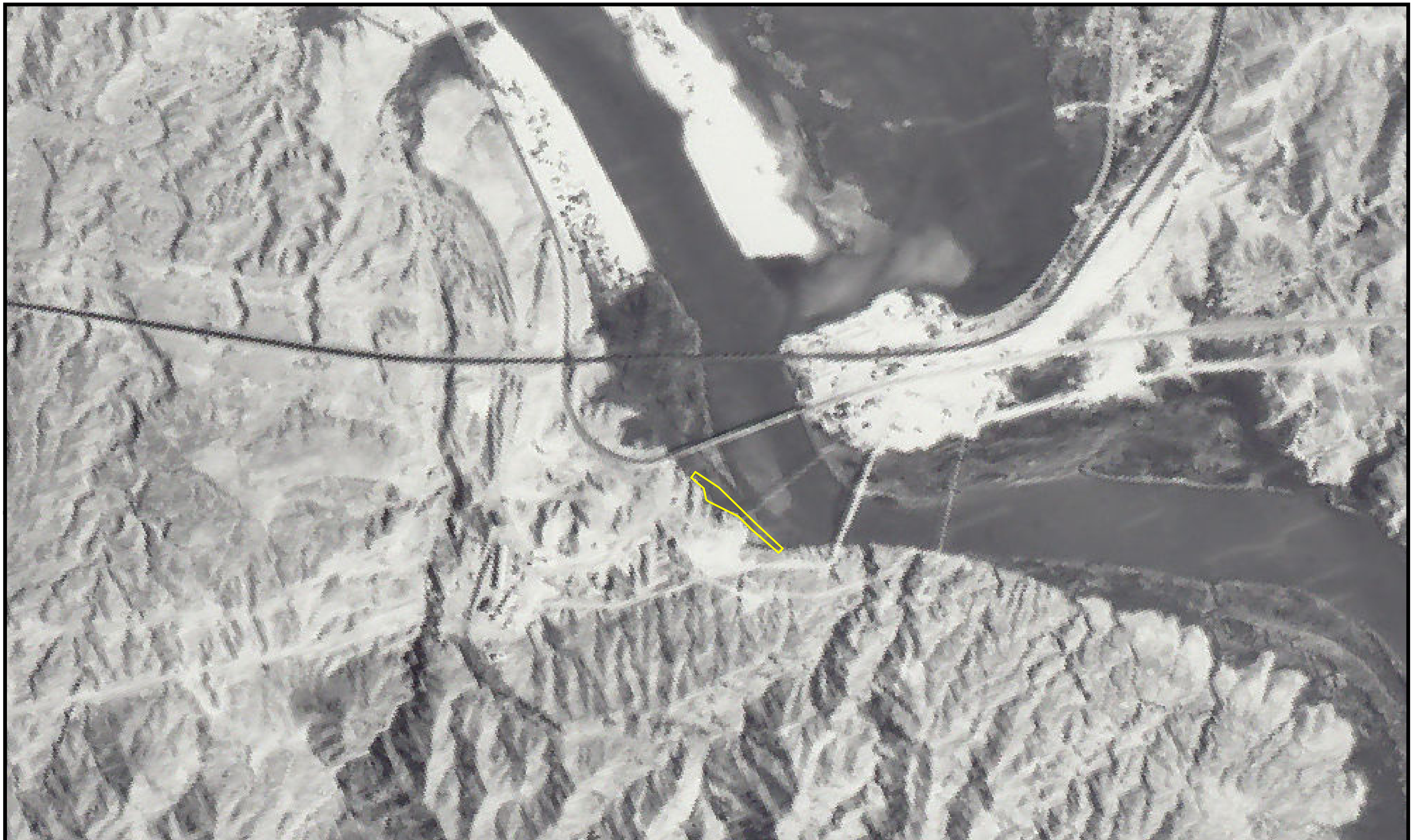
Date: 11/04/61
Roll/Frame(s): 61S 7907
Source: NOAA National Geodetic Survey, SSMC#3
Information Services Branch, N/NGS12
1315 East West Highway
Silver Spring, MD 20910

FIGURE 9
AERIAL PHOTOGRAPH
NOVEMBER 04, 1961

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1961.mxd



LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 07/24/62
Roll/Frame(s): 62S 9892,9893
Source: NOAA National Geodetic Survey, SSMC#3
Information Services Branch, N/NGS12
1315 East West Highway
Silver Spring, MD 20910

FIGURE 10
AERIAL PHOTOGRAPH
JULY 24, 1962

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1962.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

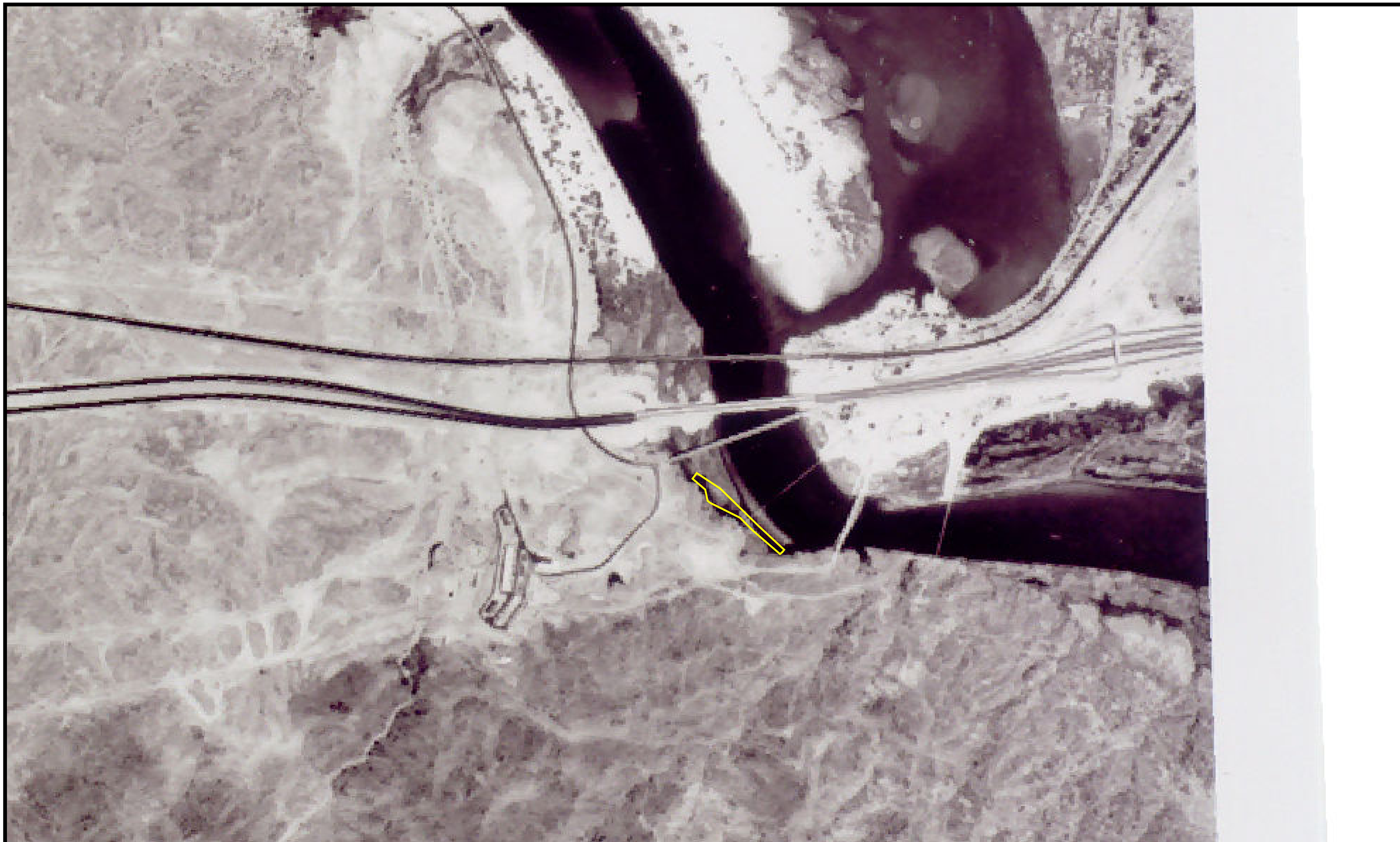
Date: 05/18/64
Roll/Frame(s): BR 423-5-125, BR 432-5-126
Source: US Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

FIGURE 11
AERIAL PHOTOGRAPH
MAY 18, 1964

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1964.mxd



LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 05/22/67
Roll/Frame(s): BR 423-1-133
Source: US Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

FIGURE 12
AERIAL PHOTOGRAPH
MAY 22, 1967

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1967a.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

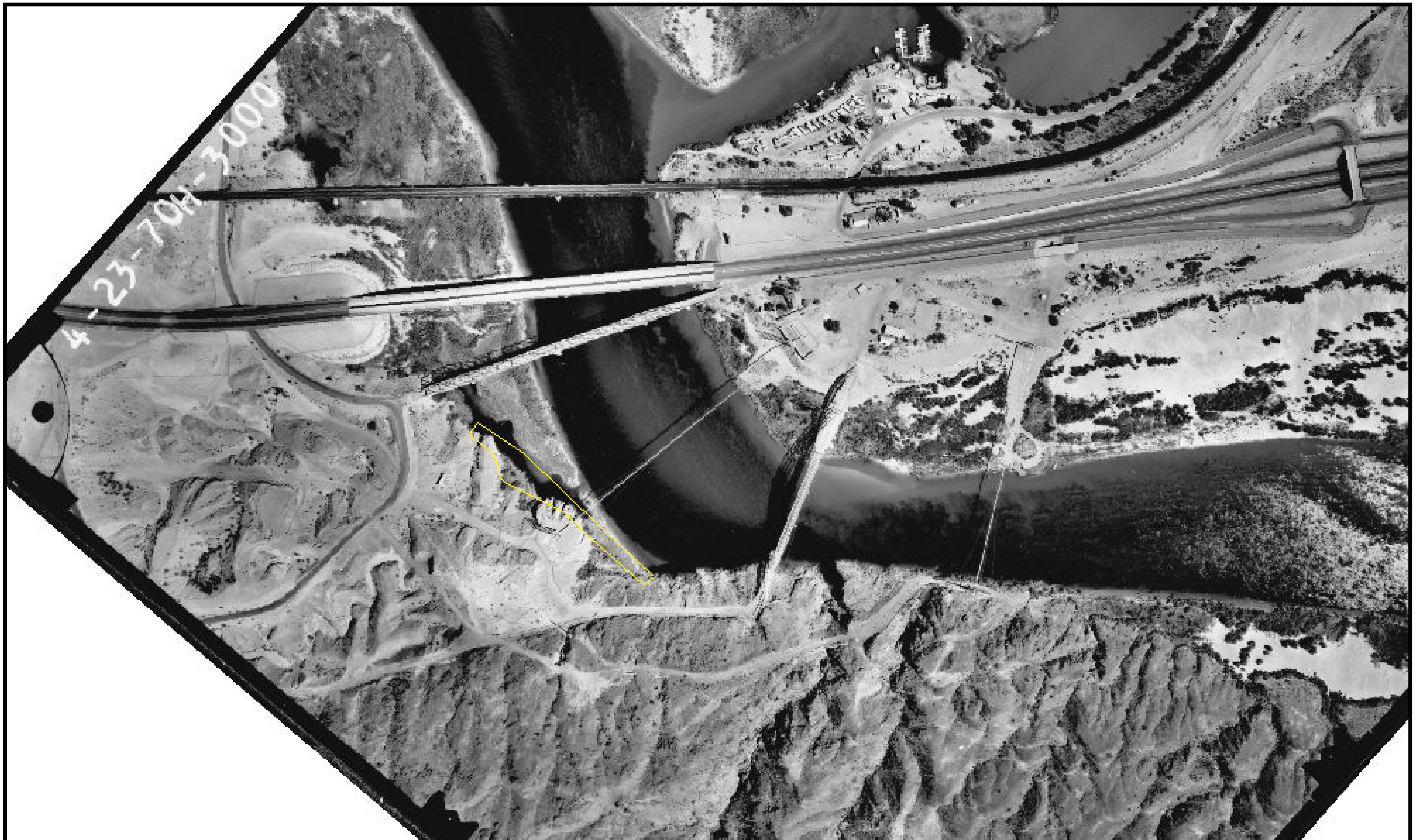
Date: 04/14/69
Roll/Frame(s): GS-VCFL 1-160
Source: USGS Rocky Mountain Mapping Center
Earth Science Information Center
Box 25046, Stop 504, DFC
Denver, CO 80225

FIGURE 13
AERIAL PHOTOGRAPH
APRIL 14, 1969

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1969.mxd



LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 200 400 800 Feet

Date: 04/23/70
Roll/Frame(s): Unknown
Source: Unknown

FIGURE 14
AERIAL PHOTOGRAPH
APRIL 23, 1970

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1970.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 200 400 800 Feet

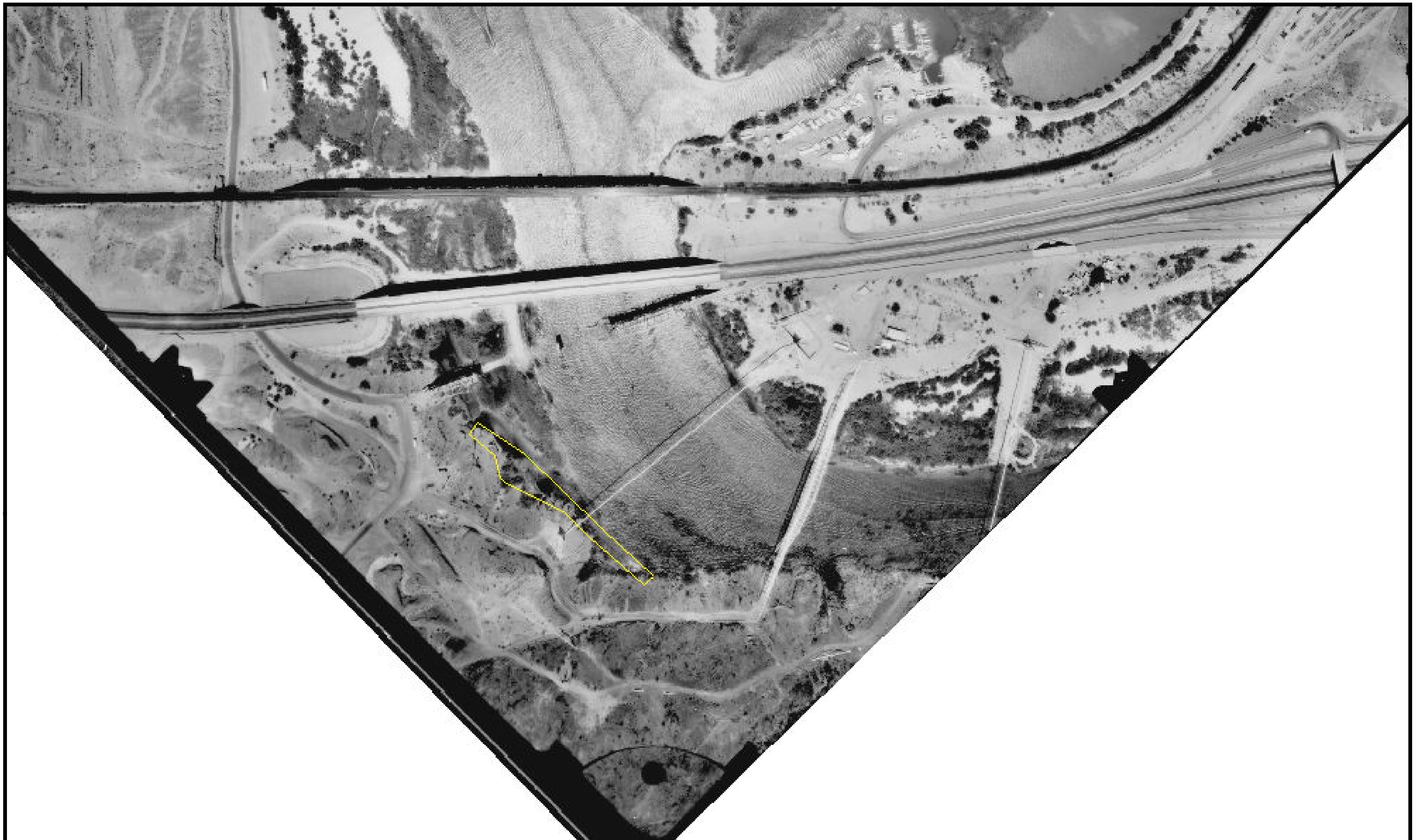
Date: 05/28/73
Roll/Frame(s): Unknown
Source: Unknown

FIGURE 15
AERIAL PHOTOGRAPH
MAY 28, 1973

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1973.mxd



LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 200 400 800 Feet

Date: 05/30/76
Roll/Frame(s): Unknown
Source: Unknown

FIGURE 16
AERIAL PHOTOGRAPH
MAY 30, 1976

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1976.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 07/08/83
Roll/Frame(s): 421 BR 212 303
Source: US Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

FIGURE 17
AERIAL PHOTOGRAPH
JULY 8, 1983

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1983.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

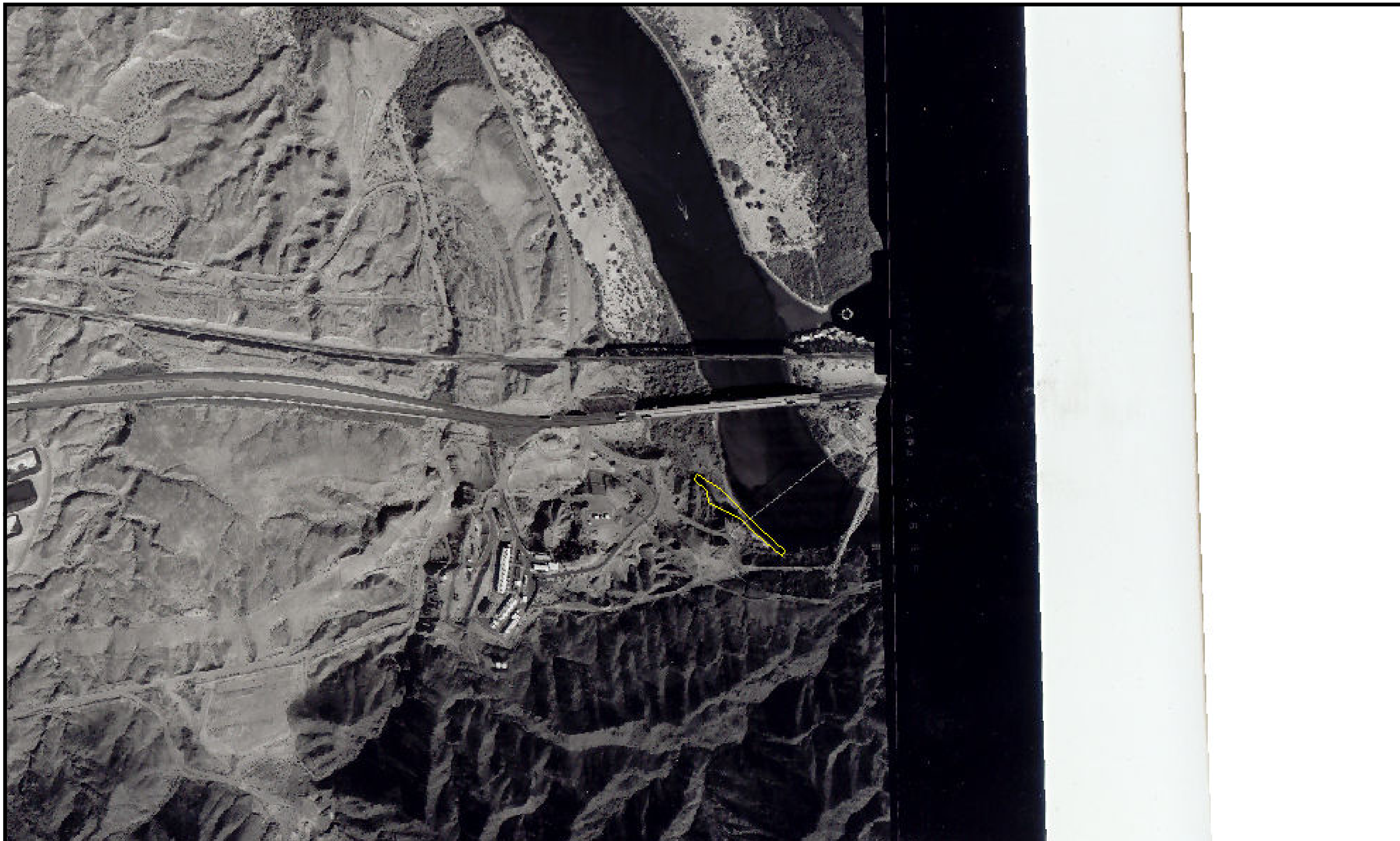
Date: 05/21/94
Flight/Frame(s): N/A
Source: TerraServer/USGS

FIGURE 18
AERIAL PHOTOGRAPH
MAY 21, 1994

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1994.mxd



LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 11/02/97
Roll/Frame(s): 97096-1,2,3
Source: PG&E

FIGURE 19
AERIAL PHOTOGRAPH
NOVEMBER 2, 1997

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_1997.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 04/19/04
Flight/Frame(s): N/A
Source: Unknown

FIGURE 20
AERIAL PHOTOGRAPH
APRIL 19, 2004

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_2004.mxd

LEGEND

Approximate East Ravine Sediment and Pore Water Investigation Area

N

0 375 750 1,500 Feet

Date: 05/09/05
Flight/Frame(s): N/A
Source: PG&E

FIGURE 21
AERIAL PHOTOGRAPH
MAY 9, 2005

EAST RAVINE SEDIMENT AND PORE WATER SAMPLING WORK PLAN,
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\HistoricAerials\Aerial_Photo_2005.mxd

Attachment 1-1
Drive-Point Piezometer Data Sheet and Instructions

Stainless Steel Drive-Point Piezometers

Model 615

The Model 615 Drive-Point Piezometer is designed as an affordable method to monitor shallow groundwater and soil vapor in suitable conditions.

The Drive-Points attach to inexpensive 3/4" (20 mm) NPT steel drive pipe which is widely available through local plumbing and hardware stores.

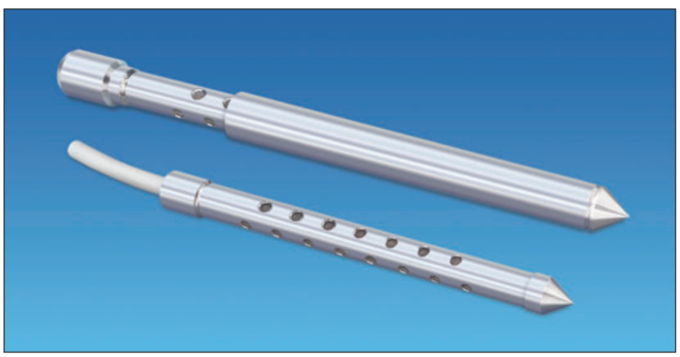
Solinst Drive-Point Piezometers are most often installed as permanent well points. They can also be used for short term monitoring applications.

High quality samples can be obtained if polyethylene or Teflon® lined tubing is attached to the stainless steel drive point. Groundwater sampling and hydraulic head measurements can be taken within the tubing using small diameter equipment, as described overleaf.

Solinst Drive-Point Piezometers can be driven into the ground with any direct push or drilling technology, including the Manual Slide Hammer shown at right. To avoid clogging or smearing of the screen during installation, a shielded version is also available.

Installing Piezometers with a Manual Slide Hammer

Get Quote | More Info



Model 615 Drive-Point and Shielded Drive-Point Piezometer

Applications

- Groundwater sampling, including VOCs
- Water level monitoring
- Base flow monitoring in stream beds
- Contaminant plume delineations
- Soil gas sampling
- UST monitoring
- Low cost and minimal disturbance site assessment
- Sparge points

High Quality Samples

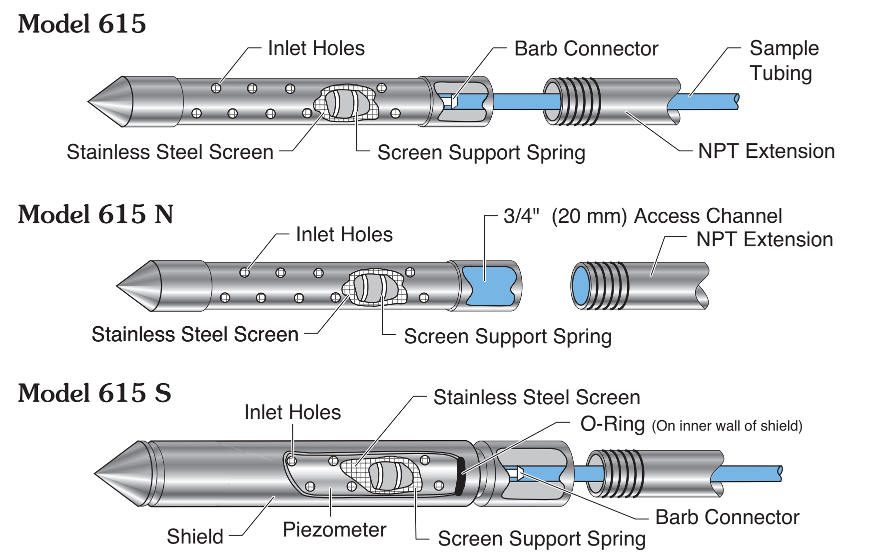
The Model 615 Piezometer has a stainless steel, 50 mesh cylindrical filter-screen, within a 3/4" (20 mm) stainless steel drive-point body, screen support and a barbed fitting for attachment of sample tubing. Optional heavy-duty extension couplings are also available to create a strengthened and more rugged piezometer.

The inner barbed fitting allows connection of 5/8" OD x 1/2" ID (16 mm x 12 mm) LDPE or Teflon sample tubing. This prevents sample water from contacting the steel extension rods, and maintains high sample integrity, even when inexpensive carbon steel extensions are used.

Ideal for soil vapor sampling. Where an air-tight connection is most desirable, the compression fitting option allows users to attach 1/4" (6 mm) sample tubing directly to the top of the screened portion of the drive-point.

The 615 S shielded drive-point has a single use, 1-1/2" (38 mm) dia. shield to avoid smearing and plugging of the screen during installation. The strengthened connector at the top of the drive-point acts as an annular seal, which avoids contamination from higher levels in the hole.

The 615 N, designed without a tubing barb, is to be used for water level measurements. This saves money and provides better access for Water Level Meters.



Sampling Within Narrow Diameters

Direct push sampling has quickly become a popular way to obtain groundwater samples. However, sampling within drive-points requires a narrow diameter sampler. Solinst offers several options for this specific sampling application.

Peristaltic Pump, Model 410

The Peristaltic Pump uses the suction lift principle. Suitable for 1/4" (6 mm) ID or larger diameters. The Peristaltic Pump provides a regulated and steady flow. It works effectively up to 33 ft. (10 m) at sea level.

Inertial Pump, Model 404

The Inertial Pump consists of a check valve and tubing. It is raised and lowered to lift a sample. The SS10 foot valve suits wells as narrow as 1/2" (12 mm) ID and works to depths of 74 ft. (25 m).

Miniature Point Source Bailer, Model 429

The 1/2" (12 mm) dia. stainless steel bailer works very well in the 615 N. The bottom emptying device permits a regulated, steady flow.

Hydraulic Head

Water levels can be measured in any of the drive-points described, using a Solinst Model 101 Water Level Meter, or Model 102 or 102M Mini Laser Marked Coaxial Cable Water Level Indicator for the most accurate hydraulic head measurements.

Manual Slide Hammer

For the most inexpensive wellpoint installations, the Manual Slide Hammer can be used to install the Solinst Drive-Point Piezometers. The 25lb (11Kg) slide hammer and all other equipment can easily be transported in a car or truck to most sites.

A heavy duty drive head is used, on which the slide hammer impacts, and a tubing by-pass ensures that the tubing does not get damaged during installation.

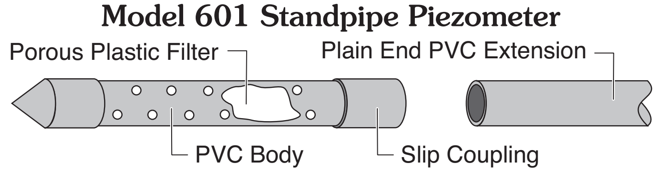
Couplings

Heavy duty couplings are available for the Model 615 Drive-Point Piezometers. The reinforced shoulder gives added support to the pipe threads, to withstand driving stresses and to give more accurate alignment. The maximum OD is 1.5" (38 mm).

Depth Limitations

Drive-point piezometers are not suitable for all sites. The depth limitations vary, especially with soil conditions and the drive method used.

Model 601 Standpipe Piezometer



The Model 601 Standpipe Piezometer, is the least expensive of the piezometer line, and is designed to be placed within an open hole. The pointed PVC tip is suitable for pushing into very loose sands at the base of a borehole, or for backfilling in place within test pits.

The piezometer uses a porous plastic filter set inside a perforated PVC body. It connects to the surface with 3/4" ID PVC riser pipe connected with slip couplings. The piezometer tips come in a variety of lengths.

Ideal for:

- Water level monitoring
- Construction control
- Slope stability investigations
- Soil gas monitoring
- Permeability measurement
- Dewatering/drainage operations
- Metals monitoring

Printed in Canada
April 18, 2011

For further information contact: Solinst Canada Ltd.
Fax: +1 (905) 873-1992; (800) 516-9081 Tel: +1 (905) 873-2255; (800) 661-2023
35 Todd Road, Georgetown, Ontario Canada L7G 4R8
Web Site: www.solinst.com E-mail: instruments@solinst.com

WARNING: Before driving into the ground, be sure you have underground service clearance to avoid cables, gas lines, pipes, etc.

Installation with a Manual Slide Hammer

1. Ensure that all components are clean prior to use.
2. Cut the piezometer tubing to the depth of the proposed installation plus an additional 5 ft (1.5 m).
3. Connect the piezometer tubing to barbed fitting on the Drive-Point Piezometer Tip by pushing firmly until the tubing reaches the base of the fitting.
4. Slide a length of extension drive pipe over the tubing, and thread it firmly onto the Drive-Point Piezometer Tip. Tighten with a pipe wrench.

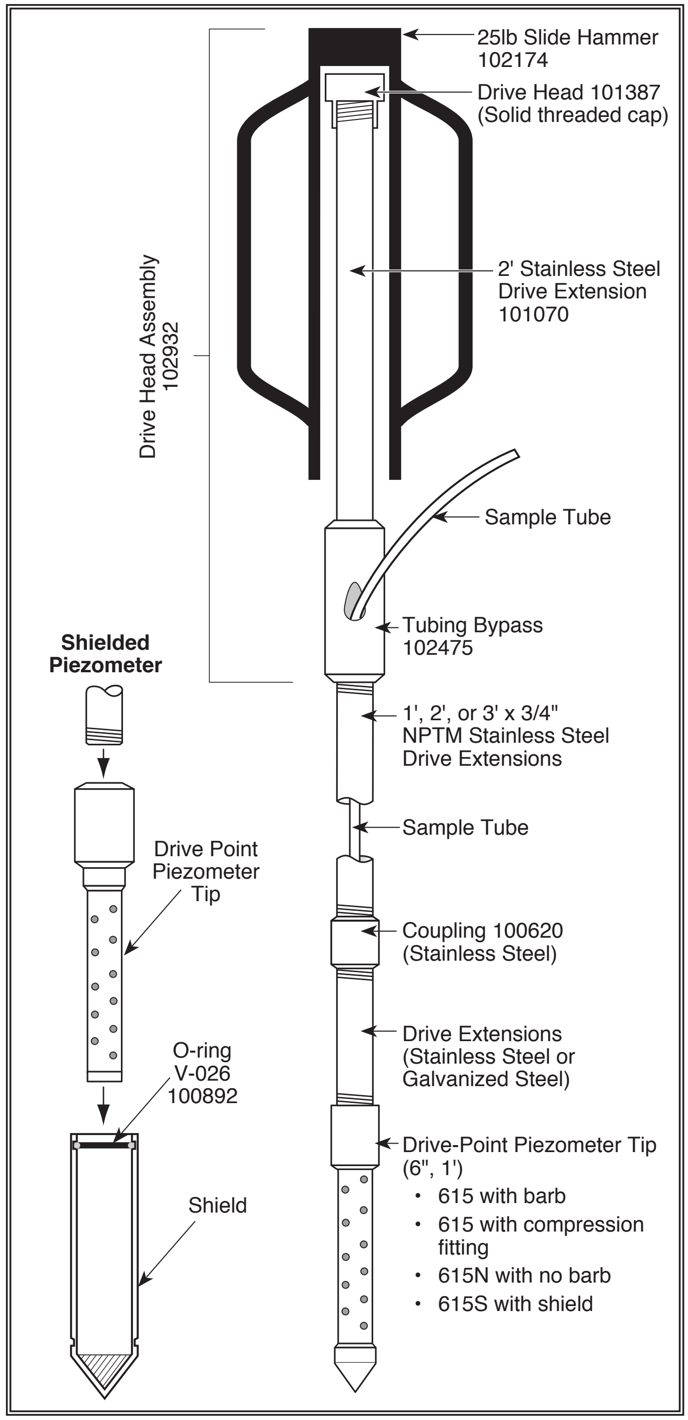
WARNING: When connecting or removing the Tubing Bypass, it is very important to hold the tubing to prevent it from turning. Failure to do so may result in the tube being dislodged from the Drive-Point Tip.

5. Hold the tubing to prevent it from turning, then slide the Tubing Bypass over the tubing and tighten it firmly onto the extension pipe, with the tubing extending through the side hole.
6. Thread a Drive Extension and the Drive Head onto the Tubing Bypass and tighten firmly.
7. Slide the Slide Hammer over the Drive Head and operate the hammer to drive the device until only about 6" (15 cm) of the extension pipe below the Tubing Bypass remains above the ground.
8. Remove the hammer, then holding the tubing to prevent it from turning, remove all sections of the Drive Head Assembly.
9. Slide a coupling over the tubing and tighten firmly onto the previous extension pipe. Slide the next extension pipe over the tubing and tighten it securely.
10. Repeat steps 5 through 10 until the desired sampling depth is reached.
11. Cut the piezometer tubing to fit flush to the top of the extension pipe. Attach a cap to the top of the piezometer to complete the installation.

Component List

- Drive-Point Piezometer Tip
- Extensions (suitable to reach the required depth)
- Couplings (one required for each extension)
- Manual Slide Hammer
- Piezometer tubing (suitable to reach the required depth)
- Drive Head Assembly (3 parts)

  Includes: Drive Head, Drive Extension & Tubing Bypass
- Stainless Steel Cap (101057)



Important Note about Shielded Piezometers

1. Before driving into the ground, ensure that the shield is on firmly and the o-ring seats properly.
2. Drive the Piezometer an equal length past the desired depth, then pull back/up to expose the inlet.
3. 1ft (102412) and 6" (104370) Replacement Shields are available when re-using the Drive-Point Piezometer.

Printed in Canada
April 14, 2009
(#103168)

For further information contact: Solinst Canada Ltd.
Fax: +1 (905) 873-1992; (800) 516-9081 Tel: +1 (905) 873-2255; (800) 661-2023
35 Todd Road, Georgetown, Ontario Canada L7G 4R8
Web Site: www.solinst.com E-mail: instruments@solinst.com

Subappendix C5
Area of Concern 11 Data Gaps Evaluation Results

Contents

Tables

Figures

Acronyms and Abbreviations

µg/kg	micrograms per kilogram
AOC	Area of Concern
bgs	below ground surface
BTV	background threshold value
CHHSL	California human health screening level
CMS/FS	corrective measures study/feasibility study
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyl trichloroethane
DQO	data quality objective
ECV	ecological comparison value
EPC	exposure point concentration
I-40	Interstate 40
mg/kg	milligrams per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
RFI/RI	RCRA facility investigation/remedial investigation
RSL	regional screening level
SPLP	synthetic precipitation leaching procedure
SSL	soil screening level
STLC	soluble threshold limit concentration
SVOC	semivolatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbons

TTLC	total threshold limit concentration
VOC	volatile organic compound

SUBAPPENDIX C5

Area of Concern 11 Data Gaps Evaluation Results

1.0 Introduction and Background

This subappendix presents the results of the Data Gaps Evaluation and Part A Phase 2 Sampling Program for Area of Concern (AOC) 11 – Topographic Low Areas at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. The process for the data gaps evaluation is outlined in Sections 2.0 through 6.0 of the main text of Appendix A, Part A Phase 1 Data Gaps Evaluation Report, to the Soil RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan.

1.1 Background

The five topographic low areas that comprise AOC 11 are depicted in Figure C5-1. Low areas AOC 11a, AOC 11b, AOC 11c, and AOC 11d are located on Havasu National Wildlife Refuge property, and 11e is located on PG&E property.

At least three compressor station storm drain outlets may discharge to AOC 11. Two of these storm drains are known to be active; it is not known whether there are any other active storm drains that may discharge into this area. There is an inactive storm drain south of the compressor station office building area that may have discharged into AOC 11. A historical engineering drawing shows that some cooling water blowdown may have initially been discharged to AOC 11 via Storm Drain 9 (PG&E, 1957). Stormwater runoff from the northeastern portion of the station and from the area containing the Transwestern Meter Station may also have flowed to AOC 11. In addition, stormwater runoff from Interstate 40 (I-40) discharges to AOC 11. A former employee reported that he observed a release from Cooling Tower B that entered the ravine containing AOC 11 (the Northeast Ravine).

Low areas AOC 11c and AOC 11e are associated with the remnants of two small former check berms identified in the Northeast Ravine. Small amounts of fine-grained soils appear to be present behind the remnant of the upper check berm, and a larger volume of fine-grained soil is present behind the lower check dam, which has greater integrity. These check berms may have been constructed to prevent stormwater damage to a gas pipeline and a former access road to the compressor station.

The original plant access road ran through the area now identified as AOC 11a. A stormwater pipe that captures runoff from I-40 and National Trails Highway discharges into AOC 11 north of AOC 11a immediately south of the I-40 overcrossing. Stormwater runoff from I-40 could have resulted in the release of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), lead, and wear metals (including barium, chromium, copper, nickel, and zinc) into AOC 11, and specifically AOC 11a, that are not due to PG&E's operations at the Topock Compressor Station. Substantial flow from the I-40 stormwater pipe has been observed. After storm events, water pools in area AOC 11a and does not readily percolate.

1.2 Potential Burn Area and Debris Mapping and Newly Identified White Powder and Topographic Low Areas

As discussed in Section 1.2 of the Part A Phase 1 Data Gaps Evaluation Report and in Appendix B to the Part A Phase 1 Data Gaps Evaluation Report, as a result of employee interviews conducted in late 2009/early 2010 and subsequent additional site reconnaissance, two new topographic low areas, a potential burn area, and a small new white powder area were identified in the vicinity of AOC 11. These new areas are described below, and were incorporated into AOC 11 as new subareas.

1.2.1 Topographic Low Areas – New Subareas 11f and 11g

Two new topographic low areas that may receive runoff from the compressor station were identified. New Subarea 11f, shown in Figure C5-1, consists of the drainage area beginning near the current decontamination pad and Transwestern Meter Station and extending downslope to the low area across from AOC 11b. It captures a portion of runoff originating from the compressor station that flows down the station access road. A reported burn area is located within the proposed boundary of Subarea 11f (see Section 2.5.2 of this subappendix). Another topographic low area is located between the station access road and the Colorado River west of the Route 66 sign. This area may have also received runoff from the station access road. It is designated Subarea 11g.

In addition, miscellaneous debris (concrete and other materials) was noted in areas to the west of the station access road (near the Transwestern Meter Station area). As requested by California Environmental Protection Agency, Department of Toxic Substances Control (AOC/Solid Waste Management Unit Specific Comment #5 in the August 10, 2007 Part A Work Plan comment letter (DTSC, 2007)), this area will be investigated in conjunction with AOC 11 as part of Subarea 11f. Neither of the new subareas has been sampled.

1.2.2 Potential Burn Area

According to former employee interviews, fire training exercises were conducted near the location of the current decontamination pad and Transwestern Meter Station. Materials that were burned during fire training exercises consisted primarily of scrap wood. Fire drills were reportedly later expanded to include extinguishing diesel fires in a 55-gallon drum. This area is located in the potential drainage area for one of the newly identified topographic low areas and was therefore incorporated into the boundaries of the new topographic low area (Subarea 11f, shown in Figure C5-1).

1.2.3 White Powder Area

A new white powder area was identified upslope of AOC 11e following the January 2010 rain event. This area is located on the steep slope below the northeastern portion of the compressor station and may represent native materials. This area is not accessible by equipment.

1.3 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 11 based on the above site history, background, and newly identified areas, as shown in Figure C5-2. Table C5-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 11. A detailed discussion of the migration pathways, exposure media, exposure routes, and human and ecological receptors is included in the Soil Part A Data Quality Objective (DQO) Technical Memorandum, which is included as Appendix A to the Part A Phase 1 Data Gaps Evaluation Report.

The primary source of contamination to AOC 11 is runoff from the compressor station, the access road to the compressor station, potential railroad debris below the station access road (asphalt, a metal sign, ceramic plates, glass resistors, and concrete were observed during 2008 field activities), the Transwestern Meter Station area, and I-40. Stormwater runoff from the compressor station could have entered the stormwater drains that discharge to AOC 11. Sheet flow surface runoff from the station could also have entered this unit from areas where the edge of the compressor station lacked curbs. Stormwater runoff from the Transwestern Meter Station area and the station access road could also have entered this AOC, including the two new subareas. Stormwater runoff from I-40 could have resulted in the release of TPH, PAHs, lead, and wear metals (including barium, chromium, copper, nickel, and zinc) into AOC 11, especially AOC 11a, that are not due to PG&E’s operations at the Topock Compressor Station. Runoff from the various potential source areas would have discharged to surface soil and collected in low areas within the AOC.

The primary source medium therefore is surface soil. From surface soil, contaminants could have migrated to shallow and deeper soils. Shallow soils may act as a secondary source medium to subsurface soil, and subsurface soil may act as a secondary source medium to groundwater. After storm events, water pools in AOC 11a (the largest topographic low area) and does not readily infiltrate. Historically, water may have also pooled behind the two check berms in AOC 11c and AOC 11e; these structures have been breached and no longer retain water; however, accumulated fine-grained soils are present behind the berm at AOC 11c. Laterally, chemicals of potential concern/chemicals of ecological concern (COPCs/COPECs) in soil would generally be expected to be limited to the area along the topographic drainages. With the exception of subarea 11g, all of the low points within this unit are terminal low points, and flow cannot exit the AOC 11 area. At these low points, contaminants could potentially be driven deeper and potentially could reach groundwater. If released, volatile organic compounds (VOCs) in surface soils would be expected to have been degraded by heat and light and are likely no longer present. Runoff down the station access road periodically reaches Subarea 11g. A significant volume of flow may result in runoff over the 11g bank and down the slope toward the Colorado River.

Within the newly identified subareas, COPCs/COPECs may be present in surface soil at the burn area and along the runoff pathways. Surface soil would therefore be the primary source medium for these new subareas. Contamination may have migrated vertically downward to affect shallow soil at the burn area and shallow and potentially subsurface soil along the runoff pathways. Laterally, COPCs/COPECs in soil would generally be expected to be limited to the immediate vicinity of the burn area and linearly along the topographic drainages (including depressions where runoff might accumulate) from the burn area and compressor station.

Another potential source of contamination to AOC 11 may also include contaminated windblown dust. Contaminated surface soil (either within AOC 11 or from the adjacent compressor station) may have been eroded by wind and deposited at the ground surface within AOC 11.

Part A Phase 1 soil samples were collected at or near the exit drain point of the stormwater drains, bottom of the ravine, in drainage depression areas, and on the western slope near the compressor station.

1.3.1 AOC 11 Data

Historical sampling has not occurred at AOC 11. During Phase 1, 74 soil samples (generally collected at 0 to 0.5, 2 to 3, 5 to 6, and 9 to 10 feet below ground surface [bgs]) were collected from 19 sample locations (AOC11a-1 through AOC11a-5, AOC11b-1, AOC11b-2, AOC11c-1, AOC11c-2, AOC11d-1, AOC11e-1, AOC11e-2, AOC11a-SS-1 through AOC11a-SS-3, AOC11c-SS-1, AOC11c-SS-2, AOC11e-SS1, and AOC11e-SS-2), as shown in Figure C5-3. Part A Phase 1 soil samples collected in AOC 11 were generally analyzed for Title 22 metals, hexavalent chromium, VOCs, semivolatile organic compounds (SVOCs), PAHs, TPH, pH, polychlorinated biphenyls (PCBs), and pesticides. Surface soil samples were not analyzed for VOCs. Ten percent of the Phase 1 soil samples collected in AOC 11 (seven soil samples) were analyzed for the full inorganic and organic suites per the CERCLA Target Analyte List and Target Compound List (TAL/TCL). In addition, synthetic precipitation leaching procedure (SPLP) extraction was performed on a soil sample collected at 2 to 3 feet bgs at sample location AOC11e-2 and a soil sample collected at 9 to 10 feet bgs at sample location AOC11c-1. The leachate from the SPLP extractions was analyzed for total and hexavalent chromium; results are presented in Table C5-2. The soil results were validated, and the data quality evaluation is included as Appendix D to the Part A Phase 1 Data Gaps Evaluation Report.

In addition, opportunistic samples were collected from one location (AOC11g-OS1) at 0 to 0.5, 2.5 to 3, 5.5 to 6, and 9 to 9.5 feet bgs, and analyzed for PAHs, VOCs, SVOCs, TPH, PCBs, and pH. In addition, the opportunistic soil sample collected at 8.5 to 9 feet bgs was analyzed for the full Title 22 suite of metals and hexavalent chromium. Laboratory analytical results for the opportunistic samples are presented in Tables C5-3, C5-6, C5-7, and C5-8. These opportunistic soil data were not used as inputs to the DQO decisions for AOC 11. However, if these data were added as inputs to DQO decisions, they would not affect the identified data gaps presented in Section 6.0 of this subappendix.

All validated Part A Phase 1 data are Category 1. The validated Part A Phase 1 data were used as inputs to the four DQO decisions for AOC 11.

2.0 Decision 1 – Nature and Extent

This section describes the nature and extent of residual soil concentrations of COPCs and COPECs at AOC 11. Laboratory analytical results for Phase 1 soil samples at AOC 11 are presented in Tables C5-3 through C5-8. Table C5-9 presents a statistical summary of soil analytical results for COPCs and COPECs that were either detected above the laboratory reporting limits or not detected but where the reporting limits for one or more samples was greater than the interim screening value.

2.1 Summary of AOC 11 Soil Data

Antimony, beryllium, cadmium, mercury, silver, thallium, cyanide, TPH-gasoline, and most species of PCBs were not detected in soil samples collected at AOC 11. Table C5-9 lists the 45 constituents detected at AOC 11, including four calculated quantities: benzo(a)pyrene equivalents, total low-molecular-weight PAHs, total high-molecular-weight PAHs, and total PCBs. Fourteen of these constituents (aluminum, calcium, iron, magnesium, manganese, potassium, sodium, Aroclor-1254, Aroclor-1260, total PCBs, 4,4-dichlorodiphenyldichloroethylene [4,4-DDE], alpha-chlordane, dieldrin, and gamma-chlordane) were detected in the samples analyzed for the full TAL/TCL suite of compounds.

Twenty-three of the constituents detected at AOC 11 (cobalt, nickel, vanadium, calcium, iron, magnesium, sodium, methyl acetate, anthracene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene, low-molecular-weight PAHs, Aroclor-1254, alpha-chlordane, gamma-chlordane, TPH-diesel, and TPH-motor-oil) were detected at concentrations below their respective interim screening levels. Twenty-two constituents, including three calculated quantities, were detected one or more times at concentrations exceeding their respective interim screening levels. These constituents included 12 metals (aluminum, arsenic, barium, total chromium, hexavalent chromium, copper, lead, manganese, molybdenum, potassium, selenium, and zinc), four PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene), one PCB isomer (Aroclor-1260), two pesticides (4,4-DDE and dieldrin), and three calculated quantities (benzo(a)pyrene equivalents, total high-molecular-weight PAHs, and total PCBs).

Nine constituents (barium, total chromium, hexavalent chromium, copper, lead, molybdenum, zinc, benzo(a)pyrene, and benzo(a)pyrene equivalents) were each detected four or more times at concentrations exceeding their respective interim screening levels; the distributions of these constituents are shown in C5-3 to C5-10.

2.2 Nature and Extent Evaluation

The following subsection discusses the nature and extent of COPCs and COPECs detected above their respective screening levels at AOC 11. As discussed in Section 3.2 of the Part A Phase 1 Data Gaps Evaluation Report, multiple factors were considered to assess whether the nature and extent of a specific constituent has been adequately delineated. Section 2.4 of this subappendix summarizes the constituents that may require further evaluation and Section 6.0 of this subappendix provides the recommended follow-up sampling for the Part A Phase 2 soil investigation.

2.2.1 Arsenic

Arsenic was detected in 74 of 74 soil samples collected from AOC 11. Only one detected concentrations of arsenic (13 milligrams per kilogram [mg/kg]) collected at AOC 11b-2 at 2 to 3 feet bgs slightly exceeded the interim screening level of 11 mg/kg (background threshold value [BTV]); this same sample also exceeded the ecological comparison value (ECV) of 11.4 mg/kg, as shown in Tables C5-3 and C5-9. This sample was collected in

AOC 11b. Sample concentrations in the other samples collected in AOC 11b (at AOC11b-1) had concentrations below the interim screening level. The deepest samples in AOC 11b (collected at 9 to 10 feet bgs) have arsenic concentrations below the interim screening level.

2.2.2 Barium

Barium was detected in 74 of 74 soil samples collected at AOC 11. Detected concentrations of barium exceeded the interim screening level (410 mg/kg, BTV) four times (maximum detected concentration of 1,300 mg/kg at AOC11a-2 at 5 to 6 feet bgs), as shown in Tables C5-3 and C5-9 and Figure C5-3. None of the detected concentrations exceeded residential or commercial/industrial California Department of Toxic Substances Control California human health screening levels (CHHSLs) (5,200 mg/kg and 63,000 mg/kg, respectively). The lateral extent of samples with concentrations exceeding the interim screening level is limited to the eastern portion of AOC 11a. Samples with concentrations below the screening levels are located upslope of AOC 11a. At these locations, the deepest samples (collected at 9 to 10 feet bgs) have concentrations exceeding the interim screening level.

2.2.3 Total Chromium

Total chromium was detected in 74 of 74 soil samples collected at AOC 11. Detected concentrations of total chromium exceeded the interim screening level (39.8 mg/kg) (BTV) 14 times (maximum detected concentration of 130 mg/kg at AOC11c-1 at 9 to 10 feet bgs), as shown in Tables C5-3 and C5-9 and Figure C5-4. None of the detected concentrations of total chromium exceeded the United States Environmental Protection Agency regional screening level (RSLs) for residential use (280 mg/kg) or the RSL for commercial/industrial use (1,400 mg/kg). The lateral extent of samples with concentrations exceeding the interim screening level is limited the upper reaches of AOC 11 at and between AOC 11e and AOC 11c, with the exception of one sample (AOC11a-3) collected in AOC 11a. Samples with concentrations below the interim screening level are located downslope of AOC 11e and AOC 11c, but no samples have been collected upslope of these areas. Samples with concentrations below the interim screening level surround location AOC11a-2. At three locations in AOC 11c and one location in AOC 11e, the deepest samples (collected at 9 to 10 feet bgs) have concentrations exceeding the interim screening level.

2.2.4 Hexavalent Chromium

Hexavalent chromium was detected in 31 of 74 soil samples collected at AOC 11. Detected concentrations of hexavalent chromium exceeded the interim screening level (0.83 mg/kg) (BTV) 18 times (maximum detected concentration of 7.78 mg/kg), as shown in Tables C5-3 and C5-9 and Figure C5-5. None of the detected concentrations of hexavalent chromium exceeded the residential or commercial CHHSLs (17 mg/kg and 37 mg/kg, respectively) or the ECV (139.6 mg/kg). The lateral extent of samples with concentrations exceeding the interim screening level is limited to the upper reaches of AOC 11, including all of AOC 11e and AOC 11c and the eastern portion of AOC 11a. Samples with concentrations below the interim screening level are located in the western portion of AOC 11a, which is downstream of Subareas 11e and 11c, but no samples have been collected upslope of these areas. At five locations (one in AOC 11a, three in AOC 11c, and one in AOC 11e), the deepest samples (collected at 9 to 10 feet bgs) have concentrations exceeding the interim screening level.

2.2.5 Copper

Copper was detected in 74 of 74 soil samples collected at AOC 11. Detected concentrations of copper exceeded the interim screening level (16.8 mg/kg) (BTV) 16 times (maximum detected concentration of 41 mg/kg at AOC11e-1), as shown in Tables C5-3 and C5-9 and Figure C5-6. Five detected concentrations exceeded the ECV (20.6 mg/kg), and no detected concentrations of copper exceeded the residential or commercial/industrial CHHSLs (3,000 mg/kg, and 38,000 mg/kg, respectively). The lateral extent of concentrations exceeding the interim screening level is limited to the upper reaches of AOC 11, including AOC 11c, AOC 11d, and AOC 11e and a small area near the western portion of AOC 11a. Copper was not detected at concentrations exceeding the screening levels in AOC 11b. Samples with concentrations below the interim screening level are located downslope of AOC 11c, AOC 11d, and AOC 11e, but no samples have been collected upslope of these areas. In four locations in AOC 11c and AOC 11e (two locations in each area), the deepest samples (collected at 9 to 10 feet bgs) have concentrations exceeding the interim screening level.

The small area near the western portion of AOC 11a with copper concentrations above the BTV (locations AOC11a-2, AOC11a-4, AOC 11a-5, and AOC11a-SS-3) is surrounded by samples with concentrations below the interim screening level, and the deepest soil samples at these locations have concentrations below the interim screening level.

2.2.6 Lead

Lead was detected in 74 of 74 soil samples collected at AOC 11. Detected concentrations of lead exceeded the interim screening level (8.39 mg/kg) (BTV/ECV) 36 times (maximum detected concentration of 45 mg/kg at AOC11b-2 at 0 to 0.5 foot bgs), as shown in Tables C5-3 and C5-9 and Figure C5-7. None of the detected concentrations exceeded the residential or commercial/industrial CHHSLs (80 mg/kg and 320 mg/kg, respectively). Lead was detected at concentrations exceeding the interim screening level across most of AOC 11, with the exception of the area north of AOC 11a, where no concentrations were detected above the interim screening level. At seven locations, the deepest (collected at 9 to 10 feet bgs) samples have concentrations exceeding the interim screening level.

2.2.7 Molybdenum

Molybdenum was detected in 17 of 74 soil samples collected from AOC 11. Detected concentrations of molybdenum exceeded the interim screening level (1.37 mg/kg) (BTV) 10 times (maximum detected concentration of 2.9 mg/kg at AOC11c-SS-1 at 5 to 6 feet bgs), as shown in Tables C5-3 and C5-9 and Figure C5-8. Eight detected concentrations exceeded the ECV (2.25 mg/kg), and no detected concentrations of molybdenum exceeded the residential and commercial/industrial CHHSLs (380 mg/kg and 4,800 mg/kg, respectively). Concentrations exceeding the interim screening level are limited to AOC 11a, AOC 11c, and AOC 11e. Samples with concentrations below the interim screening level surround the locations in AOC 11a and AOC 11e. At AOC 11c, samples with concentrations below the interim screening level are located up- and downslope of this area; however, within AOC 11c, all sample locations have concentrations exceeding the interim screening levels. At each location, with the exception of location AOC11a-5, the deepest samples (collected at 9 to 10 feet bgs) have concentrations below the interim screening level.

2.2.8 Selenium

Selenium was detected in two of 74 soil samples collected from AOC 11. The two detected concentrations of selenium at AOC11a-1 (1.6 mg/kg at 5 to 6 feet bgs) and AOC11a-5 (3.2 mg/kg at 5 to 6 feet bgs) exceeded the interim screening level (1.47 mg/kg) (BTV/ECV) in both samples, as shown in Tables C5-3 and C5-9. Neither of the detected concentrations exceeded the residential and commercial/industrial CHHSLs (380 mg/kg and 4,800 mg/kg, respectively). These locations are both in AOC 11a. Samples with concentrations below the interim screening level surround these locations. At both locations, the deepest samples (collected at 9 to 10 feet bgs) have concentrations below the interim screening level.

2.2.9 Zinc

Zinc was detected in 74 of 74 soil samples collected at AOC 11. Detected concentrations of zinc exceeded the interim screening level (58 mg/kg) (BTV/ECV) 30 times (with a maximum detected concentration of 290 mg/kg at AOC11c-SS-1 at 9 to 10 feet bgs), as shown in Tables C5-3 and C5-9 and Figure C5-9. None of the detected concentrations exceeded the residential and commercial/industrial CHHSLs (23,000 mg/kg and 100,000 mg/kg, respectively). Zinc was detected at concentrations exceeding the interim screening level across most of AOC 11, with the exception of the areas north of AOC 11a and west of AOC 11e. At six locations, the deepest samples (collected at 9 to 10 feet bgs) have concentrations exceeding the interim screening level.

2.2.10 Polycyclic Aromatic Hydrocarbons

Benzo(a)pyrene was detected in 32 of 74 soil samples collected from AOC 11. Detected concentrations of benzo(a)pyrene exceeded the interim screening level of 38 micrograms per kilograms (µg/kg) (residential CHHSL) 12 times. Several other PAHs were detected in soil samples collected from AOC 11; only benzo(a)anthracene, benzo(b)fluoranthene, and benzo(k)fluoranthene were detected at concentrations above their respective interim screening levels. To assist with evaluation of PAHs for human health, benzo(a)pyrene equivalents were calculated for each of the soil samples collected at AOC 11, as shown in Tables C5-5 and C5-9. Benzo(a)pyrene equivalent values exceeded the interim screening level of 38 µg/kg (residential CHHSL) 17 times (maximum calculated concentration of 510 µg/kg at AOC11e-2 at 0 to 0.5 foot bgs), as shown in Tables C5-5 and C5-9 and Figure C5-10. The lateral extent of concentrations exceeding the interim screening level is limited to the upper and lower reaches of AOC 11, including AOC 11c, AOC 11d, AOC 11e, and AOC 11b. Samples within and surrounding AOC 11a have concentrations below the screening levels. At all locations, except AOC11b-1, the deepest samples (collected at 9 to 10 feet bgs) have concentrations below the interim screening levels.

To assist with evaluation of PAHs for ecological risk, detected concentrations of low-molecular-weight PAHs and high-molecular-weight PAHs were summed and compared to the PAH low-molecular-weight and PAH high-molecular-weight ECVs (10,000 µg/kg and 1,160 µg/kg, respectively). Three PAH high-molecular-weight sums of detected concentrations exceeded the ECV (1,160 µg/kg); the maximum sum concentration was 4,900 µg/kg in a surface soil sample collected at location AOC11e-2. None of the sums of detected concentrations exceeded the PAH low-molecular-weight ECVs.

2.2.11 Target Analyte List/Target Compound List Constituents

Aluminum, calcium, iron, magnesium, manganese, potassium, sodium, Aroclor-1254, Aroclor-1260, 4,4-DDE, dieldrin, alpha-chlordane, and gamma-chlordane were detected in the AOC 11 soil samples analyzed for the complete TAL/TCL suite of compounds. These constituents are discussed below.

Aluminum was detected in seven of seven surface soil samples collected from AOC 11. Detected concentrations of aluminum exceeded the interim screening level (16,400 mg/kg) (BTV) twice (at AOC11a-2 [20,000 mg/kg at 0 to 0.5 foot bgs] and AOC11d-1 [19,000 mg/kg at 0 to 0.5 foot bgs]), as shown in Tables C5-4 and C5-9. Remaining concentrations of aluminum ranged from 7,900 to 15,000 mg/kg. None of the detected concentrations exceeded the residential or commercial/industrial RSLs (77,000 mg/kg and 990,000 mg/kg, respectively). An ECV has not been established for aluminum.

Calcium was detected in seven of seven surface soil samples collected from AOC 11. The maximum detected concentration of calcium was 45,000 mg/kg at AOC11a-2, which is below the interim screening level (66,500 mg/kg) (BTV), as shown in Tables C5-4 and C5-9. Remaining detected concentrations of calcium range from 23,000 to 43,000 mg/kg. Residential and commercial/industrial CHHSLs and an ECV have not been established for calcium.

Iron was detected in seven of seven surface soil samples collected from AOC 11. The maximum detected concentration of iron was 26,000 mg/kg at AOC11b-1, which is below the interim screening level of 55,000 mg/kg (residential RSL), as shown in Tables C5-4 and C5-9. Remaining detected concentrations of iron range from 12,000 to 25,000 mg/kg. A BTV and an ECV have not been established for iron.

Magnesium was detected in seven of seven surface soil samples collected from AOC 11. The maximum detected concentration of magnesium was 12,000 mg/kg at AOC11a-2 and AOC11d-1, which is below the interim screening level (12,100 mg/kg) (BTV), as shown in Tables C5-4 and C5-9. Remaining detected concentrations of magnesium range from 6,400 to 11,000 mg/kg. Residential and commercial/industrial CHHSLs and an ECV have not been established for magnesium.

Manganese was detected in seven of seven surface soil samples collected from AOC 11. One detected concentrations of manganese (440 mg/kg at AOC11b-1 at 0 to 0.5 foot bgs) slightly exceeded the interim screening level (402 mg/kg) (BTV/ECV), as shown in Tables C5-4 and C5-9. Remaining detected concentrations of manganese range from 220 to 390 mg/kg. None of the detected concentrations exceeded the residential or commercial/industrial RSLs (1,800 mg/kg and 23,000 mg/kg, respectively).

Potassium was detected in seven of seven surface soil samples collected from AOC 11. Detected concentrations of potassium exceeded the interim screening level (4,400 mg/kg) (BTV) twice (at AOC11a-2 [5,000 mg/kg at 0 to 0.5 foot bgs] and AOC11d-1 [5,300 mg/kg at 0 to 0.5 foot bgs]), as shown in Tables C5-4 and C5-9. Remaining concentrations of potassium range from 2,200 to 3,400 mg/kg. Residential and commercial CHHSLs and an ECV have not been established for potassium.

Sodium was detected in six of seven surface soil samples collected from AOC 11. The maximum detected concentration of sodium was 710 mg/kg at AOC11a-2, which is below the interim screening level of 2,070 mg/kg (BTV), as shown in Tables C5-4 and C5-9. Remaining detected concentrations of sodium range from 180 to 580 mg/kg. Residential and commercial/industrial CHHSLs, RSLs, and an ECV have not been established for sodium.

The PCB Aroclor-1254 was detected in nine of 20 soil samples collected from AOC 11; both surface and subsurface soil (up to 10 feet bgs) samples were collected. The maximum detected concentration of Aroclor-1254 of 190 µg/kg was detected at AOC11c-2 at 2 to 3 feet bgs and AOC11e-2 at 0 to 0.5 foot bgs. Remaining detected concentrations of Aroclor-1254 range from 18 to 76 µg/kg. None of the detected concentrations of Aroclor-1254 exceeded the interim screening level of 220 µg/kg (residential RSL), as shown in Tables C5-8 and 5-9.

The PCB Aroclor-1260 was detected in one of 20 soil samples collected from AOC 11. The detected concentrations of Aroclor-1260 (240 µg/kg at AOC11e-2 at 0 to 0.5 foot bgs) exceeded the interim screening level (220 µg/kg) (residential RSL), as shown in Tables C5-8 and C5-9. The detected concentration did not exceed the commercial/industrial RSL (740 µg/kg). To assist with evaluation of PCBs for ecological risk, total PCB values were calculated at AOC 11. The sample containing Aroclor-1260 also exceeded the total PCB screening value (ECV) of 204 µg/kg. Remaining total PCB concentrations range from 26.5 to 199 µg/kg. The location with the exceedance is in the upper reaches of AOC 11 in AOC 11e. No samples were collected immediately downslope of this area. At this location, the deepest sample (collected at 9 to 10 feet bgs) had a concentration below the screening level.

4,4-DDE was detected in one of seven surface soil samples collected from AOC 11. The detected concentration of 4,4-DDE (6.1 µg/kg at AOC11d-1) exceeded the interim screening level (2.1 µg/kg) (ECV), as shown in Tables C5-7 and C5-9. The detected concentration did not exceed the residential or commercial/industrial CHHSLs (1,600 µg/kg and 6,300 µg/kg, respectively). Subarea 11d is a small internally draining drainage depression, with no exit for storm water to flow, and AOC 11d-1 is located near the downgradient end of the low area; no samples were collected immediately downslope of this area.

Dieldrin was detected in one of seven surface soil samples collected from AOC 11. The detected concentration of dieldrin (6.7 µg/kg at AOC11d-1) exceeded the interim screening level (5 µg/kg) (ECV), as shown in Tables C5-7 and C5-9. The detected concentration did not exceed the residential or commercial/industrial CHHSLs (35 µg/kg and 130 µg/kg, respectively). Due to size and nature of Subarea 11d, no samples were collected immediately downslope of this area.

Alpha– and gamma-chlordane were detected in one of seven surface soil samples collected from AOC 11. The detected concentrations of alpha- and gamma-chlordane (12J µg/kg and 13J µg/kg, respectively; at location AOC11d-1) were below the interim screening level (430 µg/kg) (residential CHHSL), as shown in Tables C5-7 and C5-9. The detected concentration did not exceed the ECV (470 µg/kg). Subarea 11d is a small internally draining drainage depression, with no exit for storm water to flow.

As discussed in Section C.2 of the main text of Appendix C, PG&E recommends that PCBs be evaluated further in AOC 11. PG&E also recommends that aluminum, calcium, iron, magnesium, manganese, potassium, sodium, 4,4-DDE, dieldrin, alpha-chlordane, and gamma-chlordane not be considered COPCs/COPECs for this AOC. These constituents have been fully discussed in Section C.2 of the main text of Appendix C.

2.3 Central Tendency Comparison to Background Threshold Values

Twelve metals, (aluminum, arsenic, barium, total chromium, hexavalent chromium, copper, lead, magnesium, molybdenum, selenium, potassium, and zinc) were detected above their respective Topock BTVs in soil collected from AOC 11. A central tendency comparison was performed for seven of these 12 metals (arsenic, barium, total chromium, copper, lead, molybdenum, and zinc) to compare the AOC 11 soil data set for these metals with the corresponding Topock soil background data set to determine whether a difference exists between the two populations and whether additional sampling may be required for a given metal, as discussed in Table C5-10 of this subappendix and in Figure 3-1 of the Part A Phase 1 Data Gaps Evaluation Report.

Metals in either the AOC 11 data set or background data set that were detected infrequently (less than five detects) or had a limited number of results (less than eight) were not tested. There were insufficient detections of aluminum, magnesium, selenium, and potassium at AOC 11 to conduct the test, and there were insufficient detections of hexavalent chromium in the background data set to allow for a central tendency comparison.

No statistical difference between the two populations was noted for barium or molybdenum, as shown in Table C5-10. However, results from the Gehan test suggest that site concentrations for arsenic, total chromium, copper, lead, and zinc may exceed background. Additional sampling is proposed for total chromium, copper, lead, and zinc. Arsenic was detected above the BTV of 11 mg/kg only once at a concentration of 13 mg/kg in a soil sample collected at 2 to 3 feet bgs at sample location AOC11b-2. After careful review of AOC 11 site data and background data set for arsenic, the statistical difference between the two populations is not considered significant enough to warrant additional sampling for arsenic at AOC 11.

2.4 Nature and Extent Conclusions

Based on the site history, background, and conceptual site model, qualitative review indicates that decision error has been held to an acceptable level. Sufficient data of acceptable quality have been attained through collection of Part A Phase 1 soil samples in areas most likely to have been impacted by runoff from the compressor station, the access road to the compressor station, potential railroad debris below the station access road, the Transwestern Meter Station area, and I-40. Stormwater runoff from the compressor station could have entered the stormwater drains that discharge to AOC 11. These areas include the topographic drainage areas (AOC 11a), where water pools after storm events, and areas behind two check berms (AOC 11c and AOC 11e), where historically water may have pooled. The newly identified subareas and the white powder area have not been sampled.

Within the topographic low areas in AOC 11, the lateral and/or vertical extents of barium (vertical extent only), hexavalent chromium, copper, lead, molybdenum, PAHs, PCBs, total chromium, and zinc have not been defined.

Based on the DQOs, the following data gaps were identified to resolve Decision 1. Identified data gaps were discussed during data gaps evaluation meetings in October and November 2010 and January 2012. Subsequent revisions to the data gaps have occurred; however, the data gap numbers from those meetings have been retained.

- Data Gap #2 – Lateral and vertical extents of contamination within AOC 11c
- Data Gap #3 - Lateral extent of contamination upslope of AOC 11c and AOC 11e
- Data Gap #4 – Lateral and vertical extents of contamination within AOC 11e
- Data Gap #5 - Nature and extent of contamination associated with new Subareas 11f and 11g, the newly identified potential burn area within Subarea 11f, (near the location of the current decontamination pad and Transwestern Meter Station), and the white powder area (upslope of AOC 11e)

The proposed Phase 2 soil sample locations to fill the identified data gaps are presented in Section 6.0 of this subappendix.

3.0 Decision 2 – Data Sufficient to Calculate Exposure Point Concentrations

For Decision 2, data were evaluated to determine whether the AOC 11 data are sufficient to conduct human health and ecological risk assessments based on the criteria described in Section 4.0 of the Part A Phase 1 Data Gaps Evaluation Report. The principal consideration for Decision 2 was whether there were sufficient data to estimate a representative exposure point concentration (EPC). Data reviewed were Part A Phase 1 data at AOC 11; no historical sampling was conducted at this AOC.

Table C5-11 summarizes the results of the evaluation to determine whether data are sufficient to estimate a representative EPC. Data were reviewed for all chemicals that were detected in at least one sample and exceeded at least one comparison value. In general, existing data are adequate to support EPC development for detected chemicals that exceeded one or more comparison values (eight metals, three Contract Laboratory Program inorganics, PAHs, PCBs, and two pesticides), as described In Sections 3.1 through 3.4 of this subappendix.

3.1 Metals

Sufficient data (numbers of samples and detections) are available to calculate EPCs for arsenic, barium, total chromium, copper, lead, and zinc using ProUCL. For the remaining metals (molybdenum and selenium), additional data collection is not expected to significantly change the results of the risk assessment because the magnitude of the maximum detected concentrations are low relative to the ECVs (that is, within approximately two times the ECV). Molybdenum concentrations at AOC 11 are also comparable to background. For selenium, additional data collection would also likely result in additional nondetected values and, consequently, would not influence the EPC. Therefore, no additional data collection is recommended for metals to provide data for EPC calculations.

3.2 Inorganics

Sufficient data (numbers of samples and detections) are available to calculate EPCs for all detected inorganics that exceeded one or more comparison values (aluminum, manganese, and potassium) using ProUCL.

3.3 Polycyclic Aromatic Hydrocarbons

Sufficient data (numbers of samples and detections) are available to calculate EPCs for benzo(a)pyrene equivalents and high-molecular-weight PAHs using ProUCL.

3.4 Pesticides

4,4-DDE and dieldrin were detected in a single sample, as shown in Table C5-7. The data are insufficient to allow calculation of EPCs using ProUCL. The total concentration of dichlorodiphenyl trichloroethane (DDT) and metabolites (DDT-R) is approximately three times the ECV. Dieldrin was detected at less than two times the ECV. Collection of additional data is not expected to yield sufficient detections to strongly influence the EPC for either DDT-R or dieldrin. The EPC would likely remain the maximum detected concentration; therefore, no additional data collection is recommended to support EPC development.

4.0 Decision 3 – Potential Threat to Groundwater from Residual Soil Concentrations

A conservative, three-tiered approach will be used in the evaluation to assess the potential impact to groundwater from source areas in the vadose zone. A full description of the three-tiered approach is provided in Section 5.0 of the Part A Phase 1 Data Gaps Evaluation Report. The analysis of AOC 11 was divided into five separate analyses based on the AOC 11 subareas shown in Figure C-1 in the main text of Appendix C. No data have been collected at new Subareas 11f and 11g.

The following preliminary analysis was performed with the existing data set to assess the potential threat to groundwater and to assess if additional data, above and beyond that necessary for Decision 1, are needed to resolve Decision 3. Additional evaluation will be performed, as appropriate, as data are collected to resolve Decision 1. Data collected to satisfy Decision 1 – Nature and Extent evaluation will provide the final representative data set that will be used to assess the threat to groundwater. The preliminary conclusions regarding the threat to groundwater are based on available data and will be revisited after the implementation of the soil investigation. The combined data set will then be evaluated for data gaps, and further conclusions regarding the threat to groundwater will be provided to the agencies and stakeholders for review prior to submittal of the RFI/RI Volume 3.

4.1 AOC 11a

Table C5-12 presents the results of the tiered analysis for AOC 11a. Eight metals were detected at concentrations above the BTVs. Of those eight metals, hexavalent chromium and molybdenum exceeded the calculated soil screening levels (SSLs), as shown in Table C5-13. Numerical modeling was conducted to evaluate the potential of these two metals to leach into groundwater. Based on the initial screening model, the potential for molybdenum to leach to groundwater was ruled out. Based on the screening model, the potential for hexavalent chromium to leach to groundwater could not be ruled out.

The simulated leaching concentrations of hexavalent chromium were likely due to the following factors:

- The initial screening approach assigned the maximum concentration found at each depth interval across the entire interval, even though other samples with lower concentrations were observed at each level.
- The presence of hexavalent chromium at the deepest sampling interval at one location required assignment of that concentration from that depth down to the water table for the entire area.

Additional data are needed to better define the vertical extent of hexavalent chromium to better assess the leaching potential. The model will be refined with the new vertical data and will be discretized spatially to more realistically simulate vadose zone contaminant concentrations.

4.2 AOC 11b

Table C5-12 presents the results of the tiered analysis for AOC 11b. Three metals (arsenic, lead, and zinc) were detected at concentrations above the BTVs. None of these metals exceeded the calculated SSL, as shown in Table C5-14. Therefore, numerical modeling was not required for AOC 11b, and a current or potential threat to groundwater from this area was ruled out.

4.3 AOC 11c

Table C5-12 presents the results of the tiered analysis for AOC 11c. Six metals were detected at concentrations above the BTVs. Of those six, only hexavalent chromium and molybdenum exceeded the calculated SSLs, as shown in Table C5-15. Numerical modeling was conducted to evaluate the potential of these two metals to leach into groundwater. Based on the initial screening model, the potential for molybdenum to leach to groundwater was ruled out. Based on the screening model, the potential for hexavalent chromium to leach to groundwater could not be ruled out.

The simulated leaching concentration of hexavalent chromium at AOC 11c is likely due to the presence of hexavalent chromium at the deepest sampling interval at one location, which required assignment of that concentration from that depth down to the water table for the entire area.

Additional data are needed to better define the vertical extent of hexavalent chromium to better assess the leaching potential. The model will be refined with the new vertical data and will be discretized spatially to more realistically simulate vadose zone contaminant concentrations.

4.4 AOC 11d

Table C5-12 presents the results of the tiered analysis for AOC 11d. Four metals were detected at concentrations above the BTVs. None of the metals exceeded the calculated SSLs, as shown in Table C5-16. Therefore, numerical modeling was not required for AOC 11d, and a current or potential threat to groundwater from this area was ruled out.

4.5 AOC 11e

Table C5-12 presents the results of the tiered analysis for AOC 11e. Six metals were detected at concentrations above the BTVs. Of those six, only hexavalent chromium and molybdenum exceeded the calculated SSLs, as shown in Table C5-17. Numerical modeling was conducted to evaluate the potential of these two metals to leach into groundwater. Based on the initial screening model, the potential for molybdenum to leach to groundwater was ruled out. Based on the screening model, the potential for hexavalent chromium to leach to groundwater could not be ruled out.

The simulated leaching concentration of hexavalent chromium at AOC 11e is likely due to the presence of hexavalent chromium at the deepest sampling interval at one location, which required assignment of that concentration from that depth down to the water table for the entire area.

Additional data are needed to better define the vertical extent of hexavalent chromium to better assess the leaching potential. The model will be refined with the new vertical data and will be discretized spatially to more realistically simulate vadose zone contaminant concentrations.

5.0 Decision 4 – Data Sufficiency to Support the Corrective Measures Study/Feasibility Study

As discussed in Section 6.0 of the Part A Phase 1 Data Gaps Evaluation Report, various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study (CMS/FS). The types of data needed vary somewhat depending on the specific technology to be evaluated. The categories of data required for technologies that may be applicable to the areas outside the fence line include:

- Extent of COPCs/COPECs above action levels (required for all technologies).
- Waste characterization parameters (required if soil may be disposed of offsite).
- Constituent leachability (required to assess the need for fixation of leachable compounds and/or the feasibility of certain soil washing technologies).
- Soil physical properties (required for all technologies; however, the properties required vary among the different technologies).
- Surface and subsurface features (required to determine whether there are physical impediments to implementing specific technologies and/or remediating specific areas).
- If present, volumes of white powder and debris.

The following is a summary of data for AOC 11 that are currently available to support CMS/FS. Data gaps identified for Decision 4 will be filled using samples being collected to fill data gaps identified for other decisions. Data will not be collected to solely fill Decision 4 data gaps.

5.1 Extent of COPCs and COPECs

A summary of the nature and extent of detected COPCs/COPECs is presented in Section 2.0 Decision 1 – Nature and Extent. Data results for selected constituents are shown in Figures C5-3 through C5-9, and data gaps associated with lateral and vertical delineation are discussed in Section 6.0 of this subappendix. No data have been collected in Subareas 11f and 11g.

5.2 Waste Characterization Parameters

Only partial waste characterization data are available to characterize the soil and other materials to be potentially removed for remedial action and disposed in an offsite permitted facility. While none of the soils or other materials is considered ignitable, corrosive, or reactive, data are lacking to complete the evaluation of the toxicity characteristic. Total chemical concentrations are available to characterize the soil, certain debris, and white powder material relative to California Title 22 total threshold limit concentrations (TTLCs). The maximum concentrations of these metals for each of the units were compared to the TTLCs, and none of the metals exceeded the TTLC, as shown in Table C5-18. The maximum detected concentrations were also compared to the soluble threshold limit concentrations (STLCs), and concentrations of barium and total chromium in AOC 11 exceeded 10 times the STLC one or more times, as shown in Table C5-18. In addition, total chromium also exceeded 20 times the toxicity characteristic leaching procedure (TCLP), as indicated in Table C5-18. Because these metals have the potential to exceed STLC or TCLP thresholds, additional leachability testing for waste characterization purposes may be required if soil excavation and offsite disposal is chosen as a remedy. For the purposes of supporting the CMS/FS, the lack of STLC or TCLP analysis is not considered a data gap, for the existing total concentrations are sufficient for the purposes of evaluating various remedial alternatives. Additional data regarding potential COPC/COPEC leachability include SPLP analysis for total and hexavalent chromium, as shown in Table C5-2. SPLP analysis was conducted only for soil samples (no white powder or debris samples were tested using SPLP).

5.3 Soil Physical Properties

Soil physical property data collected during the Part A Phase 1 soil investigation were limited to grain size analysis only. Specific soil physical properties data (that is, porosity, grain size, density, organic carbon content) are required to support the CMS/FS, as described in Table 6-1 in the Part A Phase 1 Data Gaps Evaluation Report. Additional soil physical parameter data are needed to support the CMS/FS.

5.4 Surface and Subsurface Features

While there is extensive information regarding surface and subsurface features at AOC 11, additional information may be required once areas requiring remediation have been defined. Nearby roads and road structures, vegetation, and the location of bedrock are known for AOC 11. However, subsurface utilities, including gas transmission pipelines and any culverts or other features, may have to be more precisely defined to evaluate the feasibility and cost of certain remedial alternatives and to prepare construction specifications.

5.5 Volumes of White Powder and Debris

Mapping may be required to assess the extent of debris in Subareas 11f and 11g, as well as the extent of the white powder on the upper slope of AOC 11 near AOC 11e.

6.0 Summary of Data Gaps and Proposed Phase 2 Soil Sample Locations to Fill Identified Gaps

Based on the Part A DQOs, data gaps were identified for three of the four decisions and are summarized below by decisions. Identified data gaps were discussed during data gaps evaluation meetings in October and November 2010 and January 2012. Subsequent revisions to the data gaps have occurred; however, the data gap numbers from those meetings have been retained.

- **Decision 1 (Nature and Extent)**. The following data gaps were identified to resolve this decision:
  - Data Gap #2 – Lateral and vertical extents of contamination within AOC 11c
  - Data Gap #3 – Lateral extent of contamination upslope of AOC 11c and AOC 11e
  - Data Gap #4 – Lateral and vertical extents of contamination within AOC 11e
  - Data Gap #5 – Nature and extent of contamination associated with new Subareas 11f and 11g, including the potential burn area within Subarea 11f (near the location of the current decontamination pad and Transwestern Meter Station), and the white powder area (upslope of AOC 11e)
- **Decision 2 (Data Sufficient to Estimate Representative EPCs)**. No data gap was identified for this decision.
- **Decision 3 (Potential Threat to Groundwater from Residual Soil Concentrations)**. The following data gap was identified to resolve this decision:
  - Data gap #6 – Vertical extent of hexavalent chromium contamination in AOC 11a, AOC 11c, and AOC 11e to support refinement of the vadose leaching zone model
- **Decision 4 (Data Sufficient to Estimate Soil Properties and Contaminant Distribution in Support of the CMS/FS).** The following data gap was identified to resolve this decision**:**
  - Data gap #7 – Additional soil physical parameter information to support the CMS/FS
  - Data gap #8 – Volume and extent of debris in new Subareas 11f and 11g, including the potential burn area within Subarea 11f, and volume and extent of white powder material on the upper slope of AOC 11e, if applicable

Table C5-19 shows the proposed sample location IDs, sample depths, rationale for each location, and analytes, and proposed locations are shown in Figure C5-11. The proposed Phase 2 sample locations are needed to fill quantitative data gaps, meet agency requirements, and further progress toward decision-making for soil remediation.

6.1 Access Restrictions

The following access restrictions apply and may impact soil sampling in AOC 11:

- Several underground natural gas transmission lines cross AOC 11. Portions of these lines are buried fewer than 6 inches below the ground surface and are above the ground surface in some of the lower-lying areas of this AOC. Sampling cannot occur within 10 feet of these lines and crossing these lines with heavy equipment is restricted.
- Remnants of two former check berms are located in the Northeast Ravine. The check berm associated with area AOC 11c was breached during the 2008 Part A Phase 1 sampling event to allow drilling equipment to access the upper areas of the AOC. Only minor grading occurred at the other former check berm, which is associated with area AOC 11e. Several proposed Phase 2 sample locations are proposed in the upper areas of the AOC. Additional modification of these check berms may be necessary to access these Phase 2 sample locations.

7.0 References

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil*. July 1.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2007. *Comments and Conditional Approval of the RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan, Part A, Pacific Gas and Electric Company (PG&E), Topock Compressor Station, Needles, California (EPA ID No. CAT080011729)*. August 10.

Pacific Gas and Electric Company. 1957. Engineering Drawing 482629, Revision 5: *Sewers, Domestic, Utility & Fire Water System, Topock Compressor Station*. January 9 (original drawing). Revision 5 is undated.

Tables

TABLE C5-1
Conceptual Site Model – AOC 11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Medium	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Runoff from compressor station, compressor station access road, and I-40	Surface Soil	Percolation and/or infiltration Potential entrainment in stormwater/surface water runoff	Surface Soil Subsurface Soil Potential Groundwater	Wind erosion and atmospheric dispersion of surface soil Potential volatilization and atmospheric dispersion/ Potential extracted groundwater[a]
Discharge from compressor station via stormwater drains	Surface Soil	Percolation and/or infiltration Potential entrainment in stormwater/surface water runoff	Surface Soil Subsurface Soil Potential Groundwater	Wind erosion and atmospheric dispersion of surface soil Potential volatilization and atmospheric dispersion Potential extracted groundwater[a]
Disposal of Debris	Surface Soil	Percolation and/or infiltration Potential entrainment in stormwater/surface water runoff	Surface Soil Subsurface Soil Potential Groundwater	Wind erosion and atmospheric dispersion of surface soil Potential volatilization and atmospheric dispersion Potential extracted groundwater[a]
Burned Material	Surface Soil	Percolation and/or infiltration Potential entrainment in stormwater/surface water runoff	Surface Soil Subsurface Soil	Wind erosion and atmospheric dispersion of surface soil

[a] Quantitative evaluation of the groundwater pathway was completed in the groundwater risk assessment (ARCADIS, 2009); Part A Phase 1 data were reviewed on a preliminary basis in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil; a comprehensive evaluation of the potential for constituents in soil to leach to groundwater will be completed after the Part A Phase 2 data are available.

TABLE C5-2

Synthetic Precipitation Leaching Procedure (SPLP) Extraction Results
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Topock Compressor Station, Needles, California

			SPLP Results in mg/L	
Location	**Sample Date**	**Depth (ft bgs)**	**Hexavalent Chromium**	**Chromium (total)**
AOC11				
AOC11c-1	09/22/08	9-10	0.0164 J	0.0399
AOC11e-2	09/24/08	2-3	0.0044 J	0.011

Notes:

ft bgs feet below ground surface
mg/L milligrams per liter
J concentration estimated by laboratory or data validation

TABLE C5-3
Sample Results: Metals
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				0.285	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	0.0125	1.37	27.3	1.47	5.15	2.32	52.2	58
Residential Regional Screening Levels [2]:				31	0.062	15,000	160	70	0.29	280	23	3,100	150	10	390	1,500	390	390	5.1	390	23,000
Residential DTSC CHHSL [3]:				30	0.07	5,200	16	39	17	NE	660	3,000	80	18	380	1,600	380	380	5	530	23,000
Ecological Comparison Values [4]:				0.285	11.4	330	23.3	0.0151	139.6	36.3	13	20.6	0.0166	0.0125	2.25	0.607	0.177	5.15	2.32	13.9	0.164
Background [5]:				NE	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	NE	1.37	27.3	1.47	NE	NE	52.2	58
Location	Date	Depth (ft bgs)	Sample Type	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, Hexavalent	Chromium, total	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
AOC11a-1	09/21/08	0 - 0.5	N	ND (2) *	6	170	ND (2) *	ND (1)	ND (0.403)	19	5.8	12	9.9	ND (0.1) *	ND (2) *	13	ND (1)	ND (2)	ND (4) *	23	46
	09/21/08	2 - 3	N	ND (2.1) J*	6.4	190	ND (2.1) *	ND (1)	ND (0.411)	23	6.6	14	20	ND (0.1) *	ND (2.1) *	14	ND (1)	ND (2.1)	ND (4.1) *	30	58
	09/21/08	5 - 6	N	ND (2) *	4.6	190	ND (1) *	ND (1)	ND (0.41)	22	7.1	9	4.7	ND (0.1) *	ND (1)	14	1.6	ND (1)	ND (2)	31	44
	09/21/08	9 - 10	N	ND (2) *	6.9	190	ND (2) *	ND (1)	3	19	5.8	10	9.2	ND (0.1) J*	ND (2) *	13	ND (1)	ND (2)	ND (4) *	22	44
AOC11a-2	09/21/08	0 - 0.5	N	ND (2.1) *	8.3	210	ND (2.1) *	ND (1)	0.417	32	6.8	20	15	ND (0.11) *	ND (2.1) *	18	ND (2.1) *	ND (2.1)	ND (4.1) *	32	75
	09/21/08	2 - 3	N	ND (2.1) *	5.5	220	ND (2.1) *	ND (1)	ND (0.413)	19	6.9	10	7.7	ND (0.11) *	ND (2.1) *	14	ND (1)	ND (2.1)	ND (4.2) *	32	42
	09/21/08	5 - 6	N	ND (2) *	5.5	1,300	ND (2) *	ND (1)	ND (0.408)	25	8.9	14	3.4	ND (0.1) *	ND (2) *	19	ND (2) *	ND (2)	ND (4.1) *	41	56
	09/21/08	9 - 10	N	ND (2) *	5.2	480	ND (1) *	ND (1)	ND (0.412)	19	8.3	6.5	2.2	ND (0.1) J*	1	14	ND (1)	ND (1)	ND (2)	35	47
AOC11a-3	09/20/08	0 - 0.5	N	ND (2) *	6.9	190	ND (2) *	ND (1)	ND (0.411)	22	6.1	16	13	ND (0.1) *	ND (2) *	15	ND (1)	ND (2)	ND (4.1) *	24	62
	09/20/08	2 - 3	N	ND (2.1) *	6.6	220	ND (2.1) *	ND (1)	ND (0.423)	24	7	14	17	ND (0.1) *	2.2	16	ND (1)	ND (2.1)	ND (4.2) *	30	63
	09/20/08	2 - 3	FD	ND (2.1) *	7.4	220	ND (2.1) *	ND (1)	ND (0.418)	24	7.1	14	16	ND (0.1) *	2.4	16	ND (1)	ND (2.1)	ND (4.2) *	31	61
	09/20/08	5 - 6	N	ND (2.1) *	6.8	410	ND (2.1) *	ND (1)	0.634	76	7.4	15	25	ND (0.1) *	ND (2.1) *	17	ND (1)	ND (2.1)	ND (4.1) *	36	75
	09/20/08	9 - 10	N	ND (2) *	5.4	110	ND (1) *	ND (1)	ND (0.407)	23	8.1	11	2.9	ND (0.1) J*	1.1	17	ND (1)	ND (1)	ND (2)	33	48
AOC11a-4	09/20/08	0 - 0.5	N	ND (2) *	7.7	180	ND (2) *	ND (1)	ND (0.409)	25	6.4	18	17	ND (0.1) *	ND (2) *	17	ND (1)	ND (2)	ND (4.1) *	28	79
	09/20/08	2 - 3	N	ND (2) *	6.2	210	ND (2) *	ND (1)	ND (0.41)	27	8.5	13	8	ND (0.1) *	ND (2) *	20	ND (1)	ND (2)	ND (4.1) *	37	52
	09/20/08	5 - 6	N	ND (2) *	5	140	ND (2) *	ND (1)	ND (0.407) J	25	8.7	11	3.7	ND (0.1) *	ND (2) *	19	ND (1)	ND (2)	ND (4.1) *	38	54
	09/20/08	9 - 10	N	ND (2) *	7.5	640	ND (2) *	ND (1)	ND (0.41)	27	9.6	14	3.5	ND (0.1) J*	ND (2) *	22	ND (1)	ND (2)	ND (4.1) *	43	59
AOC11a-5	09/21/08	0 - 0.5	N	ND (2.1) *	7.8	210	ND (2.1) *	ND (1)	0.652	32	6.8	17	14	ND (0.1) *	ND (2.1) *	16	ND (1)	ND (2.1)	ND (4.1) *	32	71
	09/21/08	2 - 3	N	ND (2.1) *	6	370	ND (2.1) *	ND (1)	ND (0.412)	30	8.5	12	9.4	ND (0.1) *	2.5	18	ND (1)	ND (2.1)	ND (4.2) *	38	57
	09/21/08	5 - 6	N	ND (2.1) *	4.4	82	ND (1) *	ND (1)	ND (0.411)	18	8.7	9.2	3	ND (0.1) *	1.5	14	ND (1)	ND (1)	ND (2.1)	34	53
	09/21/08	5 - 6	FD	ND (2) *	4.1	84	ND (1) *	ND (1)	ND (0.412)	18	8	9.6	3.1	ND (0.1) *	1.6	14	3.2	ND (1)	ND (2)	33	51
	09/21/08	9 - 10	N	ND (2.1) J*	7.6	1,000	ND (2.1) *	ND (1)	ND (0.415)	24	8.4	9.8	3.1	ND (0.1) J*	2.5	19	ND (1)	ND (2.1)	ND (4.1) *	37	62
AOC11a-SS1	09/21/08	0 - 0.5	N	ND (2) *	3.6	88	ND (1) *	ND (1)	ND (0.402)	13	3.2	9.4	5.6	ND (0.1) J*	1.1	7.8	ND (1)	ND (1)	ND (2)	13	54
	09/21/08	2 - 3	N	ND (2) *	7.2	130	ND (2) *	ND (1)	ND (0.404)	19	6.7	8.9	6	ND (0.1) J*	ND (2) *	14	ND (1)	ND (2)	ND (4) *	29	48
	09/21/08	5 - 6	N	ND (2) *	6.1	77	ND (1) *	ND (1)	ND (0.408)	16	6.7	7.6	3	ND (0.1) J*	ND (1)	13	ND (1)	ND (1)	ND (2)	29	42
	09/21/08	9 - 10	N	ND (2) *	6.6	230	ND (1) *	ND (1)	ND (0.414)	13	6.2	7	3	ND (0.1) J*	ND (1)	11	ND (1)	ND (1)	ND (2)	29	40
AOC11a-SS2	09/21/08	0 - 0.5	N	ND (2) *	5.2	120	ND (1) *	ND (1)	ND (0.414)	15	5.1	8.1	7.1	ND (0.1) J*	ND (1)	11	ND (1)	ND (1)	ND (2)	21	42
	09/21/08	2 - 3	N	ND (2) *	5.3	140	ND (1) *	ND (1)	ND (0.402)	19	6	15	5.9	ND (0.1) J*	ND (1)	14	ND (1)	ND (1)	ND (2)	26	53
AOC11a-SS3	09/20/08	0 - 0.5	N	ND (2) *	9	240	ND (2) *	ND (1)	0.622	29	6.8	17	16	ND (0.1) J*	ND (2) *	17	ND (1)	ND (2)	ND (4) *	27	73
	09/20/08	2 - 3	N	ND (2) *	8.8	270	ND (2) *	ND (1)	ND (0.409)	27	8.5	15	5.7	ND (0.1) J*	ND (2) *	19	ND (1)	ND (2)	ND (4.1) *	38	57
	09/20/08	5 - 6	N	ND (2) *	8.5	51	ND (1) *	ND (1)	ND (0.412)	19	6.8	9.5	3.7	ND (0.1) J*	1.1	14	ND (1)	ND (1)	ND (2)	32	46
	09/20/08	9 - 10	N	ND (2.1) *	7.1	150	ND (1) *	ND (1)	ND (0.413)	24	7.7	11	3	ND (0.1) J*	1.4	19	ND (1)	ND (1)	ND (2.1)	30	48
AOC11b-1	09/17/08	0 - 0.5	N	ND (2) J*	6.7	200 J	ND (5) *	ND (1)	ND (0.402)	27	8.1	16	25	ND (0.1) *	ND (5) *	20	ND (1)	ND (5)	ND (10) *	41	71
	09/17/08	0 - 0.5	FD	ND (2) *	6.4	180	ND (5) *	ND (1)	0.553	25	8.1	15	12	ND (0.1) *	ND (5) *	19	ND (1)	ND (5)	ND (10) *	38	68
	09/17/08	2 - 3	N	ND (2) *	5.2	110	ND (2) *	ND (1)	ND (0.404)	17	3.6	7	8.2	ND (0.1) *	ND (2) *	8.9	ND (1)	ND (2)	ND (4) *	33	28
	09/17/08	5 - 6	N	ND (2) *	6.2	230	ND (2) *	ND (1)	ND (0.411)	21	6.5	15	22	ND (0.1) *	ND (2) *	15	ND (1)	ND (2)	ND (4.1) *	37	72
	09/17/08	9 - 10	N	ND (2.1) *	6	250	ND (2.1) *	ND (1)	ND (0.411)	20	5.7	13	13	ND (0.1) J*	ND (2.1) *	15	ND (1)	ND (2.1)	ND (4.1) *	33	65

Location	Date	Depth (ft bgs)	Sample Type	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, Hexavalent	Chromium, total	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
				Metals (mg/kg)																	
			Interim Screening Level [1]:	0.285	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	0.0125	1.37	27.3	1.47	5.15	2.32	52.2	58
			Residential Regional Screening Levels [2]:	31	0.062	15,000	160	70	0.29	280	23	3,100	150	10	390	1,500	390	390	5.1	390	23,000
			Residential DTSC CHHSL [3]:	30	0.07	5,200	16	39	17	NE	660	3,000	80	18	380	1,600	380	380	5	530	23,000
			Ecological Comparison Values [4]:	0.285	11.4	330	23.3	0.0151	139.6	36.3	13	20.6	0.0166	0.0125	2.25	0.607	0.177	5.15	2.32	13.9	0.164
			Background [5]:	NE	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	NE	1.37	27.3	1.47	NE	NE	52.2	58
AOC11b-2	09/17/08	0 - 0.5	N	ND (2) *	4.8	190	ND (2) *	ND (1)	0.645	21	5.6	13	45	ND (0.1) *	ND (2) *	13	ND (1)	ND (2)	ND (4) *	30	76
	09/17/08	2 - 3	N	ND (2) *	13	270	ND (5.1) *	ND (1)	ND (0.41)	32	9.1	15	7.6	ND (0.1) *	ND (5.1) *	20	ND (1)	ND (5.1)	ND (10) *	43	74
	09/17/08	5 - 6	N	ND (2) *	10	150	ND (5.1) *	ND (1)	ND (0.411)	24	8.3	14	5.9	ND (0.1) *	ND (5.1) *	18	ND (1)	ND (5.1)	ND (10) *	40	75
	09/17/08	9 - 10	N	ND (2) *	9	330	ND (5.1) *	ND (1)	ND (0.407)	24	8.3	15	8.2	ND (0.1) J*	ND (5.1) *	18	ND (1)	ND (5.1)	ND (10) *	40	86
AOC11c-1	09/21/08	0 - 0.5	N	ND (2) *	4.8	120	ND (2) *	ND (1)	ND (0.4)	26	4.8	9.7	30	ND (0.098) *	2.7	9.8	ND (1)	ND (2)	ND (4) *	19	47
	09/22/08	2 - 3	N	ND (2.1) *	7.9	220	ND (2.1) *	ND (1)	2.03	64	6.5	20	26	ND (0.11) *	2.1	16	ND (1)	ND (2.1)	ND (4.1) *	32	110
	09/22/08	2 - 3	FD	ND (2.1) *	7.4	220	ND (2.1) *	ND (1)	1.47	63	6.5	19	25	ND (0.11) *	2.3	16	ND (1)	ND (2.1)	ND (4.1) *	31	110
	09/22/08	5 - 6	N	ND (2.1) *	7.7	200	ND (2.1) *	ND (1)	2.03	64	7.4	20	24	ND (0.1) *	ND (2.1) *	18	ND (1)	ND (2.1)	ND (4.1) *	35	110
	09/22/08	9 - 10	N	ND (2) *	5.3	140	ND (2) *	ND (1)	3.33	130	5.8	17	11	ND (0.1) J*	ND (2) *	13	ND (1)	ND (2)	ND (4.1) *	24	62
AOC11c-2	09/21/08	0 - 0.5	N	ND (2) *	5.1	170	ND (2) *	ND (1)	0.744	26	5.7	12	11	ND (0.1) *	ND (2) *	12	ND (1)	ND (2)	ND (4) *	23	52
	09/22/08	2 - 3	N	ND (2.1) *	7.6	220	ND (2.1) *	ND (1.1) *	2.74	81	6.8	21	28	ND (0.11) *	2.7	16	ND (1.1)	ND (2.1)	ND (4.3) *	32	130
	09/22/08	5 - 6	N	ND (2.1) *	6.6	190	ND (2.1) *	ND (1)	1.3	56	6	16	18	ND (0.11) *	ND (2.1) *	14	ND (1)	ND (2.1)	ND (4.2) *	27	93
	09/22/08	9 - 10	N	ND (2) *	6.3	160	ND (2) *	ND (1)	2.05	70	6.2	16	10	ND (0.1) J*	ND (2) *	14	ND (1)	ND (2)	ND (4) *	27	70
AOC11c-SS1	09/21/08	0 - 0.5	N	ND (2) *	3.6	75	ND (1) *	ND (1)	ND (0.401)	12	3.3	5.2	6.8	ND (0.1) J*	ND (1)	6.8	ND (1)	ND (1)	ND (2)	14	23
	09/22/08	2 - 3	N	ND (2) *	4.3	91	ND (1) *	ND (1)	ND (0.403)	16	4.4	11	5.5	ND (0.1) J*	ND (1)	8.6	ND (1)	ND (1)	ND (2)	17	30
	09/22/08	5 - 6	N	ND (2) *	6.9	160	ND (2) *	ND (1)	1.14	37	6.1	13	11	ND (0.1) J*	2.9	14	ND (1)	ND (2)	ND (4.1) *	25	57
	09/22/08	9 - 10	N	ND (2) *	5.8	110	ND (2) *	ND (1)	ND (0.408)	19	5.9	6.2	5	ND (0.1) J*	ND (2) *	12	ND (1)	ND (2)	ND (4.1) *	21	31
AOC11c-SS2	09/22/08	0 - 0.5	N	ND (2) *	3.5	71	ND (1) *	ND (1)	ND (0.401)	14	3.4	4.9	8	ND (0.1) J*	ND (1)	6.6	ND (1)	ND (1)	ND (2)	14	25
	09/22/08	2 - 3	N	ND (2) *	3.6	77	ND (1) *	ND (1)	ND (0.402)	16	3.9	4.9	6.5	ND (0.1) J*	ND (1)	7.5	ND (1)	ND (1)	ND (2)	16	30
	09/22/08	5 - 6	N	ND (2) *	3.6	100	ND (1) *	ND (1)	7.78	32	4.2	11	8.9	ND (0.1) J*	ND (1)	9.2	ND (1)	ND (1)	ND (2)	18	54
	09/22/08	9 - 10	N	ND (2.1) *	3.4	98	ND (1) *	ND (1)	2.06	73	3.4	30	8.6	ND (0.1) J*	ND (1)	7.7	ND (1)	ND (1)	ND (2.1)	15	290
AOC11d-1	09/23/08	0 - 0.5	N	ND (2.1) J*	9.5	310 J	ND (2.1) *	ND (1)	0.677	31	8.2	19	16	ND (0.1) *	ND (2.1) *	18	ND (1)	ND (2.1)	ND (4.1) *	43	73
	09/23/08	0 - 0.5	FD	ND (2) *	9.2	250 J	ND (2) *	ND (1)	0.628	33	8.6	20	14	ND (0.1) *	ND (2) *	19	ND (1)	ND (2)	ND (4) *	44	76
	09/23/08	2.5 - 3	N	ND (2.1) *	4.5	86	ND (1) *	ND (1)	ND (0.414)	24	9	12	4.8	ND (0.1) *	1.2	17	ND (1)	ND (1)	ND (2.1)	32	48
	09/23/08	5 - 6	N	ND (2.1) *	5.9	94	ND (2.1) *	ND (1)	ND (0.416)	29	8.4	12	5	ND (0.1) *	ND (2.1) *	21	ND (1)	ND (2.1)	ND (4.1) *	39	52
	09/23/08	9 - 10	N	ND (2.1) *	8.6	180	ND (2.1) *	ND (1)	0.659	28	7.1	11	9.3	ND (0.1) J*	ND (2.1) *	16	ND (1)	ND (2.1)	ND (4.1) *	31	49
AOC11e-1	09/23/08	0 - 0.5	N	ND (2) *	5.8	180	ND (2) *	ND (1)	0.959	43	5.4	10	10	ND (0.098) *	ND (2) *	11	ND (1)	ND (2)	ND (4) *	22	54
	09/23/08	2.5 - 3	N	ND (2) *	3.4	110	ND (1) *	ND (1)	3.19	92	5.8	41	9	ND (0.1) *	ND (1)	12	ND (1)	ND (1)	ND (2)	26	170
	09/23/08	5.5 - 6	N	ND (2) *	4	100	ND (1) *	ND (1)	0.961	48	5.8	17	6.4	ND (0.1) *	ND (1)	12	ND (1)	ND (1)	ND (2)	28	59
	09/23/08	9.5 - 10	N	ND (2) *	4.6	110	ND (1) *	ND (1)	3.2	84	4.6	31	13	ND (0.1) J*	ND (1)	9.8	ND (1)	ND (1)	ND (2)	20	140
AOC11e-2	09/24/08	0 - 0.5	N	ND (2) *	4.8	140	ND (1) *	ND (1)	1.4	37	5.1	12	28	ND (0.1) *	1.1	11	ND (1)	ND (1)	ND (2)	24	160
	09/24/08	2 - 3	N	ND (2) *	3	88	ND (1) *	ND (1)	3.78	130	3.4	19	11	ND (0.099) *	2.6	7.1	ND (1)	ND (1)	ND (2)	14	130
	09/24/08	2 - 3	FD	ND (2.2) *	3.3	78	ND (1.1) *	ND (1.1) *	3.51	130	3.5	18	11	ND (0.11) *	2.9	7.3	ND (1.1)	ND (1.1)	ND (2.2)	15	120
	09/24/08	5 - 6	N	ND (2) *	3.3	100	ND (1) *	ND (1)	2.25	98	4.7	30	9.6	ND (0.1) *	1.3	9.3	ND (1)	ND (1)	ND (2)	20	150
	09/24/08	9 - 10	N	ND (2.1) *	5.2	100	ND (2.1) *	ND (1)	ND (0.436)	36	8.6	19	4.6	ND (0.11) J*	ND (2.1) *	19	ND (1)	ND (2.1)	ND (4.2) *	38	53
AOC11e-SS1	09/23/08	0 - 0.5	N	ND (2) J*	4.6	96 J	ND (1) *	ND (1)	0.698	20	3.9	8.7	8.6	ND (0.1) J*	ND (1)	8.7	ND (1)	ND (1)	ND (2)	18	35 J
	09/23/08	2.5 - 3	N	ND (2) *	4.6	87	ND (1) *	ND (1)	ND (0.411)	21	4.5	7.7	4.8	ND (0.1) J*	ND (1)	8.3	ND (1)	ND (1)	ND (2)	20	27
	09/23/08	5.5 - 6	N	ND (2) *	4.6	110	ND (1) *	ND (1)	ND (0.407)	9.2	3.8	5.1	5.2	ND (0.1) J*	ND (1)	6	ND (1)	ND (1)	ND (2)	16	20
	09/23/08	9.5 - 10	N	ND (2) *	4.7	100	ND (1) *	ND (1)	ND (0.407)	10	3.2	10	5.4	ND (0.1) J*	ND (1)	6.3	ND (1)	ND (1)	ND (2)	15	19

TABLE C5-3
Sample Results: Metals
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				**0.285**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**0.0125**	**1.37**	**27.3**	**1.47**	**5.15**	**2.32**	**52.2**	**58**
Residential Regional Screening Levels [2]:				**31**	**0.062**	**15,000**	**160**	**70**	**0.29**	**280**	**23**	**3,100**	**150**	**10**	**390**	**1,500**	**390**	**390**	**5.1**	**390**	**23,000**
Residential DTSC CHHSL [3]:				**30**	**0.07**	**5,200**	**16**	**39**	**17**	**NE**	**660**	**3,000**	**80**	**18**	**380**	**1,600**	**380**	**380**	**5**	**530**	**23,000**
Ecological Comparison Values [4]:				**0.285**	**11.4**	**330**	**23.3**	**0.0151**	**139.6**	**36.3**	**13**	**20.6**	**0.0166**	**0.0125**	**2.25**	**0.607**	**0.177**	**5.15**	**2.32**	**13.9**	**0.164**
Background [5]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
AOC11e-SS2	09/23/08	0 - 0.5	N	ND (2) *	4.5	120	ND (1) *	ND (1)	1.38	28	4.3	8.1	9.5	ND (0.1) J*	ND (1)	8.7	ND (1)	ND (1)	ND (2)	17	39
	09/23/08	2.5 - 3	N	ND (2) *	6.6	110	ND (2) *	ND (1)	0.438	21	6.2	9.7	7.4	ND (0.1) J*	ND (2) *	13	ND (1)	ND (2)	ND (4.1) *	24	35
	09/23/08	5.5 - 6	N	ND (2.1) *	4.8	98	ND (1) *	ND (1)	0.466	26	6.3	10	5.1	ND (0.1) J*	ND (1)	13	ND (1)	ND (1)	ND (2.1)	28	39
	09/23/08	5.5 - 6	FD	ND (2) *	4.5	100	ND (1) *	ND (1)	0.437	27	5.6	9.6	5.5	ND (0.1) J*	ND (1)	11	ND (1)	ND (1)	ND (2)	24	37
	09/23/08	9.5 - 10	N	ND (2.1) *	4.5	100	ND (1.1) *	ND (1.1) *	0.5	21	7.4	11	3.8	ND (0.11) J*	ND (1.1)	15	ND (1.1)	ND (1.1)	ND (2.1)	34	37
AOC11g-OS1	04/06/11	8.5 - 9	N	ND (2) *	8.3	220	ND (1) *	ND (1)	ND (0.4) J	26	9.6	11	4.1	ND (0.1) J*	7.1	18	ND (1)	ND (1)	ND (2)	45	61

1 Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.
2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.
3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.
4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.
5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-4

Sample Results: Contract Laboratory Program Inorganics
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Contract Laboratory Program (CLP) Inorganics (mg/kg)							
Interim Screening Level[1] :				**16,400**	**66,500**	**55,000**	**12,100**	**402**	**4,400**	**2,070**	**0.9**
Residential Regional Screening Levels[2] :				**77,000**	**NE**	**55,000**	**NE**	**1,800**	**NE**	**NE**	**1,600**
Residential DTSC CHHSL[3] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**220**	**NE**	**NE**	**0.9**
Background[5] :				**16,400**	**66,500**	**NE**	**12,100**	**402**	**4,400**	**2,070**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aluminum**	**Calcium**	**Iron**	**Magnesium**	**Manganese**	**Potassium**	**Sodium**	**Cyanide**
AOC11a-1	09/21/08	0 - 0.5	N	11,000	33,000	14,000	8,500	330	2,500	580	ND (1.01) *
AOC11a-2	09/21/08	0 - 0.5	N	20,000	45,000	20,000	12,000	350	5,000	710	ND (1.03) *
AOC11a-3	09/20/08	0 - 0.5	N	15,000	42,000	16,000	11,000	320	3,400	530	ND (1.03) *
AOC11b-1	09/17/08	0 - 0.5	N	11,000	27,000	26,000	8,200	440	2,400	180	ND (1) *
	09/17/08	0 - 0.5	FD	11,000	25,000	25,000	8,300	430	2,200	180	ND (1.01) *
AOC11c-2	09/21/08	0 - 0.5	N	9,000	33,000	13,000	8,400	300	2,500	430	ND (1) *
AOC11d-1	09/23/08	0 - 0.5	N	19,000 J	43,000 J	21,000 J	11,000 J	390 J	4,900	450	ND (1.04) *
	09/23/08	0 - 0.5	FD	19,000	33,000 J	23,000	12,000	400	5,300	440	ND (1.01) *
AOC11e-2	09/24/08	0 - 0.5	N	7,900	23,000	12,000	6,400	220	2,300	ND (580)	ND (1.02) *

TABLE C5-4

Sample Results: Contract Laboratory Program Inorganics
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

[1] Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil" November 2004 (January 2005 Revision). January.

[4] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil". May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.

[5] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
			Interim Screening Level[1] :	**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**38**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**10,000**	**1,160**	**38**
			Residential Regional Screening Levels[2] :	**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**15**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**NE**	**NE**	**15**
			Residential DTSC CHHSL[3] :	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**
			Ecological Comparison Values[4] :	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**10,000**	**1,160**	**NE**
			Background[5] :	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1-Methyl naphthalene**	**2-Methyl naphthalene**	**Acena phthylene**	**Acenaphthene**	**Anthracene**	**Benzo (a) anthracene**	**Benzo (a) pyrene**	**Benzo (b) fluoranthene**	**Benzo (ghi) perylene**	**Benzo (k) fluoranthene**	**Chrysene**	**Dibenzo (a,h) anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**PAH Low molecular weight**	**PAH High molecular weight**	**B(a)P Equivalent**
AOC11a-1	09/21/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.2	5.2	5.2	6.8	ND (5)	8	ND (5)	ND (5)	ND (5)	ND (5)	7.7	ND	38	5
	09/21/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
	09/21/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/21/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11a-2	09/21/08	0 - 0.5	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	7.5	10	9.3	9	12	ND (5.2)	15	ND (5.2)	7.5	ND (5.2)	ND (5.2)	13	ND	83	11
	09/21/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
	09/21/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/21/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11a-3	09/20/08	0 - 0.5	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	7.5	9	8.9	9.5	12	ND (5.1)	15	ND (5.1)	7.3	ND (5.1)	ND (5.1)	13	ND	82	11
	09/20/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	5.3	5.7	ND (5.2)	6.2	7	ND (5.2)	7.5	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	7.1	ND	39	8
	09/20/08	2 - 3	FD	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	5.8	ND (5.2)	6.9	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	6.3	ND	19	4.6
	09/20/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/20/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11a-4	09/20/08	0 - 0.5	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	6.3	8.4	8	8.9	13	ND (5.1)	18	ND (5.1)	5.6	ND (5.1)	ND (5.1)	14	ND	82	9.8
	09/20/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	26	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	26	4.5
	09/20/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/20/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11a-5	09/21/08	0 - 0.5	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	10	16	19	14	16	24	ND (5.2)	30	ND (5.2)	12	ND (5.2)	8.9	27	8.9	170	23
	09/21/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	6.9	8.1	5.8	6.5	7.6	ND (5.2)	8	ND (5.2)	5.4	ND (5.2)	ND (5.2)	8.1	ND	56	10
	09/21/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/21/08	5 - 6	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/21/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11a-SS1	09/21/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	6.9	ND (5)	6.7	ND (5)	6.6	ND (5)	ND (5)	ND (5)	ND (5)	5.7	ND	26	4.4
	09/21/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	09/21/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/21/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11a-SS2	09/21/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.3	5.4	ND (5)	ND (5)	ND (5)	5.9	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	17	4.7
	09/21/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
AOC11a-SS3	09/20/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	25	37	59	36	43	59	11	89	ND (5)	30	ND (5)	26	78	26	470	57
	09/20/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/20/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/20/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)

TABLE C5-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
			Interim Screening Level[1] :	22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	10,000	1,160	38
			Residential Regional Screening Levels[2] :	22,000	310,000	1,700,000	3,400,000	17,000,000	380	15	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	NE	NE	15
			Residential DTSC CHHSL[3] :	NE	NE	NE	NE	NE	NE	38	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	38
			Ecological Comparison Values[4] :	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	10,000	1,160	NE
			Background[5] :	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	1-Methyl naphthalene	2-Methyl naphthalene	Acena phthylene	Acenaphthene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	PAH Low molecular weight	PAH High molecular weight	B(a)P Equivalent
AOC11b-1	09/17/08	0 - 0.5	N	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	44	65	98	52	41	88	ND (25)	120	ND (25)	49	ND (25)	30	110	30	670	93
	09/17/08	0 - 0.5	FD	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	50	59	85	52	39	78	ND (25)	120	ND (25)	47	ND (25)	28	110	28	640	86
	09/17/08	2 - 3	N	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	80	110	150	74	67	130	ND (25)	190	ND (25)	75	ND (5.6)	45	180	45	1,100	150
	09/17/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	21	31	44	19	21	38	5.1	56	ND (5.1)	19	ND (5.1)	14	53	14	310	44
	09/17/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	56	54	52	34	57	67	11	100	ND (5.1)	33	ND (5.1)	25	94	25	560	78
AOC11b-2	09/17/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	12	290	360	530	170	140	430	56	860	ND (5)	180	ND (5)	180	660	190	3,700	500
	09/17/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	14	18	24	13	10	21	ND (5.1)	34	ND (5.1)	13	ND (5.1)	9.5	30	9.5	180	25
	09/17/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/17/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11c-1	09/21/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	27	35	36	21	32	45	6.7	67	ND (5)	21	ND (5)	25	61	25	350	49
	09/22/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	52	68	66	60	73	90	19	400	ND (5.2)	58	ND (5.2)	48	370	48	1,300	100
	09/22/08	2 - 3	FD	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	34	43	43	38	51	62	12	94	ND (5.2)	37	ND (5.2)	38	84	38	500	64
	09/22/08	5 - 6	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	31	46	49	46	54	60	12	78	ND (5.2)	44	ND (5.2)	24	74	24	490	68
	09/22/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11c-2	09/21/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	14	20	21	13	18	26	ND (5)	37	ND (5)	13	ND (5)	15	34	15	200	28
	09/22/08	2 - 3	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	75	110	99	98	140	140	28	180	ND (5.4)	95	ND (5.4)	61	170	61	1,100	160
	09/22/08	5 - 6	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	7.3	77	89	82	73	120 J	120	24	170	ND (5.2)	69	ND (5.2)	71	160	78	980	130
	09/22/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	17	23	23	20	30	31	5.7	40	ND (5.1)	18	ND (5.1)	12	37	12	240	34
AOC11c-SS1	09/21/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5	ND (5)	ND (5)	ND (5)	5.1	ND (5)	ND (5)	ND (5)	ND (5)	5.3	ND	15	4.4
	09/22/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	6	ND (5)	ND (5)	ND (5)	ND (5)	6	ND	12	4.4
	09/22/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.7	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.3	ND	11	4.5
	09/22/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11c-SS2	09/22/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	6.9	7.3	6.3	8.3	8.6	ND (5)	12	ND (5)	5.3	ND (5)	ND (5)	11	ND	66	10
	09/22/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	34	41	40	31	48	51	9.1	69	ND (5)	29	ND (5)	25	66	25	420	60
	09/22/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	9	18	16	17	21	16	7	18	ND (5.1)	17	ND (5.1)	8.2	16	8.2	160	27
	09/22/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.9	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	5.9	4.5
AOC11d-1	09/23/08	0 - 0.5	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	26	44	46	43	61 J	62	12	100	ND (5.2)	38	ND (5.2)	33	93	33	530	66
	09/23/08	0 - 0.5	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	31	39	46	35	55 J	65	12	120	ND (5.1)	31	ND (5.1)	36	100	36	530	60
	09/23/08	2.5 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.4)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/23/08	5 - 6	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (3.5)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
	09/23/08	9 - 10	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.1)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
AOC11e-1	09/23/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	47	67	68	61	85 J	91	21	130	ND (5)	56	ND (5)	56	130	56	760	100
	09/23/08	2.5 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	16	17	18	14	22 J	27	ND (5)	50	ND (5)	13	ND (5)	26	43	26	220	25
	09/23/08	5.5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.5	6	6.9	5.4	8.1 J	9.1	ND (5.1)	17	ND (5.1)	ND (5.1)	ND (4.6)	8.6	15	8.6	73	9.3
	09/23/08	9.5 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	45	35	49	32	48	60	12	87	ND (5.1)	30	ND (5)	43	78	43	480	57

TABLE C5-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level[1] :				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	10,000	1,160	38
Residential Regional Screening Levels[2] :				22,000	310,000	1,700,000	3,400,000	17,000,000	380	15	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	NE	NE	15
Residential DTSC CHHSL[3] :				NE	NE	NE	NE	NE	NE	38	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	38
Ecological Comparison Values[4] :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	10,000	1,160	NE
Background[5] :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	1-Methyl naphthalene	2-Methyl naphthalene	Acena phthylene	Acenaphthene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	PAH Low molecular weight	PAH High molecular weight	B(a)P Equivalent
AOC11e-2	09/24/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	440	380	400	22	380	530	6.4	1,500	ND (5)	20	5	590	1,200	600	4,900	510
	09/24/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	7.2	ND (5)	ND (5)	ND (5)	ND (5)	8.2	ND	15	4.4
	09/24/08	2 - 3	FD	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	10	ND (5.5)	ND (5.5)	ND (5)	6	11	6	21	4.8
	09/24/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.6	ND (5.1)	ND (5.1)	5.6	ND (5.1)	10	ND (5.1)	ND (5.1)	ND (4.5)	ND (5.1)	8.2	ND	29	4.8
	09/24/08	9 - 10	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4)	ND (5.3)	ND (5.3)	ND	ND	ND (4.6)
AOC11e-SS1	09/23/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	16	25	34	25	27	36	6.6	53	ND (5)	23	ND (5)	19	49	19	290	38
	09/23/08	2.5 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/23/08	5.5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (3.9)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/23/08	9.5 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.3)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC11e-SS2	09/23/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	14	23	29	24	26	31	6.7	44	ND (5)	21	ND (5)	16	42	16	260	35
	09/23/08	2.5 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/23/08	5.5 - 6	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	13	11	16	7.7	12	20	ND (5.2)	38 J	ND (5.2)	7.3	ND (4.8)	28 J	31 J	28	160	17
	09/23/08	5.5 - 6	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1) J	ND (5.1)	ND (5.1)	ND (4.7)	ND (5.1) J	ND (5.1) J	ND	ND	ND (4.5)
	09/23/08	9.5 - 10	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (4.7)	ND (5.4)	ND (5.4)	ND	ND	ND (4.7)

1 Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-6

Sample Results: VOCs, SVOCs, Total Petroleum Hydrocarbons and pH
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				VOCs (µg/kg)	Total Petroleum Hydrocarbons (mg/kg)			General Chemistry
			Interim Screening Level[1] :	22,000,000	540	540	1,800	NE
			Residential Regional Screening Levels[2] :	22,000,000	NE	NE	NE	NE
			Residential DTSC CHHSL[3] :	NE	NE	NE	NE	NE
			RWQCB Environmental Screening Levels [4] :	NE	540	540	1,800	NE
			Ecological Comparison Values[5] :	NE	NE	NE	NE	NE
			Background[6] :	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Methyl acetate**	**TPH as gasoline**	**TPH as diesel**	**TPH as motor oil**	**pH**
AOC11a-1	09/21/08	0 - 0.5	N	---	---	ND (10)	45.7 J	8.26
	09/21/08	2 - 3	N	ND (8.6)	ND (1.4)	ND (10)	10.1 J	8.76
	09/21/08	5 - 6	N	---	ND (1.3)	ND (10)	ND (10)	9.8
AOC11a-2	09/21/08	0 - 0.5	N	---	---	ND (10)	ND (10)	8.19
	09/21/08	2 - 3	N	ND (8.2)	ND (1.5)	ND (10)	ND (10)	8.89
	09/21/08	5 - 6	N	---	ND (1.4)	ND (10)	ND (10)	8.97
AOC11a-3	09/20/08	0 - 0.5	N	---	---	ND (10)	ND (10)	8.25
	09/20/08	2 - 3	N	ND (9.3)	ND (1.5)	ND (10)	ND (10)	8.6
	09/20/08	2 - 3	FD	ND (7.4)	ND (1.4)	ND (10)	ND (10)	8.96
	09/20/08	5 - 6	N	---	ND (1.1)	ND (10) J	35.6 J	8.99
AOC11a-4	09/20/08	0 - 0.5	N	---	---	10.3	14 J	7.99
	09/20/08	2 - 3	N	---	ND (1.1)	ND (10)	47.5 J	9.09
	09/20/08	5 - 6	N	---	ND (1.6)	ND (10)	11.9 J	9.34
AOC11a-5	09/21/08	0 - 0.5	N	---	---	ND (10)	11.2 J	8.37
	09/21/08	2 - 3	N	---	ND (1.1)	ND (10)	37.4 J	9.29
	09/21/08	5 - 6	N	---	ND (1.4)	ND (10)	11.3 J	9.61
	09/21/08	5 - 6	FD	---	ND (1.1)	ND (10)	ND (10)	9.51
AOC11b-1	09/17/08	0 - 0.5	N	---	---	ND (101)	ND (101)	7.64
	09/17/08	0 - 0.5	FD	---	---	ND (101)	ND (101)	7.48
	09/17/08	2 - 3	N	ND (5.6)	ND (1.2)	ND (10)	ND (10)	8.36
	09/17/08	5 - 6	N	---	ND (1.3)	ND (10)	16	8.39
AOC11b-2	09/17/08	0 - 0.5	N	---	---	ND (101)	ND (101)	7.88
	09/17/08	2 - 3	N	---	ND (1.4)	ND (10)	ND (10)	8.24
	09/17/08	5 - 6	N	---	ND (1.3)	ND (10)	ND (10)	8.13
AOC11c-1	09/21/08	0 - 0.5	N	---	---	ND (10)	ND (10)	8.74
	09/22/08	2 - 3	N	---	ND (3.8) J	ND (10) J	53.5	7.73
	09/22/08	2 - 3	FD	---	ND (2.4) J	78 J	71.2	8.03
	09/22/08	5 - 6	N	---	ND (1.5) J	ND (10)	76.5	7.9
AOC11c-2	09/21/08	0 - 0.5	N	---	---	ND (10)	ND (10)	8.56
	09/22/08	2 - 3	N	ND (16) J	ND (2.3) J	10	79.2	7.92
	09/22/08	5 - 6	N	---	ND (1.5) J	ND (10)	43.1	7.99
AOC11d-1	09/23/08	0 - 0.5	N	---	---	ND (10)	ND (10)	8.06
	09/23/08	0 - 0.5	FD	---	---	ND (10)	15.4	7.63
	09/23/08	2.5 - 3	N	ND (4.4)	ND (1)	ND (10)	ND (10)	8.7
	09/23/08	5 - 6	N	---	ND (0.96)	ND (10)	ND (10)	8.91
	09/23/08	9 - 10	N	---	ND (0.92)	ND (10) J	ND (10) J	---
AOC11e-1	09/23/08	0 - 0.5	N	---	---	ND (10)	11.7	7.94
	09/23/08	2.5 - 3	N	---	ND (0.99)	ND (10)	42.2 J	8.3
	09/23/08	5.5 - 6	N	---	ND (1.1)	ND (10)	23.6	7.87
	09/23/08	9.5 - 10	N	---	ND (0.93)	ND (10) J	17.7 J	---

TABLE C5-6

Sample Results: VOCs, SVOCs, Total Petroleum Hydrocarbons and pH
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				VOCs (µg/kg)	Total Petroleum Hydrocarbons (mg/kg)			General Chemistry
			Interim Screening Level[1] :	**22,000,000**	**540**	**540**	**1,800**	**NE**
			Residential Regional Screening Levels[2] :	**22,000,000**	**NE**	**NE**	**NE**	**NE**
			Residential DTSC CHHSL[3] :	**NE**	**NE**	**NE**	**NE**	**NE**
			RWQCB Environmental Screening Levels [4] :	**NE**	**540**	**540**	**1,800**	**NE**
			Ecological Comparison Values[5] :	**NE**	**NE**	**NE**	**NE**	**NE**
			Background[6] :	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Methyl acetate**	**TPH as gasoline**	**TPH as diesel**	**TPH as motor oil**	**pH**
AOC11e-2	09/24/08	0 - 0.5	N	---	---	13.8	166	8.05
	09/24/08	2 - 3	N	17	ND (0.9) J	ND (10)	471	7.72
	09/24/08	2 - 3	FD	---	ND (1.1) J	10.1	544	7.58
	09/24/08	5 - 6	N	---	ND (1) J	15.6	105	7.8
	09/24/08	9 - 10	N	---	ND (0.79)	ND (10) J	ND (10) J	---
AOC11e-SS1	09/23/08	0 - 0.5	N	---	---	ND (10) J	ND (10) J	---
	09/23/08	2.5 - 3	N	---	ND (0.91)	ND (10) J	ND (10) J	---
	09/23/08	5.5 - 6	N	---	ND (0.97)	ND (10) J	10.5 J	---
	09/23/08	9.5 - 10	N	---	ND (0.97)	ND (10) J	ND (10) J	---
AOC11e-SS2	09/23/08	0 - 0.5	N	---	---	ND (10) J	ND (10) J	---
	09/23/08	2.5 - 3	N	---	ND (1)	ND (10) J	ND (10) J	---
	09/23/08	5.5 - 6	N	---	ND (0.87)	ND (10) J	ND (10) J	---
	09/23/08	5.5 - 6	FD	---	ND (0.84)	ND (10) J	ND (10) J	---
	09/23/08	9.5 - 10	N	---	ND (1.1) J	10 J	ND (10) J	---

TABLE C5-6

Sample Results: VOCs, SVOCs, Total Petroleum Hydrocarbons and pH

AOC 11 - Topographic Low Area

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station, Needles, California

[1] For VOCs, interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used. For TPHs, interim screening level is the Regional Water Quality Control Board environmental screening level.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites". http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, November 2004 (January 2005 Revision)". January.

[4] Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

[5] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil. May 28 and ARCADIS. 2009. Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil". July 1.

[6] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California". May.

Results greater than the interim screening level are circled.

Only detected VOCs and SVOCs are presented.

VOCs	volatile organic compounds
TPH	total petroleum hydrocarbon
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water Board	Regional Water Quality Control Board
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-7

Sample Results: Pesticides

AOC 11 - Topographic Low Area

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Pesticides (µg/kg)																				
Interim Screening Level[1] :				**2.1**	**2.1**	**2.1**	**33**	**77**	**430**	**270**	**77**	**5**	**370,000**	**370,000**	**370,000**	**21,000**	**21,000**	**21,000**	**500**	**430**	**130**	**53**	**340,000**	**460**
Residential Regional Screening Levels[2] :				**2,000**	**1,400**	**1,700**	**29**	**77**	**1,600**	**270**	**77**	**30**	**370,000**	**370,000**	**370,000**	**18,000**	**18,000**	**18,000**	**520**	**1,600**	**110**	**53**	**310,000**	**440**
Residential DTSC CHHSL[3] :				**2,300**	**1,600**	**1,600**	**33**	**NE**	**430**	**NE**	**NE**	**35**	**NE**	**NE**	**NE**	**21,000**	**21,000**	**21,000**	**500**	**430**	**130**	**NE**	**340,000**	**460**
Ecological Comparison Values[4] :				**2.1**	**2.1**	**2.1**	**NE**	**NE**	**470**	**NE**	**NE**	**5**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**470**	**NE**	**NE**	**NE**	**NE**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**4,4-DDD**	**4,4-DDE**	**4,4-DDT**	**Aldrin**	**alpha-BHC**	**alpha-Chlordane**	**beta-BHC**	**delta-BHC**	**Dieldrin**	**Endo sulfan I**	**Endo sulfan II**	**Endosulfan sulfate**	**Endrin**	**Endrin aldehyde**	**Endrin ketone**	**gamma-BHC**	**gamma-Chlordane**	**Heptachlor**	**Heptachlor Epoxide**	**Methoxy chlor**	**Toxaphene**
AOC11a-1	09/21/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
AOC11a-2	09/21/08	0 - 0.5	N	ND (2.1) *	ND (2.1) *	ND (2.1) *	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2.1)	ND (1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.2)	ND (52)
AOC11a-3	09/20/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.1)	ND (51)
AOC11b-1	09/17/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
	09/17/08	0 - 0.5	FD	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
AOC11c-2	09/21/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
AOC11d-1	09/23/08	0 - 0.5	N	ND (2.1) *	6.1	ND (2.1) *	ND (1)	ND (1)	12 J	ND (1)	ND (1)	6.7	ND (1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (1)	13 J	ND (1)	ND (1)	ND (5.2)	ND (52)
	09/23/08	0 - 0.5	FD	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (5.1)	ND (51)
AOC11e-2	09/24/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)

1 Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison values for Additional Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-8

Sample Results: Polychlorinated Biphenyls
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polychlorinated biphenyls (µg/kg)									
			Interim Screening Level[1] :	**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**204**
			Residential Regional Screening Levels[2] :	**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**NE**
			Residential DTSC CHHSL[3] :	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**NE**
			Ecological Comparison Values[4] :	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**204**
			Background[5] :	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**	**Total PCBs**
AOC11a-1	09/21/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
AOC11a-2	09/21/08	0 - 0.5	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
AOC11a-3	09/20/08	0 - 0.5	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
AOC11b-1	09/17/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	09/17/08	0 - 0.5	FD	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
AOC11c-2	09/21/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	29	ND (17)	ND (17)	ND (17)	37.5
	09/22/08	2 - 3	N	ND (18) J	ND (35) J	ND (18) J	ND (18) J	ND (18) J	190 J	ND (18) J	ND (18) J	ND (18) J	199
AOC11d-1	09/23/08	0 - 0.5	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	76	ND (17)	ND (17)	ND (17)	84.5
	09/23/08	0 - 0.5	FD	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	41	ND (17)	ND (17)	ND (17)	49.5
	09/23/08	2.5 - 3	N	ND (17) J	ND (34) J	ND (17) J	ND (17) J	ND (17) J	ND (17) J	ND (17) J	ND (17) J	ND (17) J	ND (17)
AOC11e-2	09/24/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	190	240	ND (17)	ND (17)	430
	09/24/08	2 - 3	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	09/24/08	2 - 3	FD	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	26	ND (17)	ND (17)	ND (17)	34.5
	09/24/08	5 - 6	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	18	ND (17)	ND (17)	ND (17)	26.5
	09/24/08	9 - 10	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
AOC11e-SS1	09/23/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	30	ND (17)	ND (17)	ND (17)	38.5
	09/23/08	2.5 - 3	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	09/23/08	5.5 - 6	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	09/23/08	9.5 - 10	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
AOC11e-SS2	09/23/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	40	ND (17)	ND (17)	ND (17)	48.5
	09/23/08	2.5 - 3	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	09/23/08	5.5 - 6	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	30	ND (17)	ND (17)	ND (17)	38.5
	09/23/08	5.5 - 6	FD	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	19	ND (17)	ND (17)	ND (17)	27.5
	09/23/08	9.5 - 10	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)

[1] Interim screening level is the USEPA residential regional screening level.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

[4] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Dectected Chemicals in Soil." July 1.

[5] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-9

Constitiuent Concentrations in Soil Compared to Screening Values
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Parameter	Units	Frequency of detection	Maximum Detected Value	Background Threshold Value (BTV) [1]		Ecological Comparison Value (ECV) [2]		Residential Screening Level (Res SL) [3]		RWQCB Environmental Screening Levels (ESL) [4]		Commercial Screening Level (Com SL) [5]		Interim Screening Level (Int SL) [6]	
				# of Exceedences [7]	(BTV)	# of Exceedences [8]	(ECV)	# of Exceedences [8]	(Res SL)	# of Exceedences [8]	(ESL)	# of Exceedences [8]	(Com SL)	# of Exceedences [8]	(Int SL)
Metals															
Antimony	mg/kg	0 / 74 (0%)	ND (2.1) ‡	NA	(NE)	0	(0.285)	0	(30)	NA	(NE)	0	(380)	0	(0.285)
Arsenic	mg/kg	74 / 74 (100%)	13	1	(11)	1	(11.4)	1	(0.07) *	NA	(NE)	1	(0.24) *	1	(11)
Barium	mg/kg	74 / 74 (100%)	1,300	4	(410)	4	(330) *	0	(5,200)	NA	(NE)	0	(63,000)	4	(410)
Beryllium	mg/kg	0 / 74 (0%)	ND (5.1) ‡	0	(0.672)	0	(23.3)	0	(16)	NA	(NE)	0	(190)	0	(0.672)
Cadmium	mg/kg	0 / 74 (0%)	ND (1.1) ‡	0	(1.1)	0	(0.0151) *	0	(39)	NA	(NE)	0	(500)	0	(1.1)
Chromium	mg/kg	74 / 74 (100%)	130	14	(39.8)	14	(36.3) *	0	(280)	NA	(NE)	0	(1,400)	14	(39.8)
Chromium, Hexavalent	mg/kg	31 / 74 (42%)	7.78	18	(0.83)	0	(139.6)	0	(17)	NA	(NE)	0	(37)	18	(0.83)
Cobalt	mg/kg	74 / 74 (100%)	9.6	0	(12.7)	0	(13)	0	(23)	NA	(NE)	0	(300)	0	(12.7)
Copper	mg/kg	74 / 74 (100%)	41	16	(16.8)	5	(20.6)	0	(3,000)	NA	(NE)	0	(38,000)	16	(16.8)
Lead	mg/kg	74 / 74 (100%)	45	36	(8.39)	36	(0.0166) *	0	(80)	NA	(NE)	0	(320)	36	(8.39)
Mercury	mg/kg	0 / 74 (0%)	ND (0.11) ‡	NA	(NE)	0	(0.0125)	0	(18)	NA	(NE)	0	(180)	0	(0.0125)
Molybdenum	mg/kg	17 / 74 (23%)	2.9	10	(1.37)	8	(2.25)	0	(380)	NA	(NE)	0	(4,800)	10	(1.37)
Nickel	mg/kg	74 / 74 (100%)	22	0	(27.3)	0	(0.607) *	0	(1,600)	NA	(NE)	0	(16,000)	0	(27.3)
Selenium	mg/kg	2 / 74 (2.7%)	3.2	2	(1.47)	2	(0.177) *	0	(380)	NA	(NE)	0	(4,800)	2	(1.47)
Thallium	mg/kg	0 / 74 (0%)	ND (10) ‡	NA	(NE)	0	(2.32)	0	(5)	NA	(NE)	0	(63)	0	(2.32)
Vanadium	mg/kg	74 / 74 (100%)	44	0	(52.2)	0	(13.9) *	0	(390)	NA	(NE)	0	(5,200)	0	(52.2)
Zinc	mg/kg	74 / 74 (100%)	290	30	(58)	30	(0.164) *	0	(23,000)	NA	(NE)	0	(100,000)	30	(58)
Contract Laboratory Program Inorganics															
Aluminum	mg/kg	7 / 7 (100%)	20,000	2	(16,400)	NA	(NE)	0	(77,000)	NA	(NE)	0	(990,000)	2	(16,400)
Calcium	mg/kg	7 / 7 (100%)	45,000	0	(66,500)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(66,500)
Iron	mg/kg	7 / 7 (100%)	26,000	NA	(NE)	NA	(NE)	0	(55,000)	NA	(NE)	0	(720,000)	0	(55,000)
Magnesium	mg/kg	7 / 7 (100%)	12,000	0	(12,100)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(12,100)
Manganese	mg/kg	7 / 7 (100%)	440	1	(402)	1	(220)	0	(1,800)	NA	(NE)	0	(23,000)	1	(402)
Potassium	mg/kg	7 / 7 (100%)	5,300	2	(4,400)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	2	(4,400)
Sodium	mg/kg	6 / 7 (86%)	710	0	(2,070)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(2,070)
Cyanide	mg/kg	0 / 7 (0%)	ND (1.03) ‡	NA	(NE)	0	(0.9)	0	(1,600)	NA	(NE)	0	(20,000)	0	(0.9)
Volatile Organic Compounds															
Methyl acetate	µg/kg	1 / 7 (14%)	17	NA	(NE)	NA	(NE)	0	(22,000,000)	NA	(NE)	0	(92,000,000)	0	(22,000,000)
Polycyclic Aromatic Hydrocarbons															
Anthracene	µg/kg	2 / 74 (2.7%)	12	NA	(NE)	NA	(NE)	0	(17,000,000)	NA	(NE)	0	(170,000,000)	0	(17,000,000)
Benzo (a) anthracene	µg/kg	26 / 74 (35%)	440	NA	(NE)	NA	(NE)	1	(380)	NA	(NE)	0	(1,300)	1	(380)
Benzo (a) pyrene	µg/kg	32 / 74 (43%)	380	NA	(NE)	NA	(NE)	12	(38)	NA	(NE)	2	(130)	12	(38)
Benzo (b) fluoranthene	µg/kg	35 / 74 (47%)	530	NA	(NE)	NA	(NE)	2	(380)	NA	(NE)	0	(1,300)	2	(380)
Benzo (ghi) perylene	µg/kg	36 / 74 (49%)	170	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Benzo (k) fluoranthene	µg/kg	33 / 74 (45%)	380	NA	(NE)	NA	(NE)	1	(380)	NA	(NE)	0	(1,300)	1	(380)
Chrysene	µg/kg	35 / 74 (47%)	530	NA	(NE)	NA	(NE)	0	(3,800)	NA	(NE)	0	(13,000)	0	(3,800)
Dibenzo (a,h) anthracene	µg/kg	18 / 74 (24%)	56	NA	(NE)	NA	(NE)	0	(110)	NA	(NE)	0	(380)	0	(380)
Fluoranthene	µg/kg	41 / 74 (55%)	1,500	NA	(NE)	NA	(NE)	0	(2,300,000)	NA	(NE)	0	(22,000,000)	0	(2,300,000)
Indeno (1,2,3-cd) pyrene	µg/kg	30 / 74 (41%)	180	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Naphthalene	µg/kg	1 / 74 (1.4%)	5	NA	(NE)	NA	(NE)	0	(3,600)	NA	(NE)	0	(18,000)	0	(3,600)
Phenanthrene	µg/kg	27 / 74 (36%)	590	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)

TABLE C5-9

Constitiuent Concentrations in Soil Compared to Screening Values
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Background Threshold Value (BTV) [1]		Ecological Comparison Value (ECV) [2]		Residential Screening Level (Res SL) [3]		RWQCB Environmental Screening Levels (ESL) [4]		Commercial Screening Level (Com SL) [5]		Interim Screening Level (Int SL) [6]	
Parameter	**Units**	**Frequency of detection**	**Maximum Detected Value**	**# of Exceedences** [7]	**(BTV)**	**# of Exceedences** [8]	**(ECV)**	**# of Exceedences** [8]	**(Res SL)**	**# of Exceedences** [8]	**(ESL)**	**# of Exceedences** [8]	**(Com SL)**	**# of Exceedences** [8]	**(Int SL)**
Polycyclic Aromatic Hydrocarbons															
Pyrene	µg/kg	39 / 74 (53%)	1,200	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
PAH Low molecular weight	µg/kg	27 / 74 (36%)	600	NA	(NE)	0	(10,000)	NA	(NE)	NA	(NE)	NA	(NE)	0	(10,000)
PAH High molecular weight	µg/kg	42 / 74 (57%)	4,900	NA	(NE)	3	(1,160)	NA	(NE)	NA	(NE)	NA	(NE)	3	(1,160)
B(a)P Equivalent	µg/kg	42 / 74 (57%)	510	NA	(NE)	NA	(NE)	17	(38)	NA	(NE)	5	(130)	17	(38)
Polychlorinated biphenyls															
Aroclor 1254	µg/kg	9 / 20 (45%)	190	NA	(NE)	NA	(NE)	0	(220)	NA	(NE)	0	(740)	0	(220)
Aroclor 1260	µg/kg	1 / 20 (5.0%)	240	NA	(NE)	NA	(NE)	1	(220)	NA	(NE)	0	(740)	1	(220)
Total PCBs	µg/kg	9 / 20 (45%)	430	NA	(NE)	1	(204)	NA	(NE)	NA	(NE)	NA	(NE)	1	(204)
Pesticides															
4,4-DDE	µg/kg	1 / 7 (14%)	6.1	NA	(NE)	1	(2.1)	0	(1,600)	NA	(NE)	0	(6,300)	1	(2.1)
alpha-Chlordane	µg/kg	1 / 7 (14%)	12	NA	(NE)	0	(470)	0	(430)	NA	(NE)	0	(1,700)	0	(430)
Dieldrin	µg/kg	1 / 7 (14%)	6.7	NA	(NE)	1	(5)	0	(35)	NA	(NE)	0	(130)	1	(5)
gamma-Chlordane	µg/kg	1 / 7 (14%)	13	NA	(NE)	0	(470)	0	(430)	NA	(NE)	0	(1,700)	0	(430)
Total Petroleum Hydrocarbons															
TPH as diesel	mg/kg	7 / 47 (15%)	78	NA	(NE)	NA	(NE)	NA	(NE)	0	(540)	NA	(NE)	0	(540)
TPH as motor oil	mg/kg	23 / 47 (49%)	544	NA	(NE)	NA	(NE)	NA	(NE)	0	(1,800)	NA	(NE)	0	(1,800)

TABLE C5-9

Constitiuent Concentrations in Soil Compared to Screening Values
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Notes:

1 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

2 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil" July 1

3 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

4 Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

5 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

6 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.

7 Number of exceedences are the number of detections exceeding the background threshold value (BTV).

8 Number of exceedences are the number of detections that are equal to or exceeds the screening level (ecological comparison value, residential reporting limit, commercial reporting limit or interim screening level) or otherwise noted

* Number of exceedances are calculated using background threshold value because it is greater than the respective screening level.

‡ Maxiumum Reporting Limit greater than or equal to the interim screening level

USEPA regional screening level - USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

CHHSL - California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

mg/kg	miligrams per kilogram
µg/kg	micrograms per kilogram
ng/kg	nanograms per kilogram
NA	not applicable
ND	not detected in any of the samples
NE	not established
SL	screening level

USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water Board	Regional Water Quality Control Board

TABLE C5-10

Central Tendency Comparisons (Site to Background), AOC 11 - Topographic Low Areas

Soil Investigation Part A Phase 1 Data Summary Report,

Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Parameter	Comparison Test Used	Probability that the Observed Differences Would Occur Purely by Chance	Statistical Decision with 0.05 Significance Level	Mean of Site Detects	Mean of Bkgd Detects	Median of Site Detects	Median of Bkgd Detects	Number of Site Detects	Number of Site Samples	Number of Bkgd Detects	Number of Bkgd Samples	Percent Detects Site	Percent Detects Bkgd
Arsenic	Gehan	0.000	Site > Bkgd	5.99	4.01	5.8	3.5	74	74	58	59	100	98
Barium	Gehan	0.133	nsd	197	165	150	135	74	74	60	60	100	100
Chromium	Gehan	0.004	Site > Bkgd	33.6	22.3	24.5	21.9	74	74	70	70	100	100
Copper	Gehan	0.001	Site > Bkgd	13.4	10.5	12	10.1	74	74	70	70	100	100
Lead	Gehan	0.000	Site > Bkgd	10.6	4.38	8.2	3.5	74	74	59	60	100	98
Molybdenum	Gehan	0.265	nsd	1.87	1.03	1.6	1	17	74	11	60	23	18
Zinc	Gehan	0.000	Site > Bkgd	64.9	36.8	54	35.5	74	74	70	70	100	100

Bkgd = background

nsd = no statistical difference

> = greater than
< = less than

TABLE C5-11
Decision 2 Data Gaps Summary AOC 11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [1] Y or N	> ECV or Background as Applicable? [1] Y or N	Proposed Sample ID	Notes
Metals							
Arsenic				**11 mg/kg (bckg)**	**11.4 mg/kg**		
0-0.5 ft bgs	Y	19 of 19	9.5 mg/kg	N	N	None	Compound exceeds HHCV and ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	38 of 38	13 mg/kg	Y	Y		
0-6 ft bgs	Y	56 of 56	13 mg/kg	Y	Y		
0-10 ft bgs	Y	74 of 74	13 mg/kg	Y	NA		
Barium				**5200 mg/kg**	**410 mg/kg (bckg)**		
0-0.5 ft bgs	Y	19 of 19	310 mg/kg	N	N	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	38 of 38	370 mg/kg	N	N		
0-6 ft bgs	Y	56 of 56	1300 mg/kg	N	Y		
0-10 ft bgs	Y	74 of 74	1300 mg/kg	N	NA		
Chromium-Total				**280 mg/kg**	**39.8 mg/kg (bckg)**		
0-0.5 ft bgs	Y	19 of 19	43 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	38 of 38	130 mg/kg	N	Y		
0-6 ft bgs	Y	56 of 56	130 mg/kg	N	Y		
0-10 ft bgs	Y	74 of 74	130 mg/kg	N	NA		
Copper				**3000 mg/kg**	**20.6 mg/kg**		
0-0.5 ft bgs	Y	19 of 19	20 mg/kg	N	N	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	38 of 38	41 mg/kg	N	Y		
0-6 ft bgs	Y	56 of 56	41 mg/kg	N	Y		
0-10 ft bgs	Y	74 of 74	41 mg/kg	N	NA		
Lead				**80 mg/kg**	**8.39 mg/kg (bckg)**		
0-0.5 ft bgs	Y	19 of 19	45 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	38 of 38	45 mg/kg	N	Y		
0-6 ft bgs	Y	56 of 56	45 mg/kg	N	Y		
0-10 ft bgs	Y	74 of 74	45 mg/kg	N	NA		
Molybdenum				**380 mg/kg**	**2.25 mg/kg**		
0-0.5 ft bgs	N	3 of 19	2.7 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC with the exception of the 0-0.5 ft bgs exposure interval. While this is insufficient to calculate an EPC using ProUCL for this exposure interval, the maximum concentration is low (i.e., does not exceed two times the lowest comparison value). Therefore, using the maximum result as the EPC is not expected to significantly impact the results of the risk assessment.
0-3 ft bgs	Y	9 of 38	2.9 mg/kg	N	Y		
0-6 ft bgs	Y	13 of 56	2.9 mg/kg	N	Y		
0-10 ft bgs	Y	17 of 74	2.9 mg/kg	N	NA		

TABLE C5-11
Decision 2 Data Gaps Summary AOC 11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [1] Y or N	> ECV or Background as Applicable? [1] Y or N	Proposed Sample ID	Notes
Selenium				**380 mg/kg**	**1.47 mg/kg (bckg)**		
0-0.5 ft bgs	NA	0 of 19	NA mg/kg	N	N	None	Compound exceeds ECV. Although there are insufficient detections to allow calculation of a 95% UCL on the mean, additional data collection is not expected to yield sufficient detections to strongly influence the EPC because additional sampling would likely result in additional non-detect values.
0-3 ft bgs	NA	0 of 38	NA mg/kg	N	N		
0-6 ft bgs	N	2 of 56	3.2 mg/kg	N	Y		
0-10 ft bgs	N	2 of 74	3.2 mg/kg	N	NA		
Zinc				**23000 mg/kg**	**58 mg/kg (bckg)**		
0-0.5 ft bgs	Y	19 of 19	160 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	38 of 38	170 mg/kg	N	Y		
0-6 ft bgs	Y	56 of 56	170 mg/kg	N	Y		
0-10 ft bgs	Y	74 of 74	290 mg/kg	N	NA		
Contract Laboratory Program Inorganics							
Aluminum				**77000 mg/kg**	**16400 mg/kg (bckg)**		
0-0.5 ft bgs	Y	7 of 7	20000 mg/kg	N	Y	None	Compound exceeds ECV and background. Existing data adequate for EPC.
0-3 ft bgs	Y	7 of 7	20000 mg/kg	N	Y		
0-6 ft bgs	Y	7 of 7	20000 mg/kg	N	Y		
0-10 ft bgs	Y	7 of 7	20000 mg/kg	N	NA		
Manganese				**1800 mg/kg**	**402 mg/kg (bckg)**		
0-0.5 ft bgs	Y	7 of 7	440 mg/kg	N	Y	None	Compound exceeds ECV and background. Existing data adequate for EPC.
0-3 ft bgs	Y	7 of 7	440 mg/kg	N	Y		
0-6 ft bgs	Y	7 of 7	440 mg/kg	N	Y		
0-10 ft bgs	Y	7 of 7	440 mg/kg	N	NA		
Potassium				**4400 mg/kg (bckg)**	**4400 mg/kg (bckg)**		
0-0.5 ft bgs	Y	7 of 7	5300 mg/kg	Y	Y	None	Compound exceeds HHCV and ECV (both background). Existing data adequate for EPC.
0-3 ft bgs	Y	7 of 7	5300 mg/kg	Y	Y		
0-6 ft bgs	Y	7 of 7	5300 mg/kg	Y	Y		
0-10 ft bgs	Y	7 of 7	5300 mg/kg	Y	NA		
Polynuclear Aromatic Hydrocarbons							
PAHs (BaP TEQ)				**38 µg/kg**	**NA**		
0-0.5 ft bgs	Y	19 of 19	510 µg/kg	Y	NA	None	Compound exceeds HHCV. Existing data adequate for EPC.
0-3 ft bgs	Y	30 of 38	510 µg/kg	Y	NA		
0-6 ft bgs	Y	38 of 56	510 µg/kg	Y	NA		
0-10 ft bgs	Y	42 of 74	510 µg/kg	Y	NA		

TABLE C5-11
Decision 2 Data Gaps Summary AOC 11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

	Adequate EPC?		Maximum Detected Value	> HHCV or Background as Applicable? [1]	> ECV or Background as Applicable? [1]		
Compound/Depth	Y or N	Det/# results		Y or N	Y or N	Proposed Sample ID	Notes
HMW PAHs				**NA**	**1160 µg/kg**		
0-0.5 ft bgs	Y	19 of 19	4900 µg/kg	NA	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	30 of 38	4900 µg/kg	NA	Y		
0-6 ft bgs	Y	38 of 56	4900 µg/kg	NA	Y		
Polychlorinated Biphenyls							
Total PCBs				**220 µg/kg**	**204 µg/kg**		
0-0.5 ft bgs	Y	5 of 9	430 µg/kg	Y	Y	None	Compound exceeds HHCV and ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	7 of 14	430 µg/kg	Y	Y		
0-6 ft bgs	Y	9 of 17	430 µg/kg	Y	Y		
0-10 ft bgs	Y	9 of 20	430 µg/kg	Y	NA		
Pesticides							
DDT-R				**1600 µg/kg**	**2.1 µg/kg**		
0-0.5 ft bgs	N	1 of 7	6.1 µg/kg	N	Y	None	Compound exceeds ECV and existing data not adequate to calculate 95% UCL. DDE was detected in 1 of 7 samples; DDT and DDD were not detected. Additional sampling is not expected to significantly change the results (NDs are likely and the EPC would still be the maximum detected value).
0-3 ft bgs	N	1 of 7	6.1 µg/kg	N	Y		
0-6 ft bgs	N	1 of 7	6.1 µg/kg	N	Y		
0-10 ft bgs	N	1 of 7	6.1 µg/kg	N	NA		
Dieldrin				**35 µg/kg**	**5 µg/kg**		
0-0.5 ft bgs	N	1 of 7	6.7 µg/kg	N	Y	None	Compound exceeds ECV and existing data not adequate to calculate 95% UCL. The magnitude of the detection is low relative to the ECV. Additional sampling is not expected to significantly change the results (NDs are likely and the EPC would still be the maximum detected value).
0-3 ft bgs	N	1 of 7	6.7 µg/kg	N	Y		
0-6 ft bgs	N	1 of 7	6.7 µg/kg	N	Y		
0-10 ft bgs	N	1 of 7	6.7 µg/kg	N	NA		

Footnotes:
[1] The higher value of either the HHCV/ECV or background was selected as the screening criteria and are included in these columns for the respective compound in **BOLDED BLUE FONT**. Values based on background are indicated with "(bckg)" next to the value.

Acronyms and Abbreviations:
AOC - area of concern
BaP TEQ - benzo(a)pyrene toxic equivalents
ECV - ecological comparison values
EPC - exposure point concentration

TABLE C5-11
Decision 2 Data Gaps Summary AOC 11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [1] Y or N	> ECV or Background as Applicable? [1] Y or N	Proposed Sample ID	Notes

ft bgs - feet below ground surface
HHCV - human health comparison values
HMW PAH - high molecular weight polycyclic aromatic hydrocarbons
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
N - no
NA - not applicable
Y - yes

TABLE C5-12
Results of Tiered Analysis at AOCs 11a through 11e
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Metal	Step 1 Do COPCs/COPECs Exceed Background?	Step 2 Do COPCs/COPECs Exceed SSL?	Step 3 Does Screening Model Eliminate Potential for Impact to Groundwater?
AOC 11a			
Barium	✓		
Chromium	✓		
Chromium, Hexavalent	✓	✓	No
Copper	✓		
Lead	✓		
Molybdenum	✓	✓	Yes
Selenium	✓		
Zinc	✓		
AOC 11b			
Chromium	✓		
Chromium, Hexavalent	✓	✓	No
Copper	✓		
Lead	✓		
AOC 11c			
Chromium	✓		
Chromium, Hexavalent	✓	✓	No
Copper	✓		
Lead	✓		
Molybdenum	✓	✓	Yes
Zinc	✓		
AOC 11d			
Chromium, Hexavalent	✓		
Copper	✓		
Lead	✓		
Zinc	✓		
AOC 11e			
Chromium	✓		
Chromium, Hexavalent	✓	✓	No
Copper	✓		
Lead	✓		
Molybdenum	✓	✓	
Zinc	✓		

✓ = Constituents concentration exceeds background and/or SSL.

TABLE C5-13
Sample Results Compared to the Calculated Soil Screening Levels
AOC11a
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)							
			Soil Screening Levels : [1]	12,000	16,000	1	63,000	10,000	0.73	120	380,000
			Background : [2]	410	39.8	0.83	16.8	8.39	1.37	1.47	58
Location	Date	Depth (ft bgs)	Sample Type	Barium	Chromium	Chromium Hexavalent	Copper	Lead	Molybdenum	Selenium	Zinc
AOC11a-1	09/21/08	0 - 0.5	N	170	19	ND (0.403)	12	9.9	ND (2)	ND (1)	46
	09/21/08	2 - 3	N	190	23	ND (0.411)	14	20	ND (2.1)	ND (1)	58
	09/21/08	5 - 6	N	190	22	ND (0.41)	9	4.7	ND (1)	1.6	44
	09/21/08	9 - 10	N	190	19	3	10	9.2	ND (2)	ND (1)	44
AOC11a-2	09/21/08	0 - 0.5	N	210	32	0.417	20	15	ND (2.1)	ND (2.1)	75
	09/21/08	2 - 3	N	220	19	ND (0.413)	10	7.7	ND (2.1)	ND (1)	42
	09/21/08	5 - 6	N	1,300	25	ND (0.408)	14	3.4	ND (2)	ND (2)	56
	09/21/08	9 - 10	N	480	19	ND (0.412)	6.5	2.2	1	ND (1)	47
AOC11a-3	09/20/08	0 - 0.5	N	190	22	ND (0.411)	16	13	ND (2)	ND (1)	62
	09/20/08	2 - 3	N	220	24	ND (0.423)	14	17	2.2	ND (1)	63
	09/20/08	2 - 3	FD	220	24	ND (0.418)	14	16	2.4	ND (1)	61
	09/20/08	5 - 6	N	410	76	0.634	15	25	ND (2.1)	ND (1)	75
	09/20/08	9 - 10	N	110	23	ND (0.407)	11	2.9	1.1	ND (1)	48
AOC11a-4	09/20/08	0 - 0.5	N	180	25	ND (0.409)	18	17	ND (2)	ND (1)	79
	09/20/08	2 - 3	N	210	27	ND (0.41)	13	8	ND (2)	ND (1)	52
	09/20/08	5 - 6	N	140	25	ND (0.407) J	11	3.7	ND (2)	ND (1)	54
	09/20/08	9 - 10	N	640	27	ND (0.41)	14	3.5	ND (2)	ND (1)	59
AOC11a-5	09/21/08	0 - 0.5	N	210	32	0.652	17	14	ND (2.1)	ND (1)	71
	09/21/08	2 - 3	N	370	30	ND (0.412)	12	9.4	2.5	ND (1)	57
	09/21/08	5 - 6	N	82	18	ND (0.411)	9.2	3	1.5	ND (1)	53
	09/21/08	5 - 6	FD	84	18	ND (0.412)	9.6	3.1	1.6	3.2	51
	09/21/08	9 - 10	N	1,000	24	ND (0.415)	9.8	3.1	2.5	ND (1)	62
AOC11a-SS1	09/21/08	0 - 0.5	N	88	13	ND (0.402)	9.4	5.6	1.1	ND (1)	54
	09/21/08	2 - 3	N	130	19	ND (0.404)	8.9	6	ND (2)	ND (1)	48
	09/21/08	5 - 6	N	77	16	ND (0.408)	7.6	3	ND (1)	ND (1)	42
	09/21/08	9 - 10	N	230	13	ND (0.414)	7	3	ND (1)	ND (1)	40
AOC11a-SS2	09/21/08	0 - 0.5	N	120	15	ND (0.414)	8.1	7.1	ND (1)	ND (1)	42
	09/21/08	2 - 3	N	140	19	ND (0.402)	15	5.9	ND (1)	ND (1)	53

TABLE C5-13

Sample Results Compared to the Calculated Soil Screening Levels
AOC11a
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)							
			Soil Screening Levels : [1]	**12,000**	**16,000**	**1**	**63,000**	**10,000**	**0.73**	**120**	**380,000**
			Background : [2]	**410**	**39.8**	**0.83**	**16.8**	**8.39**	**1.37**	**1.47**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Barium**	**Chromium**	**Chromium Hexavalent**	**Copper**	**Lead**	**Molybdenum**	**Selenium**	**Zinc**
AOC11a-SS3	09/20/08	0 - 0.5	N	240	29	0.622	17	16	ND (2)	ND (1)	73
	09/20/08	2 - 3	N	270	27	ND (0.409)	15	5.7	ND (2)	ND (1)	57
	09/20/08	5 - 6	N	51	19	ND (0.412)	9.5	3.7	1.1	ND (1)	46
	09/20/08	9 - 10	N	150	24	ND (0.413)	11	3	1.4	ND (1)	48

1 Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.

2 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL and greater than or equal to the background value are circled.

mg/kg milligrams per kilogram
ft bgs feet below ground surface
N primary sample
FD field duplicate
--- not analyzed
ND not detected at the listed reporting limit
J concentration or reporting limit estimated by laboratory or data validation

TABLE C5-14

Sample Results Compared to the Calculated Soil Screening Levels
AOC11b
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)			
			Soil Screening Levels : [1]	**39**	**0.12**	**1,000**	**39,000**
			Background : [2]	**11**	**0.83**	**8.39**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Arsenic**	**Chromium Hexavalent**	**Lead**	**Zinc**
AOC11b-1	09/17/08	0 - 0.5	N	6.7	ND (0.402)	25	71
	09/17/08	0 - 0.5	FD	6.4	0.553	12	68
	09/17/08	2 - 3	N	5.2	ND (0.404)	8.2	28
	09/17/08	5 - 6	N	6.2	ND (0.411)	22	72
	09/17/08	9 - 10	N	6	ND (0.411)	13	65
AOC11b-2	09/17/08	0 - 0.5	N	4.8	0.645	45	76
	09/17/08	2 - 3	N	13	ND (0.41)	7.6	74
	09/17/08	5 - 6	N	10	ND (0.411)	5.9	75
	09/17/08	9 - 10	N	9	ND (0.407)	8.2	86

[1] Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.
[2] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL and greater than or equal to the background value are circled.

mg/kg milligrams per kilogram
ft bgs feet below ground surface
N primary sample
FD field duplicate
--- not analyzed
ND not detected at the listed reporting limit
J concentration or reporting limit estimated by laboratory or data validation

TABLE C5-15

Sample Results Compared to the Calculated Soil Screening Levels
AOC11c
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)					
			Soil Screening Levels : [1]	**16,000**	**1.1**	**64,000**	**10,000**	**0.73**	**390,000**
			Background : [2]	**39.8**	**0.83**	**16.8**	**8.39**	**1.37**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Chromium**	**Chromium Hexavalent**	**Copper**	**Lead**	**Molybdenum**	**Zinc**
AOC11c-1	09/21/08	0 - 0.5	N	26	ND (0.4)	9.7	30	2.7	47
	09/22/08	2 - 3	N	64	2.03	20	26	2.1	110
	09/22/08	2 - 3	FD	63	1.47	19	25	2.3	110
	09/22/08	5 - 6	N	64	2.03	20	24	ND (2.1)	110
	09/22/08	9 - 10	N	130	3.33	17	11	ND (2)	62
AOC11c-2	09/21/08	0 - 0.5	N	26	0.744	12	11	ND (2)	52
	09/22/08	2 - 3	N	81	2.74	21	28	2.7	130
	09/22/08	5 - 6	N	56	1.3	16	18	ND (2.1)	93
	09/22/08	9 - 10	N	70	2.05	16	10	ND (2)	70
AOC11c-SS2	09/22/08	0 - 0.5	N	14	ND (0.401)	4.9	8	ND (1)	25
	09/22/08	2 - 3	N	16	ND (0.402)	4.9	6.5	ND (1)	30
	09/22/08	5 - 6	N	32	7.78	11	8.9	ND (1)	54
	09/22/08	9 - 10	N	73	2.06	30	8.6	ND (1)	290

[1] Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.
[2] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL and greater than or equal to the background value are circled.

mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-16

Sample Results Compared to the Calculated Soil Screening Levels
AOC11d
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)			
			Soil Screening Levels : [1]	**0.71**	**43,000**	**7,000**	**260,000**
			Background : [2]	**0.83**	**16.8**	**8.39**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Chromium Hexavalent**	**Copper**	**Lead**	**Zinc**
AOC11d-1	09/23/08	0 - 0.5	N	0.677	19	16	73
	09/23/08	0 - 0.5	FD	0.628	20	14	76
	09/23/08	2.5 - 3	N	ND (0.414)	12	4.8	48
	09/23/08	5 - 6	N	ND (0.416)	12	5	52
	09/23/08	9 - 10	N	0.659	11	9.3	49

[1] Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.
[2] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL and greater than or equal to the background value are circled.

mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-17

Sample Results Compared to the Calculated Soil Screening Levels
AOC11e
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)					
			Soil Screening Levels : [1]	**8,800**	**0.58**	**35,000**	**5,600**	**0.73**	**210,000**
			Background : [2]	**39.8**	**0.83**	**16.8**	**8.39**	**1.37**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Chromium**	**Chromium Hexavalent**	**Copper**	**Lead**	**Molybdenum**	**Zinc**
AOC11e-1	09/23/08	0 - 0.5	N	43	0.959	10	10	ND (2)	54
	09/23/08	2.5 - 3	N	92	3.19	41	9	ND (1)	170
	09/23/08	5.5 - 6	N	48	0.961	17	6.4	ND (1)	59
	09/23/08	9.5 - 10	N	84	3.2	31	13	ND (1)	140
AOC11e-2	09/24/08	0 - 0.5	N	37	1.4	12	28	1.1	160
	09/24/08	2 - 3	N	130	3.78	19	11	2.6	130
	09/24/08	2 - 3	FD	130	3.51	18	11	2.9	120
	09/24/08	5 - 6	N	98	2.25	30	9.6	1.3	150
	09/24/08	9 - 10	N	36	ND (0.436)	19	4.6	ND (2.1)	53
AOC11e-SS1	09/23/08	0 - 0.5	N	20	0.698	8.7	8.6	ND (1)	35 J
	09/23/08	2.5 - 3	N	21	ND (0.411)	7.7	4.8	ND (1)	27
	09/23/08	5.5 - 6	N	9.2	ND (0.407)	5.1	5.2	ND (1)	20
	09/23/08	9.5 - 10	N	10	ND (0.407)	10	5.4	ND (1)	19
AOC11e-SS2	09/23/08	0 - 0.5	N	28	1.38	8.1	9.5	ND (1)	39
	09/23/08	2.5 - 3	N	21	0.438	9.7	7.4	ND (2)	35
	09/23/08	5.5 - 6	N	26	0.466	10	5.1	ND (1)	39
	09/23/08	5.5 - 6	FD	27	0.437	9.6	5.5	ND (1)	37
	09/23/08	9.5 - 10	N	21	0.5	11	3.8	ND (1.1)	37

TABLE C5-17

Sample Results Compared to the Calculated Soil Screening Levels
AOC11e
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

[1] Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.

[2] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL and greater than or equal to the background value are circled.

mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C5-18

Constituent Concentrations in Soil Compared to Total Threshold Limit Concentration (TTLC), Soluble Threshold Limit Concentration (STLC), and Toxic Characteristic Leaching Procedure (TCLP)
AOC 11 - Topographic Low Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Topock Compressor Station, Needles, California

Parameter	Frequency of detection	Maximum Detected Value (mg/kg)	TTLC in mg/kg[1]		STLC in mg/L[1]			TCLP in mg/L[1]		
			# of Exceedences	TTLC	# of Exceedences of STLC x 10	STLC x 10	STLC	# of Exceedences of TCLP x 20	TCLP x 20	TCLP
Antimony	0 / 74 (0%)	ND (2.1)	0	500	0	150	15	0	NE	NE
Arsenic	74 / 74 (100%)	13	0	500	0	50	5	0	100	5
Barium	74 / 74 (100%)	1,300	0	10000	1	1000	100	0	2000	100
Beryllium	0 / 74 (0%)	ND (5.1)	0	75	0	7.5	0.75	0	NE	NE
Cadmium	0 / 74 (0%)	ND (1.1)	0	100	0	10	1	0	20	1
Chromium	74 / 74 (100%)	130	0	2500	12	50	5	2	100	5
Chromium, Hexavalent	31 / 74 (42%)	7.78	0	500	0	50	5	0	NE	NE
Cobalt	74 / 74 (100%)	9.6	0	8000	0	800	80	0	NE	NE
Copper	74 / 74 (100%)	41	0	2500	0	250	25	0	NE	NE
Lead	74 / 74 (100%)	45	0	1000	0	50	5	0	100	5
Mercury	0 / 74 (0%)	ND (0.11)	0	20	0	2	0.2	0	4	0.2
Molybdenum	17 / 74 (23%)	2.9	0	3500	0	3500	350	0	NE	NE
Nickel	74 / 74 (100%)	22	0	2000	0	200	20	0	NE	NE
Selenium	2 / 74 (2.7%)	3.2	0	100	0	10	1	0	20	1
Silver	0 / 74 (0%)	ND (5.1)	0	500	0	50	5	0	100	5
Thallium	0 / 74 (0%)	ND (10)	0	700	0	70	7	0	NE	NE
Vanadium	74 / 74 (100%)	44	0	2400	0	240	24	0	NE	NE
Zinc	74 / 74 (100%)	290	0	5000	0	2500	250	0	NE	NE

Notes:

[1] Code of Regulations, Title 22, Chapter 11, Article 3

mg/kg miligrams per kilogram
mg/L milligrams per liter
ND not detected in any of the samples
NE not established
‡ maximum reporting limit greater than or equal to the STLC.

TABLE C5-19
Proposed Phase 2 Sampling Locations at AOC 11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Method[a]
AOC11c-3	14, 19, 29, 39, 49, 59, and 69 (to groundwater)	To resolve Data Gaps #6, and #7 - Collect data to assess current threat to groundwater and support CMS/FS	Hexavalent chromium, Title 22 metals, PAHs, PCBs, pesticides, soil physical parameters (Atterberg limits, relative compaction, alkalinity, cation exchange, capacity, and particle size distribution) – three samples from boring	Rotosonic
AOC11c-4	0, 2, 5, 9, 14, and 19	To resolve Data Gap #21 and #6 - Define lateral and vertical extents of contamination in AOC11c. Collect data to assess current threat to groundwater	Hexavalent chromium, Title 22 metals, PAHs, PCBs, pesticides	Rotosonic
AOC11e-3	0, 2, 5, 9, and 14	To resolve Data Gap #3 - Define lateral and vertical extents of contamination upslope of AOC 11e (may not be technically feasible to get to depth)	Hexavalent chromium, Title 22 metals, PAHs, PCBs, pesticides	Backhoe
AOC11e-4	0, 2, 5, 9, and 14	To resolve Data Gaps #3 and #7 - Define lateral and vertical extents of contamination upslope of AOC 11e (may not be technically feasible to get to depth) and support CMS/FS	Hexavalent chromium, Title 22 metals, PAHs, PCBs, pesticides, soil physical parameters (Atterberg limits, relative compaction, alkalinity, cation exchange, capacity, and particle size distribution) – three samples from boring	Backhoe
AOC11e-5	14, 19, 29, 39, 49, 59, and 69 (to groundwater)	To resolve Data Gaps #4 and #6 - Define vertical extent of contamination in AOC 11e; refine vadose zone leaching model	Hexavalent chromium, Title 22 metals, PAHs, PCBs, pesticides	Backhoe
AOC11e-6	0	To resolve Data Gaps #5 and #8 - Assess white powder material in newly identified white powder area	Title 22 metals, hexavalent chromium, general chemistry, pH	Hand tools
AOC11-1	0, 2, 5, and 9	To resolve Data Gaps #5 and #8 - Assess new subareas	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs	Rotosonic
AOC11-2	0, 2, 5, and 9	To resolve Data Gaps #5 and #8–Assess new subareas	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs, PCBs, dioxins and furans	Rotosonic
AOC11-3	0, 2, 5, and 9	To resolve Data Gaps #5 and #8–Assess new subareas	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs, PCBs, dioxins and furans	Rotosonic
AOC11-4	0, 2, 5, and 9	To resolve Data Gaps #5 and #8– new subareas	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs, dioxins and furans	Backhoe

TABLE C5-19
Proposed Phase 2 Sampling Locations at AOC 11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

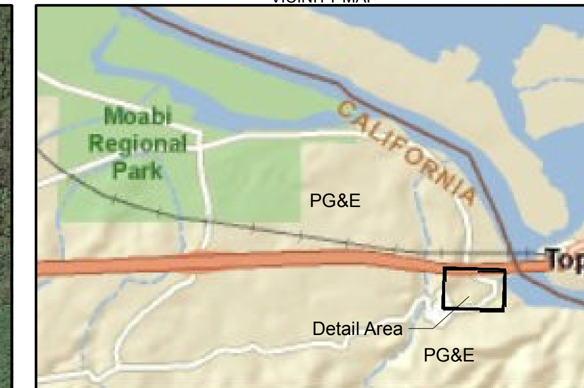
Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Method[a]
AOC11-5	0, 2, 5, and 9	To resolve Data Gaps #5 and #8 - Assess new subareas	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs, dioxins and furans	Backhoe
AOC11-6	0, 2, 5, and 9	To resolve Data Gaps #5 and #8 - Assess new subareas	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs	Rotosonic
AOC11-7	0, 2, 5, and 9	To resolve Data Gaps #5 and #8 - Assess new subareas	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs	Rotosonic drill rig
AOC11-8	0, 2, 5, and 9	To resolve Data Gaps #5 and #8 - Assess downslope areas below Subarea 11g	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs, PCBs, TAL/TCL constituents	Hand tools
AOC11-9	0, 2, 5, and 9	To resolve Data Gaps #5 and #8 - Assess downslope areas below Subarea 11g	Title 22 metals, hexavalent chromium, pH, TPH, SVOCs, PAHs, PCBs, TAL/TCL constituents	Hand tools

Notes:

[a] Proposed collection methods listed on this table are based on experience and knowledge of the site; actual collection method will be chosen in the field based on field conditions and site access restrictions.

Figures

VICINITY MAP



LEGEND

- Access Routes
- AOC 11 Boundary
- White Powder
- Potential Burning Related Location
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground

Note:
1.Topographic contours shown are in 2 foot intervals.

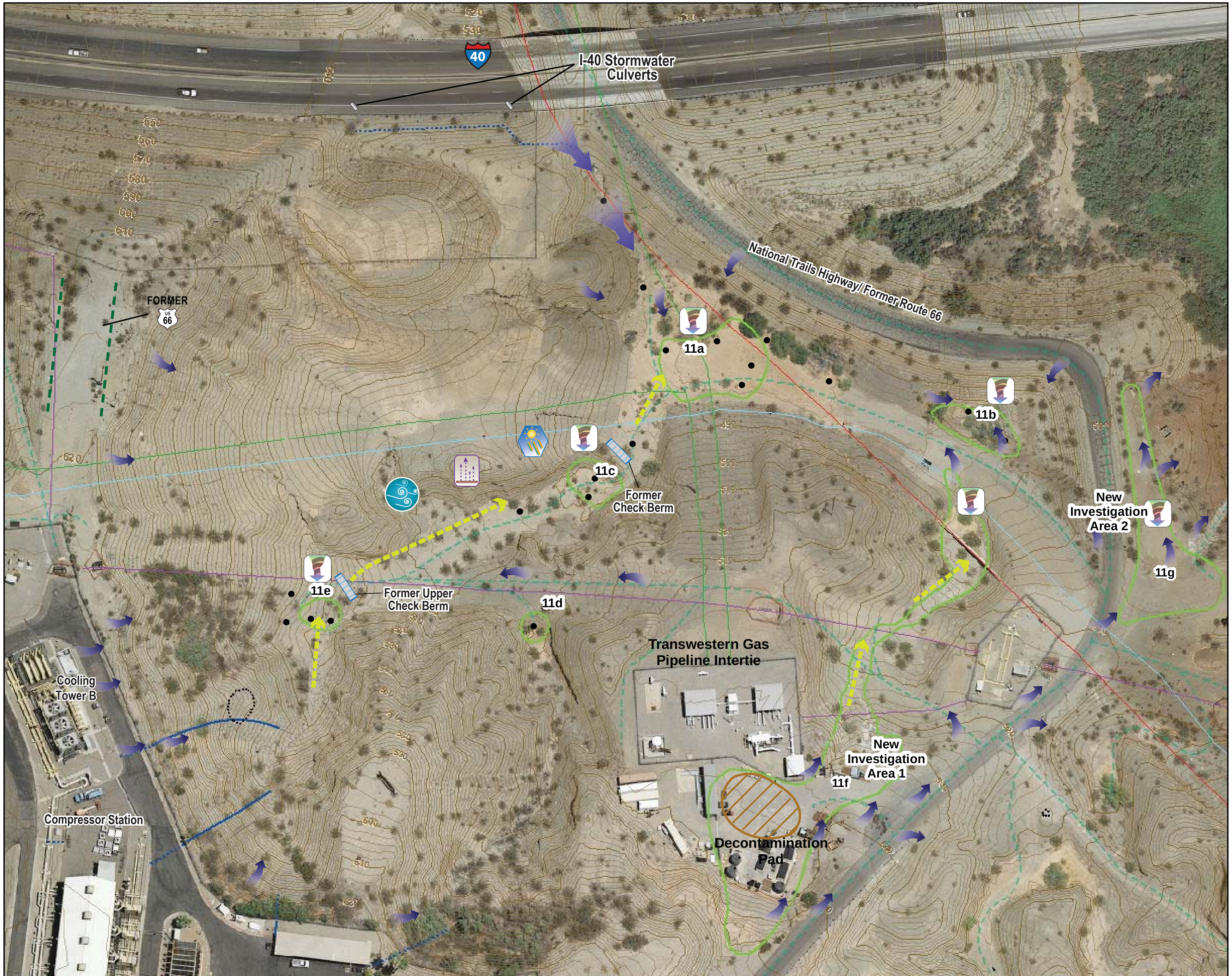
N

0 50 100 200
Feet

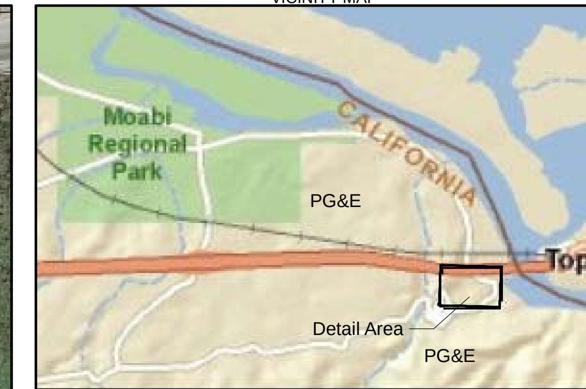
FIGURE C5-1
Burn Areas and Topographic Low Areas
AOC11

Soil Investigation Part A
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

Path: D:\Projects\Topock\MapFiles\2012\SWP_A\AOC11\AOC11_BurnAreas.mxd



VICINITY MAP



LEGEND

- Soil Boring
- Potential Burning Related Location
- Access Routes
- Area of Concern
- Solid Waste Management Unit
- White Powder
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground

Potential Release Mechanisms

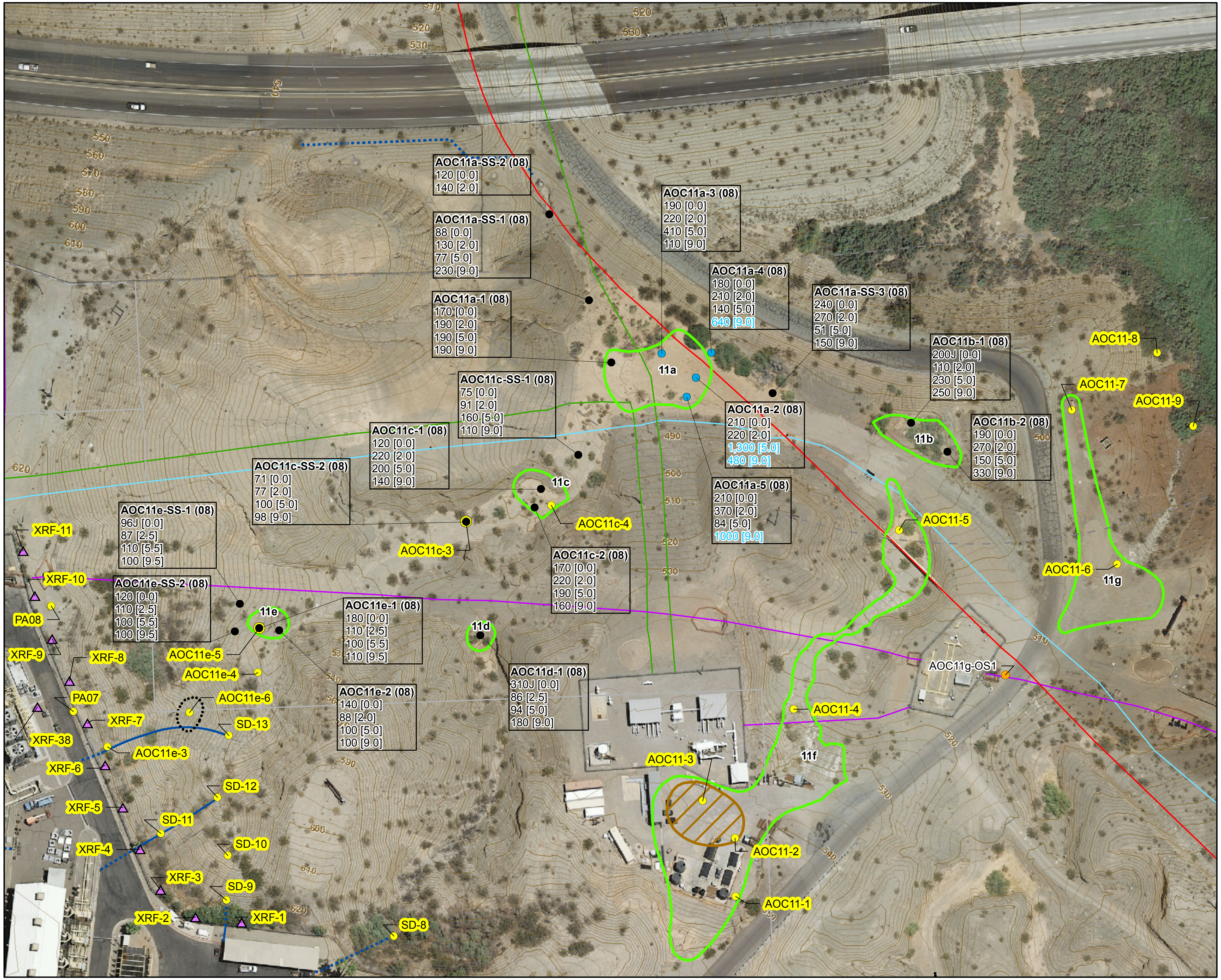
- Infrequent Surface Water Runoff
- Infiltration (Site-wide)
- Windblown Dispersion of Soil (Site-wide)
- Volatilization (Site-wide)
- Degradation by Heat/Light (Site-wide)
- Downstream Movement During Flow Events

Note:
1.Topographic contours shown are in 2 foot intervals.

N

0 50 100 200
Feet

FIGURE C5-2
Conceptual Site Model for AOC-11
Soil Investigation Part A
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California



VICINITY MAP

LEGEND

- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Existing Opportunistic Soil Sample Location
- Soil Boring
- Property Boundary
- Caltrans ROW
- White Powder
- AOC 11 Boundary
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (410 mg/kg) are shown in BLUE.
5. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (5,200 mg/kg) are shown in ORANGE.
6. J = Estimated Result.
7. Ecological Comparison Value (330 mg/kg) is below background value; therefore, the screening level is set at the background value.
8. Topographic contours are shown at 2 foot intervals.

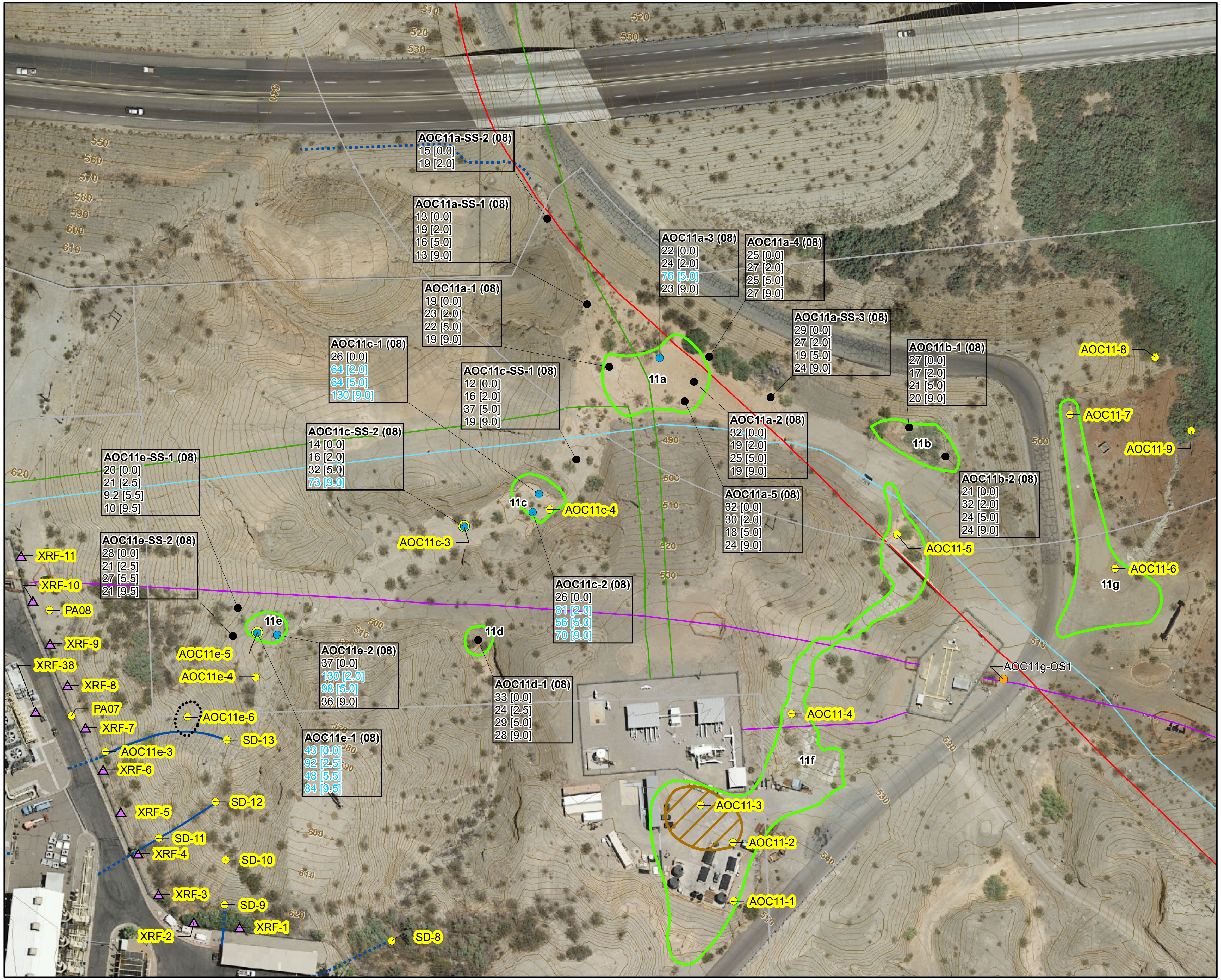
0 100 200
Feet

N

FIGURE C5-3
Barium
Soil Sample Results
AOC11

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL



VICINITY MAP

LEGEND

- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Existing Opportunistic Soil Sample Location
- Soi Boring
- Property Boundary
- Caltrans ROW
- White Powder
- AOC 11 Boundary
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (39.8 mg/kg) are shown in BLUE.
5. Results greater than or equal to the U.S. Environmental Protection Agency Residential Regional Screening Level (280 mg/kg) are shown in ORANGE.
6. J = Estimated Result.
7. Ecological Comparison Value (36.3 mg/kg) is below background value; therefore, the screening level is set at the background value.
8. Topographic contours are shown at 2 foot intervals.

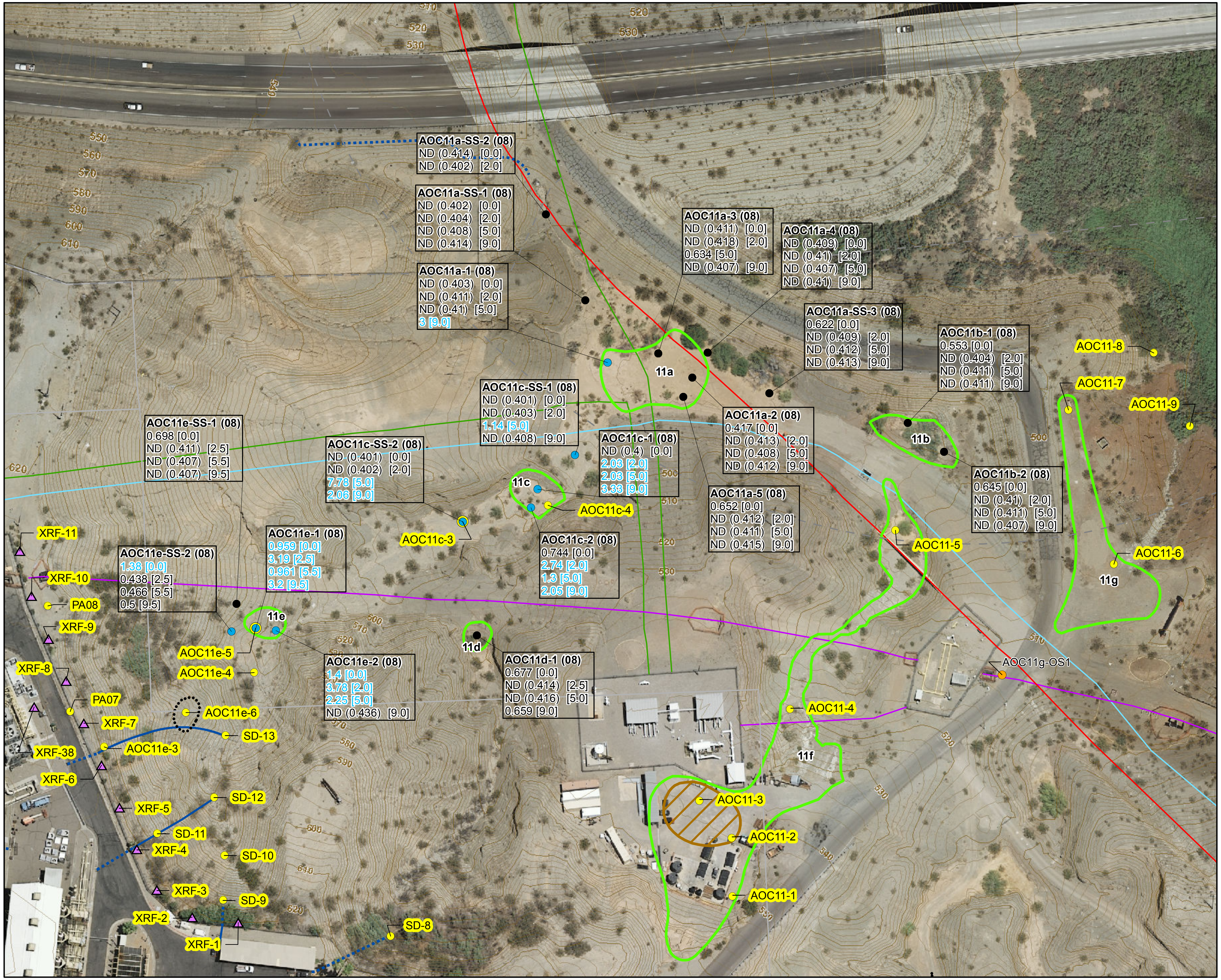
N

0 100 200
Feet

FIGURE C5-4
Total Chromium
Soil Sample Results
AOC11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC11\AOC11_DG_CRT.MXD



VICINITY MAP

LEGEND

- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Existing Opportunistic Soil Sample Location
- Soil Boring
- Property Boundary
- Caltrans ROW
- White Powder
- AOC 11 Boundary
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (0.83 mg/kg) are shown in BLUE.
5. Results greater than or equal to the Ecoligical Comparison Value (139.6) are shown in PURPLE.
6. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (17 mg/kg) are shown in ORANGE.
7. J = Estimated Result.
8. Topographic contours are shown at 2 foot intervals.

0 100 200
Feet

N

FIGURE C5-5
Hexavalent Chromium Soil Sample Results AOC11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC11\AOC11_DG_CR6.MXD

VICINITY MAP

LEGEND

- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Existing Opportunistic Soil Sample Location
- Soil Boring
- Property Boundary
- Caltrans ROW
- White Powder
- AOC 11 Boundary
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (16.8 mg/kg) are shown in BLUE.
5. Results greater than or equal to the Ecological Comparison Value (20.6 mg/kg) are shown in PURPLE.
6. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (3,000 mg/kg) are shown in ORANGE.
7. J = Estimated Result.
8. Topographic contours are shown at 2 foot intervals.

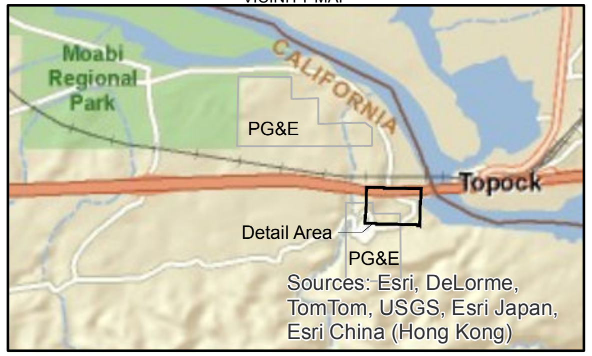
N
0 100 200
Feet

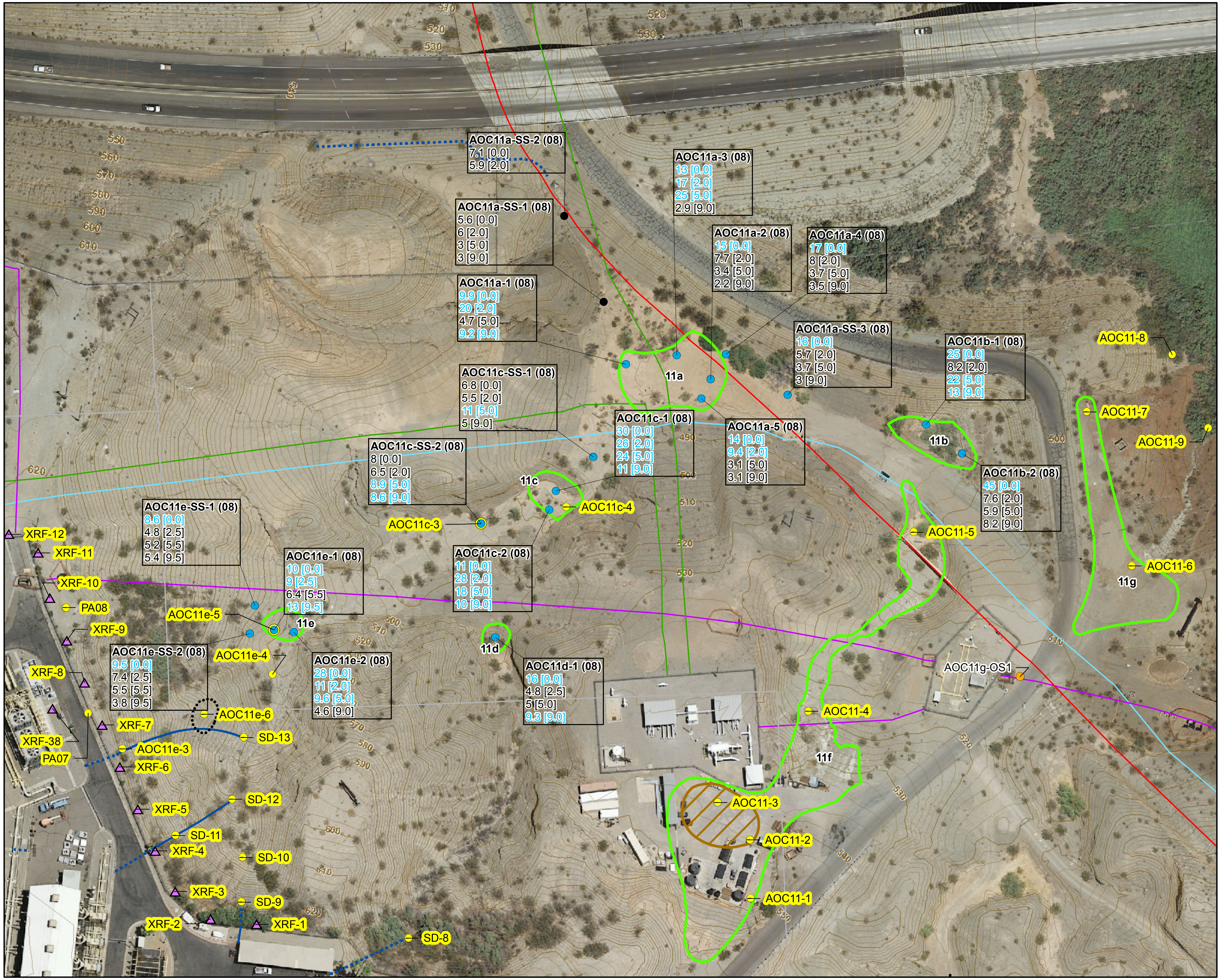
FIGURE C5-6
Copper
Soil Sample Results
AOC11

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC11\AOC11_DG_CU.MXD





LEGEND

- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Existing Opportunistic Soil Sample Location
- Soil Boring
- Property Boundary
- Caltrans ROW
- White Powder
- AOC 11 Boundary
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (8.39 mg/kg) are shown in BLUE.
5. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (150 mg/kg) are shown in ORANGE.
6. J = Estimated Result.
7. Ecological Comparison (0.0166 mg/kg) is below background value; therefore, the screening level is set at the background value.
9. Topographic contours shown at at 2 foot intervals.

N

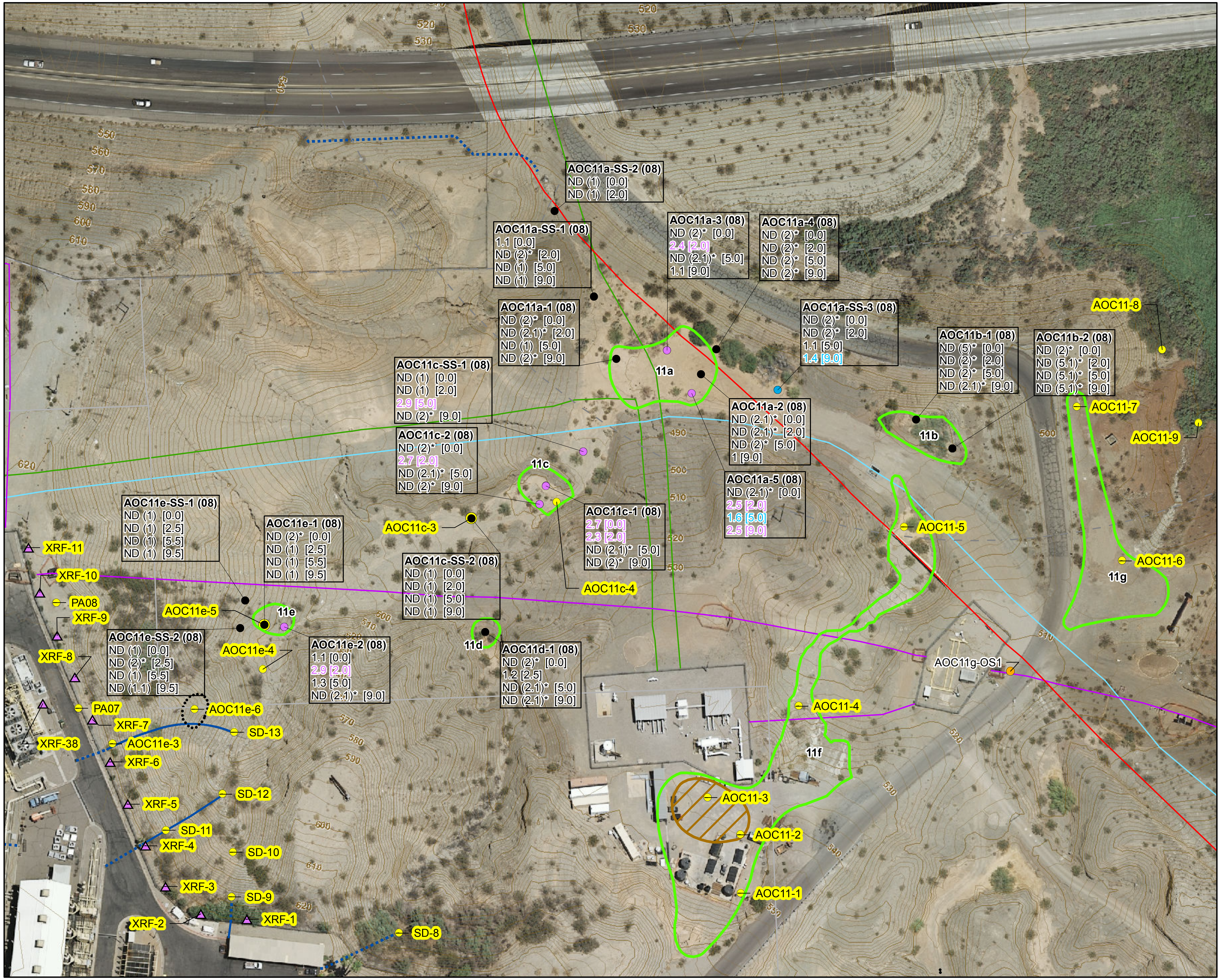
0 100 200
Feet

FIGURE C5-7
Lead
Soil Sample Results
AOC11

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC11\AOC11_DG_PB.MXD

CH2MHILL



VICINITY MAP

LEGEND

- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Existing Opportunistic Soil Sample Location
- Soil Boring
- Property Boundary
- Caltrans ROW
- White Powder
- AOC 11 Boundary
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location; Installation Date
20 [1] — Sample Beginning Depth (ft bgs); Soil Concentration (mg/kg)

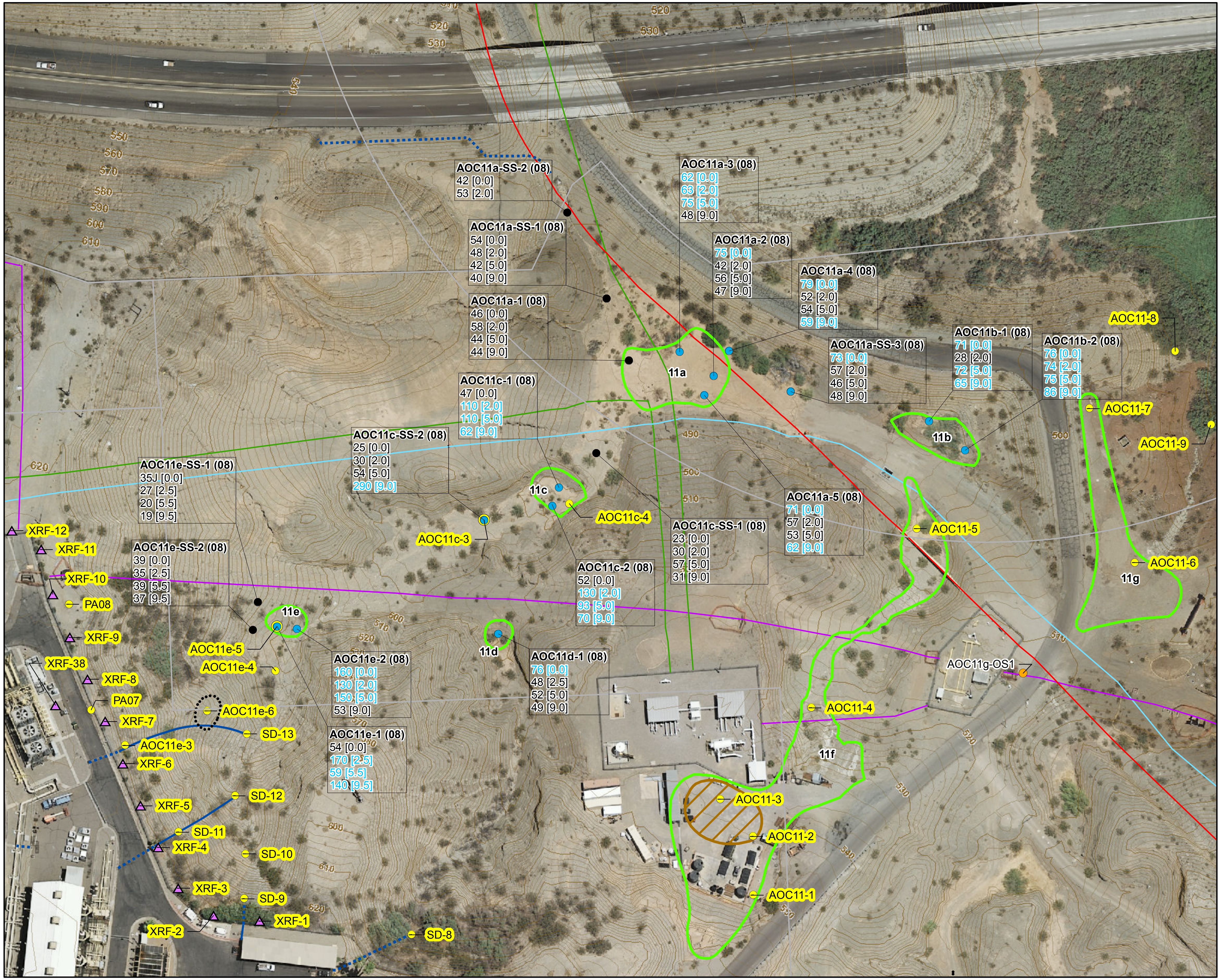
Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (1.37 mg/kg) are shown in BLUE.
5. Results greater than or equal to the Ecological Comparison Value (2.25 mg/kg) are shown in PURPLE.
6. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (380 mg/kg) are shown in ORANGE.
7. J = Estimated Result.
8. * = Laboratory reporting limit exceeds screening levels.
9. Topographic contours shown are in 2 foot intervals.

0 100 200
Feet

FIGURE C5-8
Molybdenum
Soil Sample Results
AOC11
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC11\AOC11_DG_MOLYB.MXD



VICINITY MAP

LEGEND

- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Existing Opportunistic Soil Sample Location
- Soil Boring
- Property Boundary
- Caltrans ROW
- White Powder
- AOC 11 Boundary
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (58 mg/kg) are shown in BLUE.
5. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (23,000 mg/kg) are shown in ORANGE.
6. J = Estimated Result.
7. Ecological Comparison Value (0.164 mg/kg) is below background value; therefore, the screening level is set at the background value.
8. Topographic contours shown are in 2 foor intervals.

0 100 200
Feet

N

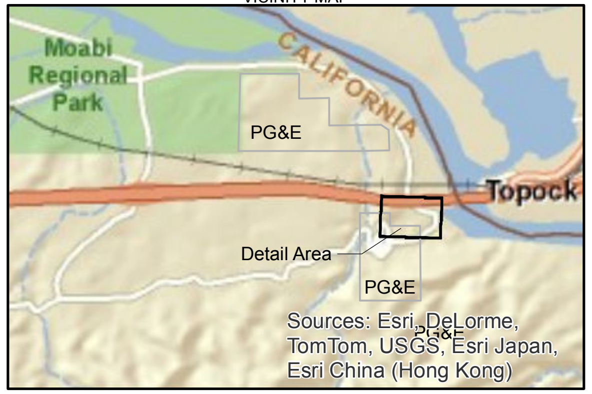
FIGURE C5-9
Zinc
Soil Sample Results
AOC11

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2009\AOC11\AOC11_DG_ZN.MXD

VICINITY MAP



LEGEND

- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Existing Opportunistic Soil Sample Location
- Soil Boring
- Property Boundary
- Caltrans ROW
- White Powder
- AOC 11 Boundary
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location; Installation Date
20 [1] — Sample Beginning Depth (ft bgs); Soil Concentration (µg/kg)

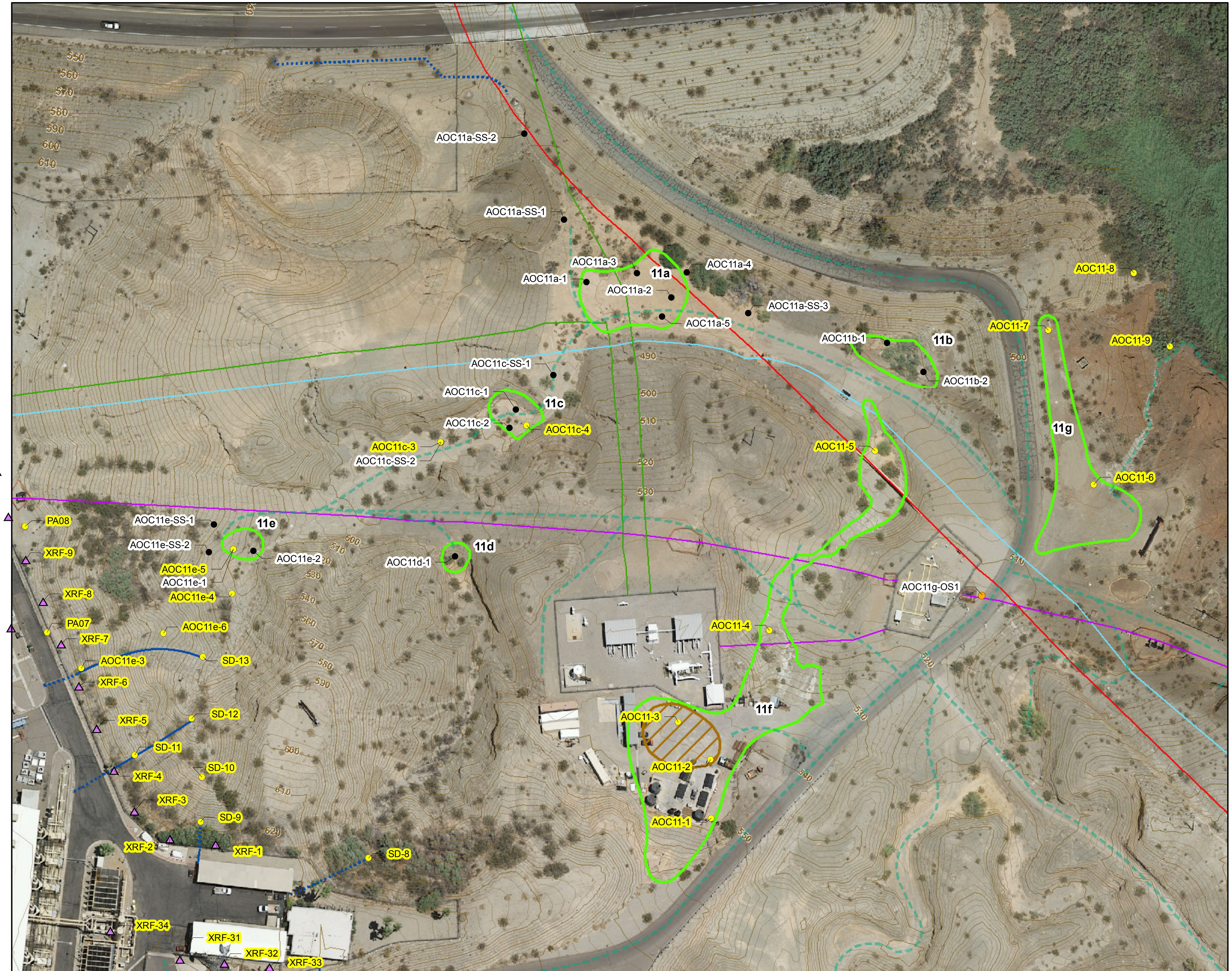
Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. µg/kg = micrograms per kilogram
3. ft bgs = feet below ground surface
4. Results greater than or equal to theCalifornia Department of Toxic Substances Control Residential California Human Health Screening Level (38 µg/kg) are shown in ORANGE.
5. J = Estimated Result.
6. No background level established
7. Topographic contours shown are in 2 foot intervals.

0 100 200
Feet

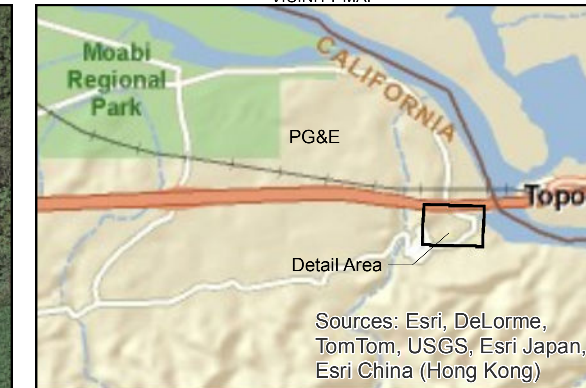
FIGURE C5-10
Benzo(A)pyrene Equivalent Soil Sample Results AOC11

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL



VICINITY MAP



LEGEND

- Soil Boring
- Existing Opportunistic Soil Sample Location
- Proposed Phase 2 Soil Sample Location
- Proposed XRF Screening Location
- Access Routes
- Area of Concern
- Potential Burning Related Location
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground

Note:
1.Topographic contours shown are in 2 foot intervals.

N

0 50 100 200
Feet

FIGURE C5-11
Proposed Phase 2
Soil Sample Locations
AOC11

Soil Investigation Part A
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

Path: \\Zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS\MapFiles\2012\SWP_A\AOC11\AOC11_DG_Additional_locs.mxd

CH2MHILL

Subappendix C6
Area of Concern 12 Data Gaps Evaluation Results

Contents

Tables

Figure

Acronyms and Abbreviations

μg/kg	micrograms per kilogram
AOC	Area of Concern
bgs	below ground surface
BTV	background threshold value
CHHSL	California human health screening level
CMS/FS	corrective measures study/feasibility study
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
ECV	ecological comparison value
EPC	exposure point concentration
mg/kg	milligrams per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
RSL	regional screening level
SSL	soil screening level
STLC	soluble threshold limit concentration
TAL	Target Analyte List
TCL	Target Compound List
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbons
TTLC	total threshold limit concentration
VOC	volatile organic compound

APPENDIX C6

Area of Concern 12 Data Gaps Evaluation Results

1.0 Introduction and Background

This sub-appendix presents the results of the Data Gaps Evaluation for Area of Concern (AOC) 12 – Fill Areas at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. The process for the data gaps evaluation is outlined in Sections 2.0 through 6.0 of the Part A Phase 1 Data Gaps Evaluation Report.

1.1 Background

AOC 12 consists of three subareas located near the Transwestern gas pipeline meter station (Transwestern Meter Station) east of the compressor station, as shown in Figure C6-1. These three subareas (identified as AOC 12a, AOC 12b, and AOC 12c) were identified through employee interviews as locations that may contain buried debris. AOC 12a was reportedly a disposal area for construction-related debris. A few small pieces of concrete are visible at the surface in the area identified as AOC 12a. The exact nature of the materials placed into this area and the date(s) of placement are unknown. Initially, AOC 12a was the only disposal area identified in AOC 12 (CH2M HILL, 2006).

Two potential disposal locations were subsequently identified from interviews with former employees, as described in the Soil Part A Phase 1 Work Plan (CH2M HILL, 2006). There is no visible debris at these two sites. These two locations are adjacent to the northwestern corner (AOC 12b) and southwestern corner (AOC 12c) of the Transwestern Meter Station. Location 12b reportedly was used to bury asbestos-containing material and two drums of unused unknown chemicals. Location 12c was apparently a small ravine (about 6 feet deep) that was reportedly used to bury asbestos-containing material and possibly other debris. AOC 12a and 12b are located on property owned by Havasu National Wildlife Refuge, and AOC 12c is located on both Havasu National Wildlife Refuge and PG&E property.

1.2 Site Conceptual Model

The depths of buried materials, if any, in AOCs 12a, 12b, and 12c, are not known. Chemicals of potential concern/chemicals of ecological potential concern (COPC/COPECs) may be present in fill material and buried waste and may have affected subsurface soil underneath the debris and laterally in the immediate vicinity of the debris. Subsurface soil would therefore be the primary source medium. Potential migration from subsurface soil to groundwater was identified as a potential secondary pathway, as shown in Table C6-1.

Because debris reportedly was buried at AOC 12a, 12b, and 12c, a geophysical survey was conducted over those areas. Part A Phase 1 trenches were excavated, and soil samples were collected in the areas that former PG&E employees indicated debris had been buried.

1.2.1 AOC 12 Data

Historical sampling has not occurred at AOC 12.

During the 2008 Part A Phase 1 Soil Investigation, five trenches were excavated to assess the AOC12a, AOC12b, and AOC12c, as shown in Figure C6-1. Prior to trenching activities, a geophysical survey was performed at each AOC 12 subarea to attempt to locate buried debris. The results of the surveys found two linear features crossing AOC 12a, a natural gas pipeline approximately 3 to 4 feet in diameter, and an anode flux wire associated with the pipeline, buried between the upper 1 foot below ground surface (bgs) and 3 to 4 feet bgs. In AOC 12a and AOC 12b, results indicated two undifferentiated utilities extending east from aboveground storage tank bunker pipe stub-outs. During the trenching activities, debris was observed in only one trench, AOC12c-T1. Debris consisted of a large piece of concrete (at approximately 1.5 feet bgs), a small piece of wire (at approximately 5 feet bgs), an 18-inch wooden slat, plastic debris, and a bung cover from a polyethylene drum. Additional information about the trenching activities is presented in Appendix B of the Part A Phase 1 Data Gaps Evaluation Report.

Seventeen soil samples[1] (ranging from 0 to 11 feet bgs) were collected from 11 sample locations (AOC12a-T1a, AOC12a-T1c, AOC12a-T2a, AOC12a-T2b, AOC12b-T1a, AOC12b-T1b, AOC12c-T1a through AOC12c-T1c, AOC12c-T2a, and AOC12c-T2b), as shown in Figure C6-1. Part A Phase 1 soil samples collected in AOC 12 were analyzed for Title 22 metals, hexavalent chromium, volatile organic compounds (VOCs), semivolatile organic compounds, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), pH, asbestos, pesticides, and polychlorinated biphenyls (PCBs). Ten percent of the Phase 1 soil samples collected in AOC12 were analyzed for the full inorganic and organic suites per the CERCLA Target Analyte List and Target Compound List (TAL/TCL). Surface soil samples were not analyzed for VOCs. Soil results were validated, and the data quality evaluation is included in Appendix D of the Part A Phase 1 Data Gaps Evaluation Report.

All Part A Phase 1 data are Category 1 and were used as inputs to the four data quality objective decisions.

2.0 Decision 1 – Nature and Extent

This section describes the nature and extent of residual soil concentrations of COPCs and COPECs at AOC 12. Laboratory analytical results for Part A Phase 1 soil samples at AOC 12 are presented in Tables C6-2 through C6-8. Table C6-9 presents a statistical summary of soil analytical results for COPCs and COPECs that were either (1) detected above the laboratory reporting limits or (2) not detected but where the reporting limits for one or more samples was greater than the interim screening value.

2.1 Summary of AOC12 Soil Data

Antimony, beryllium, cadmium, hexavalent chromium, mercury, silver, thallium, cyanide, TPH-gasoline, TPH-diesel, pesticides, VOCs, most PCBs, and most semivolatile organic

[1] Not including quality control samples.

compounds were not detected in soil samples collected in AOC 12. Table C6-9 lists the 36 constituents that were detected at AOC 12, including four calculated quantities (benzo(a)pyrene equivalents, total low molecular weight PAHs, total high molecular weight PAHs, and total PCBs). Ten of these constituents (aluminum, calcium, di-n-butyl phthalate, iron, magnesium, manganese, potassium, sodium, Aroclor-1254, and total PCBs) were detected in the TAL/TCL samples.

Twenty-nine of the constituents detected at AOC 12 (arsenic, barium, total chromium, lead, molybdenum, nickel, vanadium, aluminum, calcium, iron, magnesium, manganese, potassium, sodium, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, total low molecular weight PAHs, total high molecular weight PAHs, Aroclor-1254, total PCBs, and TPH-motor-oil) were detected at concentrations below their respective interim screening levels. Six constituents (cobalt, copper, selenium, zinc, benzo(a)pyrene, and benzo(a)pyrene equivalents) were each detected one time at a concentration exceeding their interim screening levels.

2.2 Nature and Extent Evaluation

The following subsection discusses the nature and extent of detected COPCs and COPECs detected above interim screening levels at AOC 12. As discussed in Section 3.2 of the Part A Phase 1 Data Gaps Evaluation Report, multiple factors were considered to assess whether the nature and extent of a specific constituent has been adequately delineated. Section 2.5 of this sub-appendix summarizes the constituents that may require further evaluation, and Section 5.0 of this sub-appendix provides the recommended follow-up sampling for the Part A Phase 2 soil investigation.

2.2.1 Cobalt

Cobalt was detected in 17 of 17 soil samples collected from AOC 12. One detected concentration of cobalt (14 milligrams per kilogram [mg/kg] at AOC12b-T1a at 2 to 3 feet bgs) slightly exceeded the interim screening level of 12.7 mg/kg (background threshold value [BTV]) and the ecological comparison value (ECV) (13 mg/kg) once, as shown in Tables C6-2 and C6-9. This detected concentration did not exceed United States Environmental Protection Agency residential and commercial/industrial regional screening levels (RSLs) (23 mg/kg and 300 mg/kg, respectively). The cobalt concentration a sample collected approximately 35 feet to the northeast within this same trench did not exceed the screening levels. No samples were collected to the west, south, or east at this trench location. No deeper samples were collected at this location.

2.2.2 Copper

Copper was detected in 16 of 17 soil samples collected from AOC 12. One detected concentration of copper (18 mg/kg at AOC12b-T1a at 2 to 3 feet bgs) slightly exceeded the interim screening level (16.8 mg/kg) (BTV) once, as shown in Tables C6-2 and C6-9, but did not exceed the ECV (20.6 mg/kg) or residential and commercial/industrial California human health screening level (CHHSLs) (3,000 mg/kg and 38,000 mg/kg, respectively). The copper concentration in a sample collected approximately 35 feet to the northeast within this trench did not exceed the screening levels. No samples were collected to the west, south, or east at this trench location. No deeper samples were collected at this location.

2.2.3 Selenium

Selenium was detected in one of 17 soil samples collected from AOC 12. The detected concentration of selenium (2.5 mg/kg at AOC12b-T1b at 2 to 3 feet bgs) slightly exceeded the interim screening level (1.47 mg/kg) (BTV/ECV), as shown in Tables C62 and C6-9, but did not exceed the residential or commercial/industrial CHHSLs (380 mg/kg and 4,800 mg/kg, respectively). Selenium was not detected in a sample collected approximately 35 feet to the southwest within this trench. No samples were collected to the west, north, or east at this trench location. No deeper samples were collected at this location.

2.2.4 Zinc

Zinc was detected in 17 of 17 soil samples collected from AOC 12. One detected concentration of zinc (77 mg/kg at AOC12c-T1a at 0 to 0.5 foot bgs) slightly exceeded the interim screening level (58 mg/kg) (BTV/ECV), as shown in Tables C6-2 and C6-9, but did not exceed the residential and commercial/industrial CHHSLs (23,000 mg/kg and 100,000 mg/kg, respectively). The zinc concentration in a sample collected approximately 15 feet to the north within this trench and in two other samples in an adjacent trench to the northeast and east did not exceed the interim screening level. No samples were collected to the west or south at this trench location. Concentrations of zinc in deeper samples at this location did not exceed screening levels.

2.2.5 Benzo(a)pyrene, Benzo(a)pyrene Equivalents, and PAHs

Benzo(a)pyrene was detected in three of 17 soil samples collected from AOC 12. One detected concentration of benzo(a)pyrene (39 micrograms per kilogram [µg/kg] at AOC12c-T1b at 3 to 4 feet bgs) slightly exceeded the interim screening level (38 µg/kg) (residential CHHSL). Several other PAHs were detected in soil samples collected from AOC 12 but had concentrations below their respective interim screening levels. To assist with evaluation of PAHs for human health, benzo(a)pyrene equivalents were calculated for each of the soil samples collected at AOC 12, as shown in Table C6-4. One benzo(a)pyrene equivalent value (58 µg/kg at AOC12c-T1b at 3 to 4 feet bgs) exceeded the interim screening level (38 µg/kg) (residential CHHSL), as shown in Table C6-4. The exceedences in this one sample are bounded by other samples collected approximately 20 feet to the north and 15 feet to the south within this trench and two other samples in an adjacent trench to the east and southeast. No samples bound this exceedence to the west. This exceedence is vertically bounded by a sample collected at 10 to 11 feet bgs.

2.2.6 Target Analyte List/Target Compound List Constituents

As described above, aluminum, calcium, iron, magnesium, manganese, potassium, sodium, di-N-butyl phthalate, Aroclor-1254, and total PCBs were detected in the AOC 12 soil samples analyzed for the complete TAL/TCL suite of compounds. These constituents are discussed below.

Aluminum was detected in two of two surface soil samples collected from AOC 12. Both detected concentrations of aluminum (4,500 mg/kg at AOC12a-T1a and12,000 mg/kg at AOC12c-T1a) are below the interim screening level (16,400 mg/kg) (BTV), as shown in Tables C6-3 and C6-9. Neither of the detected concentrations exceeded the residential or commercial/industrial RSLs (77,000 mg/kg and 990,000 mg/kg, respectively). An ECV has not been established for aluminum.

Calcium was detected in two of two surface soil samples collected from AOC 12. Both detected concentrations of calcium (10,000J mg/kg at AOC12a-T1a and 31,000 mg/kg at AOC12c-T1a) are below the interim screening level (66,500mg/kg) (BTV), as shown in Tables C6-3 and C6-9. Residential and commercial/industrial CHHSLs and an ECV have not been established for calcium.

Iron was detected in was detected in two of two surface soil samples collected from AOC 12. Both detected concentrations of iron (9,900J mg/kg at AOC12a-T1a and 23,000 mg/kg at AOC12c-T1a) are below the interim screening level (55,000 mg/kg) (residential regional screening level [RSL]), as shown in Tables C6-3 and C6-9. A BTV and an ECV have not been established for iron.

Magnesium was detected in two of two surface soil samples collected from AOC 12. Both detected concentrations of magnesium (AOC12a-T1a [3,000 mg/kg] and AOC12c-T1a [8,300 mg/kg]) are below the interim screening level (12,100 mg/kg) (BTV), as shown in Tables C6-3 and C6-9. Residential and commercial/industrial CHHSLs and an ECV have not been established for magnesium.

Manganese was detected in two of two surface soil samples collected from AOC 12. Both detected concentrations of manganese (130 mg/kg at AOC12a-T1a and290 mg/kg at AOC12c-T1a) are below the interim screening level (402 mg/kg) (BTV/ECV), as shown in Tables C6-3 and C6-9. Neither of the detected concentrations exceeded the residential or commercial/industrial RSLs (1,800 mg/kg and 23,000 mg/kg, respectively).

Potassium was detected in two of two surface soil samples collected from AOC 12. Both detected concentrations of potassium (1,300 mg/kg at AOC12a-T1a and 2,700 mg/kg at AOC12c-T1a) are below the interim screening level (4,400 mg/kg) (BTV), as shown in Tables C6-3 and C6-9. Residential and commercial CHHSLs and an ECV have not been established for potassium.

Sodium was detected in two of two surface soil samples collected from AOC 12. Both detected concentrations of sodium (210 mg/kg at AOC12a-T1a and340 mg/kg at AOC12c-T1a) are below the interim screening level of 2,070 mg/kg (BTV), as shown in Tables C6-3 and C6-9. Residential and commercial/industrial CHHSLs, RSLs, and an ECV have not been established for sodium.

Di-n-butyl phthalate was detected in one of 17 soil samples collected from AOC 12. One detected concentration (1,100 µg/kg at AOC12c-T1c at 10 to 11 feet bgs) exceeded the interim screening level (46.9 µg/kg) (ECV), as shown in Tables C6-5 and C6-9, but did not exceed the residential and industrial RSLs (6,100,000 µg/kg and 62,000,000 µg/kg, respectively). This exceedence is bounded by another sample collected approximately 20 feet to the south within this trench and two other samples in an adjacent trench to the southeast. No samples bound this exceedence to the west, north, or east. No vertical samples bound this exceedance below 10 to 11 feet bgs.

The PCB Aroclor-1254 was detected in one of three soil samples collected from AOC 12. The maximum detected concentration (31 µg/kg at AOC12a-T1 at 0 to 0.5 foot bgs) did not exceed the interim screening level of 220 µg/kg (residential RSL), as shown in Table C6-6. PCBs were not detected above laboratory reporting limits in the sample collected at 2 to 3 feet bgs at location AOC12a-T1. To assist with evaluation of PCBs for ecological risk, total PCB values were calculated at AOC 12. The sample containing Aroclor-1254 also was below the total PCB screening value (ECV) of 204 µg/kg.

As discussed in Section C.2 of Appendix C, PG&E recommends that aluminum, calcium, iron, magnesium, manganese, potassium, sodium, di-N-butyl phthalate, Aroclor-1254, and total PCBs not be considered a COPC/COPEC for this AOC, and no further sampling for these constituents is recommended. This constituent has been fully discussed in Section C.2 of Appendix C.

2.3 Central Tendency Comparison to Background Threshold Values

Four metals (cobalt, copper, selenium, and zinc) were detected above their respective background values in soil samples collected from AOC 12. A central tendency comparison was performed for three of these four metals (cobalt, copper, and zinc) to compare the AOC 12 soil data set for these metals with the corresponding Topock soil background data set to determine whether a difference exists between the two populations and if additional sampling is required for a given metal, as discussed in Table C6-10 of this sub-appendix and in Figure 3-1 of the Part A Phase 1 Data Gaps Evaluation Report.

Metals in either the AOC 12 data set or background data set that were detected infrequently (less than five detects) or had a limited number of results (less than eight) were not tested. There were insufficient detections of selenium at AOC 12 to conduct the central tendency comparison.

No statistical difference between the two populations was noted for cobalt and copper, as shown in Table C6-10. However, the results identified a statistically significant difference in the populations for zinc. Zinc was only detected above the BTV of 58 mg/kg once at a concentration of 77 mg/kg in a soil sample collected at 2 to 3 feet bgs. After careful review of AOC 12 site data and background data set for zinc, the statistical difference between the two populations is not considered significant enough to warrant additional sampling for zinc at AOC 12.

2.4 Nature and Extent Conclusions

Based on the site history, background, and conceptual site model, a qualitative review indicates that decision error has been held to an acceptable level. Sufficient data of acceptable quality have been attained through collection of Part A soil samples in areas most likely to have been impacted by buried debris. The sample locations were collected in the areas that former PG&E employees indicated debris had been buried.

Based on the review of the data for AOC 12, the nature and extent of all detected COPCs and COPECs have been defined. No additional sampling is recommended in Part A Phase 2 soil investigation.

3.0 Decision 2 – Data Sufficient to Estimate Representative Exposure Point Concentrations

For Decision 2, data were evaluated to determine if the AOC 12 data are sufficient to conduct human health and ecological risk assessments based on the criteria described in Section 4.0 of the Part A Phase 1 Data Gaps Evaluation Report. The principal consideration for Decision 2 was whether there were sufficient data to estimate a representative exposure point concentration (EPC). Data reviewed were all from Phase 1; no historical sampling was conducted at this AOC.

Table C6-11 summarizes the results of the evaluation to determine whether data are sufficient to estimate a representative EPC. Data were reviewed for all chemicals that were detected in at least one sample and exceeded at least one comparison value. In general, existing data are adequate to support EPC development for detected chemicals that exceeded one or more comparison values (three metals and PAHs), as described below.

3.1 Metals

Sufficient data (numbers of samples and detections) are available to calculate EPCs using ProUCL for cobalt and zinc in three of four exposure intervals. The 0-to-0.5-foot-bgs interval data are adequate to support the risk assessment for cobalt and zinc because the maximum detected concentrations are less than two times the applicable interim screening value (the ECV for cobalt or BTV for zinc). For selenium, additional data collection is not expected to significantly change the results of the risk assessment because the compound is very infrequently detected (i.e., additional non-detects would be expected) and, consequently, additional data are not expected to strongly influence the EPC.

3.2 Polycyclic Aromatic Hydrocarbons

Sufficient data (numbers of samples and detections) are available to calculate EPCs for benzo(a)pyrene equivalents using ProUCL.

4.0 Decision 3 – Potential Threat to Groundwater from Residual Soil Concentrations

The following preliminary analysis was performed with the existing data set to assess the potential threat to groundwater and to assess if additional data, above and beyond that necessary for Decision 1, are needed to resolve Decision 3. Additional evaluation will be performed as appropriate, as data are collected to resolve Decision 1. Data collected to satisfy Decision 1 – Nature and Extent evaluation will provide the final representative data set that will be used to assess the threat to groundwater. The preliminary conclusions regarding the threat to groundwater are based on available data and will be revisited after the implementation of the soil investigation. The combined data set will then be evaluated for data gaps, and further conclusions regarding the threat to groundwater will be provided to the agencies and stakeholders for review prior to submittal of the RFI/RI Volume 3.

The analysis of AOC 12 was divided into three separate analyses based on the AOC 12 subareas shown in Figure C-1 in Appendix C.

4.1 AOC 12a

There were no concentrations of metals that exceeded the BTVs at AOC 12a; therefore, comparison to the soil screening levels (SSLs) was not required for AOC 12a, and a current or potential threat to groundwater from this subarea was ruled out.

4.2 AOC 12b

Table C6-12 presents the results of the tiered analysis for AOC 12b. Three metals (cobalt, copper, and selenium) were detected at concentrations above the BTVs. None of these three metals exceeded the calculated SSLs, as shown in Table C6-13. Therefore, numerical modeling was not required for AOC 12b, and a current or potential threat to groundwater from this subarea was ruled out.

4.3 AOC 12c

Table C6-12 presents the results of the tiered analysis for AOC 12c. Only zinc was detected at a concentration above the BTV. However, zinc was not detected at concentrations that exceeded the calculated SSLs, as shown in Table C6-14. Consequently, numerical modeling was not required for AOC 12c, and a current or potential threat to groundwater from this subarea was ruled out.

5.0 Decision 4 – Data Sufficiency to Support the Corrective Measures Study/Feasibility Study

As discussed in Section 6.0 of the Part A Phase 1 Data Gaps Evaluation Report, various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study (CMS/FS). The types of data needed vary somewhat depending on the specific technology to be evaluated. The categories of data required for technologies that may be applicable to the areas outside the fence line include:

- Extent of COPCs and COPECs above action levels (required for all technologies).
- Waste characterization parameters (required if soil may be disposed of offsite)
- Constituent leachability (required to assess the need for fixation of leachable compounds and/or the feasibility of certain soil washing technologies).
- Soil physical properties (required for all technologies; however, the properties required vary among the different technologies)
- Surface and subsurface features (required to determine whether there are physical impediments to implementing specific technologies and/or remediating specific areas).
- If present, volumes of white powder and debris.

The following is a summary of data for AOC 12 that are currently available to support CMS/FS:

5.1 Extent of COPCs and COPECs

A summary of the nature and extent of detected COPCs/COPECs is presented in Section 2.0 Decision 1 – Nature and Extent. The lateral and vertical extent of the COPCs and COPECs is discussed in Section 2.2 of this sub-appendix. Data results for selected constituents are shown in Tables C6-2 through C6-8, and data gaps associated with lateral and vertical delineation are discussed in Section 6.0 of this sub-appendix.

5.2 Waste Characterization Parameters

Only partial waste characterization data are available to characterize the soil and other materials to be potentially removed for remedial action and disposed of in an offsite permitted facility. While none of the soils or other materials is considered ignitable, corrosive, or reactive, data are lacking to complete the evaluation of the toxicity characteristic. Total chemical concentrations are available to characterize the soil, certain debris, and white powder material relative to California Title 22 total threshold limit concentrations (TTLCs). The maximum concentrations of these metals for each of the units were compared to the TTLCs, and none of the metal concentrations exceeded the TTLCs, as shown in Table C6-15. The maximum detected concentrations were also compared to the soluble threshold limit concentrations (STLCs), and none of the concentrations in AOC 12 exceeded 10 times the STLC, as shown in Table C6-15. In addition, none of the metals concentrations exceeded 20 times the toxicity characteristic leaching procedure (TCLP), as shown in Table C6-15. Because none of the metals concentrations have the potential to exceed STLC or TCLP thresholds, additional leachability testing is not required if soil excavation and offsite disposal is chosen as a remedy.

5.3 Soil Physical Properties

Soil physical property data collected during the Part A Phase 1 soil investigation was limited to grain size analysis only. Specific soil physical properties data (i.e., porosity, grain size, density, organic carbon content) are required to support the CMS/FS, as described in Table 6-1 in the Data Gaps Report. Additional soil physical parameter data are needed to support the CMS/FS.

5.4 Surface and Subsurface Features

While there is extensive information regarding surface and subsurface features at AOC 12, additional information may be required once areas requiring remediation have been defined. Nearby roads and road structures, vegetation, and the location of bedrock are known for AOC 12. However, subsurface utilities, including gas transmission pipelines and any culverts or other features, may have to be more precisely defined to evaluate the feasibility and cost of certain remedial alternatives and to prepare construction specifications.

6.0 Summary of Data Gaps and Potential Phase 2 Soil Sample Locations to Fill Identified Gaps

Based on the review of the data for AOC 12, the nature and extent of all detected COPCs and COPECs has been defined, and sufficient data are available to address Decisions 2 and

3. No additional sampling is recommended in Phase 2. Data regarding soil physical properties will be collected at units where additional samples are required to address data gaps for Decisions 1, 2, and/or 3. The remaining data required to address Decision 4 data gaps will be collected following the completion of the risk assessment. No additional sampling is recommended in the Part A Phase 2 soil investigation.

7.0 References

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1.

_________. 2008. *Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil.* May 28.

California Regional Water Quality Control Board (Water Board). 2008 *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*. May 27.

CH2M HILL. 2006. *RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan, Part A, PG&E Topock Compressor Station, Needles, California*. November 16.

___________. 2009. *Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California.* May.

United States Environmental Protection Agency. 2009. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* December. Available online at: http://www.epa.gov/region09/superfund/prg/pdf/composite_sl_table_run_APRIL2009.pdf. September 12.

Tables

TABLE C6-1
Conceptual Site Model – AOC 12
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report, PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Disposal of Buried Debris	Subsurface Soil	Percolation and/or infiltration	Subsurface Soil	Potential volatilization and atmospheric dispersion
			Potential Groundwater	Potential extracted groundwater[a]

[a] Quantitative evaluation of the groundwater pathway was completed in the groundwater risk assessment (ARCADIS, 2009); Part A Phase 1 data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

TABLE C6-2
Sample Results: Metals
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				**0.285**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**0.0125**	**1.37**	**27.3**	**1.47**	**5.15**	**2.32**	**52.2**	**58**
Residential Regional Screening Levels [2]:				**31**	**0.062**	**15,000**	**160**	**70**	**0.29**	**280**	**23**	**3,100**	**150**	**10**	**390**	**1,500**	**390**	**390**	**5.1**	**390**	**23,000**
Residential DTSC CHHSL [3]:				**30**	**0.07**	**5,200**	**16**	**39**	**17**	**NE**	**660**	**3,000**	**80**	**18**	**380**	**1,600**	**380**	**380**	**5**	**530**	**23,000**
Ecological Comparison Values [4]:				**0.285**	**11.4**	**330**	**23.3**	**0.0151**	**139.6**	**36.3**	**13**	**20.6**	**0.0166**	**0.0125**	**2.25**	**0.607**	**0.177**	**5.15**	**2.32**	**13.9**	**0.164**
Background [5]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
AOC12a-T1a	09/22/08	0 - 0.5	N	ND (2) J*	3.6	79	ND (1) *	ND (1)	ND (0.421)	13	3.4	5.6	8.3	ND (0.098) *	ND (1)	6.9	ND (1)	ND (1)	ND (2)	19	26
	09/22/08	2 - 3	N	ND (2) *	3.7	14	ND (1) *	ND (1)	ND (0.402)	4.9	1.6	ND (2)	2.4	ND (0.1) *	ND (1)	2.7	ND (1)	ND (1)	ND (2)	13	9
	09/22/08	7 - 8	N	ND (2) *	7	240	ND (2) *	ND (1)	ND (0.411)	22	7.8	12	3.8	ND (0.1) *	ND (2) *	17	ND (1)	ND (2)	ND (4.1) *	32	51
AOC12a-T1c	09/22/08	7 - 8	N	ND (2.1) *	8.4	110	ND (1) *	ND (1)	ND (0.409)	17	6.7	8.6	3.9	ND (0.1) *	ND (1)	13	ND (1)	ND (1)	ND (2.1)	36	42
AOC12a-T2a	09/22/08	6 - 7	N	ND (2) *	4.4	58	ND (1) *	ND (1)	ND (0.419)	13	6.6	9	3.1	ND (0.1) *	1	10	ND (1)	ND (1)	ND (2)	28	39
AOC12a-T2b	09/22/08	7 - 8	N	ND (2) *	4.9	25	ND (1) *	ND (1)	ND (0.409)	15	6.9	7.8	3.5	ND (0.1) *	ND (1)	12	ND (1)	ND (1)	ND (2)	32	44
AOC12b-T1a	09/20/08	2 - 3	N	ND (2.1) *	4.9	81	ND (2.1) *	ND (1)	ND (0.416)	26	14	18	4.5	ND (0.1) *	ND (2.1) *	20	ND (1)	ND (2.1)	ND (4.1) *	41	57
AOC12b-T1b	09/20/08	2 - 3	N	ND (2.1) *	5.8	88	ND (2.1) *	ND (1)	ND (0.419)	26	9.6	14	4.9	ND (0.1) *	ND (2.1) *	20	2.5	ND (2.1)	ND (4.2) *	42	58
AOC12c-T1a	09/20/08	0 - 0.5	N	ND (2) J*	5.4	110 J	ND (2) *	ND (1)	ND (0.411)	28	8.4	13	7.1	ND (0.1) *	ND (2) *	18	ND (1)	ND (2)	ND (4) *	38	77
	09/20/08	2 - 3	N	ND (2.1) *	4.9	150	ND (2.1) *	ND (1)	ND (0.413)	25	9.3	11	4	ND (0.1) *	ND (2.1) *	18	ND (1)	ND (2.1)	ND (4.1) *	39	51
	09/20/08	10 - 11	N	ND (2.1) *	6	120	ND (2.1) *	ND (1)	ND (0.423)	25	8.7	9.6	4	ND (0.1) *	ND (2.1) *	18	ND (1)	ND (2.1)	ND (4.2) *	39	50
AOC12c-T1b	09/20/08	2 - 3	N	ND (2.1) *	5.1	140	ND (2.1) *	ND (1)	ND (0.431)	23	8.4	13	5.7	ND (0.1) *	ND (2.1) *	19	ND (1)	ND (2.1)	ND (4.1) *	36	49
	09/22/08	3 - 4	N	ND (2.1) *	6.5	160	ND (2.1) *	ND (1)	ND (0.419)	27	9.4	12	6.4	ND (0.11) *	ND (2.1) *	19	ND (1)	ND (2.1)	ND (4.1) *	40	57
	09/20/08	10 - 11	N	ND (2.1) *	4.7	93	ND (2.1) *	ND (1)	ND (0.415)	22	7.8	9.4	3.9	ND (0.1) *	ND (2.1) *	16	ND (1)	ND (2.1)	ND (4.1) *	35	45
AOC12c-T1c	09/20/08	10 - 11	N	ND (2.1) *	4.7	150	ND (2.1) *	ND (1.1) *	ND (0.424)	22	7.7	12	3.5	ND (0.1) *	ND (2.1) *	17	ND (1.1)	ND (2.1)	ND (4.2) *	35	49
	09/20/08	10 - 11	FD	ND (2.1) *	5	150	ND (2.1) *	ND (1)	ND (0.415)	23	7.7	11	3.8	ND (0.1) *	ND (2.1) *	17	ND (1)	ND (2.1)	ND (4.2) *	36	50
AOC12c-T2a	09/20/08	7 - 8	N	ND (2.1) *	4.2	67	ND (1.1) *	ND (1.1) *	ND (0.421)	19	7.2	10	3.4	ND (0.11) *	ND (1.1)	16	ND (1.1)	ND (1.1)	ND (2.1)	33	50
AOC12c-T2b	09/20/08	7 - 8	N	ND (2.1) *	4.8	84	ND (2.1) *	ND (1)	ND (0.424)	21	7.5	10	3.9	ND (0.1) *	ND (2.1) *	16	ND (1)	ND (2.1)	ND (4.2) *	34	45

1 Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.
2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.
3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.
4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.
5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C6-3

Sample Results: Contract Laboratory Program Inorganics
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Contract Laboratory Program (CLP) Inorganics (mg/kg)							
Interim Screening Level[1] :				**16,400**	**66,500**	**55,000**	**12,100**	**402**	**4,400**	**2,070**	**0.9**
Residential Regional Screening Levels[2] :				**77,000**	**NE**	**55,000**	**NE**	**1,800**	**NE**	**NE**	**1,600**
Residential DTSC CHHSL[3] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**220**	**NE**	**NE**	**0.9**
Background[5] :				**16,400**	**66,500**	**NE**	**12,100**	**402**	**4,400**	**2,070**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aluminum**	**Calcium**	**Iron**	**Magnesium**	**Manganese**	**Potassium**	**Sodium**	**Cyanide**
AOC12a-T1a	09/22/08	0 - 0.5	N	4,500	10,000 J	9,900 J	3,000 J	130	1,300	210	ND (1.05) *
AOC12c-T1a	09/20/08	0 - 0.5	N	12,000	31,000	23,000	8,300	290	2,700	340	ND (1.03) *

1 Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil" November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil". May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C6-4

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level[1] :				**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**38**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**10,000**	**1,160**	**38**
Residential Regional Screening Levels[2] :				**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**15**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**NE**	**NE**	**15**
Residential DTSC CHHSL[3] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**10,000**	**1,160**	**NE**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1-Methyl naphthalene**	**2-Methyl naphthalene**	**Acena phthylene**	**Acenaphthene**	**Anthracene**	**Benzo (a) anthracene**	**Benzo (a) pyrene**	**Benzo (b) fluoranthene**	**Benzo (ghi) perylene**	**Benzo (k) fluoranthene**	**Chrysene**	**Dibenzo (a,h) anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**PAH Low molecular weight**	**PAH High molecular weight**	**B(a)P Equivalent**
AOC12a-T1a	09/22/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	7.3	13	14	12	20 J	20	ND (5)	29	ND (5)	11	ND (5)	9.4	28	9.4	150	19
	09/22/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.1)	ND (5)	ND (5)	ND	ND	ND (4.4)
	09/22/08	7 - 8	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.2)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC12a-T1c	09/22/08	7 - 8	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
AOC12a-T2a	09/22/08	6 - 7	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.4)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC12a-T2b	09/22/08	7 - 8	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC12b-T1a	09/20/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.1)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
AOC12b-T1b	09/20/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	6.5	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND	6.5	4.5
AOC12c-T1a	09/20/08	0 - 0.5	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.7	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	5.7	4.5
	09/20/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
	09/20/08	10 - 11	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.3)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
AOC12c-T1b	09/20/08	2 - 3	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	8.1	11	9.9	10	14	13	ND (5.2)	16	ND (5.2)	9.3	ND (5)	ND (5.2)	16	ND	110	16
	09/22/08	3 - 4	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	30	39	45	35	45	49	11	61	ND (5.2)	32	ND (5.2)	14	60	14	410	58
	09/20/08	10 - 11	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
AOC12c-T1c	09/20/08	10 - 11	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND	ND	ND (4.6)
	09/20/08	10 - 11	FD	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.8)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)
AOC12c-T2a	09/20/08	7 - 8	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	5.4	ND	4.7
AOC12c-T2b	09/20/08	7 - 8	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND	ND	ND (4.5)

[1] Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

[4] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.

[5] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C6-5

Sample Results: VOCs, SVOCs, Total Petroleum Hydrocarbons and pH
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				SVOCs (µg/kg)	Total Petroleum Hydrocarbons (mg/kg)			General Chemistry
			Interim Screening Level[1] :	46.9	540	540	1,800	NE
			Residential Regional Screening Levels[2] :	6,100,000	NE	NE	NE	NE
			Residential DTSC CHHSL[3] :	NE	NE	NE	NE	NE
			RWQCB Environmental Screening Levels [4] :	NE	540	540	1,800	NE
			Ecological Comparison Values[5] :	46.9	NE	NE	NE	NE
			Background[6] :	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Di-N-butyl phthalate**	**TPH as gasoline**	**TPH as diesel**	**TPH as motor oil**	**pH**
AOC12a-T1a	09/22/08	0 - 0.5	N	ND (330) *	---	ND (10)	ND (10)	7.97
	09/22/08	2 - 3	N	ND (330) *	ND (1.1)	ND (10)	ND (10)	9.93
	09/22/08	7 - 8	N	ND (340) *	ND (1.1)	ND (10)	ND (10)	8.31
AOC12a-T1c	09/22/08	7 - 8	N	ND (340) *	ND (0.97)	ND (10)	ND (10)	8.98
AOC12a-T2a	09/22/08	6 - 7	N	ND (340) *	ND (1) J	ND (10)	ND (10)	8.86
AOC12a-T2b	09/22/08	7 - 8	N	ND (340) *	ND (0.84)	ND (10)	ND (10)	9.61
AOC12b-T1a	09/20/08	2 - 3	N	ND (340) *	ND (1.2)	ND (10)	ND (10)	8.34
AOC12b-T1b	09/20/08	2 - 3	N	ND (350) *	ND (160)	ND (10)	ND (10)	9.12
AOC12c-T1a	09/20/08	0 - 0.5	N	ND (330) *	---	ND (10)	ND (10)	8.47
	09/20/08	2 - 3	N	ND (340) *	ND (1)	ND (10)	ND (10)	9.28
	09/20/08	10 - 11	N	ND (350) *	ND (1.2)	ND (10)	ND (10)	7.88
AOC12c-T1b	09/20/08	2 - 3	N	ND (340) *	ND (1)	ND (10)	ND (10)	9.2
	09/22/08	3 - 4	N	ND (340) *	---	ND (10)	22.5	8.52
	09/20/08	10 - 11	N	ND (340) *	ND (0.98)	ND (10)	ND (10)	8.23
AOC12c-T1c	09/20/08	10 - 11	N	530	ND (0.82)	ND (10)	97.5 J	8.1
	09/20/08	10 - 11	FD	1,100	ND (1.1)	ND (10)	120 J	8.25
AOC12c-T2a	09/20/08	7 - 8	N	ND (350) *	ND (0.9)	ND (10)	ND (10)	9.25
AOC12c-T2b	09/20/08	7 - 8	N	ND (340) *	ND (0.86)	ND (10)	ND (10)	7.76

[1] For SVOCs, interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used. For TPHs, interim screening level is the Regional Water Quality Control Board environmental screening level.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites". http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, November 2004 (January 2005 Revision)". January.

[4] Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

[5] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil. May 28 and ARCADIS. 2009. Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil". July 1.

[6] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California". May.

Results greater than the interim screening level are circled.

Only detected VOCs and SVOCs are presented.

SVOCs	semivolatile organic compounds
TPH	total petroleum hydrocarbon
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water Board	Regional Water Quality Control Board
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C6-6
Sample Results: Pesticides
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Pesticides (µg/kg)																				
Interim Screening Level[1] :				**2.1**	**2.1**	**2.1**	**33**	**77**	**430**	**270**	**77**	**5**	**370,000**	**370,000**	**370,000**	**21,000**	**21,000**	**21,000**	**500**	**430**	**130**	**53**	**340,000**	**460**
Residential Regional Screening Levels[2] :				**2,000**	**1,400**	**1,700**	**29**	**77**	**1,600**	**270**	**77**	**30**	**370,000**	**370,000**	**370,000**	**18,000**	**18,000**	**18,000**	**520**	**1,600**	**110**	**53**	**310,000**	**440**
Residential DTSC CHHSL[3] :				**2,300**	**1,600**	**1,600**	**33**	**NE**	**430**	**NE**	**NE**	**35**	**NE**	**NE**	**NE**	**21,000**	**21,000**	**21,000**	**500**	**430**	**130**	**NE**	**340,000**	**460**
Ecological Comparison Values[4] :				**2.1**	**2.1**	**2.1**	**NE**	**NE**	**470**	**NE**	**NE**	**5**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**470**	**NE**	**NE**	**NE**	**NE**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**4,4-DDD**	**4,4-DDE**	**4,4-DDT**	**Aldrin**	**alpha-BHC**	**alpha-Chlordane**	**beta-BHC**	**delta-BHC**	**Dieldrin**	**Endo sulfan I**	**Endo sulfan II**	**Endosulfan sulfate**	**Endrin**	**Endrin aldehyde**	**Endrin ketone**	**gamma-BHC**	**gamma-Chlordane**	**Heptachlor**	**Heptachlor Epoxide**	**Methoxy chlor**	**Toxaphene**
AOC12a-T1a	09/22/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
AOC12c-T1a	09/20/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.1)	ND (51)

1 Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison values for Additional Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C6-7

Sample Results: Polychlorinated Biphenyls
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polychlorinated biphenyls (µg/kg)									
Interim Screening Level[1] :				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**204**
Residential Regional Screening Levels[2] :				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**NE**
Residential DTSC CHHSL[3] :				**89**	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**NE**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**204**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**	**Total PCBs**
AOC12a-T1a	09/22/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	31	ND (17)	ND (17)	ND (17)	31
	09/22/08	2 - 3	N	ND (17) J	ND (33) J	ND (17) J	ND (17) J	ND (17) J	ND (17) J	ND (17) J	ND (17) J	ND (17) J	ND (8.5)
AOC12c-T1a	09/20/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (8.5)

1 Interim screening level is the USEPA residential regional screening level.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Dectected Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C6-8
Sample Results: Asbestos
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Asbestos		
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**PLM/BULK** [1]	**CARB435/** [2] **PLM (%)**	**TEM** [3] **(%)**
AOC12a-T1a	09/22/08	0 - 0.5	N	Not Present	---	---
	09/22/08	2 - 3	N	---	ND (<0.1)	---
	09/22/08	7 - 8	N	---	ND (<0.1)	---
AOC12a-T1c	09/22/08	7 - 8	N	---	ND (<0.1)	---
AOC12a-T2a	09/22/08	6 - 7	N	---	ND (<0.1)	---
AOC12a-T2b	09/22/08	7 - 8	N	Not Present	---	---
AOC12b-T1a	09/20/08	2 - 3	N	Not Present	---	---
AOC12b-T1b	09/20/08	2 - 3	N	Not Present	---	---
AOC12c-T1a	09/20/08	0 - 0.5	N	Not Present	---	---
	09/20/08	2 - 3	N	Not Present	---	---
	09/20/08	10 - 11	N	Not Present	---	---
AOC12c-T1b	09/20/08	2 - 3	N	Not Present	---	---
	09/20/08	10 - 11	N	Not Present	---	---
AOC12c-T1c	09/20/08	10 - 11	N	Not Present	---	---
	09/20/08	10 - 11	FD	Not Present	---	---
AOC12c-T2a	09/20/08	7 - 8	N	Not Present	---	---
AOC12c-T2b	09/20/08	7 - 8	N	Not Present	---	---

[1] Polarized light microscopy of bulk samples
[2] California Air Resource Board Method 435 / polarized light microscopy of bulk samples
[3] Transmission electron microscopy

ft bgs feet below ground surface
N primary sample
FD field duplicate
--- not analyzed

TABLE C6-9

Constitiuent Concentrations in Soil Compared to Screening Values
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Parameter	Units	Frequency of detection	Maximum Detected Value	Background Threshold Value (BTV) [1] # of Exceedences [7]	(BTV)	Ecological Comparison Value (ECV) [2] # of Exceedences [8]	(ECV)	Residential Screening Level (Res SL) [3] # of Exceedences [8]	(Res SL)	RWQCB Environmental Screening Levels (ESL) [4] # of Exceedences [8]	(ESL)	Commercial Screening Level (Com SL) [5] # of Exceedences [8]	(Com SL)	Interim Screening Level (Int SL) [6] # of Exceedences [8]	(Int SL)
Metals															
Antimony	mg/kg	0 / 17 (0%)	ND (2.1) ‡	NA	(NE)	0	(0.285)	0	(30)	NA	(NE)	0	(380)	0	(0.285)
Arsenic	mg/kg	17 / 17 (100%)	8.4	0	(11)	0	(11.4)	0	(0.07) *	NA	(NE)	0	(0.24) *	0	(11)
Barium	mg/kg	17 / 17 (100%)	240	0	(410)	0	(330) *	0	(5,200)	NA	(NE)	0	(63,000)	0	(410)
Beryllium	mg/kg	0 / 17 (0%)	ND (2.1) ‡	0	(0.672)	0	(23.3)	0	(16)	NA	(NE)	0	(190)	0	(0.672)
Cadmium	mg/kg	0 / 17 (0%)	ND (1.1) ‡	0	(1.1)	0	(0.0151) *	0	(39)	NA	(NE)	0	(500)	0	(1.1)
Chromium	mg/kg	17 / 17 (100%)	28	0	(39.8)	0	(36.3) *	0	(280)	NA	(NE)	0	(1,400)	0	(39.8)
Cobalt	mg/kg	17 / 17 (100%)	14	1	(12.7)	1	(13)	0	(23)	NA	(NE)	0	(300)	1	(12.7)
Copper	mg/kg	16 / 17 (94%)	18	1	(16.8)	0	(20.6)	0	(3,000)	NA	(NE)	0	(38,000)	1	(16.8)
Lead	mg/kg	17 / 17 (100%)	8.3	0	(8.39)	0	(0.0166) *	0	(80)	NA	(NE)	0	(320)	0	(8.39)
Mercury	mg/kg	0 / 17 (0%)	ND (0.11) ‡	NA	(NE)	0	(0.0125)	0	(18)	NA	(NE)	0	(180)	0	(0.0125)
Molybdenum	mg/kg	1 / 17 (5.9%)	1	0	(1.37)	0	(2.25)	0	(380)	NA	(NE)	0	(4,800)	0	(1.37)
Nickel	mg/kg	17 / 17 (100%)	20	0	(27.3)	0	(0.607) *	0	(1,600)	NA	(NE)	0	(16,000)	0	(27.3)
Selenium	mg/kg	1 / 17 (5.9%)	2.5	1	(1.47)	1	(0.177) *	0	(380)	NA	(NE)	0	(4,800)	1	(1.47)
Thallium	mg/kg	0 / 17 (0%)	ND (4.2) ‡	NA	(NE)	0	(2.32)	0	(5)	NA	(NE)	0	(63)	0	(2.32)
Vanadium	mg/kg	17 / 17 (100%)	42	0	(52.2)	0	(13.9) *	0	(390)	NA	(NE)	0	(5,200)	0	(52.2)
Zinc	mg/kg	17 / 17 (100%)	77	1	(58)	1	(0.164) *	0	(23,000)	NA	(NE)	0	(100,000)	1	(58)
Contract Laboratory Program Inorganics															
Aluminum	mg/kg	2 / 2 (100%)	12,000	0	(16,400)	NA	(NE)	0	(77,000)	NA	(NE)	0	(990,000)	0	(16,400)
Calcium	mg/kg	2 / 2 (100%)	31,000	0	(66,500)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(66,500)
Iron	mg/kg	2 / 2 (100%)	23,000	NA	(NE)	NA	(NE)	0	(55,000)	NA	(NE)	0	(720,000)	0	(55,000)
Magnesium	mg/kg	2 / 2 (100%)	8,300	0	(12,100)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(12,100)
Manganese	mg/kg	2 / 2 (100%)	290	0	(402)	0	(220)	0	(1,800)	NA	(NE)	0	(23,000)	0	(402)
Potassium	mg/kg	2 / 2 (100%)	2,700	0	(4,400)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(4,400)
Sodium	mg/kg	2 / 2 (100%)	340	0	(2,070)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(2,070)
Cyanide	mg/kg	0 / 2 (0%)	ND (1.05) ‡	NA	(NE)	0	(0.9)	0	(1,600)	NA	(NE)	0	(20,000)	0	(0.9)
Semivolatile Organic Compounds															
Di-N-butyl phthalate	µg/kg	1 / 17 (5.9%)	1,100	NA	(NE)	1	(46.9)	0	(6,100,000)	NA	(NE)	0	(62,000,000)	1	(46.9)
Polycyclic Aromatic Hydrocarbons															
Benzo (a) anthracene	µg/kg	3 / 17 (18%)	30	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Benzo (a) pyrene	µg/kg	3 / 17 (18%)	39	NA	(NE)	NA	(NE)	1	(38)	NA	(NE)	0	(130)	1	(38)
Benzo (b) fluoranthene	µg/kg	3 / 17 (18%)	45	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Benzo (ghi) perylene	µg/kg	3 / 17 (18%)	35	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Benzo (k) fluoranthene	µg/kg	3 / 17 (18%)	45	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Chrysene	µg/kg	3 / 17 (18%)	49	NA	(NE)	NA	(NE)	0	(3,800)	NA	(NE)	0	(13,000)	0	(3,800)
Dibenzo (a,h) anthracene	µg/kg	1 / 17 (5.9%)	11	NA	(NE)	NA	(NE)	0	(110)	NA	(NE)	0	(380)	0	(380)
Fluoranthene	µg/kg	5 / 17 (29%)	61	NA	(NE)	NA	(NE)	0	(2,300,000)	NA	(NE)	0	(22,000,000)	0	(2,300,000)
Indeno (1,2,3-cd) pyrene	µg/kg	3 / 17 (18%)	32	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Phenanthrene	µg/kg	2 / 17 (12%)	14	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Pyrene	µg/kg	3 / 17 (18%)	60	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
PAH Low molecular weight	µg/kg	3 / 17 (18%)	14	NA	(NE)	0	(10,000)	NA	(NE)	NA	(NE)	NA	(NE)	0	(10,000)
PAH High molecular weight	µg/kg	5 / 17 (29%)	410	NA	(NE)	0	(1,160)	NA	(NE)	NA	(NE)	NA	(NE)	0	(1,160)

TABLE C6-9

Constitiuent Concentrations in Soil Compared to Screening Values
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Parameter	Units	Frequency of detection	Maximum Detected Value	Background Threshold Value (BTV) [1] # of Exceedences [7]	(BTV)	Ecological Comparison Value (ECV) [2] # of Exceedences [8]	(ECV)	Residential Screening Level (Res SL) [3] # of Exceedences [8]	(Res SL)	RWQCB Environmental Screening Levels (ESL) [4] # of Exceedences [8]	(ESL)	Commercial Screening Level (Com SL) [5] # of Exceedences [8]	(Com SL)	Interim Screening Level (Int SL) [6] # of Exceedences [8]	(Int SL)
Polycyclic Aromatic Hydrocarbons															
B(a)P Equivalent	µg/kg	6 / 17 (35%)	58	NA	(NE)	NA	(NE)	1	(38)	NA	(NE)	0	(130)	1	(38)
Polychlorinated biphenyls															
Aroclor 1254	µg/kg	1 / 3 (33%)	31	NA	(NE)	NA	(NE)	0	(220)	NA	(NE)	0	(740)	0	(220)
Total PCBs	µg/kg	1 / 3 (33%)	31	NA	(NE)	0	(204)	NA	(NE)	NA	(NE)	NA	(NE)	0	(204)
Total Petroleum Hydrocarbons															
TPH as motor oil	mg/kg	2 / 17 (12%)	120	NA	(NE)	NA	(NE)	NA	(NE)	0	(1,800)	NA	(NE)	0	(1,800)

Notes:

1 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

2 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil" July 1

3 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

4 Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

5 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

6 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.

7 Number of exceedences are the number of detections exceeding the background threshold value (BTV).

8 Number of exceedences are the number of detections that are equal to or exceeds the screening level (ecological comparison value, residential reporting limit, commercial reporting limit or interim screening level) or otherwise noted

* Number of exceedances are calculated using background threshold value because it is greater than the respective screening level.

‡ Maxiumum Reporting Limit greater than or equal to the interim screening level

USEPA regional screening level - USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

CHHSL - California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

mg/kg	miligrams per kilogram
µg/kg	micrograms per kilogram
ng/kg	nanograms per kilogram
NA	not applicable
ND	not detected in any of the samples
NE	not established
SL	screening level

USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water Board	Regional Water Quality Control Board

TABLE C6-10
Central Tendency Comparisons (Site to Background), AOC 12 - Fill Areas
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Parameter	Comparison Test Used	Probability that the Observed Differences Would Occur Purely by Chance	Statistical Decision with 0.05 Significance Level	Mean of Site Detects	Mean of Bkgd Detects	Median of Site Detects	Median of Bkgd Detects	Number of Site Detects	Number of Site Samples	Number of Bkgd Detects	Number of Bkgd Samples	Percent Detects Site	Percent Detects Bkgd
Cobalt	Gehan	0.423	nsd	7.71	7.85	7.8	7.61	17	17	58	59	100	98
Copper	Gehan	0.411	nsd	10.9	10.5	10.5	10.1	16	17	70	70	94	100
Zinc	Gehan	0.000	Site > Bkgd	47.1	36.8	50	35.5	17	17	70	70	100	100

Bkgd = background

nsd = no statistical difference
< = less than
> = greater than

TABLE C6-11
Decision 2 Data Gaps Summary AOC 12
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC?		Maximum Detected Value	> HHCV or Background as Applicable? [1]	> ECV or Background as Applicable? [1]	Proposed Sample ID	Notes
	Y or N	Det/# results		Y or N	Y or N		
Metals							
Cobalt				**23 mg/kg**	**13 mg/kg**		
0-0.5 ft bgs	N	2 of 2	8.4 mg/kg	N	N	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	7 of 7	14 mg/kg	N	Y		
0-6 ft bgs	Y	8 of 8	14 mg/kg	N	Y		
0-10 ft bgs	Y	14 of 14	14 mg/kg	N	NA		
Selenium				**380 mg/kg**	**1.47 mg/kg (bckg)**		
0-0.5 ft bgs	NA	0 of 2	NA mg/kg	N	N	None	Compound exceeds ECV. Although there are insufficient detections to allow calculation of a 95% UCL on the mean, additional data collection is not expected to yield sufficient detections to strongly influence the EPC as additional sampling would likely result in additional non-detect values.
0-3 ft bgs	N	1 of 7	2.5 mg/kg	N	Y		
0-6 ft bgs	N	1 of 8	2.5 mg/kg	N	Y		
0-10 ft bgs	N	1 of 14	2.5 mg/kg	N	NA		
Zinc				**23000 mg/kg**	**58 mg/kg (bckg)**		
0-0.5 ft bgs	N	2 of 2	77 mg/kg	N	Y	None	Compound exceeds ECV and may exceed background. Existing data adequate to calculate 95% UCL for all exposure intervals except 0 - 0.5 ft bgs. While this is insufficient to calculate an EPC using ProUCL for this exposure interval, the maximum concentration is low (i.e., does not exceed two times the lowest comparison value). Therefore, using the maximum result as the EPC is not expected to significantly impact the results of the risk assessment
0-3 ft bgs	Y	7 of 7	77 mg/kg	N	Y		
0-6 ft bgs	Y	8 of 8	77 mg/kg	N	Y		
0-10 ft bgs	Y	14 of 14	77 mg/kg	N	NA		
Polycyclic Aromatic Hydrocarbons							
PAHs (BaP TEQ)				**38 µg/kg**	**NA**		
0-0.5 ft bgs	N	2 of 2	19 µg/kg	N	NA	None	Compound exceeds HHCV. Existing data adequate for EPC.
0-3 ft bgs	N	4 of 7	19 µg/kg	N	NA		
0-6 ft bgs	Y	5 of 8	58 µg/kg	Y	NA		
0-10 ft bgs	Y	6 of 14	58 µg/kg	Y	NA		

Footnotes:
[1] The higher value of either the HHCV/ECV or background was selected as the screening criteria and are included in these columns for the respective compound in **BOLDED BLUE FONT**. Values based on background are indicated with "(bckg)" next to the value.

Acronyms and Abbreviations:
AOC - area of concern
BaP TEQ - benzo(a)pyrene toxic equivalents
ECV - ecological comparison values
EPC - exposure point concentration
ft bgs - feet below ground surface
HHCV - human health comparison values
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
N - no
NA - not applicable
95% UCL - 95 percent upper confidence limit on the mean (calculated by ProUCL Version 4.00.04; USEPA, 2009)
Y - yes

TABLE C6-12
Results of Tiered Analysis at AOC 12b and AOC 12c
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report, PG&E Topock Compressor Station, Needles, California

Metal	Step 1 Do COPCs/COPECs Exceed Background?	Step 2 Do COPCs/COPECs Exceed SSL?	Step 3 Does the Model Eliminate Potential for Leaching to Groundwater?
AOC 12b			
Cobalt[a]	√		
Copper	√		
Selenium	√		
AOC 12c			
Zinc	√		

[a] Cobalt has no maximum contaminant level. USEPA tapwater regional screening level (11 micrograms per liter) was used in place of maximum contaminant level.

✓ = Constituents concentration exceeds background and/or SSL.

TABLE C6-13

Sample Results Compared to the Calculated Soil Screening Levels

AOC12b

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)		
			Soil Screening Levels : [1]	150	46,000	91
			Background : [2]	12.7	16.8	1.47
Location	Date	Depth (ft bgs)	Sample Type	Cobalt	Copper	Selenium
AOC12b-T1a	09/20/08	2 - 3	N	14	18	ND (1)
AOC12b-T1b	09/20/08	2 - 3	N	9.6	14	2.5

1 Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.

2 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL and greater than or equal to the background value are circled.

mg/kg milligrams per kilogram

ft bgs feet below ground surface

N primary sample

FD field duplicate

--- not analyzed

ND not detected at the listed reporting limit

J concentration or reporting limit estimated by laboratory or data validation

TABLE C6-14

Sample Results Compared to the Calculated Soil Screening Levels
AOC12c
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)
			Soil Screening Levels : [1]	**320,000**
			Background : [2]	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Zinc**
AOC12c-T1a	09/20/08	0 - 0.5	N	77
	09/20/08	2 - 3	N	51
	09/20/08	10 - 11	N	50
AOC12c-T1b	09/20/08	2 - 3	N	49
	09/22/08	3 - 4	N	57
	09/20/08	10 - 11	N	45
AOC12c-T1c	09/20/08	10 - 11	N	49
	09/20/08	10 - 11	FD	50

[1] Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.
[2] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL and greater than or equal to the background value are circled.

mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C6-15

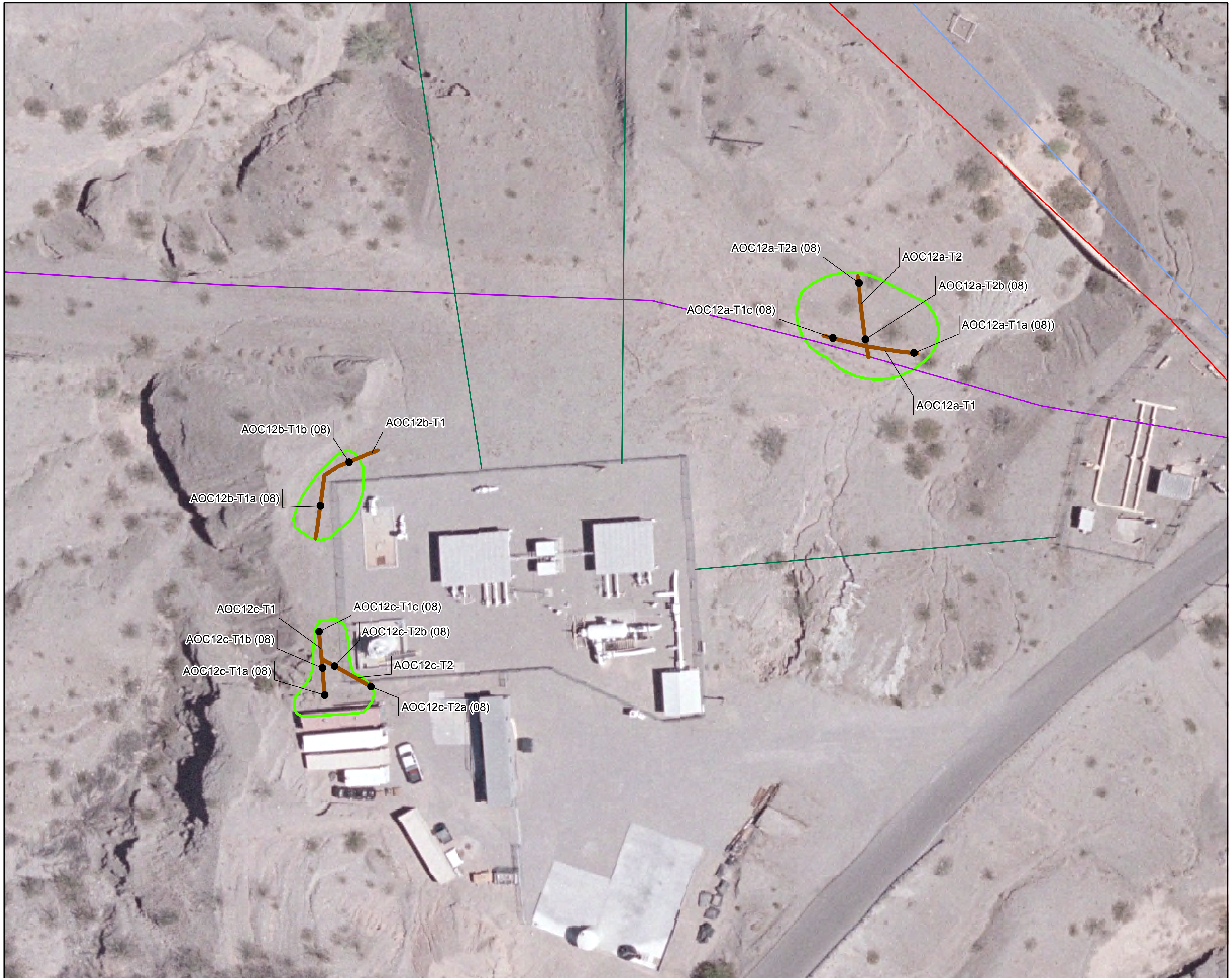
Constituent Concentrations in Soil Compared to Total Threshold Limit Concentration (TTLC), Soluble Threshold Limit Concentration (STLC), and Toxic Characteristic Leaching Procedure (TCLP)
AOC 12 - Fill Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Topock Compressor Station, Needles, California

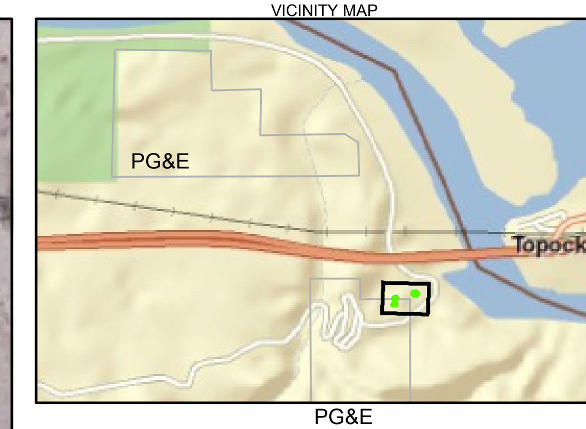
Parameter	Frequency of detection	Maximum Detected Value (mg/kg)	TTLC in mg/kg[1]		STLC in mg/L[1]			TCLP in mg/L[1]		
			# of Exceedences	TTLC	# of Exceedences of STLC x 10	STLC x 10	STLC	# of Exceedences of TCLP x 20	TCLP x 20	TCLP
Antimony	0 / 17 (0%)	ND (2.1)	0	500	0	150	15	0	NE	NE
Arsenic	17 / 17 (100%)	8.4	0	500	0	50	5	0	100	5
Barium	17 / 17 (100%)	240	0	10000	0	1000	100	0	2000	100
Beryllium	0 / 17 (0%)	ND (2.1)	0	75	0	7.5	0.75	0	NE	NE
Cadmium	0 / 17 (0%)	ND (1.1)	0	100	0	10	1	0	20	1
Chromium	17 / 17 (100%)	28	0	2500	0	50	5	0	100	5
Chromium, Hexavalent	0 / 17 (0%)	ND (0.431)	0	500	0	50	5	0	NE	NE
Cobalt	17 / 17 (100%)	14	0	8000	0	800	80	0	NE	NE
Copper	16 / 17 (94%)	18	0	2500	0	250	25	0	NE	NE
Lead	17 / 17 (100%)	8.3	0	1000	0	50	5	0	100	5
Mercury	0 / 17 (0%)	ND (0.11)	0	20	0	2	0.2	0	4	0.2
Molybdenum	1 / 17 (5.9%)	1	0	3500	0	3500	350	0	NE	NE
Nickel	17 / 17 (100%)	20	0	2000	0	200	20	0	NE	NE
Selenium	1 / 17 (5.9%)	2.5	0	100	0	10	1	0	20	1
Silver	0 / 17 (0%)	ND (2.1)	0	500	0	50	5	0	100	5
Thallium	0 / 17 (0%)	ND (4.2)	0	700	0	70	7	0	NE	NE
Vanadium	17 / 17 (100%)	42	0	2400	0	240	24	0	NE	NE
Zinc	17 / 17 (100%)	77	0	5000	0	2500	250	0	NE	NE

Notes:

[1] Code of Regulations, Title 22, Chapter 11, Article 3
mg/kg miligrams per kilogram
mg/L milligrams per liter
ND not detected in any of the samples
NE not established
‡ maximum reporting limit greater than or equal to the STLC.

Figure





LEGEND

- Boring
- Trench
- Transwestern Pipeline
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- AOC12 Boundary

AOC12a-T1a (08)
Year of Installation
Sample Location ID

N

0 25 50 100
Feet

FIGURE C6-1
Sampling and Trench Locations for AOC12 - Fill Area
RCRA Facility Investigation/Remedial Investigation
Soil Investigation Part A,
Phase I Data Gaps Evaluation Report
PG&E Topock Compressor Station
Needles, California

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2009\AOC12\AOC12_SAMPLOCS_WP.MXD BKAHLER 1/5/2010 15:34:47

Subappendix C7
Area of Concern 14 Data Gaps Evaluation Results

Contents

Tables

Figures

Acronyms and Abbreviations

µg/kg	micrograms per kilogram
AOC	Area of Concern
bgs	below ground surface
BTV	background threshold value
CHHSL	California human health screening level
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
CMS/FS	corrective measures study/feasibility study
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyl trichloroethane
DQO	data quality objective
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
ECV	ecological comparison value
EPC	exposure point concentration
I-40	Interstate 40
mg/kg	milligrams per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
RFI/RI	RCRA facility investigation/remedial investigation
RSL	regional screening level
SPLP	synthetic precipitation leaching procedure
SSL	soil screening level
STLC	soluble threshold limit concentration
SVOC	semivolatile organic compound
TAL	Target Analyte List

TCL	Target Compound List
TPH	total petroleum hydrocarbons
TTLC	total threshold limit concentration
VOC	volatile organic compound
XRF	x-ray fluorescence

SUBAPPENDIX C7

Area of Concern 14 Data Gaps Evaluation Results

1.0 Introduction and Background

This attachment presents the results of the Data Gaps Evaluation and Part A Phase 2 Sampling Program for Area of Concern (AOC) 14 – Railroad Debris Site at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. The process for the data gaps evaluation is outlined in Sections 2.0 through 6.0 of the main text of Appendix A, Part A Phase 1 Data Gaps Evaluation Report, to the Soil RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan.

1.1 Background

AOC 14 – Railroad Debris Site is located approximately 1,000 feet north of the compressor station 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 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 Bat Cave Wash.

The Railroad Debris site is approximately 1.5 acres in area and first appears in an aerial photograph dated 1947, prior to the establishment of the compressor station. In that photograph, a mound of soil apparently related to construction of the rail line is present on the site. In subsequent aerial photographs dated 1955, a white patch and other materials are present on this site. A dirt road that runs from the north end of the compressor station to this area is also visible on the 1955 aerial photographs. 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 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, 2006). AOC 14 currently contains miscellaneous construction debris including chunks of asphalt, railroad ties, and piping. Asbestos-containing material has also been identified at this site.

Employee reports suggest that a removal action for some of the debris and white powdery material was conducted in the mid-1990s; however, no documentation regarding the removal has been found (CH2M HILL, 2006). The contours of the site suggest that some excavation may have occurred in the southern portion of the area. The southern two-thirds of the area are somewhat lower in elevation than the surrounding areas, and a long, low soil mound/berm is present immediately north of this area. Some white powdery material remains in the embankment adjacent to I-40, and it appears that a thin lens of additional material has been uncovered by erosion on the southern side of the soil mound. In addition, a 1998 investigation of the area indicated that a layer of white powdery material is present below the current soil surface to approximately 5 feet below ground surface (bgs) (PG&E,

1999a). This layer has variable thickness and, in some areas, is underlain and overlain by a mix of the white powdery material and gravel.

An asbestos-containing material removal action was completed at this location in 1999 (PG&E, 1999b). In November 1998, during soil sampling at AOC 14, a small amount of friable construction debris and transite were found. The friable material contained over 1 percent asbestos. The transite was non-friable and, after sampling, the transite was left in the trench and was covered with clean fill material. PG&E removed the friable asbestos-containing material on April 14, 1999 and disposed of the material at an appropriate landfill. Two shallow confirmation samples of the underlying soils were collected. At one sample location, asbestos was detected in the underlying soil. Additional sampling was implemented to characterize the extent of the asbestos in the soil underlying the loose construction material near this sample. On June 1, 1999, 14 additional samples were taken, and no asbestos was detected in any of the sample locations.

Field observations made by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) in 2009 identified potential burn material along the I-40 road cut near the southwest corner of AOC 14. During additional employee interviews conducted by PG&E in late 2009 and early 2010, a former PG&E Topock Compressor Station employee reported periodic burning of primarily office garbage on the western edge of the AOC 14 bench area, as shown in Figures C7-1 through C7-7. The employee reported that AOC 14 was used for dumping and garbage burning until the freeway was built in the 1960s (PG&E, 2010). While several soil borings were installed and soil samples were collected during the Phase 1 investigation in 2008 from the general area identified as the area used for burning, no specific attempts were made to delineate or sample any burned material.

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 14 based on the above site history and background, as shown in Figure C7-2. Table C7-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 14. A detailed discussion of the migration pathways, exposure media, exposure routes, and human and ecological receptors is included in the Soil Part A Data Quality Objective [DQO] Technical Memorandum, which is included as Appendix A to the Part A Phase 1 Data Gaps Evaluation Report.

The primary sources of contamination at AOC 14 are disposal of debris and asbestos-containing material, water softening sludge, and potentially residuals from burning of office garbage. The primary release mechanisms are direct releases of contaminated particulates or leaching of contaminants from the debris, water softening sludge, and/or burned material. Contaminants present in these materials could have been deposited on surface soil as particulates, or entered surface soil as dissolved constituents through infiltration of rainfall. In addition, the water softening sludge was reportedly sprayed on the ground, and while the majority of the water in the sludge would have evaporated, some of the liquid in the sludge could have infiltrated into underlying soils. 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. Contaminants 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. Contaminants could have leached from surface soils and shallow soil into underlying deeper soils. Potential migration from subsurface soil to groundwater was identified as a potential secondary pathway. If released, volatile organic compounds (VOCs) in surface soils would be expected to have been degraded by heat and light, and are likely no longer present.

Windblown dust contamination from small particles of debris or contaminated surface soil within AOC 14 is a potential secondary release mechanism. Windblown contamination, if any, is expected to be limited to surface soils. Surface runoff from AOC 14 to Bat Cave Wash could also have transported chemicals of potential concern/chemicals of potential ecological concern (COPCs/COPECs) in surface soil or small pieces of debris from AOC 14 to Bat Cave Wash.

Part A Phase 1 and historical (pre-2008) soil and white powder samples were collected throughout AOC 14. Based on the site history, background, and conceptual site models, Part A Phase 1 and historical soil and debris samples were collected in areas with known debris/ disposal activity. White powder samples were collected based on observations. Grid-based soil sampling was also conducted across the AOC. Sampling has not been conducted to investigate the potential burning of office garbage west of the AOC 14 boundary and debris disposed of to the east of AOC 14 as these areas were only recently discovered (2009/2010).

1.2.1 AOC 14 Data

Twenty historical soil samples (at depths ranging from 0 to 6 feet bgs) were collected from 20 locations (S1-20, S2-6, S2-62, S2-130, S3-15, S3-72, S3-120, S4-4, S4-95, S4-160, S8-30, RR-1 through RR-3, RR-5, RR-6, RR-8, RR-10, and RR-11) in AOC 14, as shown in Figure C7-1. In addition, historical samples also included 11 white powder material samples (at depths ranging from 0 to 4 feet bgs) collected at GS-1, GS-2, S2-6, S2-62, S3-72, S4-4, S4-95, RR-4, RR-7, RR-9, and RR-12); and two black sandy material samples (S2-62 and S8-23 collected at 3 feet bgs).

Historical soil and white powder material samples were analyzed for five constituents: total chromium, hexavalent chromium, copper, nickel, and zinc. The black material samples were analyzed for metals, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPH). The railroad tie sample was analyzed for total chromium, lead, zinc, PAHs, and SVOCs.

During the 2008 Part A Phase 1 Soil Investigation, 79 soil samples (from 0 to 0.5, 2 to 3, 5 to 6, 9 to 10, and 14 to 15 feet bgs) were collected from 17 sample locations (AOC14-1 through AOC14-13 and AOC14-SS-1 through AOC14-SS-4), as shown in Figure C7-1. Phase 1 soil samples collected in AOC 14 were analyzed for Title 22 metals, hexavalent chromium, VOCs, SVOCs, PAHs, TPH, pH, asbestos, pesticides, and polychlorinated biphenyls (PCBs). Surface soil samples were not analyzed for VOCs. Ten percent of the Phase 1 soil samples collected in AOC 14 (eight soil samples) were analyzed for the full inorganic and organic suites per the CERCLA Target Analyte List and Target Compound List (TAL/TCL). In addition, synthetic precipitation leaching procedure (SPLP) extraction was conducted on a soil sample collected at 5 to 6 feet bgs at sample location AOC14-13 and a soil sample collected at 5 to 6 feet bgs at sample location AOC14-2. The leachate from the SPLP extractions was analyzed for total and hexavalent chromium. The leachate results from the SPLP extractions are presented in Table C7-2. Soil results were validated and the data quality evaluation is included in Appendix D of the Part A Phase 1 Data Gaps Evaluation Report.

In addition, white powder material was observed and sampled at 3.25 feet bgs at sample location AOC14-2, and debris (suspected transite) was observed and sampled at 1.5 feet bgs at sample location AOC14-13. The white powder material and debris samples were analyzed for the same analytical suite as listed above for the Part A Phase 1 soil samples.

All historical and Part A Phase 1 data considered Category 1 were used as inputs to the four DQO decisions.

2.0 Decision 1 – Nature and Extent

This section describes the nature and extent of residual soil concentrations of COPCs and COPECs at AOC 14. Laboratory analytical results for historical and Part A Phase 1 soil samples and the white powder sample at AOC 14 are presented in Tables C7-3 through C7-8. Table C7-9 presents a statistical summary of soil analytical results for COPCs and COPECs that were either detected above the laboratory reporting limits or not detected but where the reporting limits for one or more samples was greater than the interim screening value. White powder data are not included in this soil data statistical summary. Soil data are discussed first, followed by a discussion of the white powder sample data.

2.1 Summary of AOC 14 Soil Data

Antimony, beryllium, cadmium, silver, cyanide, TPH-gasoline, and PCBs were not detected in samples collected from AOC 14. Table C7-9 lists the 43 constituents detected in soil at AOC 14, including three calculated quantities (benzo(a)pyrene equivalents, total low-molecular-weight PAHs, and total high-molecular-weight PAHs). Nine of these constituents (aluminum, calcium, iron, magnesium, manganese, potassium, sodium 4,4-dichlorodiphenyldichloroethylene [4,4-DDE], and 4,4-dichlorodipheynyltrichloroethane [4,4-DDT]) were detected in the TAL/TCL samples.

Thirty of the constituents detected at AOC 14 (arsenic, barium, cobalt, nickel, thallium, vanadium, aluminum, calcium, iron, magnesium, manganese, potassium, sodium, 4-methylphenol, bis(2-ethylhexyl)phthalate, acenaphthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, total low-molecular-weight PAHs, TPH-diesel, and TPH-motor-oil) were detected at concentrations below their respective interim screening levels. Thirteen constituents were detected one or more times at concentrations exceeding the interim screening levels, including eight metals (total chromium, hexavalent chromium, copper, lead, mercury, molybdenum, selenium, and zinc), two pesticides (4,4-DDE and 4,4-DDT), benzo(a)pyrene, and two calculated quantities (benzo(a)pyrene equivalents and total high-molecular-weight PAHs).

Five constituents (total chromium, hexavalent chromium, copper, lead, and molybdenum) were detected at concentrations exceeding the interim screening level four or more times; the distribution of these constituents are shown in Figures C7-1 and C7-3 through C7-6.

Four sample locations associated with AOC 1 (AOC1-T6a through AOC1-T6c and SS-6) are located in the area that may potentially receive AOC 14 runoff into Bat Cave Wash. To provide further context for the evaluation of potential data gaps at AOC 14, the data from these sample locations are also shown in Figures C7-1 and C7-3 through C7-6. It should be noted that these samples are located in the bottom of the wash approximately 100 feet below the elevation of AOC 14.

2.2 Nature and Extent Evaluation

The following subsection discusses the nature and extent of COPCs and COPECs detected at concentrations exceeding the interim screening levels. As discussed in Section 3.2 of the Part A Phase 1 Data Gaps Evaluation Report, multiple factors were considered to assess whether the nature and extent of a specific constituent have been adequately delineated. Section 2.5 of this subappendix summarizes the constituents that may require further evaluation, and Section 6.0 of this subappendix provides the recommended follow-up sampling for the Part A Phase 2 soil investigation.

2.2.1 Total Chromium

Total chromium was detected in 99 of 99 soil samples collected at AOC 14. Detected concentrations of total chromium exceeded the interim screening level (39.8 milligrams per kilogram [mg/kg]) (background value/ecological comparison value [ECV]) four times (with a maximum detected concentration of 74.9 mg/kg at RR-6), as shown in Tables C7-3 and C7-9 and in Figure C7-1. None of the detected concentrations of total chromium exceeded the United States Environmental Protection Agency 2008 residential or commercial/industrial regional screening levels (RSLs) (280 mg/kg and 1,400 mg/kg, respectively). The four samples with detections exceeding the background threshold value (BTV)/ECV are located near the southwest corner of AOC 14. Samples with concentrations below the screening levels surround these locations laterally and vertically. The maximum detected concentration is only approximately twice the ECV.

2.2.2 Hexavalent Chromium

Hexavalent chromium was detected in 13 of 99 soil samples collected at AOC 14. Detected concentrations of hexavalent chromium exceeded the interim screening level (0.83 mg/kg) (BTV) eight times (with a maximum detected concentration of 5.8 mg/kg at RR-5), as shown in Tables C7-3 and C7-9 and in Figure C7-3. None of the detected concentrations of hexavalent chromium exceeded the ECV (139.6 mg/kg) or DTSC residential and commercial/industrial California human health screening levels (CHHSLs) (17 mg/kg and 37 mg/kg, respectively). Most of the samples with detections above the BTV are located near the southwest corner and southern boundary of AOC 14; two samples (AOC14-3 and S2-6) are located near the western boundary of the AOC. Samples with concentrations below the interim screening level surround the southwest locations laterally and vertically; the lateral extent of hexavalent chromium is not bounded at locations AOC14-2 and S2-6.

2.2.3 Copper

Copper was detected in 97 of 99 soil samples collected at AOC 14. Detected concentrations of copper exceeded the interim screening level (16.8 mg/kg) (BTV) four times (with a maximum detected concentration of 44 mg/kg at AOC14-2), as shown in Tables C7-3 and C7-9 and in Figure C7-4. One of the detected concentrations exceeded the ECV (20.6 mg/kg); none of the detections exceeded the residential or commercial/industrial CHHSLs (3,000 mg/kg and 38,000 mg/kg, respectively). Three of samples with detections above the BTV are located near the southwest corner and southern boundary of AOC 14; one sample is located in the northeastern corner (AOC14-8). Samples with concentrations below the interim screening level surround all of these locations laterally and vertically.

2.2.4 Lead

Lead was detected in 79 of 79 soil samples collected at AOC 14. Detected concentrations of lead exceeded the interim screening level (8.39 mg/kg) (BTV/ECV) 10 times (with a maximum concentration of 21 mg/kg at AOC14-2), as shown in Tables C7-3 and C7-9 and Figure C7-5. None of the detected concentrations exceeded the residential or commercial/industrial CHHSLs (80 mg/kg and 320 mg/kg, respectively). Five of the samples with lead above the BTV are located along the western boundary of AOC 14 and five are located in the southwest area that also had background exceedances for total and hexavalent chromium, and lead. One sample is located in the northwestern corner (AOC14-5). Samples with concentrations below the interim screening level surround most of these locations laterally and vertically. The distribution of lead exceedances is not consistent with the site-specific conceptual site model for AOC 14 (that is, in or near the disposal areas), suggesting other potential sources. The lead present at AOC 14 is most likely from other anthropogenic sources, which would cause a more widespread distribution of lead, as discussed in Appendix C, Section C.3.

2.2.5 Mercury

Mercury was detected in one of 79 soil samples collected at AOC 14 at a concentration of 0.25 mg/kg in AOC14-SS1 at 2 to 3 feet bgs. The detected concentration of mercury exceeded the interim screening level (0.0125 mg/kg, ECV) as shown in Tables C7-3 and C7-9. The detected concentration did not exceed the residential or commercial/industrial CHHSLs (18 mg/kg and 180 mg/kg). The ECV (0.0125 mg/kg) is below the capability of the instrumentation to detect mercury. The 78 nondetected sample results had reporting limits that exceeded the ECV. These reporting limits ranged from 0.099 to 0.11 mg/kg.

2.2.6 Molybdenum

Molybdenum was detected in 15 of 79 soil samples collected form AOC 14. Detected concentrations of molybdenum exceeded the interim screening level (1.37 mg/kg) (BTV) 10 times (with a maximum concentration of 2.4 mg/kg at AOC14-6. AOC14-7, and AOC14-12), as shown in Tables C7-3 and C7-9 and in Figure C7-6. Three detected concentrations exceeded the ECV (2.25 mg/kg); none of the detected concentrations exceeded residential and commercial/industrial CHHSLs (380 mg/kg and 4,800 mg/kg, respectively). The lateral extent of concentrations exceeding the interim screening level/ECV is limited to the northern and western portions of AOC 14. Samples with concentrations below the screening levels surround most of these locations, with the exception of AOC14-3, AOC14-13, and AOC14-SS-4. At all locations, the deepest samples have concentrations below the screening levels.

2.2.7 Selenium

Selenium was detected in three of 79 soil samples collected from AOC 14. As shown in Tables C7-3 and C7-9, two detected concentrations (AOC14-12 [1.5 mg/kg at 5 to 6 feet bgs] and AOC14-13 [1.6 mg/kg at 9 to 10 feet bgs]) barely exceeded the interim screening level (1.47 mg/kg) (BTV/ECV) but did not exceed the residential and commercial/industrial CHHSLs (380 mg/kg and 4,800 mg/kg, respectively). These locations are located near the southwest corner of AOC 14. Samples with concentrations below the interim screening level surround these locations laterally and vertically.

2.2.8 Zinc

Zinc was detected in 99 of 99 soil samples collected at AOC 14. Detected concentrations of zinc exceeded the interim screening level of 58 mg/kg (BTV/ECV) twice (AOC14-1 [70 mg/kg at 0 to 0.5 foot bgs] and RR-6 [243 mg/kg at 0 feet bgs]), as shown in Tables C7-3 and C7-9. None of the detected concentrations exceeded residential and commercial/industrial CHHSLs (23,000 mg/kg and 100,000 mg/kg, respectively). These locations are located near the southwest corner of AOC 14. Samples with concentrations below the interim screening level surround these locations laterally and vertically.

2.2.9 Benzo(a)pyrene, Benzo(a)pyrene Equivalents, and PAHs

Benzo(a)pyrene was detected in seven of 79 soil samples collected from AOC 14. One sample (AOC14-12 at 5 to 6 feet bgs) had a detected concentration of benzo(a)pyrene of 84 micrograms per kilograms (μg/kg) which exceeded the interim screening level of 38 μg/kg (residential CHHSL). Several other PAHs were detected in soil samples collected from AOC 14, but concentrations were below their respective interim screening levels. To assist with evaluation of PAHs for human health, benzo(a)pyrene equivalents were calculated for each of the soil samples collected at AOC 14, as shown in Table C7-5. The benzo(a)pyrene equivalent interim screening level of 38 μg/kg (residential CHHSL) was exceeded in one sample (130 μg/kg at AOC14-12 at 5 to 6 feet bgs), as shown in Tables C7-5 and C7-9. This location is located near the southwest corner of AOC 14. Samples with concentrations below the interim screening level surround this location laterally and vertically. The distribution of PAH exceedances is not consistent with the site-specific CSM for AOC 14 (that is, in the disposal area), suggesting other potential sources. The PAHs present at AOC 14 are most likely from other anthropogenic and naturally occurring sources (that is, combustion of fossil fuels, wild fires, volcanic activities, industrial facilities, petroleum oils, asphalt binders, and vehicle exhaust), which would cause a more widespread distribution of PAHs, as discussed in the main text of Appendix C, Section C.3.

To assist with evaluation of PAHs for ecological risk, detected concentrations of low-molecular-weight PAHs and high-molecular-weight PAHs were summed and compared to the PAH low-molecular-weight and PAH high-molecular-weight ECVs (10,000 μg/kg and 1,160 μg/kg, respectively). One of the sums of detected concentrations exceeded the PAH high-molecular-weight ECV (AOC14-12 at 5 to 6 feet bgs contained 1,400 μg/kg high-molecular-weight PAHs), and none of the detected sums exceeded the PAH low-molecular-weight ECV.

2.2.10 Asbestos

Seventy-nine soil samples were analyzed for asbestos. Bulk samples analyzed by polarized light microscopy indicated that asbestos fibers were present in 16 of the 72 soil samples, as shown in Table C7-8. Further analysis of these soil samples by California Air Resources Board Method 435 and transmission electron microscopy indicated that asbestos was present in only two soil samples (AOC13-2 at 14 to 15 feet bgs and AOC14-SS1 at 5 to 6 feet bgs) at trace levels (detected concentration of less than 0.1 percent, where the detection limit was less than 0.1 percent).

2.2.11 Target Analyte List/Target Compound List Constituents

Aluminum, calcium, iron, magnesium, manganese, potassium, sodium, 4-methylphenol, bis (2-ethylhexyl) phthalate, 4,4-DDE, and 4,4-DDT were detected in the AOC 14 soil samples analyzed for the complete TAL/TCL suite of compounds. These constituents are discussed below.

Aluminum was detected in eight of eight surface soil samples collected from AOC 14. The maximum detected concentration of aluminum was 9,000 mg/kg at AOC14-5, which is below the interim screening level (16,400 mg/kg) (BTV), as shown in Tables C7-4 and C7-9. Remaining detected concentrations of aluminum ranged from 3,000 to 8, 800 mg/kg. None of the detected concentrations exceeded residential and commercial CHHSLs (77,000 mg/kg and 990,000 mg/kg, respectively). An ECV has not been established for aluminum.

Calcium was detected in nine of nine soil samples collected from AOC 14, both surface and subsurface (3 and 4 feet bgs) samples were collected. The maximum detected concentration of calcium was 48,000 mg/kg at AOC14-1, which is below the interim screening level (66,500 mg/kg) (background value), as shown in Tables C7-4 and C7-9. Remaining detected concentrations of calcium ranged from 11,000 to 37,000 mg/kg. Residential and commercial/industrial CHHSLs and an ECV have not been established for calcium.

Iron was detected in nine of nine soil samples collected from AOC 14, both surface and subsurface (3 and 4 feet bgs) samples were collected. The maximum detected concentration of iron was 23,100 mg/kg at S1-20, which is below the interim screening level of 55,000 mg/kg (residential RSL), as shown in Tables C7-4 and C7-9. Remaining detected concentrations of iron ranged from 6,800 to 20,000 mg/kg. Residential and commercial/ industrial CHHSLs and an ECV have not been established for iron.

Magnesium was detected in nine of nine soil samples collected from AOC 14, both surface and subsurface (3 and 4 feet bgs) samples were collected. The maximum detected concentration of magnesium was 8,500 mg/kg at AOC14-1, which is below the interim screening level (12,100 mg/kg) (background value), as shown in Tables C7-4 and C7-9. Remaining detected concentrations of magnesium ranged from 2,600 to 8,330 mg/kg. Residential and commercial/industrial CHHSLs and an ECV have not been established for magnesium.

Manganese was detected in eight of eight surface soil samples collected from AOC 14. The maximum detected concentration of manganese was 290 mg/kg at AOC14-3, which is below the interim screening level (402 mg/kg) (BTV), as shown in Tables C7-4 and C7-9. Remaining detected concentrations of manganese ranged from 120 to 270 mg/kg. None of the detected concentrations exceeded residential and commercial/industrial CHHSLs (1,800 mg/kg and 23,000 mg/kg, respectively).

Potassium was detected in nine of nine soil samples collected from AOC 14, both surface and subsurface (3 and 4 feet bgs) samples were collected. The maximum detected concentration of potassium was 2,800 mg/kg at AOC14-3, which is below the interim screening level of 4,400 mg/kg (BTV), as shown in Tables C7-4 and C7-9. Remaining detected concentrations of potassium ranged from 690 to 2,700 mg/kg. Residential and commercial/industrial CHHSLs, RSLs, and an ECV have not been established for potassium.

Sodium was detected in eight of nine soil samples collected from AOC 14, both surface and subsurface (3 and 4 feet bgs) samples were collected. The maximum detected concentration of sodium was 850 mg/kg at AOC14-1, which is below the interim screening level (2,070 mg/kg) (BTV), as shown in Tables C7-4 and C7-9. Remaining detected concentrations of sodium ranged from 210 to 630 mg/kg. Residential and commercial/industrial CHHSLs, RSLs, and an ECV have not been established for sodium.

4-methylphenol was detected in one of 79 soil samples collected at AOC 14, both surface and subsurface soil samples were collected, as shown in Tables C7-5 and C7-9. The detected concentration was 430 µg/kg at AOC14-2 surface soil sample, which is below the interim screening level of 500 µg/kg (ECV), and well below the residential and commercial/industrial RSLs (310,000 µg/kg and 3,100,000 µg/kg, respectively).

Bis(2-ethylhexyl)phthalate was detected in one of 79 soil samples collected at AOC 14, both surface and subsurface soil samples were collected, as shown in Tables C7-5 and C7-9. The detected concentration was 810 µg/kg (at AOC14-1 at 2 to 3 feet bgs), which is below the interim screening level of 2,070 µg/kg, and well below the residential and commercial/industrial RSLs (35,000 µg/kg and 120,000 µg/kg, respectively).

4,4-DDE (2.9 µg/kg at AOC14-2), and 4,4-DDT (3 µg/kg at AOC14-2) were detected above their interim screening levels in one of eight surface soil samples collected from AOC 14. The detected concentrations exceeded the interim screening level of 2.1 µg/kg (ECV), as shown in Tables C7-7 and C7-9. The detected concentrations did not exceed the residential or commercial/industrial CHHSLs (1,600 µg/kg and 6,300 µg/kg, respectively). This location is located in the southwestern corner of the AOC.

As discussed in Section C.2 of the main text of Appendix C, PG&E recommends that the metals and organics discussed above not be considered COPCs/COPECs for this AOC and no further sampling for these constituents is proposed. These constituents have been fully discussed in Section C.2 of this subappendix.

2.3 Central Tendency Comparison to Background Threshold Values

Seven metals (total chromium, hexavalent chromium, copper, lead, molybdenum, selenium, and zinc) were detected above their background values in soil samples collected from AOC 14. A central tendency comparison was performed for five of these seven metals (total chromium, copper, lead, molybdenum, and zinc) to compare the AOC 14 soil data set for these metals with the corresponding soil background data set to determine whether a difference exists between the two populations and whether additional sampling may be required for a given metal. The comparison results are shown in Table C7-10 of this subappendix and in Figure 3-1 of the main text of the Part A Phase 1 Data Gaps Evaluation Report.

Metals in either the AOC 14 data set or background data set that were detected infrequently (less than five detects) or had a limited number of results (less than eight) were not tested. There were insufficient detections of selenium in the AOC 14 data set and insufficient detections of hexavalent chromium in the background data set to conduct the test.

No statistical difference between the two populations was noted for any of the five metals evaluated (total chromium, copper, lead, molybdenum, and zinc), as shown in Table C7-10.

2.4 White Powder Material, and Debris Samples and Mapping

This subsection discusses the historical white powder samples, white powder material and debris samples collected during the 2008 Part A Phase 1 soil investigation, and the white powder material and debris mapping.

2.4.1 White Powder Material Samples

As described above, 11 samples of historical white powder material and a sample of white powder material from the Soil Part A Phase 1 (location AOC14-2 at 3 to 3.25 feet bgs) were collected and sent to the laboratory for analysis.

DTSC also collected a sample of the AOC 14 white powder material on January 18, 2008 from the bank of the freeway (DTSC AOC 14 – Roadcut). This sample was collected as a comparison sample to the samples of white powder collected from AOC 10 - East Ravine. The results of this sampling were summarized in DTSC's memo *Field Report: White Powder Occurrences in the East Ravine - Area of Concern (AOC) 10, Pacific Gas and Electric (PG&E) Company Topock Compressor Station, Needles, California PCA 22120 WP 540015-48/36 WR 640233* (DTSC, 2008). The following compounds were detected in the DTSC-AOC14-Roadcut sample: barium, total chromium, cobalt, vanadium, zinc, sodium, calcium, iron, manganese, and potassium. Of these compounds, only calcium was detected above its interim screening level. These data are not included in the summary tables, since they were not collected, analyzed, or validated under the PG&E Program Quality Assurance Program Plan.

Total chromium, copper, nickel, and zinc were all detected in all 11 historical white powder material samples collected at AOC 14. Hexavalent chromium was detected in six of the 11 samples. Only total chromium, hexavalent chromium, and copper were detected above their respective interim screening levels in these samples, as shown in Table C7-3. The maximum detected concentration of total chromium in the historical white powder samples was 45.5 mg/kg, which only slightly exceeds the background value (39.8 mg/kg) and ECV (36.3 mg/kg) and is well below the residential RSL (280 mg/kg). The maximum detected concentration of hexavalent chromium in the historical white powder samples was 15.4 mg/kg, which exceeds the background value (0.83 mg/kg) but is below the residential CHHSL (17 mg/kg) and the ECV (139.6 mg/kg). The maximum detected concentration of copper in the historical white powder samples was 27.9 mg/kg, which exceeds the background value (16.8 mg/kg) and the ECV (20.6 mg/kg) but is well below the residential CHHSL (3,000 mg/kg).

During the 2008 Part A Phase 1 soil investigation, white powder material was encountered only in one location (AOC14-2) at approximately 3 feet bgs. A sample of the white powder material was collected from the 3- to 3.25-foot-bgs interval. Soil samples were also collected above and beneath the white powder material at (at 2 to 3 feet bgs and at 5 to 6 feet bgs) and were sent to the laboratory for analysis. The following compounds were detected in the white powder material sample: arsenic, barium, total chromium, hexavalent chromium, nickel, and vanadium. Of those compounds detected, arsenic (15 mg/kg) and hexavalent chromium (2.16 mg/kg) were detected above their respective interim screening levels, as shown in Table C7-3.

The following compounds were detected in the two soil samples collected at AOC14-2 above and beneath the white powder material: arsenic, barium, total chromium, hexavalent chromium, cobalt, copper, lead, nickel, vanadium, zinc, and TPH-motor-oil. Several PAHs were detected in the sample beneath the white powder material. Of the compounds detected, total chromium (42 mg/kg in both samples) and hexavalent chromium (1.04 and 1.32 mg/kg) were detected above their respective interim screening levels in both samples. Copper (19 mg/kg) and lead (21 mg/kg) were detected above their respective interim screening levels in the deeper sample. Asbestos was also detected in the soil sample collected beneath the white powder material.

2.4.2 Debris Samples

As previously mentioned in Section 1.1, two historical debris samples (black sandy material) and a sample of debris (suspected transite) were collected and sent to the laboratory for analysis. TPH-diesel (15,000 mg/kg) and TPH-motor-oil (17,000 mg/kg) were the only constituents detected above laboratory detection limits in the two black sandy material samples. These concentrations exceed the initial screening levels for TPH-diesel (540 mg/kg) and TPH-motor-oil (1,800 mg/kg); however, the risk assessment will evaluate the constituents contained in these samples, and no further sampling is recommended at this time to address the presence of this material. During the 2008 Part A Phase 1 soil investigation, debris (suspected transite) was encountered in one location (AOC14-13 at 0.5 to 1.5 feet bgs) near the surface, and a sample was collected. A soil sample was also collected beneath the debris at 5 to 6 feet bgs and was sent to the laboratory for analysis. The following compounds were detected in the debris sample: arsenic, barium, total chromium, hexavalent chromium, copper, lead, molybdenum, nickel, zinc, several PAHs, and TPH-motor-oil. Of those compounds detected, arsenic (18 mg/kg), total chromium (63 mg/kg), copper (33 mg/kg), lead (16 mg/kg), molybdenum (98 mg/kg), and nickel (57 mg/kg) were detected above their respective interim screening levels, as shown in Table C7-3. The debris sample contained 25 percent asbestos.

The following compounds were detected in the soil sample collected at 5 to 6 feet bgs, beneath the debris: arsenic, barium, total chromium, cobalt, copper, lead, molybdenum, nickel, vanadium, zinc, and TPH-motor-oil. Of those compounds detected, only molybdenum (2 mg/kg) was detected above its interim screening level. The soil sample identified asbestos fibers present using polarized light microscopy, but further analysis of the soil beneath the debris by California Air Resources Board Method 435 indicated that asbestos was not detected above the detection limit.

2.4.3 White Powder Material and Debris Mapping

As part of the conditional approval of the Draft Soil Part A Work Plan (CH2M HILL, 2006), DTSC requested that the white powder material and debris observed in AOC 14 be mapped. PG&E mapped white powder material during the Part A Phase 1 field investigation in 2008. The extent of the white powder material in AOC 14 was documented by walking the perimeter of the visible white powder material, recording the global positioning system coordinates, and plotting those areas on a figure. There were six areas of white powder material observed in AOC 14. Sampling locations AOC14-1, AOC14-2, AOC14-11, AOC14-12, and AOC14-13 were co-located within white powder areas.[1] During drilling activities at AOC 14, white powder material and/or debris was encountered in boring AOC14-2 (at 2 to 3.5 feet bgs). More detailed results of the white powder material mapping are presented in Appendix B of the Part A Phase 1 Data Gaps Evaluation Report.

In May 2009, PG&E conducted a site walk at AOC14 in to map the debris areas. Debris was observed on the hill above AOC 14 towards the east. The debris consisted of concrete rubble, transite, cans, and miscellaneous trash; these debris areas are shown in Figures C7-1 to C7-6. No sampling has occurred in these debris areas. Nature and extent of contamination in these debris areas have not been defined. Additional characterization of debris may be needed to assess if asbestos containing materials are present. Section 6.0 of this subappendix presents the proposed Phase 2 sample locations within these debris areas.

Additional debris was also identified on the west side of AOC 14 near a small cut in the Bat Cave Wash embankment near the northwestern edges of AOC 14. Some debris was noted on the side of the embankment. The nature and extent of the debris toward Bat Cave Wash have not been defined. Three soil borings (AOC1-T6a, -T6b, and -T6c were installed in a transect across Bat Cave Wash downslope from the western edge of AOC 14. Eleven soil samples (not including quality control samples) were collected. With the exception of two detects of lead (12 and 8.5 mg/kg in the 10-foot-bgs samples from AOC1-T6a and AOC1-T6b, respectively), metals were not detected above their respective interim screening levels. PAHs were detected in the surface samples in all three locations but below interim screening levels. Additional samples are proposed to fully assess impacts from AOC 14. Section 6.0 of this attachment presents the potential Phase 2 sampling to assess potential impacts from this debris area. The potential Phase 2 sample locations are needed to fill quantitative data gaps, meet agency requirements, and further progress toward decision-making for soil remediation.

2.5 Nature and Extent Conclusions

Based on the site history, background, and conceptual site model, qualitative review indicates than decision error has been held to an acceptable level. Sufficient data of acceptable quality have been attained by the collection of soil samples in areas most likely to have been impacted by the disposal of debris and asbestos-containing material, and water softening sludge. Some of the newly identified burn area, debris, and white powder areas have not been sampled.

Review of the nature and extent discussions above indicates that the lateral and vertical extents of samples with concentrations exceeding the screening levels are confined primarily

[1] White powder material samples were also collected during prior investigation efforts; see Table C7-3.

to the southwestern corner of the AOC 14 boundary. Within this area, the lateral and/or vertical extents of hexavalent chromium, molybdenum, PAHs, and pesticides have not been defined.

There are two sources of white powder material at Topock Compressor Station: (1) the water softening sludge, which is typically low in COPC concentrations, and (2) the concentrated minerals resulting from evaporation of cooling tower blowdown water. The white powder material found at AOC 14 contains a maximum total chromium concentration of 45 mg/kg and relatively low concentrations of other metals. This indicates that the likely source of this white powder material is the water softening sludge from the soda ash and lime-based water conditioning system that was in use at Topock until 1962; thus, chemical data are consistent with anecdotal employee reports.

Because the white powder material found at AOC 14 is likely the water softening sludge, and due to the fact that there was extensive sample coverage in the entire area (26 historical and 17 Phase 1 locations), no additional sampling of the white powder material in AOC 14 is recommended.

Based on review of the data and the Part A DQO, two data gaps were identified to resolve Decision 1 – Nature and Extent, and limited additional sampling is recommended in Phase 2 to fill the following data gaps:

1. Data Gap #1 – Western extent of benzo(a)pyrene, metals, and pesticide contamination in the southwestern corner of AOC 14
2. Data Gap #2 – Nature and extent of contamination in the newly identified burn area west of AOC 14 and the newly identified debris area east of AOC 14

The potential Phase 2 soil sample locations to fill the data gaps are presented in Section 6.0 of this subappendix.

3.0 Decision 2 – Data Sufficient to Estimate Representative Exposure Point Concentrations

For Decision 2, data were evaluated to determine if the AOC 14 data are sufficient to conduct human health and ecological risk assessments based on the criteria described in Section 4.0 of the Part A Phase 1 Data Gaps Evaluation Report. The principal consideration for Decision 2 was whether there were sufficient data to estimate a representative exposure point concentration (EPC). Data reviewed were all available Category 1 data (including historical data from investigations in 1998 and 2000) at AOC 14. The sample designated as "white powder" (AOC14-2 at 3 to 3.25 feet bgs) was included in the data reviewed as a conservative measure, assuming that exposure to white powder areas would not differ significantly from exposure to surrounding soil areas. Similarly, because the precise physical characteristics (and consequently the potential exposure mechanism) of the samples identified as "black sandy material (asphalt material)" cannot be determined based on the available data reports, these samples were included in the data reviewed based on the same rationale.

Table C7-11 summarizes the results of the evaluation to determine whether data are sufficient to estimate a representative EPC. Data were reviewed for all chemicals that were detected in at least one sample and exceeded at least one comparison value. Existing data are adequate to support EPC development for detected chemicals that exceeded one or more comparison values (10 metals, three Contract Laboratory Program inorganics, PAHs, total DDT [DDT-R]), TPH-diesel, and TPH-motor-oil, as described below. Phase 2 data will be added to the existing data set to calculate the final EPC (after Decision 1 is satisfied).

3.1 Metals

Sufficient data (numbers of samples and detections) are available to calculate EPCs for arsenic, total chromium, copper, lead, nickel, and zinc using ProUCL. For the remaining metals (antimony, mercury, molybdenum, and selenium), additional data collection is not expected to significantly change the results of the risk assessment either because the compound is very infrequently detected (antimony and mercury) (that is, additional nondetects would be expected) or because the maximum detected concentration is below or only slightly greater than the lowest comparison value (molybdenum and selenium).

3.2 Inorganics

Sufficient data (numbers of samples and detections) are available to calculate EPCs for calcium, magnesium, and sodium using ProUCL.

3.3 Polycyclic Aromatic Hydrocarbons

Sufficient data (numbers of samples and detections) are available to calculate EPCs for benzo(a)pyrene toxicity equivalents and high-molecular-weight PAHs using ProUCL.

3.4 Pesticides

4,4-DDE and 4,4-DDT were detected in a single sample at concentrations near the detection limit, as shown in Table C7-7. The data are insufficient to allow calculation of an EPC using ProUCL. The total concentration of DDT and metabolites (DDT-R) is approximately three times the ECV. However, collection of additional data is not expected to yield sufficient detections to strongly influence the EPC; therefore, no additional data collection is recommended to support EPC development.

3.5 Petroleum Hydrocarbons

Sufficient data (number of samples and detections) are available to calculate EPCs for TPH-diesel and TPH-motor-oil using ProUCL.

4.0 Decision 3 – Potential Threat to Groundwater from Residual Soil Concentrations

The following preliminary analysis was performed with the existing data set to assess the potential threat to groundwater and to assess if additional data, above and beyond that necessary for Decision 1 are needed to resolve Decision 3. Additional evaluations will be performed as appropriate as data are collected to resolve Decision 1. Data collected to satisfy

Decision 1 – Nature and Extent Evaluation will provide the final representative data set that will be used to assess the threat to groundwater. The preliminary conclusions regarding the threat to groundwater are based on available data and will be revisited after the implementation of the soil investigation. The combined data set will then be evaluated for data gaps, and further conclusions regarding the threat to groundwater will be provided to the agencies and stakeholders for review prior to submittal of the RFI/RI Volume 3.

Table C7-12 presents the results of the tiered analysis for AOC 14. Nine metals were detected at concentrations above the BTVs. Of those nine, hexavalent chromium, molybdenum, and thallium exceeded the calculated soil screening levels, as shown in Table C7-13. Numerical modeling was conducted to evaluate the potential of these three metals to leach into groundwater. Based on the initial screening model, the potential for molybdenum to leach to groundwater was ruled out. Based on the screening model, the potential for hexavalent chromium or thallium to leach to groundwater could not be ruled out.

4.1 Thallium

At AOC 14, only one sample had a detectable concentration of thallium (2.2 mg/kg). This single detection prompted the additional analysis. The simulated leaching concentrations of thallium were likely due to the following three factors:

- Nondetects in the initial concentration profile were input as one-half of the detection limit, resulting in a non-zero concentration and mass throughout the simulated vadose zone. Further, the reporting limit for thallium in AOC 14 samples was as high as 22 mg/kg; therefore, the assumed concentration for that interval was elevated.
- Thallium has a very low K_d (dissociation constant)[2] of 3.2 milliliters per gram.
- The background upper tolerance limit for thallium in groundwater is very low at 0.908 micrograms per liter.

Additional data are not needed for thallium; however, further refinement of the vadose zone leaching model and assumptions are proposed.

4.2 Hexavalent Chromium

The simulated leaching concentration of hexavalent chromium at AOC 14 is likely due to the fact that the initial screening approach assigned the maximum concentration found at each depth interval across the entire interval, even though many other samples with far lower concentrations were observed at each level.

The model will be refined by discretizing the area spatially to more realistically simulate vadose zone contaminant concentrations. Additional proposed soil borings described in Decision 1 will also be used to support the model refinement.

The vertical extent of hexavalent chromium is fully defined at AOC 14, with no exceedances of BTVs at the deepest samples collected; therefore, a current threat to groundwater has been ruled out.

[2] The dissociation constant describes how strongly a chemical adsorbs to soil solids.

5.0 Decision 4 – Data Sufficiency to Support the Corrective Measures Study/Feasibility Study

As discussed in Section 6.0 of the Part A Phase 1 Data Gaps Evaluation Report, various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study (CMS/FS). The types of data needed vary somewhat depending on the specific technology to be evaluated. The categories of data required for technologies that may be applicable to the areas outside the fence line include:

- Extent of COPCs/COPECs above action levels (required for all technologies).
- Waste characterization parameters (required if soil may be disposed of offsite).
- Constituent leachability (required to assess the need for fixation of leachable compounds and/or the feasibility of certain soil-washing technologies).
- Soil physical properties (required for all technologies; however, the properties required vary among the different technologies).
- Surface and subsurface features (required to determine whether there are physical impediments to implementing specific technologies and/or remediating specific areas).
- Volumes of white powder and debris.

The following is a summary of available data for AOC 14 that is currently available to support CMS/FS:

5.1 Extent of COPCs and COPECs

A summary of the nature and extent of detected COPCs/COPECs is presented in Section 2.0 Decision 1 – Nature and Extent. The results of COPCs/COPECs are shown in Figure C7-1 and Figures C7-3 to C7-6, and data gaps associated with lateral and vertical delineation are discussed in Section 6.0.

5.2 Waste Characterization Parameters

Only partial waste characterization data are available to characterize the soil and other materials to be potentially removed for remedial action and disposed in an offsite permitted facility. While none of the soils or other materials is considered ignitable, corrosive, or reactive, data are lacking to complete the evaluation of the toxicity characteristic. Total chemical concentrations are available to characterize the soil, certain debris, and white powder material relative to California Title 22 total threshold limit concentrations (TTLCs). The maximum concentrations of these metals were compared to the TTLCs, and none of the metals in AOC 14 exceeded the TTLCs, as shown in Table C7-14. The maximum detected concentrations were also compared to the soluble threshold limit concentrations (STLC), and only one of the metals concentrations in AOC 14 (total chromium at 74.9 mg/kg at RR-6 at 0 feet bgs) exceeded 10 times STLC, as discussed in Table C7-14. Because there was only one exceedance, and the concentration is relatively close to 10 times the STLC, this detection is not considered a data gap. Finally, soil metals concentrations were also compared the TCLP and none of the metals detected exceeded 20 times the TCLP, as shown in

Table C4-14. Additional data regarding potential COPC/COPEC leachability include SPLP analysis for total and hexavalent chromium, as shown in Table C7-2. SPLP analysis was conducted only for soil samples (no white powder or debris samples were tested using SPLP).

5.3 Soil Physical Properties

Soil physical property data collected during the Part A Phase 1 investigation were limited to grain size analysis only. Specific soil physical properties data (that is, porosity, grain size, density, organic carbon content) are required to support the CMS/FS, as described in Table 6-1 of the Part A Phase 1 Data Gaps Evaluation Report.

5.4 Surface and Subsurface Features

While there is extensive information regarding surface and subsurface features at AOC 14, additional information may be required once areas requiring remediation have been defined. Nearby roads and road structures, vegetation, and the location of bedrock are known for AOC 14. However, subsurface utilities, including gas transmission pipelines and any culverts or other features, may have to be more precisely defined to evaluate the feasibility and cost of certain remedial alternatives, and prepare construction specifications.

5.5 Volumes of White Powder and Debris

Preliminary mapping has been conducted to identify the extent and type of debris present in AOC 14; findings of this mapping are presented in Section 3.0 and in Appendix B to the Part A Phase 1 Data Gaps Evaluation Report. Additional soil physical parameter data are needed to support the CMS/FS.

6.0 Summary of Data Gaps Evaluation and Potential Phase 2 Soil Sample Locations to Fill the Identified Gaps

Based on the Part A DQO, data gaps were identified for three of the four decisions and are summarized below by decisions. Identified data gaps were discussed during data gaps evaluation meetings in October and November 2010 and January 2012. Subsequent revisions to the data gaps have occurred; however, the data gap numbers from those meetings have been retained.

- **Decision 1 – Nature and Extent** – The following data gaps were identified to resolve this decision:
  - Data Gap #1 – Western extent of benzo(a)pyrene, metals, and pesticide contamination in the southwestern corner of AOC 14
  - Data Gap #2 – Nature and extent of contamination in the newly identified burn area west of AOC 14 and the newly identified debris area east of AOC 14
- **Decision 2 (Data Sufficient to Estimate Representative EPCs)** – No data gap was identified for this decision.

- **Decision 3 (Potential Threat to Groundwater from Residual Soil Concentrations)** – No data gap was identified for this decision.
- **Decision 4 (Data Sufficient to Estimate Soil Properties and Contaminant Distribution in Support of the CMS/FS) –** The following data gap was identified to resolve this decision**:**
  - Data gap #5 – Soil physical parameters to support the CMS/FS

In an effort to reduce intrusive sampling, a portable x-ray fluorescence (XRF) analyzer will be used to assist with identifying possible sample locations in debris areas on the slope east of AOC 14 (Data Gap #2). Up to 20 XRF samples will be collected in the debris area. Corrected XRF results will be compared to applicable screening levels on Table 2-1 in the Soil RFI/RI Work Plan on a point-by-point basis. (For field screening purposes, XRF concentration readings will be adjusted using least squares regression equation calculated from the RCRA facility investigation/remedial investigation samples analyzed in the lab and by the XRF.) PG&E, the agencies, and the Tribes will meet to review the XRF results prior to making determinations about the need for and locations of intrusive activities within the debris area of AOC 14. If intrusive activities are required,, soil samples will be collected at 0 to 0.5, 2 to 3, 5 to 6, and 9 to 10 feet below ground surface at that location and will be submitted to the laboratory for analysis for hexavalent chromium, PAHs, Title 22 metals, and asbestos.

Table C7-15 summarizes the potential Phase 2 sample locations, depths, rationale for each location, and analytes. Potential Phase 2 sample locations are also shown in Figures C7-1 and C7-3 through Figure C7-7. The potential Phase 2 sample locations are needed to fill quantitative data gaps, meet agency requirements, and further progress toward decision-making for soil remediation.

6.1 Access Restrictions

AOC 14 – Railroad Debris Site is currently bounded by the Burlington Northern Santa Fe railroad tracks to the north, I-40 to the south, Bat Cave Wash to the west, and the former access road to the location to the east. The bottom of Bat Cave Wash is located approximately 100 feet below AOC 14 and I-40 is approximately 10 feet below AOC 14. Access to the site is limited to foot traffic only crossing over the railroad tracks, which requires a Burlington Northern Santa Fe permit. Heavy equipment would need to be craned onto the site from I-40.

7.0 References

ARCADIS. 2008. *Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil.* May 28.

__________. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2008. *Field Report: White Powder Occurrences in the East Ravine - Area of Concern*

(AOC) 10, Pacific Gas and Electric (PG&E) Company Topock Compressor Station, Needles, California PCA 22120 WP 540015-48/36 WR 640233. June 18.

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. 2005. *Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil*. November 2004 (January 2005 Revision). January.

California Regional Water Quality Control Board, San Francisco Bay Region (Water Board). 2008. *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*. May 27.

CH2M HILL. 2006. *RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan, Part A, PG&E Topock Compressor Station, Needles, California*. November 16.

__________. 2009. *Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California.* May.

Pacific Gas and Electric Company (PG&E). 1999a. Letter from Melvin Wong (PG&E) to Mr. Robert Senga (DTSC). "Soil Sampling Results, RCRA Facility Investigation at Bat Cave Wash Area, PG&E Topock Compressor Station, Needles California, USEPA ID No. CAT080011729." February 5.

__________. 1999b. Letter from Melvin Wong (PG&E) to Mr. Robert Senga (DTSC). "Additional Asbestos Results, Railroad Debris Site, Topock Compressor Station, Needles, California." June 16.

__________. 2010. *Data Quality Objectives Steps 1 through 5 – Part A Soil Investigation at the Pacific Gas and Electric Company Topock Compressor Station, Needles, California.* March 12.

United States Environmental Protection Agency. 2009. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* December. Available online at: http://www.epa.gov/region09/superfund/prg/pdf/composite_sl_table_run_APRIL2009.pdf. September 12.

Tables

TABLE C7-1
Conceptual Site Model, AOC 14 – Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Disposal of Debris	Surface Soil	Percolation and/or infiltration Potential entrainment in stormwater/ surface water runoff	Subsurface Soil Potential Groundwater	Wind erosion and atmospheric dispersion of surface soil Potential volatilization and atmospheric dispersion Potential extracted groundwater[a]
Burned Material	Surface Soil	Percolation and/or infiltration Potential entrainment in stormwater/ surface water runoff	Subsurface Soil	Wind erosion and atmospheric dispersion of surface soil

[a] Quantitative evaluation of the groundwater pathway completed in the groundwater risk assessment (ARCADIS, 2009). Part A Phase I data were reviewed on a preliminary basis in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil; a comprehensive evaluation of the potential for constituents in soil to leach to groundwater will be completed after the Part A Phase 2 data are available.

TABLE C7-2

Synthetic Precipitation Leaching Procedure (SPLP) Extraction Results
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Topock Compressor Station, Needles, California

			SPLP Results in mg/L	
Location	**Sample Date**	**Depth (ft bgs)**	**Hexavalent Chromium**	**Chromium (total)**
AOC14				
AOC14-13	10/01/08	0.5-1.5	0.0059 J	0.0094
AOC14-2	09/30/08	5-6	0.0436 J	0.0425

Notes:

ft bgs feet below ground surface
mg/L milligrams per liter
J concentration estimated by laboratory or data validation

TABLE C7-3
Sample Results: Metals
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				**0.285**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**0.0125**	**1.37**	**27.3**	**1.47**	**5.15**	**2.32**	**52.2**	**58**
Residential Regional Screening Levels [2]:				**31**	**0.062**	**15,000**	**160**	**70**	**0.29**	**280**	**23**	**3,100**	**150**	**10**	**390**	**1,500**	**390**	**390**	**5.1**	**390**	**23,000**
Residential DTSC CHHSL [3]:				**30**	**0.07**	**5,200**	**16**	**39**	**17**	**NE**	**660**	**3,000**	**80**	**18**	**380**	**1,600**	**380**	**380**	**5**	**530**	**23,000**
Ecological Comparison Values [4]:				**0.285**	**11.4**	**330**	**23.3**	**0.0151**	**139.6**	**36.3**	**13**	**20.6**	**0.0166**	**0.0125**	**2.25**	**0.607**	**0.177**	**5.15**	**2.32**	**13.9**	**0.164**
Background [5]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
AOC14-1	09/30/08	0 - 0.5	N	ND (2) *	4.8	190 J	ND (2) *	ND (1)	0.841	25	7.2	11	18	ND (0.1) *	ND (2) *	11	ND (1)	ND (2)	ND (4) *	30	70
	09/30/08	2 - 3	N	ND (2) *	4.8	220	ND (2) *	ND (1)	ND (0.412)	25	8.4	8.5	8.7	ND (0.1) *	ND (2) *	11	ND (1)	ND (2)	ND (4.1) *	36	47
	09/30/08	5 - 6	N	ND (2) *	2.2	180	ND (1) *	ND (1)	ND (0.412)	27	8.5	9.5	2.3	ND (0.1) *	1.6	12	ND (2) *	ND (1)	ND (2)	34	38
	09/30/08	9 - 10	N	ND (2) *	2.3	160	ND (1) *	ND (1)	ND (0.403)	17	7.4	8.2	2.7	ND (0.099) *	ND (1)	11	ND (1)	ND (1)	ND (2)	31	34
	09/30/08	14 - 15	N	ND (2) *	2.7	140	ND (1) *	ND (1)	ND (0.412)	18	8.6	12	2.1	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	29	34
AOC14-2	09/30/08	0 - 0.5	N	ND (2) *	5.8	190	ND (2) *	ND (1)	0.768	28	6.8	44	18	ND (0.1) *	ND (2) *	12	ND (1)	ND (2)	ND (4.1) *	28	49
	09/30/08	2 - 3	N	ND (2.1) *	11	130	ND (11) *	ND (1.1) *	1.04	42	ND (11)	ND (21) *	7.6	ND (0.11) *	ND (11) *	12	ND (1.1)	ND (11) *	ND (21) *	25	34
	10/01/08 [6]	3 - 3.25	N	ND (2.3) *	15	120	ND (11) *	ND (1.1) *	2.16	26	ND (11)	ND (23) *	ND (1.1)	ND (0.11) *	ND (11) *	4.5	ND (1.1)	ND (11) *	ND (23) *	13	ND (11)
	09/30/08	5 - 6	N	ND (2.1) *	8.5	150	ND (5.2) *	ND (1)	1.32	42	6.6	19	21	ND (0.11) *	ND (5.2) *	13	ND (1)	ND (5.2) *	ND (10) *	27	51
	09/30/08	9 - 10	N	ND (2) *	2.6	180	ND (1) *	ND (1)	ND (0.405)	21	8.5	16 J	1.8	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	32	40
	09/30/08	9 - 10	FD	ND (2) *	2.6	180	ND (1) *	ND (1)	ND (0.404)	21	8.4	11 J	1.9	ND (0.1) *	ND (1)	10	ND (2) *	ND (1)	ND (2)	33	41
	09/30/08	14 - 15	N	ND (2) *	3.1	120	ND (1) *	ND (1)	ND (0.407)	15	7.2	9.1	2.1	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	28	35
AOC14-3	10/01/08	0 - 0.5	N	ND (2) J*	3.7	140	ND (1) *	ND (1)	ND (0.403)	31	7.5	12	8.4	ND (0.1) *	1.6	11	ND (1)	ND (1)	ND (2)	30	52
	10/01/08	2 - 3	N	ND (2) *	3.3	90	ND (1) *	ND (1)	ND (0.405)	26	8.1	13	6.4	ND (0.1) *	ND (1)	13	ND (1)	ND (1)	ND (2)	34	46
	10/01/08	5 - 6	N	ND (2) *	3.4	130	ND (1) *	ND (1)	0.877	32	6.6	11	9	ND (0.1) *	2.1	11	ND (1)	ND (1)	ND (2)	26	40
	10/01/08	9 - 10	N	ND (2) *	2.1	140	ND (1) *	ND (1)	ND (0.404)	19	7.5	7.1	2	ND (0.1) *	ND (1)	10	ND (1)	ND (1)	ND (2)	30	33
	10/01/08	14 - 15	N	ND (2) *	2.7	110	ND (1) *	ND (1)	ND (0.403)	17	7.6	12	2.2	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	29	32
AOC14-4	10/01/08	0 - 0.5	N	ND (2) *	4.5	99	ND (1) *	ND (1)	ND (0.402)	13	4.3	7.3	7.2	ND (0.1) *	ND (1)	7.1	ND (1)	ND (1)	ND (2)	20	31
	10/01/08	2 - 3	N	ND (2) *	4.5	130	ND (1) *	ND (1)	ND (0.405)	16	4.4	6.2	3.5	ND (0.1) *	1.5	7.6	ND (1)	ND (1)	ND (2)	21	23
	10/01/08	5 - 6	N	ND (2) *	4.1	110	ND (1) *	ND (1)	ND (0.403)	16	4.4	5.3	3.5	ND (0.1) *	1.5	7.3	ND (1)	ND (1)	ND (2)	21	23
	10/01/08	9 - 10	N	ND (2) *	2.9	86	ND (1) *	ND (1)	ND (0.403)	8.2	3.4	2.9	2.8	ND (0.1) *	1.2	4.8	ND (1)	ND (1)	ND (2)	19	16
	10/01/08	9 - 10	FD	ND (2) *	3.1	96	ND (1) *	ND (1)	ND (0.404)	8.1	3.3	2.7	2.9	ND (0.1) *	1.2	4.8	ND (1)	ND (1)	ND (2)	18	16
	10/01/08	14 - 15	N	ND (2) *	3.4	130	ND (1) *	ND (1)	ND (0.406)	15	6.4	7.9	2.2	ND (0.1) *	ND (1)	10	ND (1)	ND (1)	ND (2)	27	29
AOC14-5	10/02/08	0 - 0.5	N	ND (2) *	6.8	300	ND (2) *	ND (1)	ND (0.403)	15	6.8	9.6	5.3	ND (0.099) *	ND (2) *	10	ND (1)	ND (2)	ND (4) *	29	35
	10/02/08	2 - 3	N	ND (2) *	9	240	ND (2) *	ND (1)	ND (0.405)	17	6.1	16	16	ND (0.1) *	ND (2) *	13	ND (1)	ND (2)	ND (4) *	28	46
	10/02/08	5 - 6	N	ND (2) *	3.2	240	ND (1) *	ND (1)	ND (0.404)	15	7.3	7.9	2.7	ND (0.099) *	ND (1)	10	ND (1)	ND (1)	ND (2)	28	35
	10/02/08	9 - 10	N	ND (2) *	2.8	110	ND (1) *	ND (1)	ND (0.403)	15	7.6	9.5	2.3	ND (0.1) *	ND (1)	10	ND (1)	ND (1)	ND (2)	30	35
	10/02/08	14 - 15	N	ND (2) *	3.2	90	ND (1) *	ND (1)	ND (0.406)	16	6.8	7.3	2.2	ND (0.1) *	ND (1)	12	ND (1)	ND (1)	ND (2)	28	30
AOC14-6	10/02/08	0 - 0.5	N	ND (2) *	5	120	ND (1) *	ND (1)	ND (0.402)	11	4	6.1	7.4	ND (0.1) *	1.2	7	ND (1)	ND (1)	ND (2)	20	35
	10/02/08	2 - 3	N	ND (2) *	6	210	ND (2) *	ND (1)	ND (0.403)	23	7.8	9.5	3.3	ND (0.1) *	2.4	11	ND (1)	ND (2)	ND (4) *	34	37
	10/02/08	5 - 6	N	ND (2) *	3.4	140	ND (1) *	ND (1)	ND (0.405)	18	7.7	9.1	2.3	ND (0.099) *	ND (1)	11	ND (1)	ND (1)	ND (2)	31	35
	10/02/08	9 - 10	N	ND (2) *	2.6	120	ND (1) *	ND (1)	ND (0.406)	18	8.3	9.6	2.4	ND (0.1) *	ND (1)	12	ND (1)	ND (1)	ND (2)	33	39
	10/02/08	9 - 10	FD	ND (2) *	2.8	110	ND (1) *	ND (1)	ND (0.406)	18	8.4	9.7	2.3	ND (0.1) *	ND (1)	12	ND (1)	ND (1)	ND (2)	33	39
	10/02/08	14 - 15	N	ND (2) *	3.3	110	ND (1) *	ND (1)	ND (0.402)	16	5.9	7.2	2.2	ND (0.1) *	ND (1)	9.3	ND (1)	ND (1)	ND (2)	25	28
AOC14-7	10/02/08	0 - 0.5	N	ND (2) *	5	160	ND (1) *	ND (1)	ND (0.404)	15	4.7	7.4	6.1	ND (0.099) *	ND (1)	9.6	ND (1)	ND (1)	ND (2)	25	31
	10/02/08	2 - 3	N	ND (2) *	5	170	ND (1) *	ND (1)	ND (0.405)	13	6.1	10	7.1	ND (0.1) *	ND (1)	9.3	ND (1)	ND (1)	ND (2)	23	30
	10/02/08	5 - 6	N	ND (2) *	5.3	210	ND (2) *	ND (1)	ND (0.405)	18	7.5	10	4.8	ND (0.1) *	ND (2) *	12	ND (1)	ND (2)	ND (4) *	30	35
	10/02/08	9 - 10	N	ND (2) *	3.9	120	ND (1) *	ND (1)	ND (0.404)	26	10	14	2.9	ND (0.1) *	ND (1)	16	ND (1)	ND (1)	ND (2)	38	46
	10/02/08	14 - 15	N	ND (2) *	3.7	150	ND (1) *	ND (1)	ND (0.401)	25	6.5	9.9	3.5	ND (0.1) *	2.4	11	ND (1)	ND (1)	ND (2)	25	32

TABLE C7-3
Sample Results: Metals
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				**0.285**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**0.0125**	**1.37**	**27.3**	**1.47**	**5.15**	**2.32**	**52.2**	**58**
Residential Regional Screening Levels [2]:				**31**	**0.062**	**15,000**	**160**	**70**	**0.29**	**280**	**23**	**3,100**	**150**	**10**	**390**	**1,500**	**390**	**390**	**5.1**	**390**	**23,000**
Residential DTSC CHHSL [3]:				**30**	**0.07**	**5,200**	**16**	**39**	**17**	**NE**	**660**	**3,000**	**80**	**18**	**380**	**1,600**	**380**	**380**	**5**	**530**	**23,000**
Ecological Comparison Values [4]:				**0.285**	**11.4**	**330**	**23.3**	**0.0151**	**139.6**	**36.3**	**13**	**20.6**	**0.0166**	**0.0125**	**2.25**	**0.607**	**0.177**	**5.15**	**2.32**	**13.9**	**0.164**
Background [5]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
AOC14-8	10/02/08	0 - 0.5	N	ND (2) *	6.8	110	ND (2) *	ND (1)	ND (0.403)	12	4.9	7.9	6.4	ND (0.099) *	ND (2) *	9.4	ND (1)	ND (2)	ND (4) *	24	30
	10/02/08	2 - 3	N	ND (2) *	6.9	93	ND (2) *	ND (1)	ND (0.406)	15	5.5	8.8	6.8	ND (0.1) *	ND (2) *	11	ND (1)	ND (2)	ND (4) *	26	31
	10/02/08	5 - 6	N	ND (2) *	2.8	210	ND (1) *	ND (1)	ND (0.404)	18	8.6	6.6	2.4	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	35	39
	10/02/08	9 - 10	N	ND (2) *	3.3	89	ND (1) *	ND (1)	ND (0.404)	19	8.5	12	2.7	ND (0.1) *	ND (1)	13	ND (1)	ND (1)	ND (2)	33	38
	10/02/08	9 - 10	FD	ND (2) *	3.3	92	ND (1) *	ND (1)	ND (0.404)	19	8.5	10	3	ND (0.1) *	ND (1)	13	ND (1)	ND (1)	ND (2)	35	39
	10/02/08	14 - 15	N	ND (2.1) J*	4.7	73 J	ND (1) *	ND (1)	ND (0.413)	23 J	9.7	18	3.7	ND (0.1) *	ND (1)	16	ND (1)	ND (1)	ND (2.1)	36 J	42 J
AOC14-9	10/01/08	0 - 0.5	N	ND (2) *	5.3	140	ND (1) *	ND (1)	ND (0.404)	13	4.8	7.6	5.4	ND (0.1) *	ND (1)	9.5	ND (1)	ND (1)	ND (2)	23	28
	10/01/08	2 - 3	N	ND (2) *	6.3	170	ND (2) *	ND (1)	ND (0.407)	12	4.8	7.2	6	ND (0.1) *	ND (2) *	9.1	ND (1)	ND (2)	ND (4) *	23	29
	10/01/08	5 - 6	N	ND (2) *	3	61	ND (1) *	ND (1)	ND (0.4)	9	2.8	4.1	2.8	ND (0.1) *	ND (1)	5	ND (1)	ND (1)	ND (2)	13	13
	10/01/08	9 - 10	N	ND (2) *	4.4	220	ND (1) *	ND (1)	ND (0.405)	15	5.5	7.6	3.6	ND (0.1) *	ND (1)	9.1	ND (1)	ND (1)	ND (2)	23	29
	10/01/08	14 - 15	N	ND (2) J*	6.2	120 J	ND (2) *	ND (1)	ND (0.406)	13	5.9	8.2	5	ND (0.1) *	ND (2) *	9.4	ND (1)	ND (2)	ND (4.1) *	22	32
AOC14-10	10/01/08	0 - 0.5	N	ND (2) *	3.6	69	ND (1) *	ND (1)	ND (0.401)	10	2.4	3.5	3.5	ND (0.1) *	ND (1)	4.2	ND (1)	ND (1)	ND (2)	13	14
	10/01/08	2 - 3	N	ND (2) *	2.9	65	ND (1) *	ND (1)	ND (0.401)	11	2.4	3.1	2.9	ND (0.1) *	ND (1)	3.9	ND (1)	ND (1)	ND (2)	11	14
	10/01/08	5 - 6	N	ND (2) *	3.3	110	ND (1) *	ND (1)	ND (0.403)	12	2.9	4.6	3.4	ND (0.1) *	ND (1)	5.2	ND (1)	ND (1)	ND (2)	14	17
	10/01/08	5 - 6	FD	ND (2) *	3.1	97	ND (1) *	ND (1)	ND (0.402)	12	2.6	4.1	3.1	ND (0.1) *	ND (1)	4.6	ND (1)	ND (1)	ND (2)	13	15
	10/01/08	9 - 10	N	ND (2) *	5	81	ND (1) *	ND (1)	ND (0.409)	11	4.5	7.1	5.9	ND (0.1) *	ND (1)	8.7	ND (1)	ND (1)	2.2	21	28
	10/01/08	14 - 15	N	ND (2) *	7.1	110	ND (4) *	ND (1)	ND (0.404)	9.8	ND (4)	ND (8.1)	2.6	ND (0.1) *	ND (4) *	4.6	ND (1)	ND (4)	ND (8.1) *	13	13
AOC14-11	10/01/08	5 - 6	N	ND (2) *	5.5	140	ND (1) *	ND (1)	ND (0.406)	15	5.9	7.3	4.2	ND (0.1) *	1	9.9	ND (1)	ND (1)	ND (2)	28	28
	10/01/08	9 - 10	N	ND (2) *	2.4	140	ND (1) *	ND (1)	ND (0.405)	18	8.4	13	2	ND (0.1) *	ND (1)	12	ND (1)	ND (1)	ND (2)	34	37
	10/01/08	14 - 15	N	ND (2) *	4	80	ND (1) *	ND (1)	ND (0.41)	20	8.5	9	3	ND (0.1) *	ND (1)	14	ND (1)	ND (1)	ND (2)	35	39
AOC14-12	09/30/08	5 - 6	N	ND (2) *	3.2	190	ND (1) *	ND (1)	ND (0.406)	27	7.5	8.4	3.2	ND (0.1) *	2.4	9.8	1.5	ND (1)	ND (2)	29	36
	09/30/08	9 - 10	N	ND (2) *	2.3	150	ND (1) *	ND (1)	ND (0.405)	17	7.4	7.7	3	ND (0.1) *	ND (1)	11	1.2	ND (1)	ND (2)	29	37
	09/30/08	14 - 15	N	ND (2) *	3.2	140	ND (1) *	ND (1)	ND (0.401)	20	7.7	9.8	2.8	ND (0.1) *	1.2	13	ND (1)	ND (1)	ND (2)	29	35
AOC14-13	10/01/08 [7]	0.5 - 1.5	N	ND (2) *	18	160	ND (10) *	ND (1)	0.487	63	ND (10)	33	16	ND (0.1) *	98	57	ND (1)	ND (10) *	ND (20) *	ND (10)	39
	09/30/08	5 - 6	N	ND (2) *	3.3	130	ND (1) *	ND (1)	ND (0.405)	22	5.8	11	3.6	ND (0.099) *	2	9	ND (1)	ND (1)	ND (2)	21	30
	09/30/08	9 - 10	N	ND (2) *	1.9	140	ND (1) *	ND (1)	ND (0.405)	16	7.7	7.2	2.1	ND (0.1) *	ND (1)	10	1.6	ND (1)	ND (2)	28	34
	09/30/08	14 - 15	N	ND (2) *	3.2	110	ND (1) *	ND (1)	ND (0.409)	16	7	11	2.2	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	29	33
	09/30/08	14 - 15	FD	ND (2) *	2.9	100	ND (1) *	ND (1)	ND (0.409)	16	7.5	13	2.4	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	29	33
AOC14-SS1	10/01/08	0 - 0.5	N	ND (2) *	5	150	ND (1) *	ND (1)	ND (0.405)	15	5.2	9.4	7.2	ND (0.1) *	ND (1)	8.8	ND (1)	ND (1)	ND (2)	23	34
	10/01/08	2 - 3	N	ND (2) *	7.2	150	ND (2) *	ND (1)	0.456	22	5.7	15	11	0.25	ND (2) *	13	ND (1)	ND (2)	ND (4) *	23	32
	10/01/08	5 - 6	N	ND (2) *	6	240	ND (2) *	ND (1)	ND (0.406)	18	6.7	15	4.8	ND (0.1) *	ND (2) *	12	ND (1)	ND (2)	ND (4.1) *	25	35
	10/01/08	9 - 10	N	ND (2) *	2.8	120	ND (1) *	ND (1)	ND (0.402)	17	7	7.4	1.6	ND (0.1) *	ND (1)	10	ND (1)	ND (1)	ND (2)	26	33
	10/01/08	14 - 15	N	ND (2) *	3.1	110	ND (1) *	ND (1)	ND (0.406)	13	6.7	9	2.6	ND (0.1) *	ND (1)	10	ND (1)	ND (1)	ND (2)	27	31
AOC14-SS2	10/01/08	0 - 0.5	N	ND (2) *	4.8	160	ND (1) *	ND (1)	ND (0.403)	14	4.8	8.8	4.8	ND (0.1) *	1.1	10	ND (1)	ND (1)	ND (2)	24	27
	10/01/08	2 - 3	N	ND (2) *	7	160	ND (2) *	ND (1)	ND (0.407)	14	4.9	7.6	5.5	ND (0.1) *	ND (2) *	9.4	ND (1)	ND (2)	ND (4) *	22	29
	10/01/08	5 - 6	N	ND (2) *	7	150	ND (2) *	ND (1)	ND (0.405)	10	4.2	6.5	5.5	ND (0.1) *	ND (2) *	8.2	ND (1)	ND (2)	ND (4.1) *	19	25
	10/01/08	9 - 10	N	ND (2) *	4.6	130	ND (1) *	ND (1)	ND (0.407)	9.5	4.2	6.7	5.3	ND (0.1) *	ND (1)	8.1	ND (1)	ND (1)	ND (2)	18	24
	10/01/08	14 - 15	N	ND (2) *	3.3	120	ND (1) *	ND (1)	ND (0.404)	17	7	9.6	3	ND (0.1) *	ND (1)	13	ND (1)	ND (1)	ND (2)	27	32
	10/01/08	14 - 15	FD	ND (2) *	3	130	ND (1) *	ND (1)	ND (0.405)	18	7.3	9.6	3	ND (0.1) *	ND (1)	13	ND (1)	ND (1)	ND (2)	28	33

TABLE C7-3

Sample Results: Metals
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				**0.285**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**0.0125**	**1.37**	**27.3**	**1.47**	**5.15**	**2.32**	**52.2**	**58**
Residential Regional Screening Levels [2]:				**31**	**0.062**	**15,000**	**160**	**70**	**0.29**	**280**	**23**	**3,100**	**150**	**10**	**390**	**1,500**	**390**	**390**	**5.1**	**390**	**23,000**
Residential DTSC CHHSL [3]:				**30**	**0.07**	**5,200**	**16**	**39**	**17**	**NE**	**660**	**3,000**	**80**	**18**	**380**	**1,600**	**380**	**380**	**5**	**530**	**23,000**
Ecological Comparison Values [4]:				**0.285**	**11.4**	**330**	**23.3**	**0.0151**	**139.6**	**36.3**	**13**	**20.6**	**0.0166**	**0.0125**	**2.25**	**0.607**	**0.177**	**5.15**	**2.32**	**13.9**	**0.164**
Background [5]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
AOC14-SS3	10/02/08	0 - 0.5	N	ND (2) *	5.4	190	ND (1) *	ND (1)	ND (0.401)	17	7.1	11	3.8	ND (0.1) *	ND (1)	10	ND (1)	ND (1)	ND (2)	30	35
	10/02/08	2 - 3	N	ND (2) *	4	180	ND (1) *	ND (1)	ND (0.402)	18	8.3	9.5	2.7	ND (0.1) *	ND (1)	12	ND (1)	ND (1)	ND (2)	33	36
	10/02/08	5 - 6	N	ND (2) *	2.9	100	ND (1) *	ND (1)	ND (0.403)	12	5.4	6.7	2	ND (0.1) *	ND (1)	7.2	ND (1)	ND (1)	ND (2)	23	29
	10/02/08	9 - 10	N	ND (2) *	3	160	ND (1) *	ND (1)	ND (0.404)	16	7	8.4	2.2	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	31	32
	10/02/08	14 - 15	N	ND (2) *	3.2	89	ND (1) *	ND (1)	ND (0.404)	17	8.9	9.5	2.4	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	34	35
AOC14-SS4	10/02/08	0 - 0.5	N	ND (2) *	5	190	ND (1) *	ND (1)	ND (0.402)	15	6.3	8.1	5.1	ND (0.1) *	ND (1)	9.6	ND (1)	ND (1)	ND (2)	27	31
	10/02/08	2 - 3	N	ND (2) *	5	130	ND (1) *	ND (1)	ND (0.401)	14	4.4	6.9	10	ND (0.1) *	ND (1)	7	ND (1)	ND (1)	ND (2)	20	27
	10/02/08	5 - 6	N	ND (2) *	4.5	120	ND (1) *	ND (1)	ND (0.403)	16	4.1	6.4	11	ND (0.1) *	1.5	6.7	ND (1)	ND (1)	ND (2)	19	27
	10/02/08	9 - 10	N	ND (2) *	3	120	ND (1) *	ND (1)	ND (0.404)	16	8	11	2.3	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	31	32
	10/02/08	14 - 15	N	ND (2) *	2.7	120	ND (1) *	ND (1)	ND (0.405)	17	8.5	11	3	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	32	37
	10/02/08	14 - 15	FD	ND (2) *	2.5	120	ND (1) *	ND (1)	ND (0.405)	17	8.6	8.5	1.6	ND (0.1) *	ND (1)	11	ND (1)	ND (1)	ND (2)	32	34
S1-20	11/01/98	3	N	---	---	---	---	---	0.7	31.8	---	15.7	---	---	---	14	---	---	---	---	49.4
S2-6	11/01/98 [6]	3	N	---	---	---	---	---	12	45.5	---	1.8	---	---	---	0.57	---	---	---	---	14.5
	11/01/98	5	N	---	---	---	---	---	1.8	39.9	---	9.7	---	---	---	9.4	---	---	---	---	35.7
S2-62	11/01/98 [6]	2	N	---	---	---	---	---	1	32	---	4.1	---	---	---	1.8	---	---	---	---	8.4
	11/01/98 [8]	3	N	1.1 J	2.6	72.2	ND (0.89) *	ND (0.89)	---	72.7	5.9	22.2	7.9	0.046 J	0.86 J	47	0.99 J	ND (2.2)	ND (22) *	39.2	ND (29.3)
	11/01/98	4	N	---	---	---	---	---	ND (0.5)	21.9	---	11.5	---	---	---	10.2	---	---	---	---	39.8
S2-130	11/01/98	1	N	---	---	---	---	---	ND (0.5)	22.1	---	10.6	---	---	---	10.8	---	---	---	---	34.5
S3-15	11/01/98	2	N	---	---	---	---	---	ND (0.5)	13.8	---	9.4	---	---	---	7.5	---	---	---	---	24.1
	11/01/98	4	N	---	---	---	---	---	ND (0.5)	12.1	---	11	---	---	---	9.6	---	---	---	---	29.2
S3-72	11/01/98 [6]	1	N	---	---	---	---	---	ND (0.5)	18.7	---	6.7	---	---	---	5.9	---	---	---	---	27
	11/01/98	2	N	---	---	---	---	---	ND (0.5)	11.3	---	8	---	---	---	8.6	---	---	---	---	28.9
S3-120	11/01/98	1	N	---	---	---	---	---	ND (0.5)	12.1	---	4.2	---	---	---	4.3	---	---	---	---	18
S4-4	11/01/98 [6]	4	N	---	---	---	---	---	15.4	23.4	---	3.2	---	---	---	0.43 J	---	---	---	---	1.9
	11/01/98	6	N	---	---	---	---	---	1	13.7	---	10.3	---	---	---	9.8	---	---	---	---	32.6
S4-95	11/01/98 [6]	2	N	---	---	---	---	---	ND (0.5)	10.3	---	2.5	---	---	---	4.3	---	---	---	---	4.3
	11/01/98	3	N	---	---	---	---	---	ND (0.5)	14.9	---	8.3	---	---	---	8.8	---	---	---	---	27
S4-160	11/01/98	2	N	---	---	---	---	---	0.5	25	---	11.8	---	---	---	10.9	---	---	---	---	38.2
S8-23	11/01/98 [8]	3	N	0.43 J	4.3	154	0.19 J	ND (0.83)	---	28.7	8.4	14.3	12.5	0.092 J	0.42 J	21	0.59 J	ND (2.1)	ND (21) *	36.4	57
S8-30	11/01/98	3	N	---	---	---	---	---	0.5	12.8	---	10.8	---	---	---	9.4	---	---	---	---	40.9
GS-1	11/01/98 [6]	0	N	---	---	---	---	---	0.59	33.7	---	2.2	---	---	---	0.28 J	---	---	---	---	31.3
GS-2	11/01/98 [6]	0	N	---	---	---	---	---	ND (0.5)	21.9	---	8.2	---	---	---	6	---	---	---	---	32.7
RR-1	02/02/00	0	N	---	---	---	---	---	ND (0.5)	23.4	---	15.6	---	---	---	15.8	---	---	---	---	44
RR-2	02/02/00	0	N	---	---	---	---	---	ND (0.5)	16.1	---	13.8	---	---	---	12.3	---	---	---	---	37.5
RR-3	02/02/00	0	N	---	---	---	---	---	ND (0.5)	18.3	---	11.6	---	---	---	13	---	---	---	---	35
RR-4	02/02/00 [6]	0	N	---	---	---	---	---	0.6	19.4	---	19.2	---	---	---	0.92	---	---	---	---	27.1
RR-5	02/02/00	0	N	---	---	---	---	---	5.8	39.5	---	7.1	---	---	---	0.33	---	---	---	---	34.1
RR-6	02/02/00	0	N	---	---	---	---	---	4.8	74.9	---	7.5	---	---	---	0.39	---	---	---	---	243
RR-7	02/02/00 [6]	0	N	---	---	---	---	---	ND (0.51)	28.6	---	9.7	---	---	---	10.4	---	---	---	---	35.1

TABLE C7-3

Sample Results: Metals
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				0.285	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	0.0125	1.37	27.3	1.47	5.15	2.32	52.2	58
Residential Regional Screening Levels [2]:				31	0.062	15,000	160	70	0.29	280	23	3,100	150	10	390	1,500	390	390	5.1	390	23,000
Residential DTSC CHHSL [3]:				30	0.07	5,200	16	39	17	NE	660	3,000	80	18	380	1,600	380	380	5	530	23,000
Ecological Comparison Values [4]:				0.285	11.4	330	23.3	0.0151	139.6	36.3	13	20.6	0.0166	0.0125	2.25	0.607	0.177	5.15	2.32	13.9	0.164
Background [5]:				NE	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	NE	1.37	27.3	1.47	NE	NE	52.2	58
Location	Date	Depth (ft bgs)	Sample Type	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, Hexavalent	Chromium, total	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
RR-8	02/02/00	0	N	---	---	---	---	---	ND (0.51)	28.9	---	9.9	---	---	---	7.4	---	---	---	---	29.8
RR-9	02/02/00 [6]	0	N	---	---	---	---	---	2.7	19.6	---	27.9	---	---	---	2.2	---	---	---	---	15.4
RR-10	02/02/00	0	N	---	---	---	---	---	ND (0.51)	18.8	---	12.9	---	---	---	11.6	---	---	---	---	36.3
RR-11	02/02/00	0	N	---	---	---	---	---	ND (0.51)	18.1	---	20.2	---	---	---	13.4	---	---	---	---	47.5
RR-12	02/02/00 [6]	0	N	---	---	---	---	---	ND (0.5)	17.5	---	3.8	---	---	---	1.5	---	---	---	---	11.3

1 Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.
2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.
3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.
4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.
5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.
6 White powder sample
7 debris sample
8 black sandy material

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C7-4

Sample Results: Contract Laboratory Program Inorganics
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Contract Laboratory Program (CLP) Inorganics (mg/kg)							
Interim Screening Level[1] :				**16,400**	**66,500**	**55,000**	**12,100**	**402**	**4,400**	**2,070**	**0.9**
Residential Regional Screening Levels[2] :				**77,000**	**NE**	**55,000**	**NE**	**1,800**	**NE**	**NE**	**1,600**
Residential DTSC CHHSL[3] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**220**	**NE**	**NE**	**0.9**
Background[5] :				**16,400**	**66,500**	**NE**	**12,100**	**402**	**4,400**	**2,070**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aluminum**	**Calcium**	**Iron**	**Magnesium**	**Manganese**	**Potassium**	**Sodium**	**Cyanide**
AOC14-1	09/30/08	0 - 0.5	N	8,700	48,000	20,000	8,500	270	2,700	850	ND (1.02) *
AOC14-2	09/30/08	0 - 0.5	N	8,500	37,000	19,000	7,200	270	2,600	630	ND (1.02) *
AOC14-3	10/01/08	0 - 0.5	N	8,800	20,000	20,000	7,200	290	2,800 J	350	ND (1.01) *
AOC14-4	10/01/08	0 - 0.5	N	5,400	12,000	11,000	4,300	170	1,600	340	ND (1.01) *
AOC14-5	10/02/08	0 - 0.5	N	9,000	31,000	17,000	7,000	260	2,500	390	ND (1.01) *
AOC14-7	10/02/08	0 - 0.5	N	6,800	23,000	13,000	6,100	250	1,500	600	ND (1.01) *
AOC14-8	10/02/08	0 - 0.5	N	6,500	32,000	14,000	6,600	260	1,400	340	ND (1.01) *
AOC14-10	10/01/08	0 - 0.5	N	3,000	11,000	6,800	2,600	120	690	210	ND (1) *
S1-20	11/01/98	3	N	---	26,300	23,100	8,330	---	2,250	ND (410)	---
S4-4	11/01/98 [6]	4	N	---	379,000	425	23,000	---	89.6 J	6,590	---

TABLE C7-4

Sample Results: Contract Laboratory Program Inorganics

AOC 14 - Railroad Debris Site

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station, Needles, California

[1] Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil" November 2004 (January 2005 Revision). January.

[4] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil". May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.

[5] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

[6] White powder sample

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C7-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level[1] :				**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**38**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**10,000**	**1,160**	**38**
Residential Regional Screening Levels[2] :				**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**15**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**NE**	**NE**	**15**
Residential DTSC CHHSL[3] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**10,000**	**1,160**	**NE**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1-Methyl naphthalene**	**2-Methyl naphthalene**	**Acena phthylene**	**Acenaphthene**	**Anthracene**	**Benzo (a) anthracene**	**Benzo (a) pyrene**	**Benzo (b) fluoranthene**	**Benzo (ghi) perylene**	**Benzo (k) fluoranthene**	**Chrysene**	**Dibenzo (a,h) anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**PAH Low molecular weight**	**PAH High molecular weight**	**B(a)P Equivalent**
24debris-01	01/18/08[7]	Unknown	N	---	ND (3,300)	ND (3,300)	ND (3,300)	ND (3,300)	ND (3,300) *	ND (3,300) *	ND (3,300) *	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300)	ND (3,300)	ND	ND	ND (2,900) *
24debris-02	01/18/08[7]	Unknown	N	---	ND (3,300)	ND (3,300)	ND (3,300)	ND (3,300)	ND (3,300) *	ND (3,300) *	ND (3,300) *	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300)	ND (3,300)	ND	ND	ND (2,900) *
24debris-03	01/18/08[7]	Unknown	N	---	ND (160,000)	ND (160,000)	ND (160,000)	ND (160,000)	ND (160,000) *	ND (160,000) *	ND (160,000) *	ND (160,000)	ND (160,000) *	ND (160,000) *	ND (160,000) *	ND (160,000)	ND (160,000)	ND (160,000) *	ND (160,000) *	ND (160,000)	ND (160,000)	ND	ND	ND (140,000) *
24soil-01	01/31/08	Unknown	N	---	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)	ND (330) *	ND (330)	ND (330)	ND (330)	ND (330)	ND (330) *	ND (330)	ND (330)	ND (330)	ND (330)	450	ND (330)	450	ND	290
24soil-02	01/31/08	Unknown	N	---	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)	ND (330) *	ND (330)	ND (330)	ND (330)	ND (330)	ND (330) *	370	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)	ND	370	290
AOC14-1	09/30/08	0 - 0.5	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.8	6.1	8.2	10	8.1	9.6	ND (5.1)	9.2	ND (5.1)	5.3	ND (5.1)	ND (5.1)	9.4	ND	72	9.8
	09/30/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/30/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/30/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	09/30/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-2	09/30/08	0 - 0.5	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	11	ND (5.1)	ND (5.1)	ND (5.1)	5.9	ND (5.1)	ND (5.1)	ND (5.1)	5.2	5.9	5.2	23	4.5
	09/30/08	2 - 3	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND	ND	ND (4.7)
	10/01/08[6]	3 - 3.25	N	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND (5.7) J	ND	ND	ND (5)
	09/30/08	5 - 6	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	9.5	8.7	12	12	12	12	ND (5.2)	12	ND (5.2)	7.6	ND (5.2)	ND (5.2)	13	ND	99	14
	09/30/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	09/30/08	9 - 10	FD	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	09/30/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-3	10/01/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	15	10	15	7.1	12	18	ND (5)	22	ND (5)	6.1	ND (5)	6	20	6	130	16
	10/01/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.2	ND (5)	ND (5)	6.1	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.6	ND	17	4.7
	10/01/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.5	ND (5)	ND (5)	5.4	ND (5)	6.6	ND (5)	ND (5)	ND (5)	ND (5)	7.1	ND	25	4.7
	10/01/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.9)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-4	10/01/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.6)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (3.9)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	9 - 10	FD	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-5	10/02/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.6	9.5	31	14	22	24	ND (5)	27	ND (5)	12	ND (4.6)	11	21	11	170	18
	10/02/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.9)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.2)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)

TABLE C7-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level[1] :				**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**38**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**10,000**	**1,160**	**38**
Residential Regional Screening Levels[2] :				**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**15**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**NE**	**NE**	**15**
Residential DTSC CHHSL[3] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**10,000**	**1,160**	**NE**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1-Methyl naphthalene**	**2-Methyl naphthalene**	**Acena phthylene**	**Acenaphthene**	**Anthracene**	**Benzo (a) anthracene**	**Benzo (a) pyrene**	**Benzo (b) fluoranthene**	**Benzo (ghi) perylene**	**Benzo (k) fluoranthene**	**Chrysene**	**Dibenzo (a,h) anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**PAH Low molecular weight**	**PAH High molecular weight**	**B(a)P Equivalent**
AOC14-6	10/02/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.9 J	ND (5)	5.9 J	5.2 J	ND (5)	5.9 J	ND (5)	ND (5)	ND (5)	ND (5)	5.3 J	ND	28	5.1
	10/02/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.6)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.8)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/02/08	9 - 10	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.2)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/02/08	14 - 15	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.3)	ND (5)	ND (5)	ND	ND	ND (4.4)
AOC14-7	10/02/08	0 - 0.5	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	7.7	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	7.7	4.5
	10/02/08	2 - 3	N	ND (5)	ND (5)	6.8	ND (5)	17	ND (5)	5.9	16	17	10	10	ND (5)	6.6	ND (5)	10	ND (4.1)	ND (5)	6.6	24	82	11
	10/02/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.6)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/02/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.8)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/02/08	14 - 15	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.6)	ND (5)	ND (5)	ND	ND	ND (4.4)
AOC14-8	10/02/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.7)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/02/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	13	12	13	12	14	14	13	5.1	ND (5)	12	ND (4.6)	ND (5)	5.7	ND	110	22
	10/02/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	9 - 10	FD	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.9)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.9)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-9	10/01/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.9)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-10	10/01/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.7)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	5 - 6	FD	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.6)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.8)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-11	10/01/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.4)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.6)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-12	09/30/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	22	180	84	110	40	82	210	17	350	ND (5.1)	39	ND (5.1)	120	310	140	1,400	130
	09/30/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.8)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/30/08	14 - 15	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)

TABLE C7-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level[1] :				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	10,000	1,160	38
Residential Regional Screening Levels[2] :				22,000	310,000	1,700,000	3,400,000	17,000,000	380	15	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	NE	NE	15
Residential DTSC CHHSL[3] :				NE	NE	NE	NE	NE	NE	38	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	38
Ecological Comparison Values[4] :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	10,000	1,160	NE
Background[5] :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	1-Methyl naphthalene	2-Methyl naphthalene	Acena phthylene	Acenaphthene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	PAH Low molecular weight	PAH High molecular weight	B(a)P Equivalent
AOC14-13	10/01/08[7]	0.5 - 1.5	N	ND (5) J	ND (5) J	ND (5) J	ND (5) J	ND (5) J	16 J	12 J	17 J	6.6 J	12 J	17 J	ND (5) J	25 J	ND (5) J	5.8 J	ND (5) J	5.3 J	22 J	5.3	130	18
	09/30/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	09/30/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/30/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	09/30/08	14 - 15	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-SS1	10/01/08	0 - 0.5	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	11 J	5.3 J	9.8 J	11 J	ND (5.1)	8.1 J	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	7.1 J	ND	52	6.1
	10/01/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/01/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.3)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-SS2	10/01/08	0 - 0.5	N	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	26	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND	26	22
	10/01/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	9 - 10	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.8)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/01/08	14 - 15	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.2)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-SS3	10/02/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (3.9)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.8)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
AOC14-SS4	10/02/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	2 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (3.8)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	9 - 10	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/02/08	14 - 15	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (3.3)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/02/08	14 - 15	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (3.7)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
S2-62	11/01/98[8]	3	N	---	ND (550)	ND (550)	ND (550)	ND (550)	ND (550) *	ND (550) *	ND (550) *	ND (550)	ND (550) *	ND (550)	ND (550) *	ND (550)	ND (550)	ND (550) *	ND (550)	ND (550)	ND (550)	ND	ND	ND (480) *
S8-23	11/01/98[8]	3	N	---	ND (21,000)	ND (21,000)	ND (21,000)	ND (21,000)	ND (21,000) *	ND (21,000) *	ND (21,000) *	ND (21,000)	ND (21,000) *	ND (21,000) *	ND (21,000) *	ND (21,000)	ND (21,000)	ND (21,000) *	ND (21,000) *	ND (21,000)	ND (21,000)	ND	ND	ND (18,000) *

[1] Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

[4] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.

[5] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

[6] White powder sample

[7] debris sample

[8] black sandy material

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C7-6

Sample Results: Semivolatile Organic Compounds, Total Petroleum Hydrocarbons, and General Chemistry Parameters
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				SVOCs (µg/kg)		Total Petroleum Hydrocarbons (mg/kg)			General Chemistry (mg/kg)							
Interim Screening Level [1]:				500	2,870	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
Residential Regional Screening Levels [2]:				310,000	35,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Residential DTSC CHHSL [3]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
RWQCB Environmental Screening Levels [4]:				NE	NE	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
Ecological Comparison Values [5]:				500	2,870	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Background [6]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	4-Methylphenol	Bis (2-ethylhexyl) phthalate	TPH as gasoline	TPH as diesel	TPH as motor oil	Alkalinity, as carbonate	Alkalinity, bicarb as CaCO3	Alkalinity, total as CaCO3	pH	Phosphate	Chloride	Nitrate	Sulfate
24debris-01	01/18/08 [8]	Unknown	N	ND (3,300) *	ND (3,300) *	---	---	---	---	---	---	11	---	---	---	---
24debris-02	01/18/08 [8]	Unknown	N	ND (3,300) *	ND (3,300) *	---	---	---	---	---	---	4.6	---	---	---	---
24debris-03	01/18/08 [8]	Unknown	N	ND (160,000) *	ND (160,000) *	---	---	---	---	---	---	8	---	---	---	---
24soil-01	01/31/08	Unknown	N	ND (330)	ND (330)	---	13	---	---	---	---	8.8	---	---	---	---
24soil-02	01/31/08	Unknown	N	ND (330)	ND (330)	---	160	---	---	---	---	9.1	---	---	---	---
AOC14-1	09/30/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	30.8 J	---	---	---	---	---	---	---	---
	09/30/08	2 - 3	N	ND (340)	ND (340)	ND (1)	ND (10)	13.5	---	---	---	---	---	---	---	---
	09/30/08	5 - 6	N	ND (330)	ND (330)	ND (1.2)	ND (10)	28.6	---	---	---	---	---	---	---	---
	09/30/08	9 - 10	N	ND (330)	ND (330)	ND (1.3)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	09/30/08	14 - 15	N	ND (340)	ND (340)	ND (1.3)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
AOC14-2	09/30/08	0 - 0.5	N	430	ND (340)	---	34.1	252	---	---	---	---	---	---	---	---
	09/30/08	2 - 3	N	ND (350)	ND (350)	ND (1.4)	14.1	64.1	---	---	---	---	---	---	---	---
	10/01/08 [7]	3 - 3.25	N	ND (370) J	ND (370) J	---	ND (10) J	ND (10) J	---	---	---	8.88 J	---	---	---	---
	09/30/08	5 - 6	N	ND (340)	ND (340)	ND (1.5)	ND (10)	164	---	---	---	---	---	---	---	---
	09/30/08	9 - 10	N	ND (330)	ND (330)	ND (0.92)	ND (10)	26.2	---	---	---	---	---	---	---	---
	09/30/08	9 - 10	FD	ND (330)	ND (330)	ND (1)	ND (10)	21.5	---	---	---	---	---	---	---	---
	09/30/08	14 - 15	N	ND (340)	ND (340)	ND (1.6)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
AOC14-3	10/01/08	0 - 0.5	N	ND (330)	640	---	ND (10)	10.9	---	---	---	---	---	---	---	---
	10/01/08	2 - 3	N	ND (330)	ND (330)	ND (1)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	5 - 6	N	ND (330)	ND (330)	ND (0.91)	ND (10)	11.6	---	---	---	---	---	---	---	---
	10/01/08	9 - 10	N	ND (330)	ND (330)	ND (1.1)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	14 - 15	N	ND (330)	ND (330)	ND (1.1) J	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
AOC14-4	10/01/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	2 - 3	N	ND (330)	ND (330)	ND (0.94)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	5 - 6	N	ND (330)	ND (330)	ND (0.95)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	9 - 10	N	ND (330)	ND (330)	ND (0.87)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	9 - 10	FD	ND (330)	ND (330)	ND (0.83)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	14 - 15	N	ND (330)	ND (330)	ND (1)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---

TABLE C7-6

Sample Results: Semivolatile Organic Compounds, Total Petroleum Hydrocarbons, and General Chemistry Parameters
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				SVOCs (µg/kg)		Total Petroleum Hydrocarbons (mg/kg)			General Chemistry (mg/kg)							
Interim Screening Level [1]:				500	2,870	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
Residential Regional Screening Levels [2]:				310,000	35,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Residential DTSC CHHSL [3]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
RWQCB Environmental Screening Levels [4]:				NE	NE	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
Ecological Comparison Values [5]:				500	2,870	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Background [6]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	4-Methylphenol	Bis (2-ethylhexyl) phthalate	TPH as gasoline	TPH as diesel	TPH as motor oil	Alkalinity, as carbonate	Alkalinity, bicarb as CaCO3	Alkalinity, total as CaCO3	pH	Phosphate	Chloride	Nitrate	Sulfate
AOC14-5	10/02/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	2 - 3	N	ND (830) *	ND (830)	ND (0.88)	ND (10)	10.3	---	---	---	---	---	---	---	---
	10/02/08	5 - 6	N	ND (330)	ND (330)	ND (0.98)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	9 - 10	N	ND (330)	ND (330)	ND (0.79)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	14 - 15	N	ND (330)	ND (330)	ND (0.95)	10 J	10 J	---	---	---	---	---	---	---	---
AOC14-6	10/02/08	0 - 0.5	N	ND (330)	ND (330)	---	17	67.4	---	---	---	---	---	---	---	---
	10/02/08	2 - 3	N	ND (330)	ND (330)	ND (1.1)	ND (10)	10.6	---	---	---	---	---	---	---	---
	10/02/08	5 - 6	N	ND (330)	ND (330)	ND (0.92)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	9 - 10	N	ND (330)	ND (330)	ND (0.82)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	9 - 10	FD	ND (330)	ND (330)	ND (0.95)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	14 - 15	N	ND (330)	ND (330)	ND (1)	10 J	10 J	---	---	---	---	---	---	---	---
AOC14-7	10/02/08	0 - 0.5	N	ND (830) *	ND (830)	---	ND (10)	21.1	---	---	---	---	---	---	---	---
	10/02/08	2 - 3	N	ND (830) *	ND (830)	ND (0.84)	ND (10)	14.3	---	---	---	---	---	---	---	---
	10/02/08	5 - 6	N	ND (330)	ND (330)	ND (0.86)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	9 - 10	N	ND (340)	ND (340)	ND (0.96)	ND (10)	14.8	---	---	---	---	---	---	---	---
	10/02/08	14 - 15	N	ND (330)	ND (330)	ND (0.89)	10 J	11.4 J	---	---	---	---	---	---	---	---
AOC14-8	10/02/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	2 - 3	N	ND (330)	ND (330)	ND (0.96)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	5 - 6	N	ND (330)	ND (330)	ND (0.86)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	9 - 10	N	ND (330)	ND (330)	ND (0.8)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	9 - 10	FD	ND (330)	ND (330)	ND (0.89)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/02/08	14 - 15	N	ND (340)	ND (340)	ND (0.9)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
AOC14-9	10/01/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	57.5 J	---	---	---	---	---	---	---	---
	10/01/08	2 - 3	N	ND (330)	ND (330)	ND (0.79)	ND (10)	22.1 J	---	---	---	---	---	---	---	---
	10/01/08	5 - 6	N	ND (330)	ND (330)	ND (0.89) J	ND (10)	57 J	---	---	---	---	---	---	---	---
	10/01/08	9 - 10	N	ND (330)	ND (330)	ND (0.91)	ND (10)	14 J	---	---	---	---	---	---	---	---
	10/01/08	14 - 15	N	ND (340)	ND (340)	ND (0.94) J	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---

TABLE C7-6

Sample Results: Semivolatile Organic Compounds, Total Petroleum Hydrocarbons, and General Chemistry Parameters
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				SVOCs (µg/kg)		Total Petroleum Hydrocarbons (mg/kg)			General Chemistry (mg/kg)							
			Interim Screening Level [1]:	500	2,870	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
			Residential Regional Screening Levels [2]:	310,000	35,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
			Residential DTSC CHHSL [3]:	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
			RWQCB Environmental Screening Levels [4]:	NE	NE	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
			Ecological Comparison Values [5]:	500	2,870	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
			Background [6]:	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	4-Methylphenol	Bis (2-ethylhexyl) phthalate	TPH as gasoline	TPH as diesel	TPH as motor oil	Alkalinity, as carbonate	Alkalinity, bicarb as CaCO3	Alkalinity, total as CaCO3	pH	Phosphate	Chloride	Nitrate	Sulfate
AOC14-10	10/01/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	2 - 3	N	ND (330)	ND (330)	ND (0.99)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	5 - 6	N	ND (330)	ND (330)	ND (0.86)	ND (10)	21.2	---	---	---	---	---	---	---	---
	10/01/08	5 - 6	FD	ND (330)	ND (330)	ND (0.97)	ND (10)	23.3	---	---	---	---	---	---	---	---
	10/01/08	9 - 10	N	ND (340)	ND (340)	ND (1.1)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	14 - 15	N	ND (330)	ND (330)	ND (0.8)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
AOC14-11	10/01/08	5 - 6	N	ND (330)	ND (330)	ND (0.95)	ND (10)	23	---	---	---	---	---	---	---	---
	10/01/08	9 - 10	N	ND (330)	ND (330)	ND (0.83)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	10/01/08	14 - 15	N	ND (340)	ND (340)	ND (1.2)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
AOC14-12	09/30/08	5 - 6	N	ND (330)	ND (330)	ND (1.4)	ND (10)	33	---	---	---	---	---	---	---	---
	09/30/08	9 - 10	N	ND (330)	ND (330)	ND (1.1)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	09/30/08	14 - 15	N	ND (330)	ND (330)	ND (0.87)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
AOC14-13	10/01/08 [8]	0.5 - 1.5	N	ND (330) J	ND (330) J	---	ND (10) J	89.1 J	---	---	---	8.85 J	---	---	---	---
	09/30/08	5 - 6	N	ND (330)	ND (330)	ND (1.4)	ND (10)	28	---	---	---	---	---	---	---	---
	09/30/08	9 - 10	N	ND (330)	ND (330)	ND (1.3)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	09/30/08	14 - 15	N	ND (340)	ND (340)	ND (0.99)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
	09/30/08	14 - 15	FD	ND (340)	ND (340)	ND (0.92)	ND (10)	ND (10)	---	---	---	---	---	---	---	---
AOC14-SS1	10/01/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
	10/01/08	2 - 3	N	ND (340)	ND (340)	ND (0.97)	ND (10) J	56.7 J	---	---	---	---	---	---	---	---
	10/01/08	5 - 6	N	ND (340)	ND (340)	ND (1) J	ND (10) J	38.9 J	---	---	---	---	---	---	---	---
	10/01/08	9 - 10	N	ND (330)	ND (330)	ND (1.1) J	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
	10/01/08	14 - 15	N	ND (340)	ND (340)	ND (1) J	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
AOC14-SS2	10/01/08	0 - 0.5	N	ND (3,300) *	ND (3,300) *	---	11 J	134 J	---	---	---	---	---	---	---	---
	10/01/08	2 - 3	N	ND (330)	ND (330)	ND (0.99)	ND (10) J	28.2 J	---	---	---	---	---	---	---	---
	10/01/08	5 - 6	N	ND (340)	ND (340)	ND (0.98)	ND (10) J	10.9 J	---	---	---	---	---	---	---	---
	10/01/08	9 - 10	N	ND (340)	ND (340)	ND (0.92)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
	10/01/08	14 - 15	N	ND (330)	ND (330)	ND (0.96)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
	10/01/08	14 - 15	FD	ND (330)	ND (330)	ND (0.92)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---

TABLE C7-6

Sample Results: Semivolatile Organic Compounds, Total Petroleum Hydrocarbons, and General Chemistry Parameters
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				SVOCs (µg/kg)		Total Petroleum Hydrocarbons (mg/kg)			General Chemistry (mg/kg)							
Interim Screening Level [1]:				500	2,870	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
Residential Regional Screening Levels [2]:				310,000	35,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Residential DTSC CHHSL [3]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
RWQCB Environmental Screening Levels [4]:				NE	NE	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
Ecological Comparison Values [5]:				500	2,870	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Background [6]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**4-Methylphenol**	**Bis (2-ethylhexyl) phthalate**	**TPH as gasoline**	**TPH as diesel**	**TPH as motor oil**	**Alkalinity, as carbonate**	**Alkalinity, bicarb as CaCO3**	**Alkalinity, total as CaCO3**	**pH**	**Phosphate**	**Chloride**	**Nitrate**	**Sulfate**
AOC14-SS3	10/02/08	0 - 0.5	N	ND (330)	ND (330)	---	30.4 J	172 J	---	---	---	---	---	---	---	---
	10/02/08	2 - 3	N	ND (330)	ND (330)	ND (0.84)	10 J	16.4 J	---	---	---	---	---	---	---	---
	10/02/08	5 - 6	N	ND (330)	ND (330)	ND (0.96)	10 J	24.7 J	---	---	---	---	---	---	---	---
	10/02/08	9 - 10	N	ND (330)	ND (330)	ND (0.85)	10 J	10 J	---	---	---	---	---	---	---	---
	10/02/08	14 - 15	N	ND (330)	ND (330)	ND (0.97)	10 J	10 J	---	---	---	---	---	---	---	---
AOC14-SS4	10/02/08	0 - 0.5	N	ND (330)	ND (330)	---	10 J	14.3 J	---	---	---	---	---	---	---	---
	10/02/08	2 - 3	N	ND (330)	ND (330)	ND (0.96)	10 J	11.2 J	---	---	---	---	---	---	---	---
	10/02/08	5 - 6	N	ND (330)	ND (330)	ND (0.83)	10 J	10.1 J	---	---	---	---	---	---	---	---
	10/02/08	9 - 10	N	ND (330)	ND (330)	ND (0.85)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
	10/02/08	14 - 15	N	ND (330)	ND (330)	ND (0.63)	ND (10) J	ND (10) J	---	---	---	---	---	---	---	---
	10/02/08	14 - 15	FD	ND (330)	ND (330)	ND (0.97) J	10 J	10 J	---	---	---	---	---	---	---	---
S1-20	11/01/98	3	N	---	---	---	---	---	ND (10)	100	100	9.1	64.2	223	17	585
S2-6	11/01/98 [7]	3	N	---	---	---	---	---	---	---	---	9.1	---	---	---	---
	11/01/98	5	N	---	---	---	---	---	---	---	---	9.2	---	---	---	---
S2-62	11/01/98 [7]	2	N	---	---	---	---	---	---	---	---	8.8	---	---	---	---
	11/01/98 [9]	3	N	---	ND (550)	ND (1.1)	ND (11)	2 J	---	---	---	---	---	---	---	---
	11/01/98	4	N	---	---	---	---	---	---	---	---	9.2	---	---	---	---
S2-130	11/01/98	1	N	---	---	---	---	---	---	---	---	9.9	---	---	---	---
S3-15	11/01/98	2	N	---	---	---	---	---	---	---	---	9.7	---	---	---	---
	11/01/98	4	N	---	---	---	---	---	---	---	---	9.5	---	---	---	---
S3-72	11/01/98 [7]	1	N	---	---	---	---	---	---	---	---	9.1	---	---	---	---
	11/01/98	2	N	---	---	---	---	---	---	---	---	9.7	---	---	---	---
S3-120	11/01/98	1	N	---	---	---	---	---	---	---	---	8.8	---	---	---	---
S4-4	11/01/98 [7]	4	N	---	---	---	---	---	344	220	560	9.24	10.7	3,010	29	1,630
	11/01/98	6	N	---	---	---	---	---	---	---	---	10.4	---	---	---	---
S4-95	11/01/98 [7]	2	N	---	---	---	---	---	---	---	---	9.1	---	---	---	---
	11/01/98	3	N	---	---	---	---	---	---	---	---	10.3	---	---	---	---
S4-160	11/01/98	2	N	---	---	---	---	---	---	---	---	9.1	---	---	---	---
S8-23	11/01/98 [9]	3	N	---	ND (21,000) *	ND (1)	15,000	17,000	---	---	---	---	---	---	---	---
S8-30	11/01/98	3	N	---	---	---	---	---	---	---	---	9.2	---	---	---	---

TABLE C7-6

Sample Results: Semivolatile Organic Compounds, Total Petroleum Hydrocarbons, and General Chemistry Parameters
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				SVOCs (µg/kg)		Total Petroleum Hydrocarbons (mg/kg)			General Chemistry (mg/kg)							
			Interim Screening Level [1]:	500	2,870	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
			Residential Regional Screening Levels [2]:	310,000	35,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
			Residential DTSC CHHSL [3]:	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
			RWQCB Environmental Screening Levels[4]:	NE	NE	540	540	1,800	NE	NE	NE	NE	NE	NE	NE	NE
			Ecological Comparison Values [5]:	500	2,870	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
			Background [6]:	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**4-Methylphenol**	**Bis (2-ethylhexyl) phthalate**	**TPH as gasoline**	**TPH as diesel**	**TPH as motor oil**	**Alkalinity, as carbonate**	**Alkalinity, bicarb as CaCO3**	**Alkalinity, total as CaCO3**	**pH**	**Phosphate**	**Chloride**	**Nitrate**	**Sulfate**
GS-1	11/01/98 [7]	0	N	---	---	---	---	---	---	---	---	8.81	---	---	---	---
GS-2	11/01/98 [7]	0	N	---	---	---	---	---	---	---	---	8.14	---	---	---	---
RR-1	02/02/00	0	N	---	---	---	---	---	---	---	---	8.7	---	---	---	---
RR-2	02/02/00	0	N	---	---	---	---	---	---	---	---	9.64	---	---	---	---
RR-3	02/02/00	0	N	---	---	---	---	---	---	---	---	8.67	---	---	---	---
RR-4	02/02/00 [7]	0	N	---	---	---	---	---	---	---	---	9.39	---	---	---	---
RR-5	02/02/00	0	N	---	---	---	---	---	---	---	---	9.03	---	---	---	---
RR-6	02/02/00	0	N	---	---	---	---	---	---	---	---	8.9	---	---	---	---
RR-7	02/02/00 [7]	0	N	---	---	---	---	---	---	---	---	8.71	---	---	---	---
RR-8	02/02/00	0	N	---	---	---	---	---	---	---	---	9.06	---	---	---	---
RR-9	02/02/00 [7]	0	N	---	---	---	---	---	---	---	---	9.08	---	---	---	---
RR-10	02/02/00	0	N	---	---	---	---	---	---	---	---	9.01	---	---	---	---
RR-11	02/02/00	0	N	---	---	---	---	---	---	---	---	9.15	---	---	---	---
RR-12	02/02/00 [7]	0	N	---	---	---	---	---	---	---	---	8.94	---	---	---	---

1 For SVOCs, interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used. For TPHs, interim screening level is the Regional Water Quality Control Board environmental screening level.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites". http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, November 2004 (January 2005 Revision)". January.

4 Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

5 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil. May 28 ARCADIS. 2009. Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil". July 1.

6 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California". May.

7 White powder sample

8 Debris sample

9 Black sandy material

Results greater than the interim screening level are circled.

Only detected SVOCs are presented.

SVOCs	semivolatile organic compounds
TPH	total petroleum hydrocarbon
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water board	Regional Water Quality Control Board
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C7-7

Sample Results: Pesticides
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Pesticides (µg/kg)																				
Interim Screening Level [1] :				**2.1**	**2.1**	**2.1**	**33**	**77**	**430**	**270**	**77**	**5**	**370,000**	**370,000**	**370,000**	**21,000**	**21,000**	**21,000**	**500**	**430**	**130**	**53**	**340,000**	**460**
Residential Regional Screening Levels [2] :				**2,000**	**1,400**	**1,700**	**29**	**77**	**1,600**	**270**	**77**	**30**	**370,000**	**370,000**	**370,000**	**18,000**	**18,000**	**18,000**	**520**	**1,600**	**110**	**53**	**310,000**	**440**
Residential DTSC CHHSL [3] :				**2,300**	**1,600**	**1,600**	**33**	**NE**	**430**	**NE**	**NE**	**35**	**NE**	**NE**	**NE**	**21,000**	**21,000**	**21,000**	**500**	**430**	**130**	**NE**	**340,000**	**460**
Ecological Comparison Values [4] :				**2.1**	**2.1**	**2.1**	**NE**	**NE**	**470**	**NE**	**NE**	**5**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**470**	**NE**	**NE**	**NE**	**NE**
Background [5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**4,4-DDD**	**4,4-DDE**	**4,4-DDT**	**Aldrin**	**alpha-BHC**	**alpha-Chlordane**	**beta-BHC**	**delta-BHC**	**Dieldrin**	**Endo sulfan I**	**Endo sulfan II**	**Endosulfan sulfate**	**Endrin**	**Endrin aldehyde**	**Endrin ketone**	**gamma-BHC**	**gamma-Chlordane**	**Heptachlor**	**Heptachlor Epoxide**	**Methoxy chlor**	**Toxaphene**
AOC14-1	09/30/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.1)	ND (51)
AOC14-2	09/30/08	0 - 0.5	N	ND (2)	2.9	3	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.1)	ND (51)
AOC14-3	10/01/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
AOC14-4	10/01/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
AOC14-5	10/02/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
AOC14-7	10/02/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.1)	ND (51)
AOC14-8	10/02/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
AOC14-10	10/01/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)

1 Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison values for Additional Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C7-8
Sample Results: Asbestos
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Location	Date	Depth (ft bgs)	SampleType	Asbestos PLM/BULK [1]	CARB435/ [2] PLM (%)	TEM [3] (%)
AOC14-1	09/30/08	0 - 0.5	N	Present	ND (<0.1)	ND (0.07)
	09/30/08	2 - 3	N	Not Present	---	---
	09/30/08	5 - 6	N	Not Present	---	---
	09/30/08	9 - 10	N	Not Present	---	---
	09/30/08	14 - 15	N	Not Present	---	---
AOC14-2	09/30/08	0 - 0.5	N	Present	ND (<0.1)	---
	09/30/08	2 - 3	N	Not Present	ND (<0.1)	ND (0.07)
	10/01/08 [4]	3 - 3.25	N	Not Present	---	---
	09/30/08	5 - 6	N	Present	ND (<0.1)	---
	09/30/08	9 - 10	N	Not Present	ND (<0.1)	ND (0.07)
	09/30/08	9 - 10	FD	Not Present	---	---
	09/30/08	14 - 15	N	---	<0.1	---
AOC14-3	10/01/08	0 - 0.5	N	Present	ND (<0.1)	---
	10/01/08	2 - 3	N	Present	ND (<0.1)	---
	10/01/08	5 - 6	N	Present	ND (<0.1)	---
	10/01/08	9 - 10	N	Not Present	---	---
	10/01/08	14 - 15	N	Not Present	---	---
AOC14-4	10/01/08	0 - 0.5	N	Present	ND (<0.1)	---
	10/01/08	2 - 3	N	Not Present	---	---
	10/01/08	5 - 6	N	Not Present	---	---
	10/01/08	9 - 10	N	Not Present	---	---
	10/01/08	9 - 10	FD	Not Present	---	---
	10/01/08	14 - 15	N	Not Present	---	---
AOC14-5	10/02/08	0 - 0.5	N	Not Present	---	---
	10/02/08	2 - 3	N	Present	ND (<0.1)	---
	10/02/08	5 - 6	N	Not Present	---	---
	10/02/08	9 - 10	N	Not Present	---	---
	10/02/08	14 - 15	N	Present	ND (<0.1)	---
AOC14-6	10/02/08	0 - 0.5	N	Not Present	---	---
	10/02/08	2 - 3	N	Not Present	---	---
	10/02/08	5 - 6	N	Not Present	---	---
	10/02/08	9 - 10	N	Not Present	---	---
	10/02/08	9 - 10	FD	Not Present	---	---
	10/02/08	14 - 15	N	Not Present	---	---

TABLE C7-8

Sample Results: Asbestos
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Location	Date	Depth (ft bgs)	SampleType	Asbestos PLM/BULK [1]	Asbestos CARB435/ [2] PLM (%)	Asbestos TEM [3] (%)
AOC14-7	10/02/08	0 - 0.5	N	Not Present	---	---
	10/02/08	2 - 3	N	Not Present	---	---
	10/02/08	5 - 6	N	Not Present	---	---
	10/02/08	9 - 10	N	Not Present	---	---
	10/02/08	14 - 15	N	Not Present	---	---
AOC14-8	10/02/08	0 - 0.5	N	Not Present	---	---
	10/02/08	2 - 3	N	Not Present	---	---
	10/02/08	5 - 6	N	Not Present	---	---
	10/02/08	9 - 10	N	Not Present	---	---
	10/02/08	9 - 10	FD	Not Present	---	---
	10/02/08	14 - 15	N	Not Present	---	---
AOC14-9	10/01/08	0 - 0.5	N	Not Present	---	---
	10/01/08	2 - 3	N	Present	ND (<0.1)	ND (0.07)
	10/01/08	5 - 6	N	Not Present	---	---
	10/01/08	9 - 10	N	Not Present	---	---
	10/01/08	14 - 15	N	Not Present	---	---
AOC14-10	10/01/08	0 - 0.5	N	Not Present	---	---
	10/01/08	2 - 3	N	Not Present	---	---
	10/01/08	5 - 6	N	Not Present	---	---
	10/01/08	5 - 6	FD	Not Present	---	---
	10/01/08	9 - 10	N	Not Present	---	---
	10/01/08	14 - 15	N	Not Present	---	---
AOC14-11	10/01/08	5 - 6	N	Not Present	---	---
	10/01/08	9 - 10	N	Not Present	---	---
	10/01/08	14 - 15	N	Not Present	---	---
AOC14-12	09/30/08	5 - 6	N	Present	ND (<0.1)	---
	09/30/08	9 - 10	N	Not Present	---	---
	09/30/08	14 - 15	N	Not Present	---	---
AOC14-13	10/01/08 [5]	0.5 - 1.5	N	25	---	---
	09/30/08	5 - 6	N	Present	ND (<0.1)	---
	09/30/08	9 - 10	N	Not Present	---	---
	09/30/08	14 - 15	N	Not Present	---	---
	09/30/08	14 - 15	FD	Not Present	---	---
AOC14-SS1	10/01/08	0 - 0.5	N	Present	ND (<0.1)	---
	10/01/08	2 - 3	N	Present	ND (<0.1)	---
	10/01/08	5 - 6	N	Present	<0.1	---
	10/01/08	9 - 10	N	Not Present	---	---
	10/01/08	14 - 15	N	Not Present	---	---

TABLE C7-8
Sample Results: Asbestos
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Location	Date	Depth (ft bgs)	SampleType	Asbestos PLM/BULK [1]	Asbestos CARB435/ [2] PLM (%)	Asbestos TEM [3] (%)
AOC14-SS2	10/01/08	0 - 0.5	N	Not Present	---	---
	10/01/08	2 - 3	N	Not Present	---	---
	10/01/08	5 - 6	N	Not Present	---	---
	10/01/08	9 - 10	N	Not Present	---	---
	10/01/08	14 - 15	N	---	ND (<0.1)	---
	10/01/08	14 - 15	FD	---	ND (<0.1)	---
AOC14-SS3	10/02/08	0 - 0.5	N	Not Present	---	---
	10/02/08	2 - 3	N	Not Present	---	---
	10/02/08	5 - 6	N	Not Present	---	---
	10/02/08	9 - 10	N	Not Present	---	---
	10/02/08	14 - 15	N	Not Present	---	---
AOC14-SS4	10/02/08	0 - 0.5	N	Not Present	---	---
	10/02/08	2 - 3	N	Not Present	---	---
	10/02/08	5 - 6	N	Present	ND (<0.1)	---
	10/02/08	9 - 10	N	Not Present	---	---
	10/02/08	14 - 15	N	Not Present	---	---
	10/02/08	14 - 15	FD	Not Present	---	---

[1] Polarized light microscopy of bulk samples
[2] California Air Resource Board Method 435 / polarized light microscopy of bulk samples
[3] Transmission electron microscopy
[4] White powder sample
[5] debris sample

ft bgs feet below ground surface
FD field duplicate
--- not analyzed

TABLE C7-9

Constitiuent Concentrations in Soil Compared to Screening Values
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Background Threshold Value (BTV) [1]		Ecological Comparison Value (ECV) [2]		Residential Screening Level (Res SL) [3]		RWQCB Environmental Screening Levels (ESL) [4]		Commercial Screening Level (Com SL) [5]		Interim Screening Level (Int SL) [6]	
Parameter	Units	Frequency of detection	Maximum Detected Value	# of Exceedences [7]	(BTV)	# of Exceedences [8]	(ECV)	# of Exceedences [8]	(Res SL)	# of Exceedences [8]	(ESL)	# of Exceedences [8]	(Com SL)	# of Exceedences [8]	(Int SL)
Metals															
Antimony	mg/kg	0 / 79 (0%)	ND (2.1) ‡	NA	(NE)	0	(0.285)	0	(30)	NA	(NE)	0	(380)	0	(0.285)
Arsenic	mg/kg	79 / 79 (100%)	11	0	(11)	0	(11.4)	0	(0.07) *	NA	(NE)	0	(0.24) *	0	(11)
Barium	mg/kg	79 / 79 (100%)	300	0	(410)	0	(330) *	0	(5,200)	NA	(NE)	0	(63,000)	0	(410)
Beryllium	mg/kg	0 / 79 (0%)	ND (11) ‡	0	(0.672)	0	(23.3)	0	(16)	NA	(NE)	0	(190)	0	(0.672)
Cadmium	mg/kg	0 / 79 (0%)	ND (1.1) ‡	0	(1.1)	0	(0.0151) *	0	(39)	NA	(NE)	0	(500)	0	(1.1)
Chromium	mg/kg	99 / 99 (100%)	74.9	4	(39.8)	4	(36.3) *	0	(280)	NA	(NE)	0	(1,400)	4	(39.8)
Chromium, Hexavalent	mg/kg	13 / 99 (13%)	5.8	8	(0.83)	0	(139.6)	0	(17)	NA	(NE)	0	(37)	8	(0.83)
Cobalt	mg/kg	77 / 79 (97%)	10	0	(12.7)	0	(13)	0	(23)	NA	(NE)	0	(300)	0	(12.7)
Copper	mg/kg	97 / 99 (98%)	44	4	(16.8)	1	(20.6)	0	(3,000)	NA	(NE)	0	(38,000)	4	(16.8)
Lead	mg/kg	79 / 79 (100%)	21	10	(8.39)	10	(0.0166) *	0	(80)	NA	(NE)	0	(320)	10	(8.39)
Mercury	mg/kg	1 / 79 (1.3%)	0.25	NA	(NE)	1	(0.0125)	0	(18)	NA	(NE)	0	(180)	1	(0.0125)
Molybdenum	mg/kg	15 / 79 (19%)	2.4	10	(1.37)	3	(2.25)	0	(380)	NA	(NE)	0	(4,800)	10	(1.37)
Nickel	mg/kg	99 / 99 (100%)	16	0	(27.3)	0	(0.607) *	0	(1,600)	NA	(NE)	0	(16,000)	0	(27.3)
Selenium	mg/kg	3 / 79 (3.8%)	1.6	2	(1.47)	2	(0.177) *	0	(380)	NA	(NE)	0	(4,800)	2	(1.47)
Silver	mg/kg	0 / 79 (0%)	ND (11) ‡	NA	(NE)	0	(5.15)	0	(380)	NA	(NE)	0	(4,800)	0	(5.15)
Thallium	mg/kg	1 / 79 (1.3%)	2.2	NA	(NE)	0	(2.32)	0	(5)	NA	(NE)	0	(63)	0	(2.32)
Vanadium	mg/kg	79 / 79 (100%)	38	0	(52.2)	0	(13.9) *	0	(390)	NA	(NE)	0	(5,200)	0	(52.2)
Zinc	mg/kg	99 / 99 (100%)	243	2	(58)	2	(0.164) *	0	(23,000)	NA	(NE)	0	(100,000)	2	(58)
Contract Laboratory Program Inorganics															
Aluminum	mg/kg	8 / 8 (100%)	9,000	0	(16,400)	NA	(NE)	0	(77,000)	NA	(NE)	0	(990,000)	0	(16,400)
Calcium	mg/kg	9 / 9 (100%)	48,000	0	(66,500)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(66,500)
Iron	mg/kg	9 / 9 (100%)	23,100	NA	(NE)	NA	(NE)	0	(55,000)	NA	(NE)	0	(720,000)	0	(55,000)
Magnesium	mg/kg	9 / 9 (100%)	8,500	0	(12,100)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(12,100)
Manganese	mg/kg	8 / 8 (100%)	290	0	(402)	0	(220)	0	(1,800)	NA	(NE)	0	(23,000)	0	(402)
Potassium	mg/kg	9 / 9 (100%)	2,800	0	(4,400)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(4,400)
Sodium	mg/kg	8 / 9 (89%)	850	0	(2,070)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(2,070)
Cyanide	mg/kg	0 / 8 (0%)	ND (1.02) ‡	NA	(NE)	0	(0.9)	0	(1,600)	NA	(NE)	0	(20,000)	0	(0.9)
Semivolatile Organic Compounds															
4-Methylphenol	µg/kg	1 / 79 (1.3%)	430	NA	(NE)	0	(500)	0	(310,000)	NA	(NE)	0	(3,100,000)	0	(500)
Bis (2-ethylhexyl) phthalate	µg/kg	1 / 79 (1.3%)	640	NA	(NE)	0	(2,870)	0	(35,000)	NA	(NE)	0	(120,000)	0	(2,870)
Polycyclic Aromatic Hydrocarbons															
Acena phthylene	µg/kg	1 / 79 (1.3%)	6.8	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Anthracene	µg/kg	2 / 79 (2.5%)	22	NA	(NE)	NA	(NE)	0	(17,000,000)	NA	(NE)	0	(170,000,000)	0	(17,000,000)
Benzo (a) anthracene	µg/kg	6 / 79 (7.6%)	180	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Benzo (a) pyrene	µg/kg	7 / 79 (8.9%)	84	NA	(NE)	NA	(NE)	1	(38)	NA	(NE)	0	(130)	1	(38)
Benzo (b) fluoranthene	µg/kg	11 / 79 (14%)	110	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Benzo (ghi) perylene	µg/kg	9 / 79 (11%)	40	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Benzo (k) fluoranthene	µg/kg	9 / 79 (11%)	82	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Chrysene	µg/kg	13 / 79 (16%)	210	NA	(NE)	NA	(NE)	0	(3,800)	NA	(NE)	0	(13,000)	0	(3,800)
Dibenzo (a,h) anthracene	µg/kg	2 / 79 (2.5%)	17	NA	(NE)	NA	(NE)	0	(110)	NA	(NE)	0	(380)	0	(380)
Fluoranthene	µg/kg	11 / 79 (14%)	350	NA	(NE)	NA	(NE)	0	(2,300,000)	NA	(NE)	0	(22,000,000)	0	(2,300,000)

TABLE C7-9

Constitiuent Concentrations in Soil Compared to Screening Values
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Background Threshold Value (BTV) [1]		Ecological Comparison Value (ECV) [2]		Residential Screening Level (Res SL) [3]		RWQCB Environmental Screening Levels (ESL) [4]		Commercial Screening Level (Com SL) [5]		Interim Screening Level (Int SL) [6]	
Parameter	Units	Frequency of detection	Maximum Detected Value	# of Exceedences [7]	(BTV)	# of Exceedences [8]	(ECV)	# of Exceedences [8]	(Res SL)	# of Exceedences [8]	(ESL)	# of Exceedences [8]	(Com SL)	# of Exceedences [8]	(Int SL)
Polycyclic Aromatic Hydrocarbons															
Indeno (1,2,3-cd) pyrene	µg/kg	7 / 79 (8.9%)	39	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Phenanthrene	µg/kg	4 / 79 (5.1%)	120	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Pyrene	µg/kg	12 / 79 (15%)	310	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
PAH Low molecular weight	µg/kg	5 / 79 (6.3%)	140	NA	(NE)	0	(10,000)	NA	(NE)	NA	(NE)	NA	(NE)	0	(10,000)
PAH High molecular weight	µg/kg	14 / 79 (18%)	1,400	NA	(NE)	1	(1,160)	NA	(NE)	NA	(NE)	NA	(NE)	1	(1,160)
B(a)P Equivalent	µg/kg	14 / 79 (18%)	130	NA	(NE)	NA	(NE)	1	(38)	NA	(NE)	1	(130)	1	(38)
Pesticides															
4,4-DDE	µg/kg	1 / 8 (13%)	2.9	NA	(NE)	1	(2.1)	0	(1,600)	NA	(NE)	0	(6,300)	1	(2.1)
4,4-DDT	µg/kg	1 / 8 (13%)	3	NA	(NE)	1	(2.1)	0	(1,600)	NA	(NE)	0	(6,300)	1	(2.1)
Total Petroleum Hydrocarbons															
TPH as diesel	mg/kg	16 / 79 (20%)	34.1	NA	(NE)	NA	(NE)	NA	(NE)	0	(540)	NA	(NE)	0	(540)
TPH as motor oil	mg/kg	40 / 79 (51%)	252	NA	(NE)	NA	(NE)	NA	(NE)	0	(1,800)	NA	(NE)	0	(1,800)

Notes

1 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

2 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil" July 1

3 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

4 Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

5 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

6 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.

7 Number of exceedences are the number of detections exceeding the background threshold value (BTV).

8 Number of exceedences are the number of detections that are equal to or exceeds the screening level (ecological comparison value, residential reporting limit, commercial reporting limit or interim screening level) or otherwise noted

* Number of exceedances are calculated using background threshold value because it is greater than the respective screening level.

‡ Maxiumum Reporting Limit greater than or equal to the interim screening level

USEPA regional screening level - USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

CHHSL - California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

mg/kg miligrams per kilogram
µg/kg micrograms per kilogram
ng/kg nanograms per kilogram
NA not applicable
ND not detected in any of the samples
NE not established
SL screening level

USEPA United States Environmental Protection Agency
DTSC California Department of Toxic Substances Control
CHHSL California human health screening levels
Water Board Regional Water Quality Control Board

TABLE C7-10
Central Tendency Comparisons (Site to Background)
AOC 14 - Railroad Debris Site
Soil Investigation Part A, Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Parameter	Comparison Test Used	Probability that the Observed Differences Would Occur Purely by Chance	Statistical Decision with 0.05 Significance Level	Mean of Site Detects	Mean of Bkgd Detects	Median of Site Detects	Median of Bkgd Detects	Number of Site Detects	Number of Site Samples	Number of Bkgd Detects	Number of Bkgd Samples	Percent Detects Site	Percent Detects Bkgd
Chromium	Gehan	1.000	nsd	18.8	22.3	17	21.9	99	99	70	70	100	100
Copper	Gehan	0.987	nsd	9.91	10.5	9.4	10.1	97	99	70	70	98	100
Lead	Gehan	0.744	nsd	4.91	4.38	3.5	3.5	79	79	59	60	100	98
Molybdenum	Gehan	0.996	nsd	1.65	1.03	1.5	1	15	79	11	60	19	18
Zinc	Gehan	0.997	nsd	35.6	36.8	34	35.5	99	99	70	70	100	100

Bkgd = background

nsd = no statistical difference

> = greater than

TABLE C7-11

Decision 2 Data Gaps Summary AOC 14 - Railroad Debris Site

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [1] Y or N	> ECV or Background as Applicable? [1] Y or N	Proposed Sample ID	Notes
Metals							
Antimony				**30 mg/kg**	**0.285 mg/kg**		
0-0.5 ft bgs	NA	0 of 14	NA mg/kg	N	N	None	Compound exceeds ECV. Detection limit exceeds ECV. Although there are insufficient detections to allow calculation of a 95% UCL on the mean, additional data collection is not expected to yield sufficient detections to strongly influence the EPC, because additional sampling would likely result in additional non-detect values.
0-3 ft bgs	N	2 of 30	1.1 mg/kg	N	Y		
0-6 ft bgs	N	2 of 48	1.1 mg/kg	N	Y		
0-10 ft bgs	N	2 of 65	1.1 mg/kg	N	NA		
Arsenic				**11 mg/kg (bckg)**	**11.4 mg/kg**		
0-0.5 ft bgs	Y	14 of 14	6.8 mg/kg	N	N	None	Compound exceeds HHCV and ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	30 of 30	11 mg/kg	N	N		
0-6 ft bgs	Y	48 of 48	15 mg/kg	Y	Y		
0-10 ft bgs	Y	65 of 65	15 mg/kg	Y	NA		
Chromium-Total				**280 mg/kg**	**39.8 mg/kg (bckg)**		
0-0.5 ft bgs	Y	31 of 31	74.9 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	56 of 56	74.9 mg/kg	N	Y		
0-6 ft bgs	Y	79 of 79	74.9 mg/kg	N	Y		
0-10 ft bgs	Y	96 of 96	74.9 mg/kg	N	NA		
Copper				**3000 mg/kg**	**20.6 mg/kg**		
0-0.5 ft bgs	Y	31 of 31	44 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	55 of 56	44 mg/kg	N	Y		
0-6 ft bgs	Y	77 of 79	44 mg/kg	N	Y		
0-10 ft bgs	Y	94 of 96	44 mg/kg	N	NA		
Lead				**80 mg/kg**	**8.39 mg/kg (bckg)**		
0-0.5 ft bgs	Y	14 of 14	18 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	30 of 30	18 mg/kg	N	Y		
0-6 ft bgs	Y	47 of 48	21 mg/kg	N	Y		
0-10 ft bgs	Y	64 of 65	21 mg/kg	N	NA		

TABLE C7-11
Decision 2 Data Gaps Summary AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [1] Y or N	> ECV or Background as Applicable? [1] Y or N	Proposed Sample ID	Notes
Mercury				**18 mg/kg**	**0.0125 mg/kg**		
0-0.5 ft bgs	NA	0 of 14	NA mg/kg	N	N	None	Compound exceeds ECV and no background value has been established. Detection limits are elevated relative to the ECV. Additional data collection is likely to yield additional non-detected values. The EPC has been defined within the limits of the analytical instrumentation.
0-3 ft bgs	N	3 of 30	0.25 mg/kg	N	Y		
0-6 ft bgs	N	3 of 48	0.25 mg/kg	N	Y		
0-10 ft bgs	N	3 of 65	0.25 mg/kg	N	NA		
Molybdenum				**380 mg/kg**	**2.25 mg/kg**		
0-0.5 ft bgs	N	3 of 14	1.6 mg/kg	N	N	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	7 of 30	2.4 mg/kg	N	Y		
0-6 ft bgs	Y	14 of 48	2.4 mg/kg	N	Y		
0-10 ft bgs	Y	15 of 65	2.4 mg/kg	N	NA		
Nickel				**1600 mg/kg**	**27.3 mg/kg (bckg)**		
0-0.5 ft bgs	Y	31 of 31	15.8 mg/kg	N	N	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	56 of 56	47 mg/kg	N	Y		
0-6 ft bgs	Y	79 of 79	47 mg/kg	N	Y		
0-10 ft bgs	Y	96 of 96	47 mg/kg	N	NA		
Selenium				**380 mg/kg**	**1.47 mg/kg (bckg)**		
0-0.5 ft bgs	NA	0 of 14	NA mg/kg	N	N	None	Compound exceeds ECV. Although there are insufficient detections to allow calculation of a 95% UCL on the mean, additional data collection is not expected to yield sufficient detections to strongly influence the EPC because additional sampling would likely result in additional non-detect values and because the maximum detected value is only slightly greater than the lowest comparison value.
0-3 ft bgs	N	2 of 30	0.99 mg/kg	N	N		
0-6 ft bgs	N	3 of 48	1.5 mg/kg	N	Y		
0-10 ft bgs	Y	5 of 65	1.6 mg/kg	N	NA		
Zinc				**23000 mg/kg**	**58 mg/kg (bckg)**		
0-0.5 ft bgs	Y	31 of 31	243 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	55 of 56	243 mg/kg	N	Y		
0-6 ft bgs	Y	77 of 79	243 mg/kg	N	Y		
0-10 ft bgs	Y	94 of 96	243 mg/kg	N	NA		

TABLE C7-11
Decision 2 Data Gaps Summary AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [1] Y or N	> ECV or Background as Applicable? [1] Y or N	Proposed Sample ID	Notes
Contract Laboratory Program Inorganics							
Calcium				**66500 mg/kg (bckg)**	**66500 mg/kg (bckg)**		
0-0.5 ft bgs	Y	8 of 8	48000 mg/kg	N	N	None	Compound may exceed background. Existing data adequate for EPC.
0-3 ft bgs	Y	9 of 9	48000 mg/kg	N	N		
0-6 ft bgs	Y	10 of 10	379000 mg/kg	Y	Y		
0-10 ft bgs	Y	10 of 10	379000 mg/kg	Y	NA		
Magnesium				**12100 mg/kg (bckg)**	**12100 mg/kg (bckg)**		
0-0.5 ft bgs	Y	8 of 8	8500 mg/kg	N	N	None	Compound may exceed background. Existing data adequate for EPC.
0-3 ft bgs	Y	9 of 9	8500 mg/kg	N	N		
0-6 ft bgs	Y	10 of 10	23000 mg/kg	Y	Y		
0-10 ft bgs	Y	10 of 10	23000 mg/kg	Y	NA		
Sodium				**2070 mg/kg (bckg)**	**2070 mg/kg (bckg)**		
0-0.5 ft bgs	Y	8 of 8	850 mg/kg	N	N	None	Compound may exceed background. Existing data adequate for EPC.
0-3 ft bgs	Y	8 of 9	850 mg/kg	N	N		
0-6 ft bgs	Y	9 of 10	6590 mg/kg	Y	Y		
0-10 ft bgs	Y	9 of 10	6590 mg/kg	Y	NA		
Polycyclic Aromatic Hydrocarbons							
PAHs (BaP TEQ)				**38 µg/kg**	NA		
0-0.5 ft bgs	Y	7 of 14	22 µg/kg	N	NA	None	Compound exceeds HHCV. Existing data adequate for EPC.
0-3 ft bgs	Y	10 of 30	22 µg/kg	N	NA		
0-6 ft bgs	Y	14 of 48	130 µg/kg	Y	NA		
0-10 ft bgs	Y	14 of 65	130 µg/kg	Y	NA		
HMW PAHs				NA	**1160 µg/kg**		
0-0.5 ft bgs	Y	7 of 14	130 µg/kg	NA	N	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	10 of 30	170 µg/kg	NA	N		
0-6 ft bgs	Y	14 of 48	1400 µg/kg	NA	Y		
Pesticides							
DDT-R				**1600 µg/kg**	**2.1 µg/kg**		
0-0.5 ft bgs	N	1 of 8	5.9 µg/kg	N	Y	None	Compound exceeds ECV. Although there are insufficient detections to allow calculation of a 95% UCL on the mean, additional data collection is not expected to yield sufficient detections to strongly influence the EPC, as additional sampling would likely result in additional non-detect values.
0-3 ft bgs	N	1 of 8	5.9 µg/kg	N	Y		
0-6 ft bgs	N	1 of 8	5.9 µg/kg	N	Y		
0-10 ft bgs	N	1 of 8	5.9 µg/kg	N	NA		

TABLE C7-11
Decision 2 Data Gaps Summary AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [1] Y or N	> ECV or Background as Applicable? [1] Y or N	Proposed Sample ID	Notes
Total Petroleum Hydrocarbons							
TPH as diesel				**545 mg/kg**	**NA**		
0-0.5 ft bgs	Y	5 of 14	34.1 mg/kg	N	NA	None	Compound exceeds HHCV. Existing data adequate for EPC.
0-3 ft bgs	Y	9 of 30	15000 mg/kg	Y	NA		
0-6 ft bgs	Y	11 of 48	15000 mg/kg	Y	NA		
0-10 ft bgs	Y	12 of 65	15000 mg/kg	Y	NA		
TPH as motor oil				**1833 mg/kg**	**NA**		
0-0.5 ft bgs	Y	9 of 14	252 mg/kg	N	NA	None	Compound exceeds HHCV. Existing data adequate for EPC.
0-3 ft bgs	Y	21 of 30	17000 mg/kg	Y	NA		
0-6 ft bgs	Y	33 of 48	17000 mg/kg	Y	NA		
0-10 ft bgs	Y	37 of 65	17000 mg/kg	Y	NA		

Footnotes:
[1] The higher value of either the HHCV/ECV or background was selected as the screening criteria and are included in these columns for the respective compound in **BOLDED BLUE FONT**. Values based on background are indicated with "(bckg)" next to the value.

Acronyms and Abbreviations:
AOC - area of concern
BaP TEQ - benzo(a)pyrene toxic equivalents
ECV - ecological comparison values
EPC - exposure point concentration
ft bgs - feet below ground surface
HHCV - human health comparison values
HMW PAH - high molecular weight polycyclic aromatic hydrocarbons
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
N - no
NA - not applicable
95% UCL - 95 percent upper confidence limit on the mean (calculated by ProUCL Version 4.00.04; USEPA, 2009)
Y - yes

TABLE C7-12
Results of Tiered Analysis at AOC 14 – Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Metal	Step 1 Do COPCs/COPECs Exceed Background?	Step 2 Do COPCs/COPECs Exceed SSL?	Step 3 Does Screening Model Eliminate Potential for Leaching to Groundwater?
Chromium	✓		
Chromium, Hexavalent	✓	✓	No
Copper	✓		
Lead	✓		
Mercury	✓		
Molybdenum	✓	✓	Yes
Nickel	✓		
Selenium	✓		
Thallium	✓	✓	No
Zinc	✓		

✓ = Constituents concentration exceeds background and/or soil screening level (SSL).

TABLE C7-13

Sample Results Compared to the Calculated Soil Screening Levels
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)									
		Soil Screening Levels : [1]		**5,500**	**0.36**	**22,000**	**3,500**	**600**	**0.73**	**3,800**	**42**	**0.19**	**130,000**
		Background : [2]		**39.8**	**0.83**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Chromium**	**Chromium Hexavalent**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Thallium**	**Zinc**
AOC14-1	09/30/08	0 - 0.5	N	25	0.841	11	18	ND (0.1)	ND (2)	11	ND (1)	ND (4)	70
	09/30/08	2 - 3	N	25	ND (0.412)	8.5	8.7	ND (0.1)	ND (2)	11	ND (1)	ND (4.1)	47
	09/30/08	5 - 6	N	27	ND (0.412)	9.5	2.3	ND (0.1)	1.6	12	ND (2)	ND (2)	38
	09/30/08	9 - 10	N	17	ND (0.403)	8.2	2.7	ND (0.099)	ND (1)	11	ND (1)	ND (2)	34
	09/30/08	14 - 15	N	18	ND (0.412)	12	2.1	ND (0.1)	ND (1)	11	ND (1)	ND (2)	34
AOC14-2	09/30/08	0 - 0.5	N	28	0.768	44	18	ND (0.1)	ND (2)	12	ND (1)	ND (4.1)	49
	09/30/08	2 - 3	N	42	1.04	ND (21)	7.6	ND (0.11)	ND (11)	12	ND (1.1)	ND (21)	34
	10/01/08[6]	3 - 3.25	N	26	2.16	ND (23)	ND (1.1)	ND (0.11)	ND (11)	4.5	ND (1.1)	ND (23)	ND (11)
	09/30/08	5 - 6	N	42	1.32	19	21	ND (0.11)	ND (5.2)	13	ND (1)	ND (10)	51
	09/30/08	9 - 10	N	21	ND (0.405)	16 J	1.8	ND (0.1)	ND (1)	11	ND (1)	ND (2)	40
	09/30/08	9 - 10	FD	21	ND (0.404)	11 J	1.9	ND (0.1)	ND (1)	10	ND (2)	ND (2)	41
	09/30/08	14 - 15	N	15	ND (0.407)	9.1	2.1	ND (0.1)	ND (1)	11	ND (1)	ND (2)	35
AOC14-3	10/01/08	0 - 0.5	N	31	ND (0.403)	12	8.4	ND (0.1)	1.6	11	ND (1)	ND (2)	52
	10/01/08	2 - 3	N	26	ND (0.405)	13	6.4	ND (0.1)	ND (1)	13	ND (1)	ND (2)	46
	10/01/08	5 - 6	N	32	0.877	11	9	ND (0.1)	2.1	11	ND (1)	ND (2)	40
	10/01/08	9 - 10	N	19	ND (0.404)	7.1	2	ND (0.1)	ND (1)	10	ND (1)	ND (2)	33
	10/01/08	14 - 15	N	17	ND (0.403)	12	2.2	ND (0.1)	ND (1)	11	ND (1)	ND (2)	32
AOC14-4	10/01/08	0 - 0.5	N	13	ND (0.402)	7.3	7.2	ND (0.1)	ND (1)	7.1	ND (1)	ND (2)	31
	10/01/08	2 - 3	N	16	ND (0.405)	6.2	3.5	ND (0.1)	1.5	7.6	ND (1)	ND (2)	23
	10/01/08	5 - 6	N	16	ND (0.403)	5.3	3.5	ND (0.1)	1.5	7.3	ND (1)	ND (2)	23
	10/01/08	9 - 10	N	8.2	ND (0.403)	2.9	2.8	ND (0.1)	1.2	4.8	ND (1)	ND (2)	16
	10/01/08	9 - 10	FD	8.1	ND (0.404)	2.7	2.9	ND (0.1)	1.2	4.8	ND (1)	ND (2)	16
	10/01/08	14 - 15	N	15	ND (0.406)	7.9	2.2	ND (0.1)	ND (1)	10	ND (1)	ND (2)	29
AOC14-5	10/02/08	0 - 0.5	N	15	ND (0.403)	9.6	5.3	ND (0.099)	ND (2)	10	ND (1)	ND (4)	35
	10/02/08	2 - 3	N	17	ND (0.405)	16	16	ND (0.1)	ND (2)	13	ND (1)	ND (4)	46
	10/02/08	5 - 6	N	15	ND (0.404)	7.9	2.7	ND (0.099)	ND (1)	10	ND (1)	ND (2)	35
	10/02/08	9 - 10	N	15	ND (0.403)	9.5	2.3	ND (0.1)	ND (1)	10	ND (1)	ND (2)	35
	10/02/08	14 - 15	N	16	ND (0.406)	7.3	2.2	ND (0.1)	ND (1)	12	ND (1)	ND (2)	30

TABLE C7-13
Sample Results Compared to the Calculated Soil Screening Levels
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)									
			Soil Screening Levels : [1]	**5,500**	**0.36**	**22,000**	**3,500**	**600**	**0.73**	**3,800**	**42**	**0.19**	**130,000**
			Background : [2]	**39.8**	**0.83**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Chromium**	**Chromium Hexavalent**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Thallium**	**Zinc**
AOC14-6	10/02/08	0 - 0.5	N	11	ND (0.402)	6.1	7.4	ND (0.1)	1.2	7	ND (1)	ND (2)	35
	10/02/08	2 - 3	N	23	ND (0.403)	9.5	3.3	ND (0.1)	2.4	11	ND (1)	ND (4)	37
	10/02/08	5 - 6	N	18	ND (0.405)	9.1	2.3	ND (0.099)	ND (1)	11	ND (1)	ND (2)	35
	10/02/08	9 - 10	N	18	ND (0.406)	9.6	2.4	ND (0.1)	ND (1)	12	ND (1)	ND (2)	39
	10/02/08	9 - 10	FD	18	ND (0.406)	9.7	2.3	ND (0.1)	ND (1)	12	ND (1)	ND (2)	39
	10/02/08	14 - 15	N	16	ND (0.402)	7.2	2.2	ND (0.1)	ND (1)	9.3	ND (1)	ND (2)	28
AOC14-7	10/02/08	0 - 0.5	N	15	ND (0.404)	7.4	6.1	ND (0.099)	ND (1)	9.6	ND (1)	ND (2)	31
	10/02/08	2 - 3	N	13	ND (0.405)	10	7.1	ND (0.1)	ND (1)	9.3	ND (1)	ND (2)	30
	10/02/08	5 - 6	N	18	ND (0.405)	10	4.8	ND (0.1)	ND (2)	12	ND (1)	ND (4)	35
	10/02/08	9 - 10	N	26	ND (0.404)	14	2.9	ND (0.1)	ND (1)	16	ND (1)	ND (2)	46
	10/02/08	14 - 15	N	25	ND (0.401)	9.9	3.5	ND (0.1)	2.4	11	ND (1)	ND (2)	32
AOC14-8	10/02/08	0 - 0.5	N	12	ND (0.403)	7.9	6.4	ND (0.099)	ND (2)	9.4	ND (1)	ND (4)	30
	10/02/08	2 - 3	N	15	ND (0.406)	8.8	6.8	ND (0.1)	ND (2)	11	ND (1)	ND (4)	31
	10/02/08	5 - 6	N	18	ND (0.404)	6.6	2.4	ND (0.1)	ND (1)	11	ND (1)	ND (2)	39
	10/02/08	9 - 10	N	19	ND (0.404)	12	2.7	ND (0.1)	ND (1)	13	ND (1)	ND (2)	38
	10/02/08	9 - 10	FD	19	ND (0.404)	10	3	ND (0.1)	ND (1)	13	ND (1)	ND (2)	39
	10/02/08	14 - 15	N	23 J	ND (0.413)	18	3.7	ND (0.1)	ND (1)	16	ND (1)	ND (2.1)	42 J
AOC14-9	10/01/08	0 - 0.5	N	13	ND (0.404)	7.6	5.4	ND (0.1)	ND (1)	9.5	ND (1)	ND (2)	28
	10/01/08	2 - 3	N	12	ND (0.407)	7.2	6	ND (0.1)	ND (2)	9.1	ND (1)	ND (4)	29
	10/01/08	5 - 6	N	9	ND (0.4)	4.1	2.8	ND (0.1)	ND (1)	5	ND (1)	ND (2)	13
	10/01/08	9 - 10	N	15	ND (0.405)	7.6	3.6	ND (0.1)	ND (1)	9.1	ND (1)	ND (2)	29
	10/01/08	14 - 15	N	13	ND (0.406)	8.2	5	ND (0.1)	ND (2)	9.4	ND (1)	ND (4.1)	32
AOC14-10	10/01/08	0 - 0.5	N	10	ND (0.401)	3.5	3.5	ND (0.1)	ND (1)	4.2	ND (1)	ND (2)	14
	10/01/08	2 - 3	N	11	ND (0.401)	3.1	2.9	ND (0.1)	ND (1)	3.9	ND (1)	ND (2)	14
	10/01/08	5 - 6	N	12	ND (0.403)	4.6	3.4	ND (0.1)	ND (1)	5.2	ND (1)	ND (2)	17
	10/01/08	5 - 6	FD	12	ND (0.402)	4.1	3.1	ND (0.1)	ND (1)	4.6	ND (1)	ND (2)	15
	10/01/08	9 - 10	N	11	ND (0.409)	7.1	5.9	ND (0.1)	ND (1)	8.7	ND (1)	2.2	28
	10/01/08	14 - 15	N	9.8	ND (0.404)	ND (8.1)	2.6	ND (0.1)	ND (4)	4.6	ND (1)	ND (8.1)	13

TABLE C7-13

Sample Results Compared to the Calculated Soil Screening Levels
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Location	Date	Depth (ft bgs)	Sample Type	Chromium	Chromium Hexavalent	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Thallium	Zinc
				Metals (mg/kg)									
		Soil Screening Levels : [1]		5,500	0.36	22,000	3,500	600	0.73	3,800	42	0.19	130,000
		Background : [2]		39.8	0.83	16.8	8.39	NE	1.37	27.3	1.47	NE	58
AOC14-11	10/01/08	5 - 6	N	15	ND (0.406)	7.3	4.2	ND (0.1)	1	9.9	ND (1)	ND (2)	28
	10/01/08	9 - 10	N	18	ND (0.405)	13	2	ND (0.1)	ND (1)	12	ND (1)	ND (2)	37
	10/01/08	14 - 15	N	20	ND (0.41)	9	3	ND (0.1)	ND (1)	14	ND (1)	ND (2)	39
AOC14-12	09/30/08	5 - 6	N	27	ND (0.406)	8.4	3.2	ND (0.1)	2.4	9.8	1.5	ND (2)	36
	09/30/08	9 - 10	N	17	ND (0.405)	7.7	3	ND (0.1)	ND (1)	11	1.2	ND (2)	37
	09/30/08	14 - 15	N	20	ND (0.401)	9.8	2.8	ND (0.1)	1.2	13	ND (1)	ND (2)	35
AOC14-13	10/01/08 [7]	0.5 - 1.5	N	63	0.487	33	16	ND (0.1)	98	57	ND (1)	ND (20)	39
	09/30/08	5 - 6	N	22	ND (0.405)	11	3.6	ND (0.099)	2	9	ND (1)	ND (2)	30
	09/30/08	9 - 10	N	16	ND (0.405)	7.2	2.1	ND (0.1)	ND (1)	10	1.6	ND (2)	34
	09/30/08	14 - 15	N	16	ND (0.409)	11	2.2	ND (0.1)	ND (1)	11	ND (1)	ND (2)	33
	09/30/08	14 - 15	FD	16	ND (0.409)	13	2.4	ND (0.1)	ND (1)	11	ND (1)	ND (2)	33
AOC14-SS1	10/01/08	0 - 0.5	N	15	ND (0.405)	9.4	7.2	ND (0.1)	ND (1)	8.8	ND (1)	ND (2)	34
	10/01/08	2 - 3	N	22	0.456	15	11	0.25	ND (2)	13	ND (1)	ND (4)	32
	10/01/08	5 - 6	N	18	ND (0.406)	15	4.8	ND (0.1)	ND (2)	12	ND (1)	ND (4.1)	35
	10/01/08	9 - 10	N	17	ND (0.402)	7.4	1.6	ND (0.1)	ND (1)	10	ND (1)	ND (2)	33
	10/01/08	14 - 15	N	13	ND (0.406)	9	2.6	ND (0.1)	ND (1)	10	ND (1)	ND (2)	31
AOC14-SS2	10/01/08	0 - 0.5	N	14	ND (0.403)	8.8	4.8	ND (0.1)	1.1	10	ND (1)	ND (2)	27
	10/01/08	2 - 3	N	14	ND (0.407)	7.6	5.5	ND (0.1)	ND (2)	9.4	ND (1)	ND (4)	29
	10/01/08	5 - 6	N	10	ND (0.405)	6.5	5.5	ND (0.1)	ND (2)	8.2	ND (1)	ND (4.1)	25
	10/01/08	9 - 10	N	9.5	ND (0.407)	6.7	5.3	ND (0.1)	ND (1)	8.1	ND (1)	ND (2)	24
	10/01/08	14 - 15	N	17	ND (0.404)	9.6	3	ND (0.1)	ND (1)	13	ND (1)	ND (2)	32
	10/01/08	14 - 15	FD	18	ND (0.405)	9.6	3	ND (0.1)	ND (1)	13	ND (1)	ND (2)	33
AOC14-SS3	10/02/08	0 - 0.5	N	17	ND (0.401)	11	3.8	ND (0.1)	ND (1)	10	ND (1)	ND (2)	35
	10/02/08	2 - 3	N	18	ND (0.402)	9.5	2.7	ND (0.1)	ND (1)	12	ND (1)	ND (2)	36
	10/02/08	5 - 6	N	12	ND (0.403)	6.7	2	ND (0.1)	ND (1)	7.2	ND (1)	ND (2)	29
	10/02/08	9 - 10	N	16	ND (0.404)	8.4	2.2	ND (0.1)	ND (1)	11	ND (1)	ND (2)	32
	10/02/08	14 - 15	N	17	ND (0.404)	9.5	2.4	ND (0.1)	ND (1)	11	ND (1)	ND (2)	35
AOC14-SS4	10/02/08	0 - 0.5	N	15	ND (0.402)	8.1	5.1	ND (0.1)	ND (1)	9.6	ND (1)	ND (2)	31

TABLE C7-13

Sample Results Compared to the Calculated Soil Screening Levels
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)									
		Soil Screening Levels : [1]		**5,500**	**0.36**	**22,000**	**3,500**	**600**	**0.73**	**3,800**	**42**	**0.19**	**130,000**
		Background : [2]		**39.8**	**0.83**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Chromium**	**Chromium Hexavalent**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Thallium**	**Zinc**
AOC14-SS4	10/02/08	2 - 3	N	14	ND (0.401)	6.9	10	ND (0.1)	ND (1)	7	ND (1)	ND (2)	27
	10/02/08	5 - 6	N	16	ND (0.403)	6.4	11	ND (0.1)	1.5	6.7	ND (1)	ND (2)	27
	10/02/08	9 - 10	N	16	ND (0.404)	11	2.3	ND (0.1)	ND (1)	11	ND (1)	ND (2)	32
	10/02/08	14 - 15	N	17	ND (0.405)	11	3	ND (0.1)	ND (1)	11	ND (1)	ND (2)	37
	10/02/08	14 - 15	FD	17	ND (0.405)	8.5	1.6	ND (0.1)	ND (1)	11	ND (1)	ND (2)	34
S1-20	11/01/98	3	N	31.8	0.7	15.7	---	---	---	14	---	---	49.4
S2-6	11/01/98[6]	3	N	45.5	12	1.8	---	---	---	0.57	---	---	14.5
	11/01/98	5	N	39.9	1.8	9.7	---	---	---	9.4	---	---	35.7
S2-62	11/01/98[6]	2	N	32	1	4.1	---	---	---	1.8	---	---	8.4
	11/01/98[8]	3	N	72.7	---	22.2	7.9	0.046 J	0.86 J	47	0.99 J	ND (22)	ND (29.3)
	11/01/98	4	N	21.9	ND (0.5)	11.5	---	---	---	10.2	---	---	39.8
S2-130	11/01/98	1	N	22.1	ND (0.5)	10.6	---	---	---	10.8	---	---	34.5
S3-15	11/01/98	2	N	13.8	ND (0.5)	9.4	---	---	---	7.5	---	---	24.1
	11/01/98	4	N	12.1	ND (0.5)	11	---	---	---	9.6	---	---	29.2
S3-72	11/01/98[6]	1	N	18.7	ND (0.5)	6.7	---	---	---	5.9	---	---	27
	11/01/98	2	N	11.3	ND (0.5)	8	---	---	---	8.6	---	---	28.9
S3-120	11/01/98	1	N	12.1	ND (0.5)	4.2	---	---	---	4.3	---	---	18
S4-4	11/01/98[6]	4	N	23.4	15.4	3.2	---	---	---	0.43 J	---	---	1.9
	11/01/98	6	N	13.7	1	10.3	---	---	---	9.8	---	---	32.6
S4-95	11/01/98[6]	2	N	10.3	ND (0.5)	2.5	---	---	---	4.3	---	---	4.3
	11/01/98	3	N	14.9	ND (0.5)	8.3	---	---	---	8.8	---	---	27
S4-160	11/01/98	2	N	25	0.5	11.8	---	---	---	10.9	---	---	38.2
S8-30	11/01/98	3	N	12.8	0.5	10.8	---	---	---	9.4	---	---	40.9
GS-1	11/01/98[6]	0	N	33.7	0.59	2.2	---	---	---	0.28 J	---	---	31.3
GS-2	11/01/98[6]	0	N	21.9	ND (0.5)	8.2	---	---	---	6	---	---	32.7
RR-1	02/02/00	0	N	23.4	ND (0.5)	15.6	---	---	---	15.8	---	---	44
RR-2	02/02/00	0	N	16.1	ND (0.5)	13.8	---	---	---	12.3	---	---	37.5

TABLE C7-13

Sample Results Compared to the Calculated Soil Screening Levels
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)									
			Soil Screening Levels : [1]	**5,500**	**0.36**	**22,000**	**3,500**	**600**	**0.73**	**3,800**	**42**	**0.19**	**130,000**
			Background : [2]	**39.8**	**0.83**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Chromium**	**Chromium Hexavalent**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Thallium**	**Zinc**
RR-3	02/02/00	0	N	18.3	ND (0.5)	11.6	---	---	---	13	---	---	35
RR-4	02/02/006	0	N	19.4	0.6	19.2	---	---	---	0.92	---	---	27.1
RR-5	02/02/00	0	N	39.5	5.8	7.1	---	---	---	0.33	---	---	34.1
RR-6	02/02/00	0	N	74.9	4.8	7.5	---	---	---	0.39	---	---	243
RR-7	02/02/006	0	N	28.6	ND (0.51)	9.7	---	---	---	10.4	---	---	35.1
RR-8	02/02/00	0	N	28.9	ND (0.51)	9.9	---	---	---	7.4	---	---	29.8
RR-9	02/02/006	0	N	19.6	2.7	27.9	---	---	---	2.2	---	---	15.4
RR-10	02/02/00	0	N	18.8	ND (0.51)	12.9	---	---	---	11.6	---	---	36.3
RR-11	02/02/00	0	N	18.1	ND (0.51)	20.2	---	---	---	13.4	---	---	47.5
RR-12	02/02/006	0	N	17.5	ND (0.5)	3.8	---	---	---	1.5	---	---	11.3

1 Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.
2 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL are circled.

mg/kg milligrams per kilogram
ft bgs feet below ground surface
N primary sample
FD field duplicate
--- not analyzed
ND not detected at the listed reporting limit
J concentration or reporting limit estimated by laboratory or data validation

TABLE C7-14

Constituent Concentrations in Soil Compared to Total Threshold Limit Concentration (TTLC), Soluble Threshold Limit Concentration (STLC), and Toxic Characteristic Leaching Procedure (TCLP)
AOC 14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Topock Compressor Station, Needles, California

Parameter	Frequency of detection	Maximum Detected Value (mg/kg)	TTLC in mg/kg[1]		STLC in mg/L[1]			TCLP in mg/L[1]		
			# of Exceedences	TTLC	# of Exceedences of STLC x 10	STLC x 10	STLC	# of Exceedences of TCLP x 20	TCLP x 20	TCLP
Antimony	0 / 79 (0%)	ND (2.1)	0	500	0	150	15	0	NE	NE
Arsenic	79 / 79 (100%)	11	0	500	0	50	5	0	100	5
Barium	79 / 79 (100%)	300	0	10000	0	1000	100	0	2000	100
Beryllium	0 / 79 (0%)	ND (11) ‡	0	75	0	7.5	0.75	0	NE	NE
Cadmium	0 / 79 (0%)	ND (1.1)	0	100	0	10	1	0	20	1
Chromium	99 / 99 (100%)	74.9	0	2500	1	50	5	0	100	5
Chromium, Hexavalent	13 / 99 (13%)	5.8	0	500	0	50	5	0	NE	NE
Cobalt	77 / 79 (97%)	10	0	8000	0	800	80	0	NE	NE
Copper	97 / 99 (98%)	44	0	2500	0	250	25	0	NE	NE
Lead	79 / 79 (100%)	21	0	1000	0	50	5	0	100	5
Mercury	1 / 79 (1.3%)	0.25	0	20	0	2	0.2	0	4	0.2
Molybdenum	15 / 79 (19%)	2.4	0	3500	0	3500	350	0	NE	NE
Nickel	99 / 99 (100%)	16	0	2000	0	200	20	0	NE	NE
Selenium	3 / 79 (3.8%)	1.6	0	100	0	10	1	0	20	1
Silver	0 / 79 (0%)	ND (11)	0	500	0	50	5	0	100	5
Thallium	1 / 79 (1.3%)	2.2	0	700	0	70	7	0	NE	NE
Vanadium	79 / 79 (100%)	38	0	2400	0	240	24	0	NE	NE
Zinc	99 / 99 (100%)	243	0	5000	0	2500	250	0	NE	NE

Notes

[1] Code of Regulations, Title 22, Chapter 11, Article 3
mg/kg miligrams per kilogram
mg/L milligrams per liter
ND not detected in any of the samples
NE not established
‡ maximum reporting limit greater than or equal to the STLC.

24 Bench Samples not included in table summary.

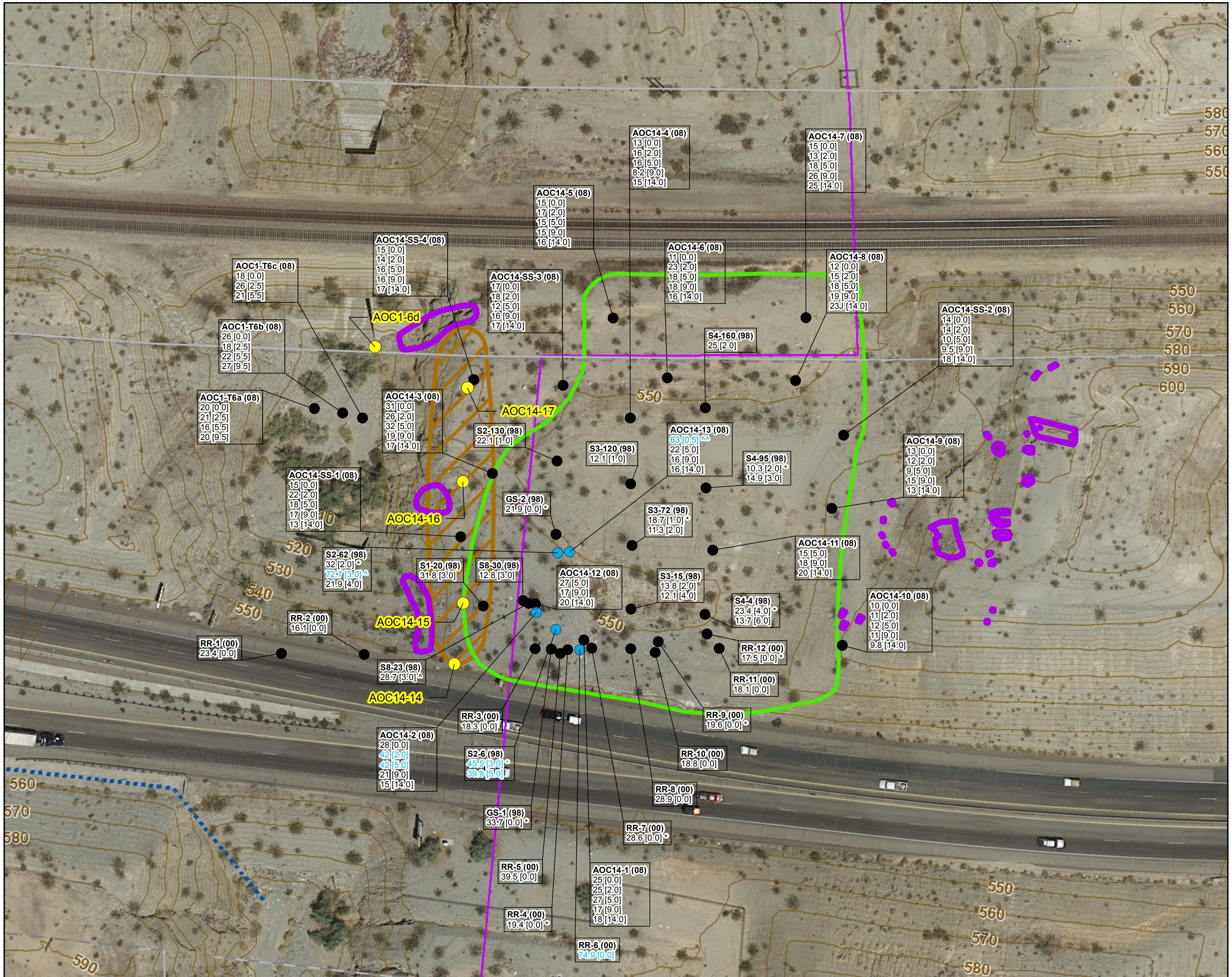
TABLE C7-15
Proposed Phase 2 Soil Sampling Locations at AOC 14 – Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

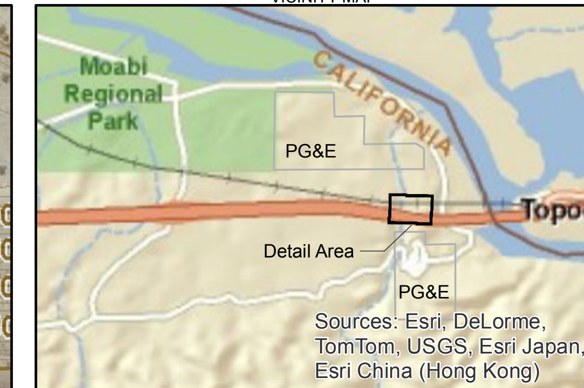
Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Methods[a]
AOC14-14	0, 2, 5, 9, and 14	To resolve Data Gap #2 - Assess the newly identified potential burn area west of AOC14	Dioxins and furans	Rotosonic
AOC14-15	0, 2, 5, 9, and 14	To resolve Data Gaps #1, #2, and #5 - Define lateral and vertical extents of exceedances in southwestern corner and assess the newly identified potential burn area west of AOC14 and collect additional parameters to support the CMS/FS	Dioxins and furans, pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pH, soil physical parameters (Atterberg limits, relative compaction, alkalinity, cation exchange, capacity, and particle size distribution) – three samples from boring	Rotosonic
AOC14-16	0, 2, 5, 9, and 14	To resolve Data Gap #2 - Assess the newly identified potential burn area west of AOC14	Dioxins and furans, pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pH	Rotosonic
AOC14-17	0, 2, 5, 9, and 14	To resolve Data Gap #2 - Assess the newly identified potential burn area west of AOC14	Dioxins and furans, pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pH	Rotosonic
Assorted debris locations		To resolve Data Gap #2 – Sampling of new debris areas east of the AOC	XRF screen	Hand tools

[a] Proposed collection methods listed on this table are based on experience and knowledge of the site; actual collection method will be chosen in the field based on field conditions and site access restrictions.

Contingent samples will be collected if anomalies are identified during the geophysical survey or if corrected XRF results exceed applicable screening levels.

Figures





LEGEND

- Proposed Phase 2 Sample Locations
- Soil Boring
- Proposed Trench
- Property Boundary
- Caltrans ROW
- AOC14 Boundary
- Debris Features
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location; Installation Date
20 [1] — Sample Beginning Depth (ft bgs); Soil Concentration (mg/kg)

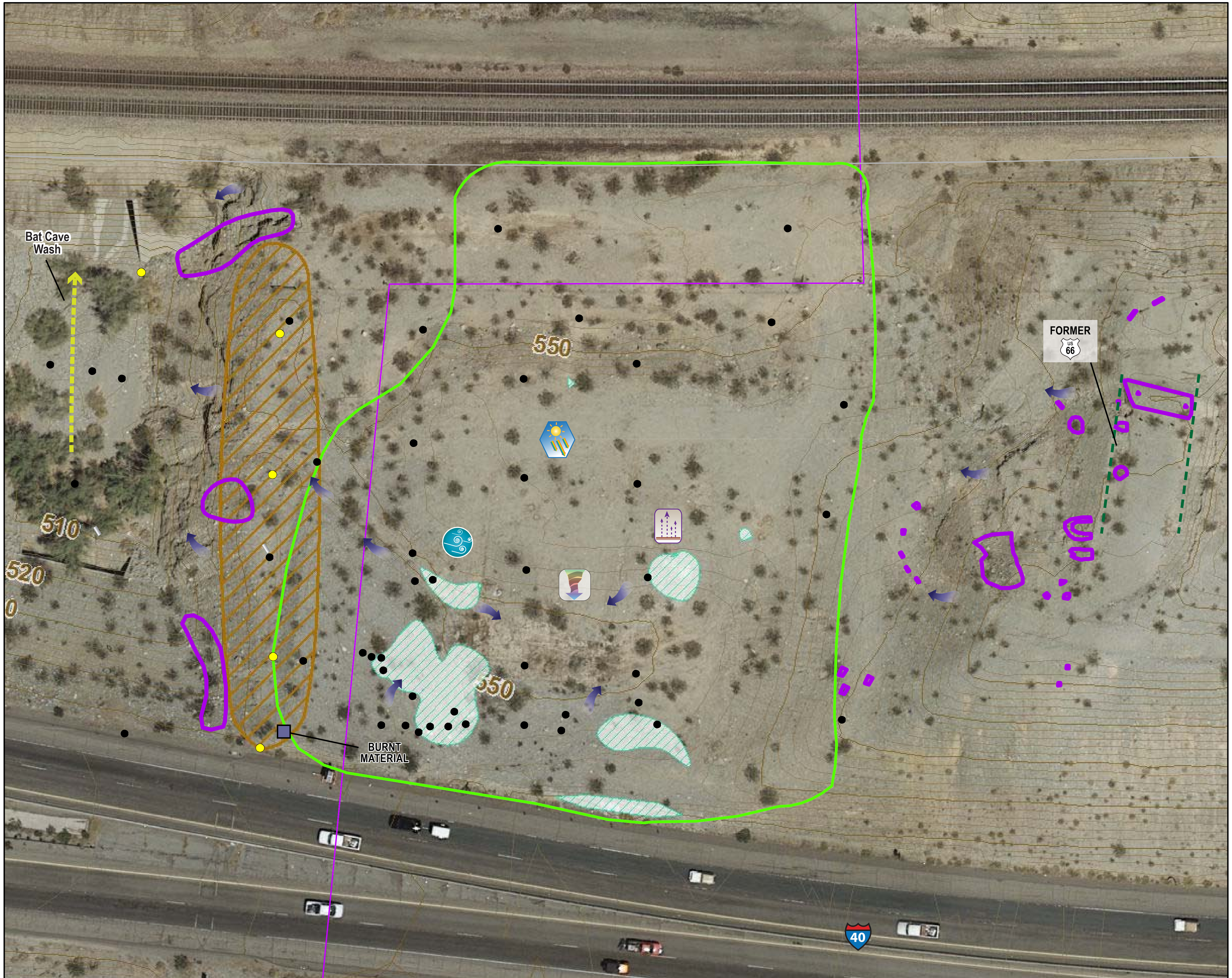
Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. * = White Powder Sample
5. ^ = Black Sandy Material
6. ^^= Debis
7. Results greater than Background (39.8 mg/kg) are shown in BLUE.
8. Results greater than or equal to the U.S. Environmental Protection Agency Residential Regional Screening Level (280 mg/kg) are shown in ORANGE.
9. J = Estimated Result.
10. Ecological Comparison Value (36.3 mg/kg) is below background value; therefore, the screening level is set at the background value.
11. Topographic contours are shown at 2 foot intervals.

0 25 50 100
Feet

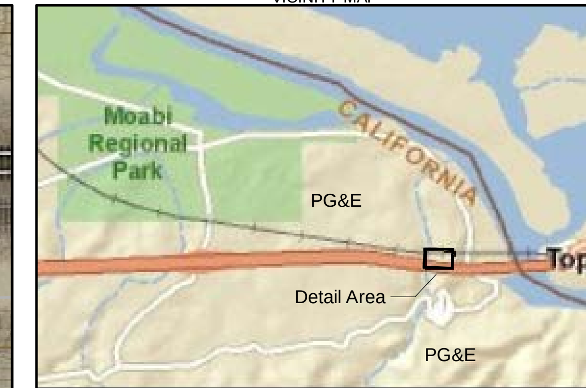
FIGURE C7-1
Total Chromium Soil Sample Results and Proposed Phase 2 Sampling Locations AOC14 - Railroad Debris Site

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL



VICINITY MAP



LEGEND

- Soil Boring
- Proposed Phase 2 Sample Locations
- Debris Features
- Potential Burning Related Location
- AOC 14 Boundary
- Approximate location of White Powder (Line Sludge) at Ground Surface
- Property Boundary
- PG&E Pipeline

Potential Release Mechanisms

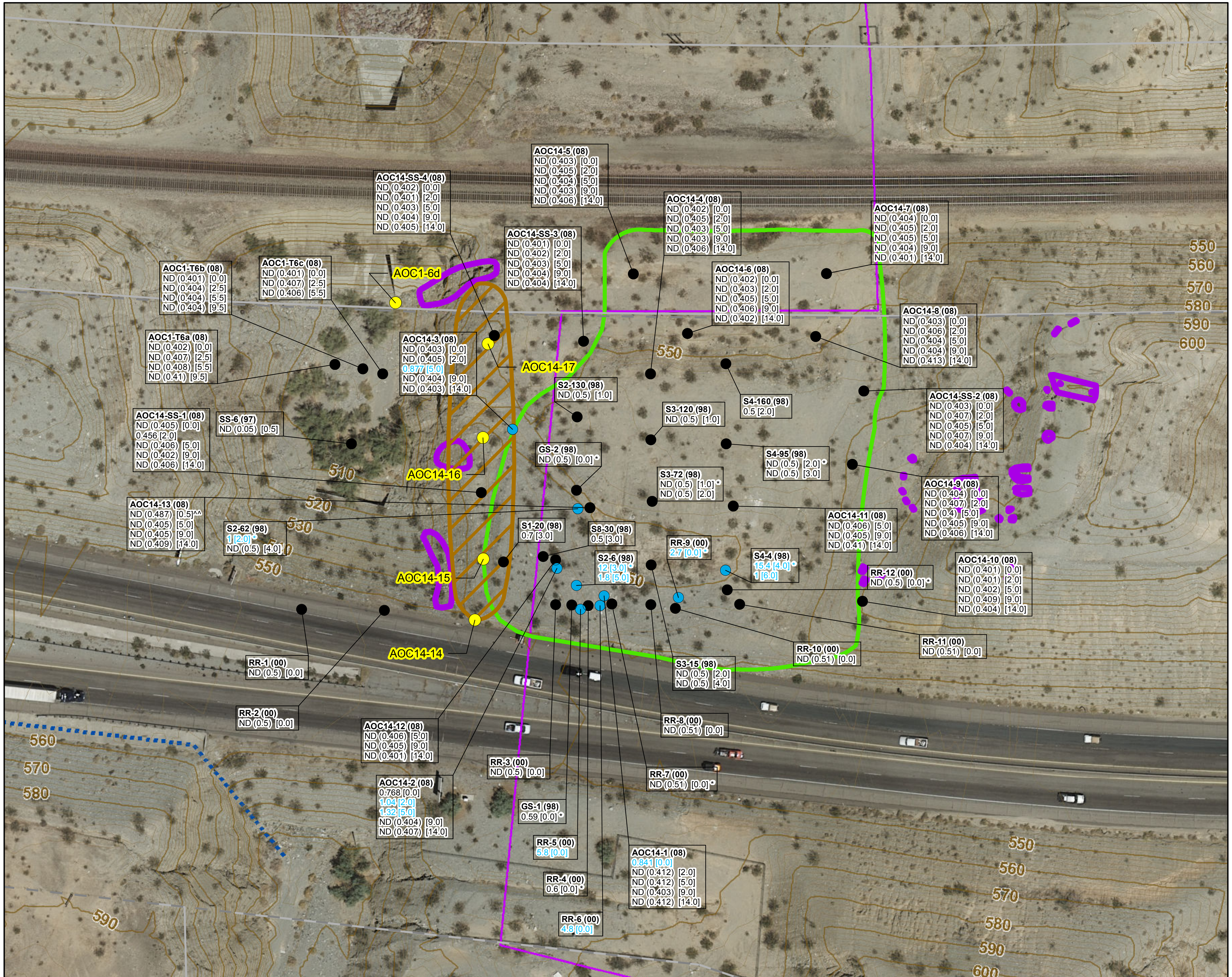
- Infrequent Surface Water Runoff
- Infiltration (Site-wide)
- Windblown Dispersion of Soil (Site-wide)
- Volatilization (Site-wide)
- Degradation by Heat/Light (Site-wide)
- Hypothetical Downstream Movement During Flow Events

Note:
1. Topographic contours are shown at 2 foot intervals.

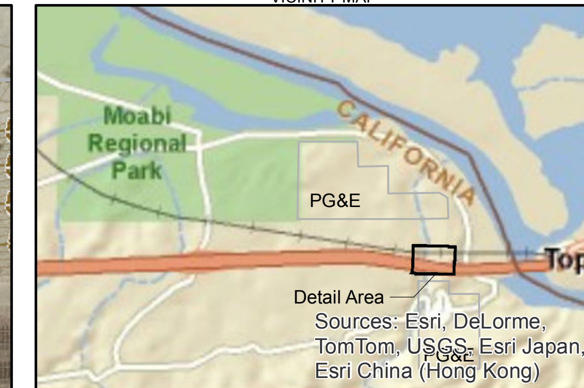
N

0 25 50 100
Feet

FIGURE C7-2
Conceptual Site Model for AOC-14
Soil Investigation Part A Phase 1 Data Summary Report
PG&E Topock Compressor Station
Needles, California



VICINITY MAP



LEGEND

- Proposed Phase 2 Sample Locations
- Soil Boring
- Proposed Trench
- Property Boundary
- Caltrans ROW
- AOC14 Boundary
- Debris Features
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

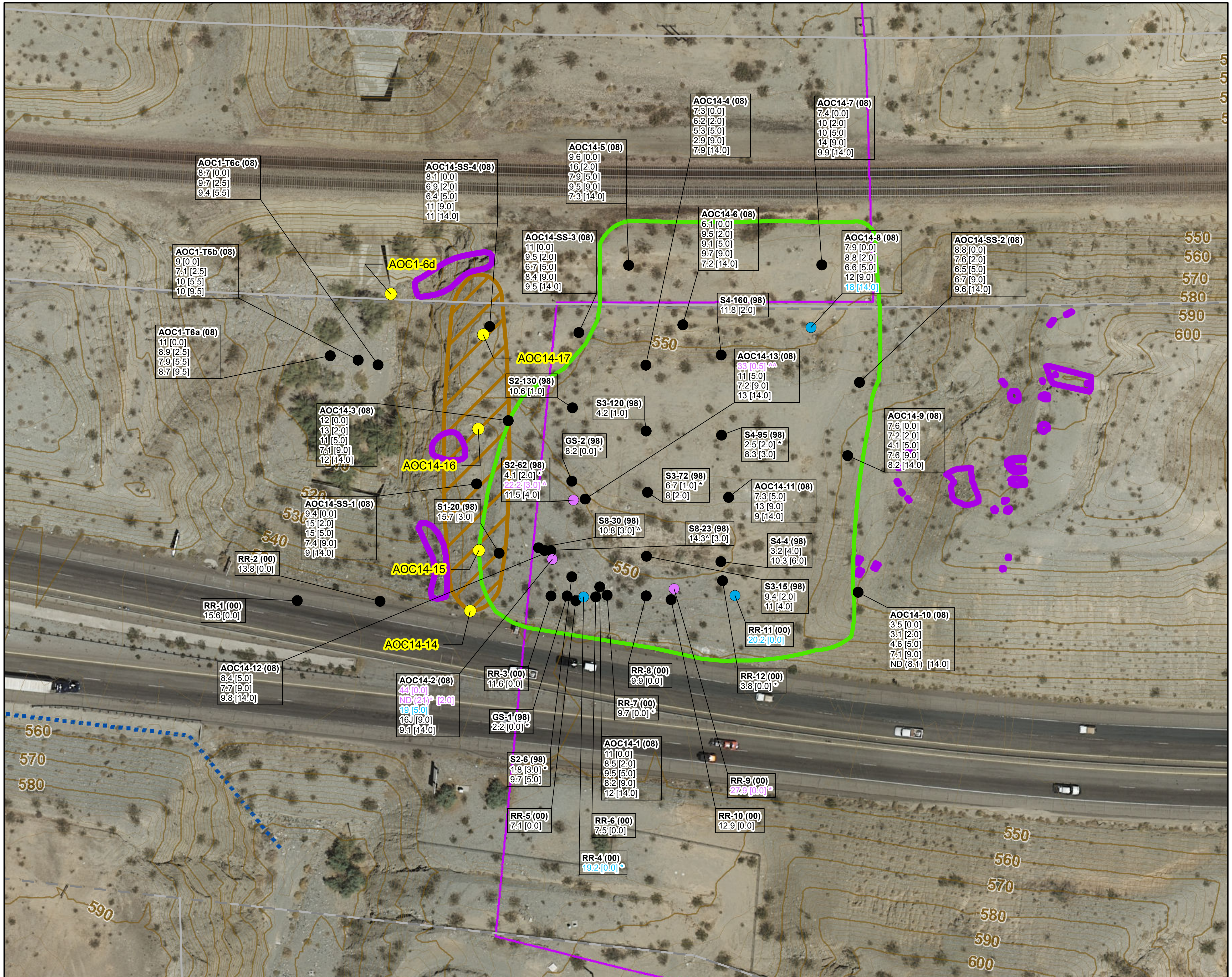
Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. * = White Powder Sample
5. ^^= Debis
6. Results greater than Background (0.83 mg/kg) are shown in BLUE.
7. Results greater than or equal to the Ecological Comparison Value (139.6 mg/kg) are shown in PURPLE.
8. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (17 mg/kg) are shown in ORANGE.
9. J = Estimated Result.
10. Topographic contours are shown at 2 foot intervals.

0 25 50 100
Feet

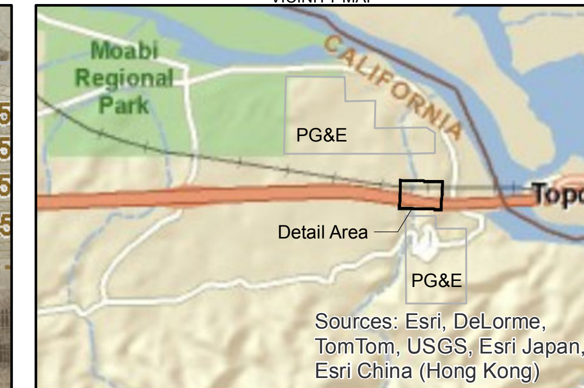
N

FIGURE C7-3
Hexavalent Chromium Soil Sample Results and Proposed Phase 2 Sample Locations AOC14 - Railroad Debris Site

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California



VICINITY MAP



LEGEND

- Proposed Phase 2 Sample Locations
- Soil Boring
- Proposed Trench
- Property Boundary
- Caltrans ROW
- AOC14 Boundary
- Debris Features
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. * = White Powder Sample
5. ^ = Black Sandy Material
6. ^^= Debis
7. Results greater than Background (16.8 mg/kg) are shown in BLUE.
8. Results greater than or equal to the Ecological Comparison Value (20.6 mg/kg) are shown in PURPLE.
9. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (3,000 mg/kg) are shown in ORANGE.
10. J = Estimated Result.
11. Topographic contours are shown at 2 foot intervals.

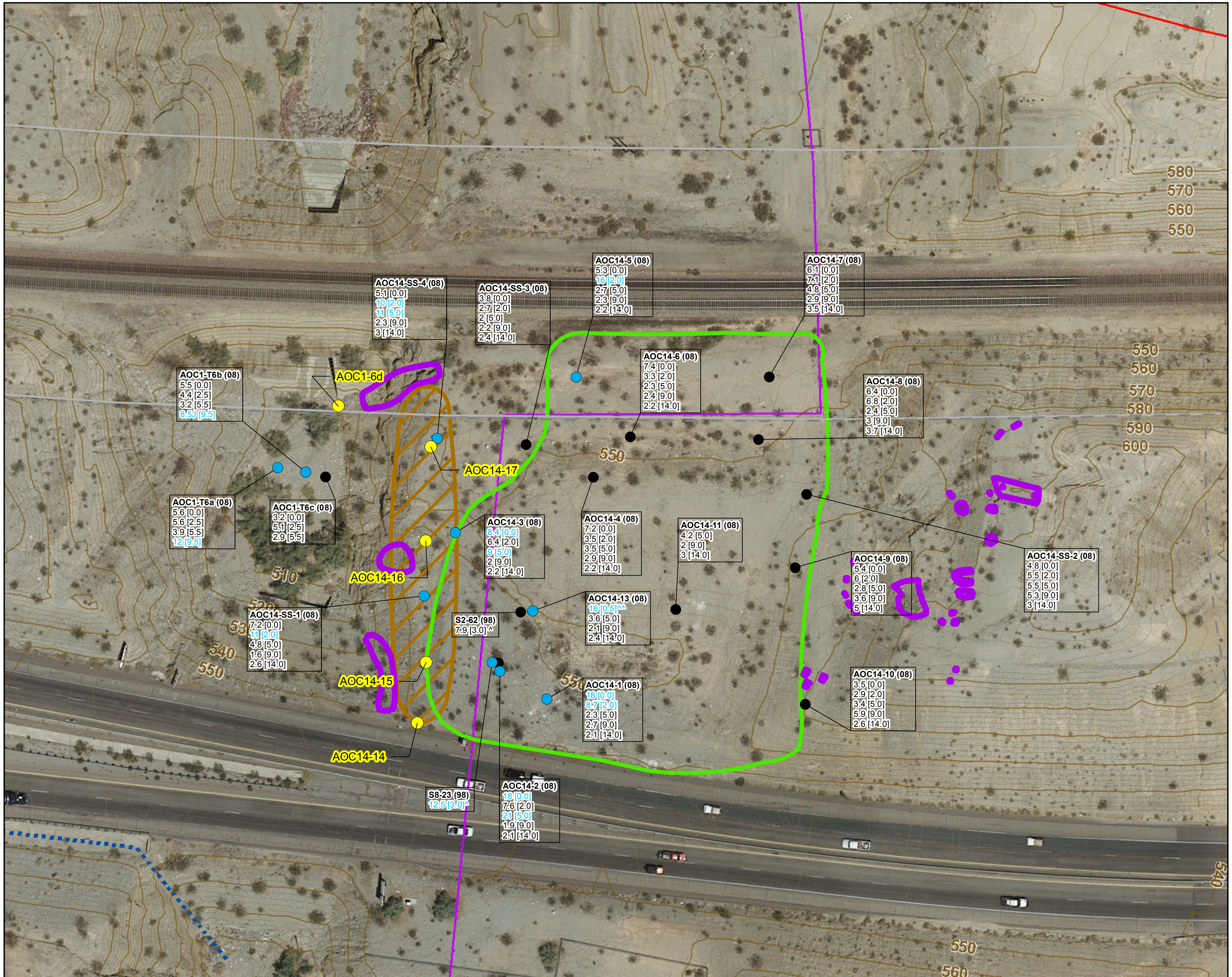
0 25 50 100
Feet

N

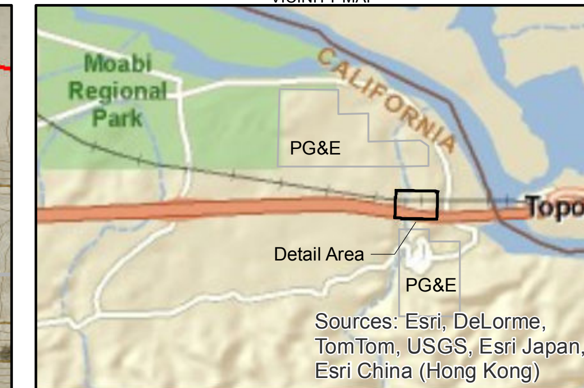
FIGURE C7-4
Copper
Soil Sample Results and Proposed Phase 2 Sample Locations
AOC14 - Railroad Debris Site
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC14\DATAGAPS\AOC14_DG_CU.MXD

CH2MHILL



VICINITY MAP



LEGEND

- Proposed Phase 2 Sample Locations
- Soil Boring
- Proposed Trench
- Property Boundary
- Caltrans ROW
- AOC14 Boundary
- Debris Features
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

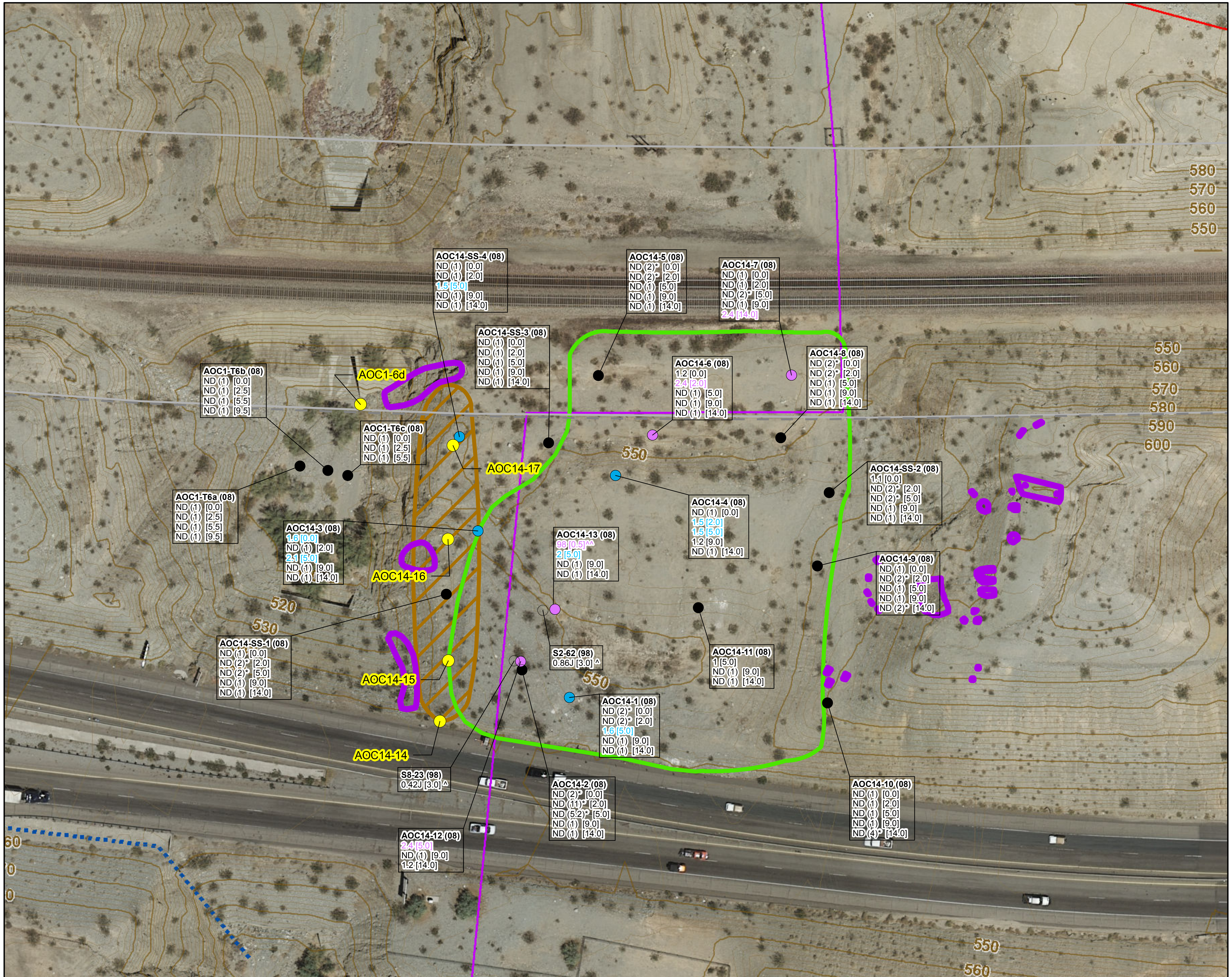
Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. ^ = Black Sandy Material
5. ^^= Debis
6. Results greater than Background (8.39 mg/kg) are shown in BLUE.
7. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (150 mg/kg) are shown in ORANGE.
8. J = Estimated Result.
9. Ecological Comparison Value (0.0166 mg/kg) is below background value; therefore, the screening level is set at the background value.
10. Topographic contours are shown at 2 foot intervals.

0 25 50
Feet

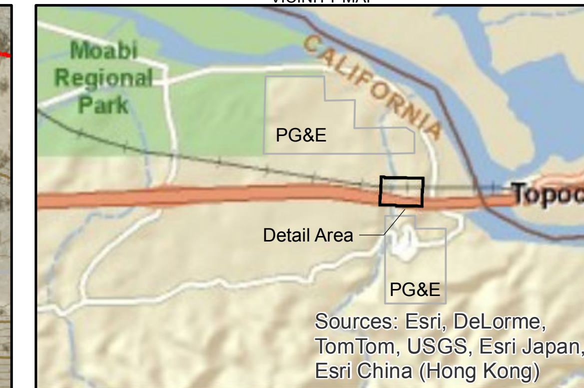
N

FIGURE C7-5
Lead
Soil Sample Results and Proposed Phase 2 Sample Locations
AOC14 - Railroad Debris Site

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California



VICINITY MAP



LEGEND

- Proposed Phase 2 Sample Locations
- Soil Boring
- Proposed Trench
- Property Boundary
- Caltrans ROW
- AOC14 Boundary
- Debris Features
- Potential Burning Related Location
- Approximate Location of Stormwater Piping Below Ground
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- Transwestern Pipeline

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

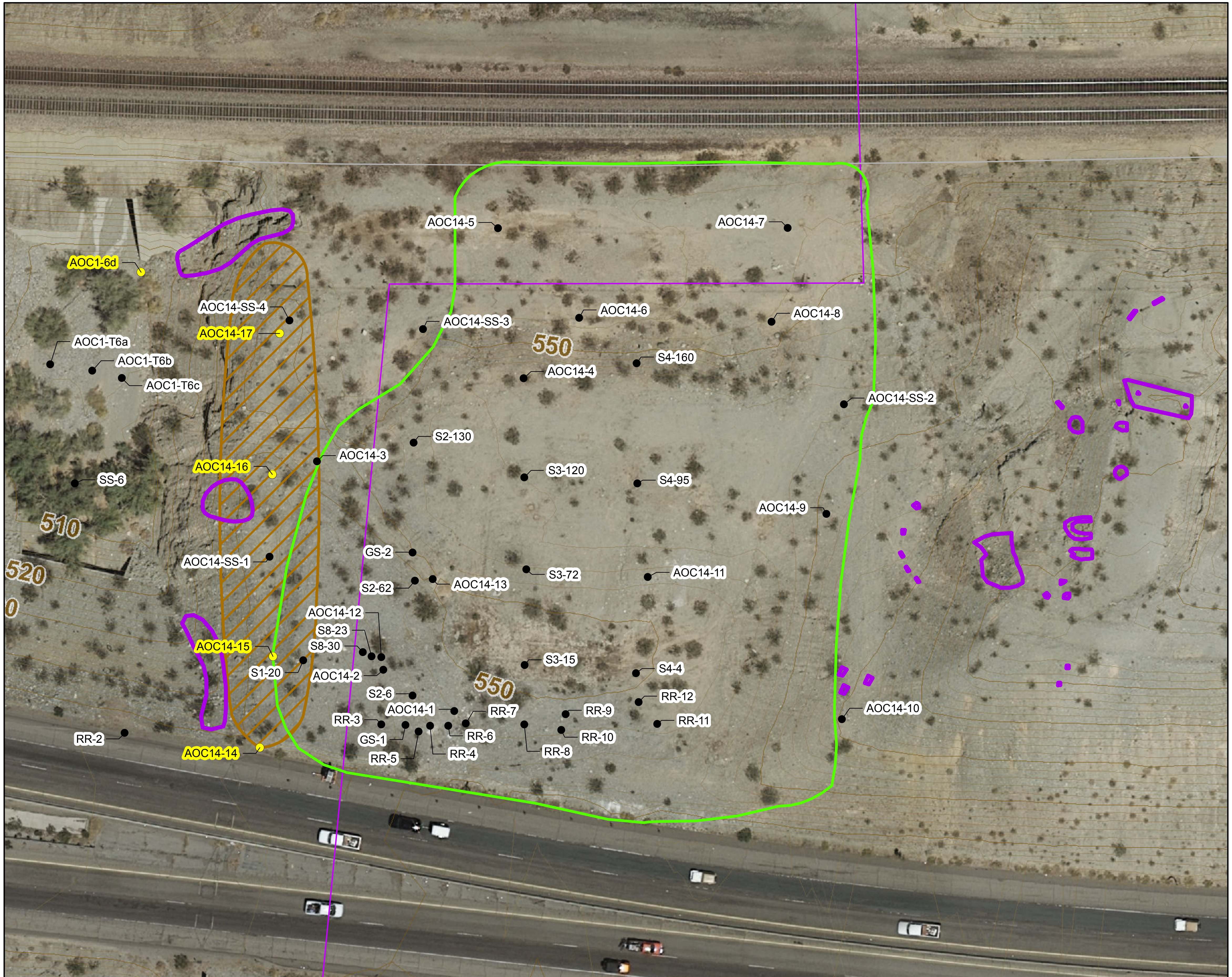
Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (1.37 mg/kg) are shown in BLUE.
5. Results greater than or equal to the Ecological Comparison Value (2.25 mg/kg) are shown in PURPLE.
6. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (380 mg/kg) are in shown in ORANGE.
7. J = Estimated Result.
8. ^ = Black Sandy Material
9. ^^ = Debris
9. * = Laboratory reporting limit exceeds screening levels.
10. Topographic contours are shown at 2 foot intervals.

N

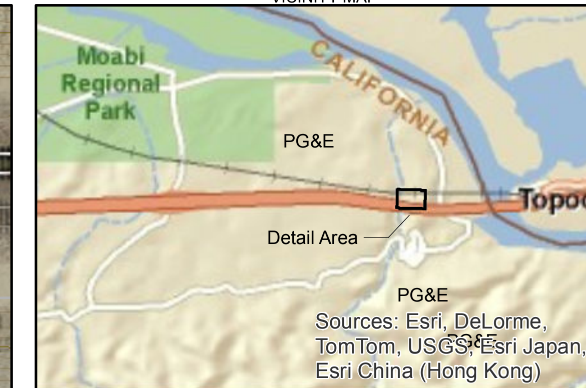
0 150 Feet

FIGURE C7-6
Molybdenum
Soil Sample Results and Proposed Phase 2 Sample Locations
AOC14 - Railroad Debris Site

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California



VICINITY MAP



LEGEND

- Soil Boring
- Proposed Phase 2 Sample Locations
- Property Boundary
- PG&E Pipeline
- AOC 14 Boundary
- Debris Features
- Potential Burning Related Location

Note:
1. Topographic contours are shown at 2 foot intervals.

N

0 25 50 100
Feet

FIGURE C7-7
Proposed Phase 2
Soil Sample Locations
AOC 14 - Railroad Debris Site
Soil Investigation Part A
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

Path: \\Zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS\MapFiles\2012\SWP_A\AOC14\AOC14_DG_Additional_Locs.mxd

Subappendix C8
Undesignated Area 1 Data Gaps Evaluation Results

Contents

Acronyms and Abbreviations

bgs	below ground surface
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
PG&E	Pacific Gas and Electric Company
ROW	right-of-way
UA	Undesignated Area
UU	undifferentiated utility

APPENDIX C8

Undesignated Area 1 Data Gaps Evaluation Results

1.0 Introduction and Background

This sub-appendix presents the results of the Data Gaps Evaluation for Undesignated Area (UA) 1 – Potential Pipeline Disposal Area at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. Analytical data have not been collected at UA 1; therefore, the process for the data gaps evaluation that is outlined in Sections 2.0 through 6.0 of the Part A Phase 1 Data Gaps Evaluation Report is not used to assess this area. This sub-appendix presents the background information regarding this area, including the geophysical survey that was conducted as part of the 2008 field activities, and proposed further investigation at this area.

2.0 Background

During site historical data gathering, a former employee identified an area just north of the gas pipeline road near the former evaporation ponds as a potential historical asbestos-containing material disposal site. The former employee described 20-foot lengths of asbestos-covered metal pipes as having been buried in a trench immediately north of the pipeline road, across from the northern boundary of the former pounds, shown on Figure C8-1 as UA-1.

During the 2008 field investigation, a geophysical survey was performed in UA 1 to evaluate the potential presence of buried asbestos-wrapped metal pipes in this area and to identify the location of underground utility infrastructure. Results of the geophysical survey did not suggest the presence of buried pipes in this area; however, several small metallic anomalies and two undifferentiated utilities (UUs) were observed sporadically across the UA 1 area. One UU was truncated in the north and extended out of the survey area in the south, and the other UU was located in the southern portion of the survey area trending east-west within the alignment of the access road adjacent to UA 1. The UU within the access road was identified as the former wastewater transference pipeline that transferred non-hazardous waste water from the compressor station to the evaporation ponds. This pipeline was abandoned in place in 2007 when it was replaced with a new transfer pipeline. The complete geophysical survey results are presented in Appendix B to the Part A Phase 1 Data Gaps Evaluation Report.

Following the geophysical survey, further visual assessment of the area in the vicinity of UA 1 identified miscellaneous pipe band clamps and small quantities of insulation on the ground surface at a second location approximately 200 to 250 feet to the east of UA 1. A pronounced soil mound approximately 100 feet long by 25 feet wide was also observed in this area and is shown in Figure C8-1 as UA-1A.

During a follow-up interview with the same former employee in early 2011, the employee indicated that he did not remember the burial location with precision. He indicated that the original location, the second location described in the preceding paragraph, and a third location to the west of the originally identified location are all potential locations for the burial. The third locations is shown on Figure C8-1 as UA-1B. The employee indicated that the burial occurred in the 1970s or 1980s and his memory did not allow him to precisely determine which of the three locations are the most likely burial site. Therefore, PG&E intends to investigate all three potential areas identified by the former employee.

3.0 Historical Aerial Photographs Review of Undesignated Area 1 – Potential Pipe Disposal Area

As requested by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) in a December 13, 2010 e-mail, PG&E performed a detailed historical aerial photograph analysis near UA-1 and the immediate surrounding area to determine/identify evidence of soil disturbances, including potential pipe disposal (Figure C8-1). All available and applicable historical aerial photographs which span from 1936 to 2004 were reviewed in detail. The date for one of the aerial photographs reviewed is not known with certainty, although it was taken after 1973 and before 1989. Additionally, aerial photographs from the late 1940s, 1947, 1951, 1957, 1960, 1966, 1970, 1973, 1976, 1981, 1983, 1995, 2001, 2005, and 2006 were also viewed but did not show UA-1 or the immediate vicinity; therefore, these aerial photographs are not discussed further in this document.

Table C8-1 presents a summary of the information observed in each of the applicable aerial photographs reviewed. The aerial photographs are presented in Figures C8-2 through C8-18. The approximate location of UA-1 is shown in these figures.

TABLE C8-1
Summary of Aerial Photographs, 1936 to 2004
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
PG&E Topock Compressor Station, Needles, California

Year	Description
1936, 1942, and 1944 (Figures C8-2, C8-3, and C8-4)	UA-1 and the surrounding area are undeveloped. An undeveloped desert road with a north-south orientation is located in the general area of UA-1 (see arrows in figures). No evidence of other constructed features or other soil disturbance is visible in UA-1 or surrounding area.
1953 (Figure C8-5)	The compressor station (built in 1951) is present in this aerial photograph (see arrow #1 in figure). The pipeline right-of-way (ROW) and road south of UA-1 is now visible (see arrow #2 in figure). There are several smaller roads/paths/turnaround loops stemming off the pipeline ROW (see arrow #3 in figure). What appears to be a small constructed structure is present north of the pipeline ROW (see arrow #4 in figure). Soil disturbance appears to be limited to ROW clearing and road construction.
1955 & 1956 (Figures C8-6 and C8-7)	The small constructed structure north of the pipeline ROW is no longer visible (see arrow in figures). No significant changes in manmade features or soil disturbance in UA-1 and the surrounding area can be seen between the 1953, 1955, and 1956 aerial photographs.

TABLE C8-1
Summary of Aerial Photographs, 1936 to 2004
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
PG&E Topock Compressor Station, Needles, California

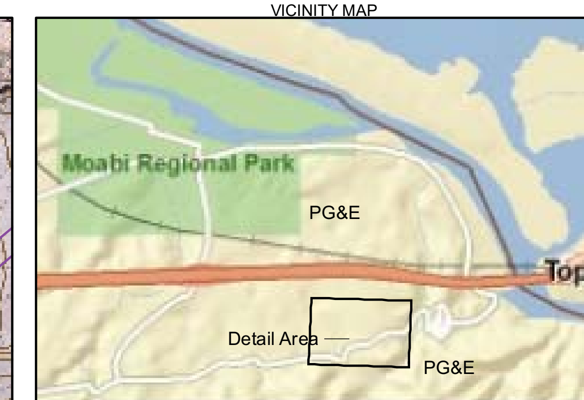
Year	Description
1961 and 1962 (Figures C8-8 and C8-9)	A new pipeline ROW and/or pipeline road is visible to the north and parallel to the existing pipeline ROW (see arrow #1 in figures). Several access roads connecting the new pipeline ROW and the existing pipeline ROW are visible (see arrow #2 in figures). No evidence of other constructed features or other soil disturbance is visible in UA-1 or the surrounding area.
1964 (Figure C8-10)	Several white areas near the pipeline ROWs are visible in this photograph (see arrow #1 in figure). These white areas were not identified in the previous aerial photos, perhaps because those photos were overexposed. A black feature is visible to the south of the pipeline road (see arrow #2 in figure). No other changes can be seen between the 1961 and 1962 photographs and the 1964 photograph.
1967 (Figure C8-11)	No significant changes in manmade features or soil disturbance in UA-1 and the surrounding area can be seen between 1964 and 1967 photographs.
1969 (Figure C8-12)	The white areas near the pipeline ROWs are no longer visible in this photograph. No significant changes in constructed features or soil disturbance in UA-1 and the surrounding area can be seen between 1967 and 1969 photographs.
1975 (Figure C8-13)	The old evaporation ponds are visible south of the pipeline ROW (see arrow #1 in figure). No other changes in constructed features or soil disturbance in UA-1 and the surrounding area can be seen between 1969 and 1975 photographs.
Undated Photo: Sometime Between 1973 and 1989 (Figure C8-14)	What appears to be a constructed structure is visible south of the UA-1 area along the pipeline ROW (see arrow #1). The old evaporation ponds are visible south of the pipeline road (see arrow #2). Dark marks or shadows appear on a portion of the pipeline road to the east of the UA-1 area (see arrow #3).
1992, 1994, 1997, and 2004 (Figures C8-15, C8-16, C8-17, and C8-18)	The northern-most pipeline ROW was widened significantly (see arrow #1 in figures) for the installation of the new Mojave Gas Pipeline in 1992. The old and new evaporation ponds are visible south of the pipeline road (see arrows #2 and #3 in figures).

4.0 Proposed Further Investigation

Per the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) 2007 conditional approval and additional clarification in 2010, PG&E has expanded the potential work area, as shown in Figure C8-1. As directed by DTSC in the December 13, 2010 email, PG&E proposes to perform an additional geophysical survey at the original UA-1 location to further evaluate the two UUs observed in the original UA-1 area. In addition, PG&E proposes to conduct a geophysical survey in both of the new areas (UA-1A and UA-1B) identified during the latest interview with the former employee to attempt to verify the presence of the buried pipelines and their specific placement. If the geophysical surveys provide new information regarding the two UUs in the original UA-1 location or indicate the type of anomalies suggestive of buried metal piping in the UA-1 alternate locations, PG&E will present/discuss the information with agencies and stakeholders.

Figures

VICINITY MAP



LEGEND

- Potential Work Area
- UA1 Boundary
- PG&E Pipeline
- Limits of 2008 Geophysical Survey
- Unidentified Linear Anomaly
- Vertical Magnetic Gradient Contour
  Contour Interval = 10 n Tm
- Evaporation Pond Waste
  Water Pipeline (Abandoned)

Note:
Topographic contours shown are in 2 foot intervals.

N

0 50 100 150 200 250 300 350
Feet

FIGURE C8-1
UA-1 Potential Pipeline Disposal Area

Soil Investigation Part A
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

ES051410163258BAO UA1CrossSection.ai 05-03-11 dash
D:\Projects\Topock\MapFiles\2011\DataGapsB\UA1CrossSection

CH2MHILL

Source:
Fairchild Aerial Photography Collection
Whittier College
Whittier, CA 90608

- Appropriate location of Undesignated Area 1

FIGURE C8-2
1936
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

Source:
Fairchild Aerial Photography Collection
Whittier College
Whittier, CA 90608

- Appropriate location of Undesignated Area 1

FIGURE C8-3
1942
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

Source:
Fairchild Aerial Photography Collection
Whittier College
Whittier, CA 90608

\- Appropriate location of Undesignated Area 1

FIGURE C8-4
1944
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

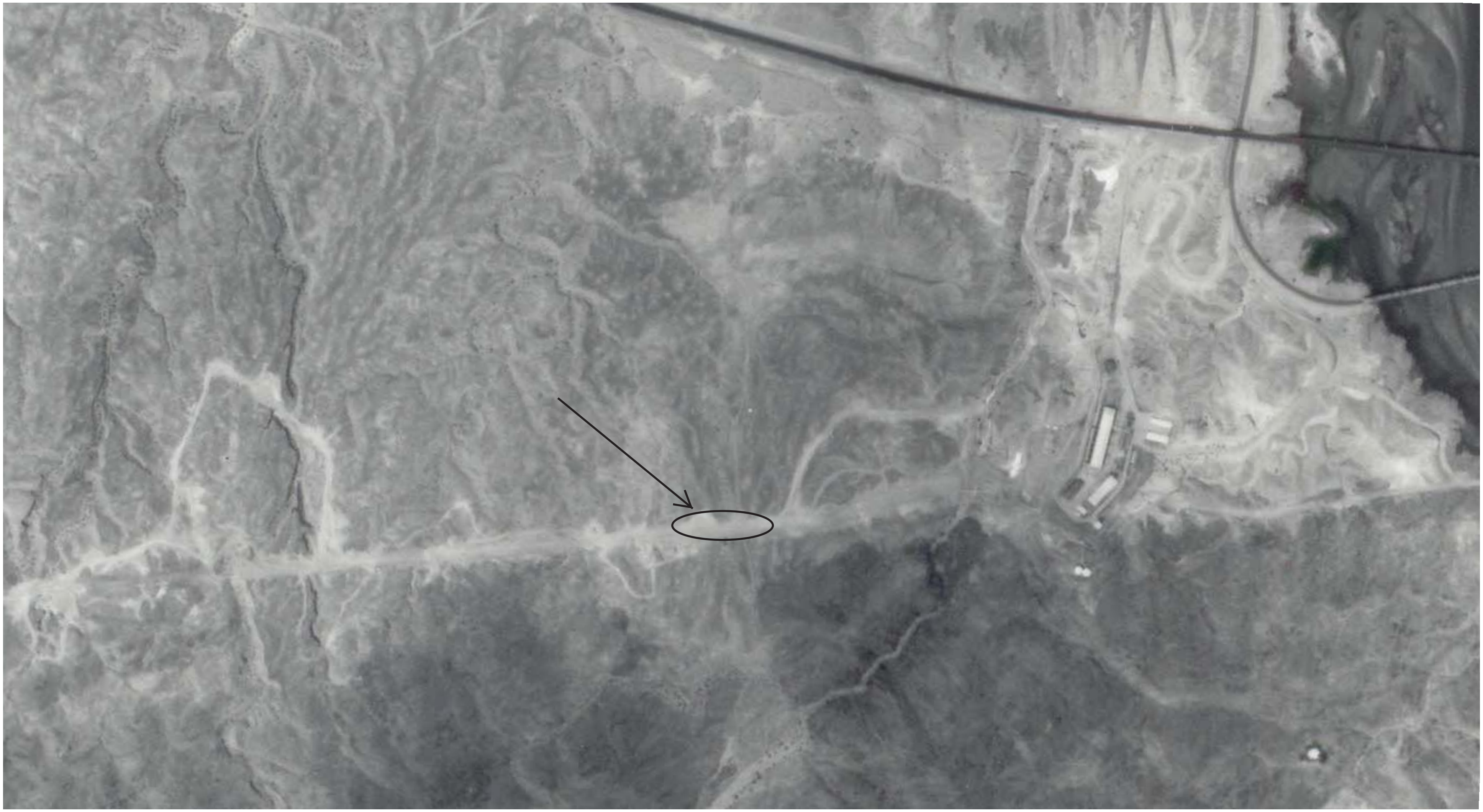
CH2MHILL

Source:
USDA photo via
County of San Bernardino Flood Control District
825 E. Third Street
San Bernardino, CA 92415-0835

- Appropriate location of Undesignated Area 1

FIGURE C8-5
1953
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL



Source:
NOAA National Geodetic Survey, SSMC#3
Information Services Branch, N/NGS12
1315 East West Highway
Silver Spring, MD 20910

- Appropriate location of Undesignated Area 1

FIGURE C8-6
1955
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

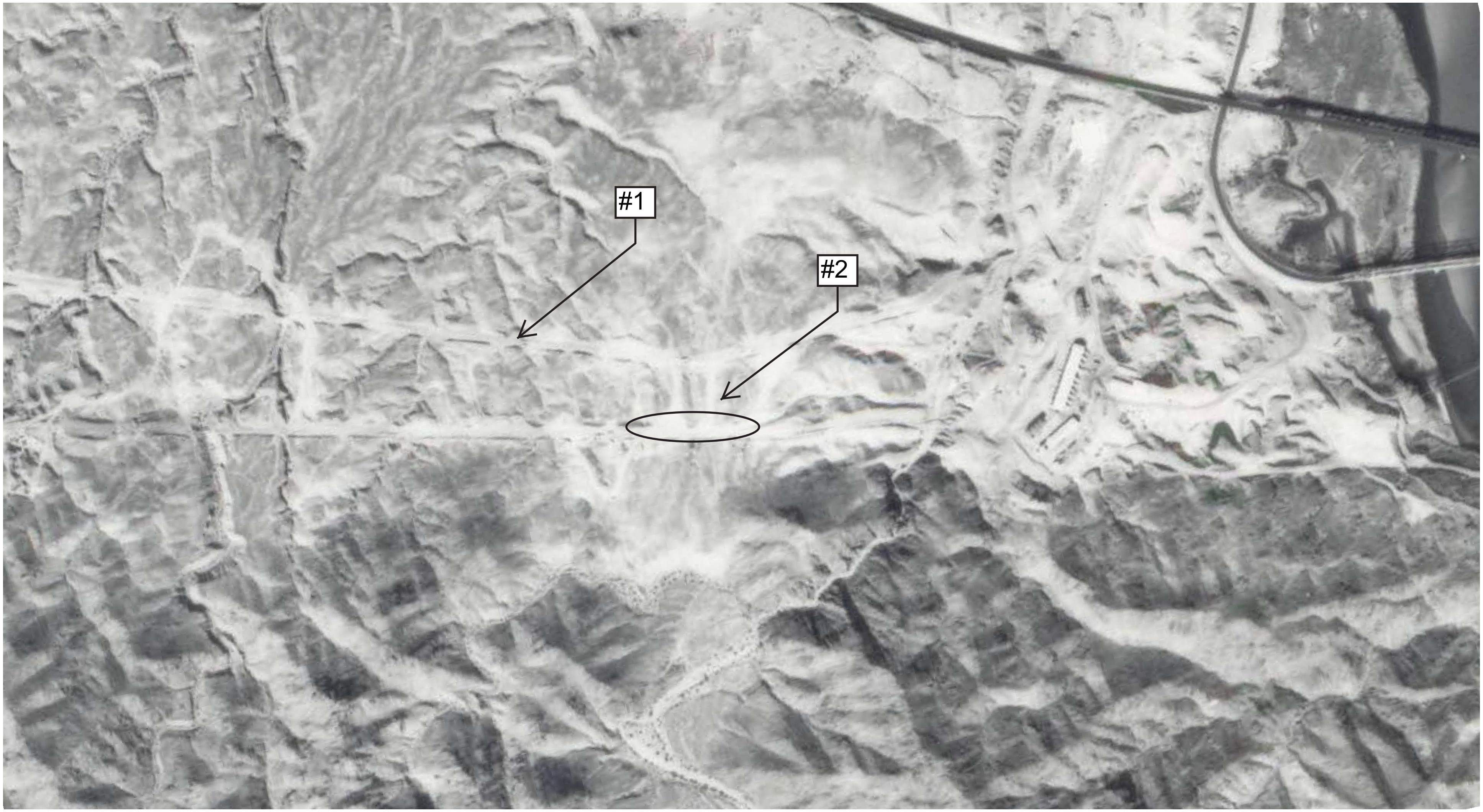
Source:

Unknown

- Appropriate location of Undesignated Area 1

FIGURE C8-7
1956
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

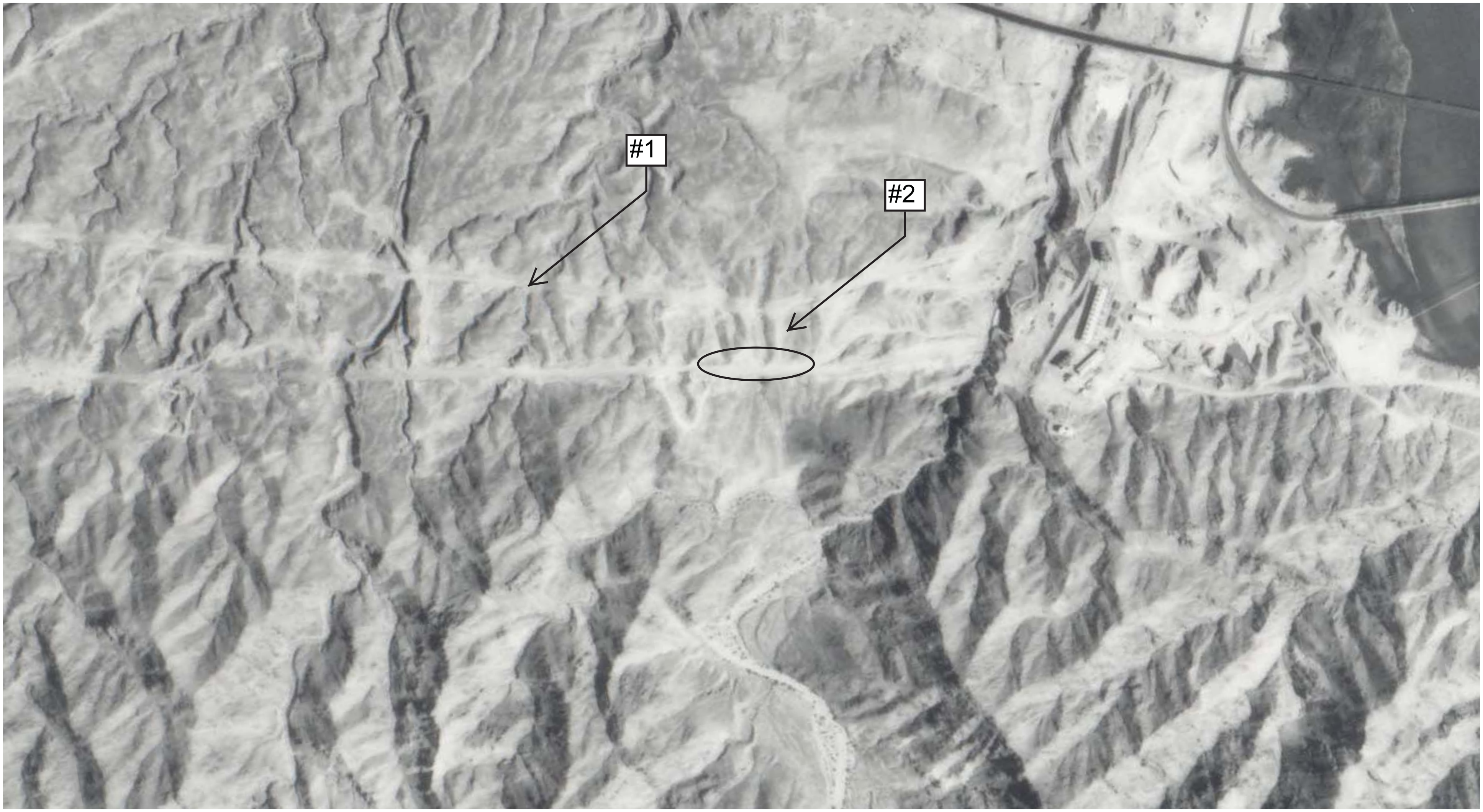
CH2MHILL



Source:
NOAA National Geodetic Survey, SSMC#3
Information Services Branch, N/NGS12
1315 East West Highway
Silver Spring, MD 20910

- Appropriate location of Undesignated Area 1

FIGURE C8-8
1961
Pacific Gas and Electric Company Topock Compressor Station
Needles, California



Source:
NOAA National Geodetic Survey, SSMC#3
Information Services Branch, N/NGS12
1315 East West Highway
Silver Spring, MD 20910

- Appropriate location of Undesignated Area 1

FIGURE C8-9
1962
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

Source:
US Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

- Appropriate location of Undesignated Area 1

FIGURE C8-10
1964
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

Source:
US Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

\- Appropriate location of Undesignated Area 1

FIGURE C8-11
1967
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

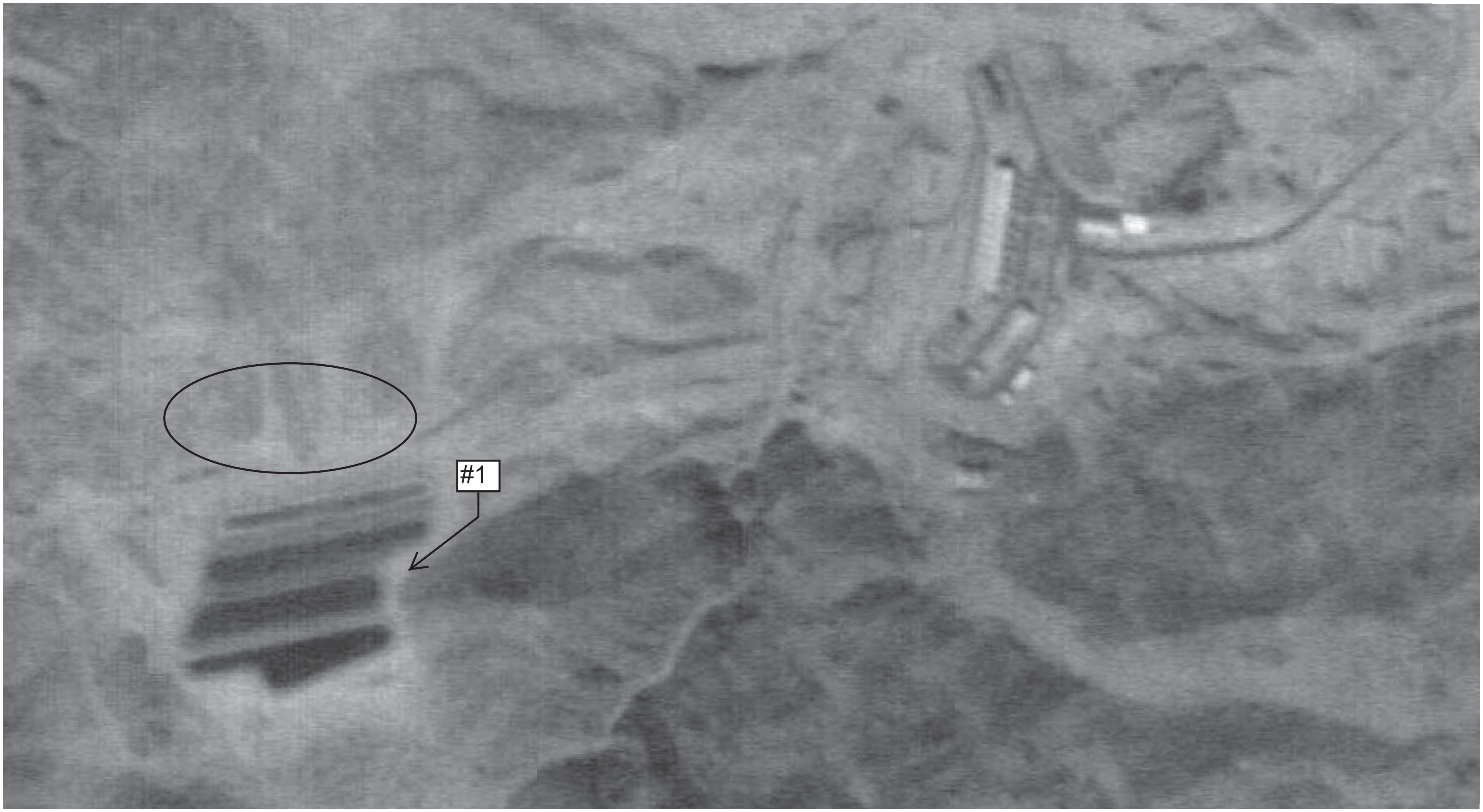
CH2MHILL

Source:
USGS Rocky Mountain Mapping Center
Earth Science Information Center
Box 25046, Stop 504, DFC
Denver, CO 80255

\- Appropriate location of Undesignated Area 1

FIGURE C8-12
1969
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL



Source:
USGS Rocky Mountain Mapping Center
Earth Science Information Center
Box 25046, Stop 504, DFC
Denver, CO 80255

Appropriate Location of Undesignated Area (UA1)

FIGURE C8-13
1975
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

Source:

Unknown

Appropriate Location of Undesignated Area (UA1)

FIGURE C8-14
Undated Photograph: Sometime between 1973 and 1989
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

Source:

Unknown

- Appropriate location of Undesignated Area 1

FIGURE C8-15
1992
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

Source:

Unknown

Appropriate Location of Undesignated Area (UA1)

FIGURE C8-16
1994
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

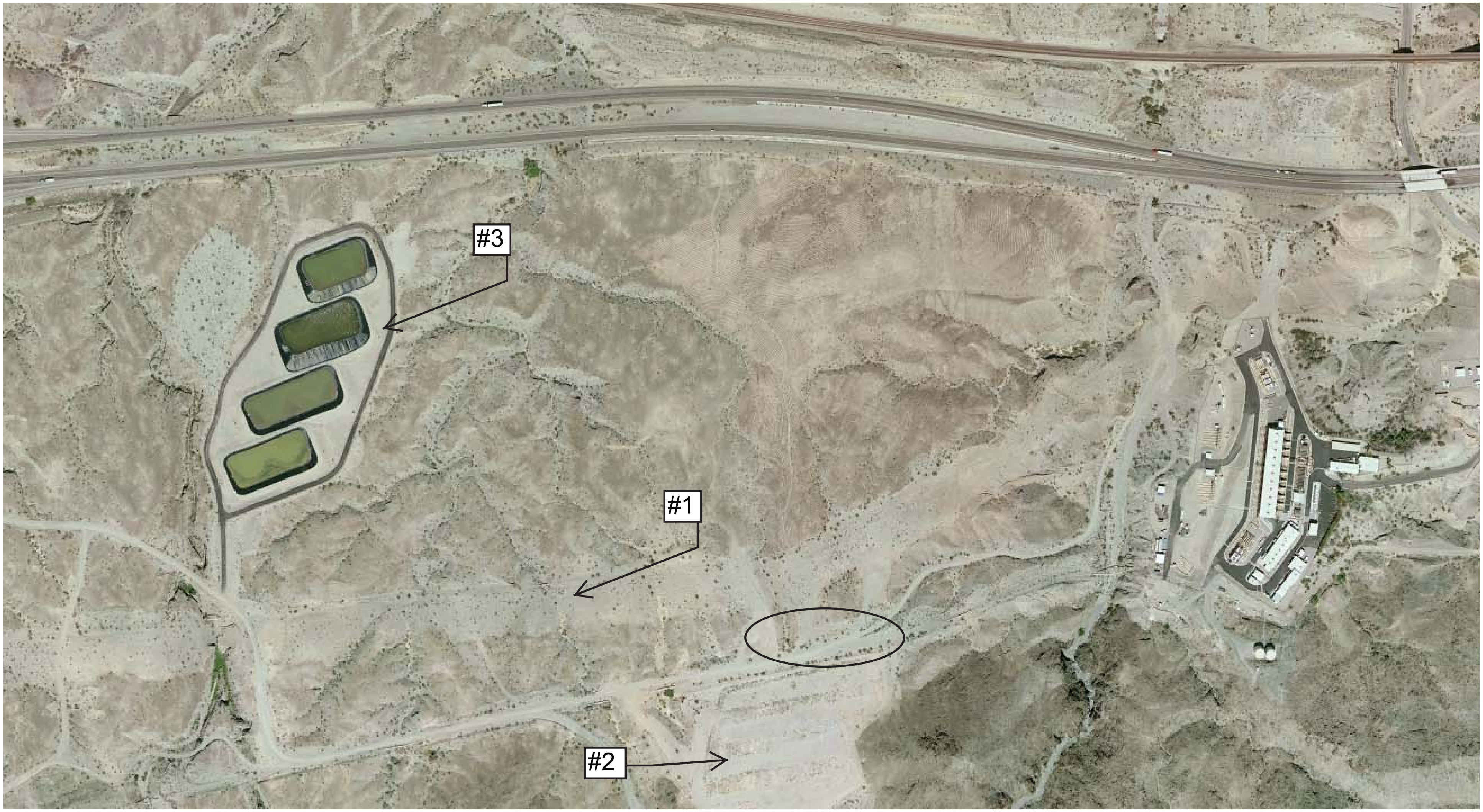
Source:

Pacific Gas and Electric Company

- Appropriate location of Undesignated Area 1

FIGURE C8-17
1997
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL



Source:

Unknown

Appropriate Location of Undesignated Area (UA1)

FIGURE C8-18
2004
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

Subappendix C9
Undesignated Area 2 Data Gaps Evaluation Results

Contents

Figures

Acronyms and Abbreviations

bgs	below ground surface
BTV	background threshold value
CHHSL	California human health screening level
CMS/FS	corrective measures study/feasibility study
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
ECV	ecological comparison value
EPC	exposure point concentration
mg/kg	milligrams per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
STLC	soluble threshold limit concentration
SVOC	semivolatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons
TTLC	total threshold limit concentration
UA	Undesignated Area
VOC	volatile organic compound

APPENDIX C9

Unidentified Area 2 Data Gaps Evaluation Results

1.0 Introduction and Background

This sub-appendix presents the results of the Data Gaps Evaluation for Undesignated Area (UA) 2 – Former 300B Pipeline Liquids Tank Area at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. The process for the data gaps evaluation is outlined in Sections 2.0 through 6.0 of the Part A Phase 1 Data Gaps Evaluation Report.

1.1 Background

PG&E's 300B pipeline was formerly equipped with a 900-gallon-capacity aboveground drip tank. The 300B Pipeline Liquids Tank was formerly used to collect pipeline liquids from the 300B natural gas pipeline. The drip tank was located southeast of the plant on a shelf in the hill next to a section of old Route 66, as shown in Figure C9-1. (All tables and figures appear at the end of this sub-appendix.) The tank was 2 feet, 10 inches in diameter and 20 feet long. It was an aboveground tank located on two concrete saddle supports. The tank pad was unpaved (CH2M HILL, 2006). In 1994, oil-stained soil was observed underneath and immediately adjacent to a portion of the tank, and an initial site investigation was performed on December 2, 1994. Samples were analyzed for total petroleum hydrocarbons in the motor-oil range (TPH-motor-oil). Low levels of TPH-motor-oil were detected at 1.2 and 2 feet below ground surface (bgs) (CH2M HILL, 2006). The tank was subsequently removed in 1995. One surface soil sample was collected on April 16, 1996 to characterize the stained soil for future disposal. The soil sample was analyzed for total recoverable petroleum hydrocarbons (TRPH), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and California Assessment Method 17 metals. TRPH was detected at an elevated concentration. Metals, VOCs, SVOCs, and PCBs were sampled at a location coincident with the highest level of TRPH, and analytical results indicated no elevated concentrations of these constituents; therefore, TRPH was considered the only constituent of concern.

A closure plan was submitted in May 1996 to remove the TRPH-impacted soil (Trident, 1996a). The cleanup was implemented and soil excavation was conducted between July 18, 1996 and September 26, 1996. Four rounds of excavation were performed, with a total excavation depth of 5.5 feet bgs. Confirmation samples were collected after each round of excavation. The cleanup target was 1,000 milligrams per kilogram (mg/kg) TRPH. Samples collected during the last two sampling events indicated that the soil remaining in place below and adjacent to the excavation contained TRPH at concentrations ranging from less than analytical detection limits to 150 mg/kg. The soil excavation and sampling results are documented in the Closure Certification Report (Trident, 1996b).

The County of San Bernardino, County Fire Department, Hazardous Materials Management Division issued a closure letter on June 9, 1997 confirming the completion of the site investigation and remedial action for the contaminated soil at this site.

The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) requested additional sampling at this site. The area of potential contamination is small (20 feet by 40 feet). Based on DTSC's request, the Soil Part A Work Plan recommended further characterization at UA 2 (CH2M HILL, 2006).

A graphical conceptual site model has been developed for UA 2 based on the above site history and background and is shown in Figure C9-1. Table C9-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for UA 2. A detailed discussion of the migration pathways, exposure media, exposure routes, and human and ecological receptors is included in the Soil Part A Data Quality Objective Tech Memo, included as Appendix A to the Part A Phase 1 Data Gaps Evaluation Report.

The primary sources of contamination in UA 2 consisted of potential historic spills while filling or emptying the tank, and potentially historic leaks from the tank. Any constituents released would have been released in liquid form and released to surface soil. Surface soil is therefore the primary source medium. The majority of the affected soil has been removed, as documented by post-remediation confirmation sampling. Because the materials released in this area were pipeline liquids (i.e., primarily low-volatility hydrocarbons), they had limited migration potential; however, some contaminants could have infiltrated from surface soil into underlying shallow soil. Potential migration from subsurface soil to groundwater was identified as a potential secondary pathway. During extreme wet weather events, it is possible that some constituents may have been transported from the unit to the adjacent pipeline road in surface run-off. If released, VOCs in surface soils would be expected to have been degraded by heat and light and are likely no longer present.

Part A Phase 1 and historical soil samples were collected in the area in and around where the former aboveground storage tank had been located.

1.2 C9UA 2 Data

Historical sampling occurred at UA 2; however, the data are considered Category 3, which are not usable for site characterization or risk assessments. Historical sample location HDTP is shown on Figure 9-1. Historical sample location could not be located because previous reports do not provide a figure showing this location.

During the 2008 Part A Phase 1 Soil Investigation, 17 soil samples (from 0 to 0.5, 0.5 to 1, 2 to 3, and a few at 5 to 6 feet bgs) were collected from five sample locations (UA2-300B-1 through UA2-330B-5), as shown in Figure C9-2. Phase 1 soil samples collected in UA 2 were analyzed for Title 22 metals, hexavalent chromium, VOCs, SVOCs, polycyclic aromatic hydrocarbons (PAHs), TPH, pH, pesticides, and PCBs. Ten percent of the Phase 1 soil samples (two samples) were analyzed for the full inorganic and organic suites per the CERCLA Target Analyte List and Target Compound List (TAL/TCL). Soil results were validated, and the data quality evaluation is included in Appendix D to the Part A Phase 1 Data Gaps Evaluation Report.

All validated Phase 1 data are Category 1 and were used as inputs to the four data quality objectives decisions.

2.0 Decision 1 – Nature and Extent

This section describes the nature and extent of residual soil concentrations of chemicals of potential concern (COPCs) and chemicals of potential ecological concern (COPECs) at UA 2. Laboratory analytical results for Phase 1 soil samples at UA 2 are presented in Tables C9-2 through C9-7. Table C9-8 presents a statistical summary of soil analytical results for COPCs and COPECs that were either detected above the laboratory reporting limits or not detected but where the reporting limits for one more samples was greater than the interim screening value.

2.1 Summary of UA 2 Soil Data

Antimony, beryllium, cadmium, hexavalent chromium, mercury, selenium, silver, thallium, cyanide, TPH in the gasoline range (TPH-gasoline), pesticides, and PCBs were not detected in any soil samples collected in UA 2.

Table C9-8 lists the 28 constituents, including three calculated quantities (benzo(a)pyrene equivalents, total low molecular weight PAHs, and total high molecular weight PAHs) detected at UA 2. Seven of the detected constituents (aluminum, calcium, iron, magnesium, manganese, potassium, and sodium) were detected in the TAL/TCL samples.

Twenty-three of the 28 detected constituents (total chromium, cobalt, copper, molybdenum, nickel, vanadium, aluminum, calcium, iron, magnesium, potassium, sodium, 4-methylphenol, bis(2-ethylhexyl)phthalate, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, phenanthrene, total low molecular weight PAHs, total high molecular weight PAHs, benzo(a)pyrene equivalents, TPH in the diesel range [TPH-diesel], and TPH-motor-oil) were detected at concentrations below their respective interim screening levels. Five constituents (arsenic, barium, lead, manganese, and zinc) were detected one or more times at concentrations exceeding interim screening levels.

Arsenic and zinc were detected four or more times above their respective interim screening levels; the distribution of these constituents are shown in Figures C9-2 and C9-3.

2.2 Nature and Extent Evaluation

The following subsection discusses the nature and extent of detected COPCs and COPECs detected above interim screening levels at UA 2. As discussed in Section 3.2 of the Part A Phase 1 Data Gaps Evaluation Report, multiple factors were considered to assess whether the nature and extent of a specific constituent has been adequately delineated. Section 2.5 of this sub-appendix summarizes the constituents that may require further evaluation, and Section 6.0 of this sub-appendix provides the recommended follow-up sampling for the Part A Phase 2 soil investigation.

2.2.1 Arsenic

Arsenic was detected in 17 of 17 soil samples collected at UA 2. Detected concentrations of arsenic exceeded the interim screening level (11 mg/kg) (background threshold value

[BTV]) seven times (maximum concentration of 24 mg/kg at UA2-300B-1), as shown in Tables C9-2 and C9-8 and Figure C9-2. All seven of these detected concentrations of arsenic also exceeded the ecological comparison value (ECV) (11.4 mg/kg).

Although the site data set for arsenic appears to exceed background, the arsenic concentrations detected at UA 2 may represent a different background population from the sample population used to establish background comparison concentrations. UA 2 is located on bedrock, whereas the majority of the samples comprising the background data set were collected from alluvial material. The potential for the arsenic concentrations detected at this unit to represent background concentrations was evaluated statistically and visually via probability plots, see Section 2.4 of this sub-appendix for more information.

The lateral and vertical extents of arsenic concentrations exceeding the interim screening level have been defined to natural boundaries (i.e., dirt road to the north, bedrock at 5.5 feet bgs, bedrock outcropping to the east and south, and steep slope to the west).

2.2.2 Barium

Barium was detected in 17 of 17 soil samples collected from UA 2. Detected concentrations of barium exceeded the interim screening level (410 mg/kg) (background value/ECV) twice (at UA2-300B-2 [520 mg/kg at 0.5 to 1 feet bgs and UA2-300B-3 [890 mg/kg at 5 to 6 feet bgs]), as shown in Tables C9-2 and C9-8. None of the detected concentrations exceeded residential and commercial/industrial DTSC California human health screening levels (CHHSLs) (5,200 mg/kg and 63,000 mg/kg, respectively). These locations are located along the northwestern boundaries of this area.

The lateral and vertical extents of the barium concentrations exceeding the interim screening level have been defined to natural boundaries (i.e., dirt road to the north, bedrock at 5.5 feet bgs, bedrock outcropping to the east and south, and steep slope to the west).

2.2.3 Lead

Lead was detected in 17 of 17 soil samples collected at UA 2. Detected concentrations of lead exceeded the interim screening level (8.39 mg/kg) (background value/ECV) once (13 mg/kg at UA2-300B-5), as shown in Tables C9-2 and C9-8. The detected concentration did not exceed the residential or commercial/industrial CHHSLs (80 mg/kg and 320 mg/kg, respectively). This location is surrounded by locations that have concentrations below the screening level. At these locations, the deepest samples have concentrations below the screening levels.

The lateral and vertical extents of the lead concentrations exceeding the interim screening level have been defined.

2.2.4 Zinc

Zinc was detected in 17 of 17 soil samples collected at UA 2. Detected concentrations of zinc exceeded the interim screening level (58 mg/kg) (BTV/ECV) 10 times (maximum detected concentration of 65 mg/kg at UA2-300B-3 and UA2-300B-5), as shown in Tables C9-2 and C9-8 and Figure C9-3. None of the detected concentrations exceeded residential and commercial/industrial CHHSLs (23,000 mg/kg and 100,000 mg/kg, respectively).

The lateral and vertical extents of zinc concentrations exceeding the interim screening level have been defined to natural boundaries (i.e., dirt road to the north, bedrock at 5.5 feet bgs, bedrock outcropping to the east and south, and steep slope to the west).

2.2.5 Target Analyte List/Target Compound List Constituents

As described above, aluminum, calcium, iron, magnesium, manganese, potassium, and sodium were detected in the two UA 2 soil samples analyzed for the complete TAL/TCL suite of compounds. Manganese is the only TAL/TCL constituent that was detected at concentrations exceeding its interim screening level in soil samples collected from UA 2.

Aluminum was detected in both surface soil samples collected from UA 2. Aluminum was detected at 11,000 mg/kg at both locations UA2-300B-1 and UA2-300B-5; this concentration is below the interim screening level (16,400 mg/kg) (BTV) as shown in Tables C9-3 and C9-8. The detected concentration did not exceed the residential or commercial/industrial CHHSLs (77,000 mg/kg and 990,000 mg/kg, respectively). An ECV has not been established for aluminum.

Calcium was detected in both surface soil samples collected from UA 2. Detected concentrations of calcium (UA2-300B-1 [21,000 mg/kg] at 0 to 0.5 foot bgs and UA2-300B-5 [26,000 mg/kg] at 0 to 0.5 foot bgs) are below the interim screening level (66,500 mg/kg) (BTV), as shown in Tables C9-3 and C9-8. Residential and commercial/industrial CHHSLs and an ECV have not been established for calcium.

Iron was detected in both surface soil samples collected from UA 2. Detected concentrations of iron (UA2-300B-1 [20,000 mg/kg] at 0 to 0.5 foot bgs and UA2-300B-5 [27,000 mg/kg] at 0 to 0.5 foot bgs) are below the interim screening level (55,000 mg/kg) (residential regional screening level), as shown in Tables C9-3 and C9-8. A BTV and an ECV have not been established for iron.

Magnesium was detected in both surface soil samples collected from UA 2. Detected concentrations of magnesium (UA2-300B-1 [7,400 mg/kg] at 0 to 0.5 foot bgs and UA2-300B-5 [8,900 mg/kg] at 0 to 0.5 foot bgs) are below the interim screening level (12,100 mg/kg) (BTV), as shown in Tables C9-3 and C9-8. Residential and commercial/industrial CHHSLs and an ECV have not been established for magnesium.

Manganese was detected in both surface samples collected from UA 2. Detected concentrations of manganese exceeded the interim screening level (402 mg/kg) (BTV/ECV) twice (UA2-300B-1 [670 mg/kg at 0 to 0.5 foot bgs] and UA2-300B-5 [840 mg/kg at 0 to 0.5 foot bgs), as shown in Tables C9-3 and C9-8. Neither of the detected concentrations exceeded residential and commercial/industrial CHHSLs (1,800 mg/kg and 23,000 mg/kg, respectively).

Potassium was detected in both surface soil samples collected from UA 2. Detected concentrations of potassium (UA2-300B-1 [2,900 mg/kg] at 0 to 0.5 foot bgs and UA2-300B-5 [2,400 mg/kg] at 0 to 0.5 foot bgs) are below the interim screening level (4,400 mg/kg) (BTV), as shown in Tables C9-3 and C9-8. Residential and commercial CHHSLs and an ECV have not been established for potassium.

Sodium was detected in both surface soil samples collected from UA 2. Detected concentrations of sodium (UA2-300B-1 [230 mg/kg] at 0 to 0.5 foot bgs and UA2-300B-5

[210 mg/kg] at 0 to 0.5 foot bgs) are below the interim screening level of 2,070 mg/kg (BTV), as shown in Tables C9-3 and C9-8. Residential and commercial/industrial CHHSLs, regional screening levels, and an ECV have not been established for sodium.

As discussed in Section C.2 of the main text of Appendix C, PG&E recommends that none of the inorganic compounds discussed above (aluminum, calcium, iron, magnesium, manganese, potassium, and sodium) be considered a COPC/COPEC for this area, and no further sampling is recommended for these constituents. These constituents have been fully discussed in Section C.2 of Appendix C.

2.3 Central Tendency Comparison to Background Values

Five metals (arsenic, barium, lead, manganese, and zinc) were detected above their respective background values in soil samples collected from UA 2. A central tendency comparison was performed for four of the five metals (arsenic, barium, lead, and zinc) to compare the UA 2 soil data set for these metals with the corresponding Topock soil background data set to determine whether a difference exists between the two populations and whether additional sampling is required for a given metal, as shown in Table C9-9 and Figure 3-1 of the Part A Phase 1 Data Gaps Evaluation Report.

Metals in either the UA 2 data set or background data set that were detected infrequently (less than five detects) or had a limited number of results (less than eight) were not tested. There were insufficient detections of manganese at UA 2 to conduct the test.

Results from the Gehan test indicated that site concentrations for arsenic, barium, lead, and zinc may exceed background, as shown in Table C9-9. The lateral and vertical extents of arsenic, barium, lead, and zinc have been adequately defined, as discussed above. Physical limitations (i.e., bedrock, bedrock outcroppings, and roads) prevent further samples at UA 2 for arsenic. Barium was detected in two soil samples at concentrations exceeding the BTV (410 mg/kg). Lead was detected in one soil sample at a concentration exceeding the BTV (8.39 mg/kg). Zinc was detected in ten soil samples at concentrations exceeding the BTV (58 mg/kg); however, the maximum detected concentration (65 mg/kg) only exceeds the BTV slightly.

After careful review of UA 2 site data and background data set for arsenic, barium, lead, and zinc, the difference between the two populations and concentrations detected is not considered substantial enough to warrant additional sampling at UA 2, especially in consideration of the physical limitations and characteristics of the site. Further evaluation of the arsenic data is provided in Section 2.4, below.

2.4 Arsenic Concentrations Background Assessment

Although the site data set for arsenic appears to exceed background, the arsenic concentrations detected at UA 2 may represent a different background population from the sample population used to establish background comparison concentrations. UA 2 is located on bedrock, whereas the majority of the samples comprising the background data set were collected from alluvial material. The potential for the arsenic concentrations detected at this unit to represent background concentrations was evaluated statistically and visually via probability plots. The distribution of detected arsenic concentrations at UA 2 is consistent with a single population or background data set.

As discussed in Section 2.2.1, arsenic was detected in all 17 samples collected from UA 2, and seven of the detected concentrations exceed the BTV developed for Topock. A probability plot was constructed for the arsenic data from UA 2 to evaluate the distribution of the data. Probability plots provide a visual tool for identifying possible inflections or breakpoints in the data set. They graph actual concentrations against theoretical quantiles of the potential true distribution of the data. Inflections or breakpoints may serve as evidence that multiple populations appear in the data, which could be consistent with the presence of some site-impacted concentrations along with some un-impacted (potential background) concentrations. The distribution of arsenic concentrations for UA 2 is a relatively smooth curve consistent with a true normal distribution of the data, as shown in Figure C9-4.[1] There are no breakpoints or inflections suggestive of two separate populations of arsenic concentrations (i.e., a background concentrations and an elevated site-related concentration).

One needs to temper expectations of how straight the line for a normal distribution will be with typical sample sizes. Relatively small jumps or steps in the data set are often a part of random variability. One should also be careful not to associate the natural horizontal widening of points in the lower and upper tails of the data distribution with the determination of a breakpoint or the identification of outliers. This can be seen in the 12 randomly-generated example plots using data generated from a true normal 100-point distribution with sample size of 17, as shown in Figure C9-4. As can be seen from comparing the 12 example plots with the UA 2 data presented in Figure C9-5, the randomly-generated true normal distributions are similar in appearance to the plot of the site data. While the above analysis does not conclusively demonstrate that the detected concentrations of arsenic are, in fact, representative of a site-specific background, it does indicate that the interpretation that these concentrations represent site background concentrations is consistent with the distribution of the data.

2.5 Nature and Extent Conclusions

Based on the site history, background, and conceptual site model, qualitative review indicates that decision error has been held to an acceptable level. Sufficient data of acceptable quality have been attained through collection of historical and Part A soil samples in areas most likely to have been impacted by the former aboveground storage tank.

Based on the review of the data for UA 2, the nature and extent of all detected COPCs and COPECs have been defined, and no follow-up sampling is recommended for Phase 2.

3.0 Decision 2 – Data Sufficient to Estimate Representative Exposure Point Concentrations

For Decision 2, data were evaluated to determine if the UA2-300B data are sufficient to conduct human health and ecological risk assessments based on the criteria described in Section 4.0 of the Part A Phase 1 Data Gaps Evaluation Report. The principal consideration

[1] Often, the chosen distribution is the normal distribution even though it is not a certainty that the true distribution is either normal or any other given distribution. Other distributions can be considered.

for Decision 2 was whether there were sufficient data to estimate a representative exposure point concentration (EPC). Data reviewed were validated Phase 1 data.

Table C9-10 summarizes the results of the evaluation to determine whether data are sufficient to estimate a representative EPC. Data were reviewed for all chemicals that were detected in at least one sample and exceeded at least one comparison value. In general, existing data are adequate to support EPC development for detected chemicals that exceeded one or more comparison values (arsenic, barium, lead, zinc, and manganese).

In the shallowest exposure interval (0.0 to 0.5 foot bgs), there were five samples and five detected concentrations for metals. While this is insufficient to calculate an EPC using ProUCL, the maximum concentration is low (i.e., does not exceed two times the lowest comparison value). Therefore, using the maximum result as the EPC is not expected to significantly impact the results of the risk assessment. Further, as previously described in Sections 2.2.1 and 2.3, although arsenic was detected above the BTV (11 mg/kg), a separate statistical evaluation was conducted, examining the distribution of arsenic specific to the UA2-300B area, which supports that the arsenic detected in this area is reflective of background conditions. Accordingly, additional samples for arsenic in the 0- to 0.5-foot interval will not affect the results of the risk assessment.

For manganese, there are only two samples, and the maximum value is slightly greater than two times the BTV, which is the applicable comparison value. (The ECV [220 mg/kg] is less than the BTV.) Using the maximum detected concentration of 840 mg/kg as the EPC rather than collecting additional samples to increase the data set is not expected to significantly change the outcome of the ecological risk assessment. This is because the additional sampling is not expected to provide very different results; there is no known source of manganese at UA 2. There is no information to indicate that manganese was associated with the operation of the 300B pipeline or aboveground drip tank.

4.0 Decision 3 – Potential Threat to Groundwater from Residual Soil Concentrations

The following preliminary analysis was performed with the existing data set to assess the potential threat to groundwater and to assess if additional data, above and beyond that necessary for Decision 1, are needed to resolve Decision 3. Additional evaluation will be performed as appropriate, as data are collected to resolve Decision 1. Data collected to satisfy Decision 1 – Nature and Extent evaluation will provide the final representative data set that will be used to assess the threat to groundwater. The preliminary conclusions regarding the threat to groundwater are based on available data and will be revisited after the implementation of the soil investigation. The combined data set will then be evaluated for data gaps, and further conclusions regarding the threat to groundwater will be provided to the agencies and stakeholders for review prior to submittal of the RFI/RI Volume 3.

Table C9-11 presents the results of the tiered screening analysis for UA 2. Four metals had concentrations in excess of their respective BTVs. None of these metals exceeded the calculated soil screening level, as shown in Table C9-12; therefore, numerical modeling was not required for UA 2, and a current or potential threat to groundwater has been ruled out.

5.0 Decision 4 – Data Sufficiency to Support the Corrective Measures Study/Feasibility Study

As discussed in Section 6.0 of the Part A Phase 1 Data Gaps Evaluation Report, various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study (CMS/FS). The types of data needed vary somewhat depending on the specific technology to be evaluated. The categories of data required for technologies that may be applicable to the areas outside the fence line include:

- Extent of COPCs and COPECs above action levels (required for all technologies).
- Waste characterization parameters (required if soil may be disposed of offsite).
- Constituent leachability (required to assess the need for fixation of leachable compounds and/or the feasibility of certain soil washing technologies).
- Soil physical properties (required for all technologies; however, the properties required vary among the different technologies).
- Surface and subsurface features (required to determine whether there are physical impediments to implementing specific technologies and/or remediating specific areas).
- If present, volumes of white powder and debris.

The following is a summary of data for UA 2 that are currently available to support CMS/FS.

5.1 Extent of COPCs and COPECs

A summary of the nature and extent of detected COPCs/COPECs is presented in Section 2.0 Decision 1 – Nature and Extent. The lateral and vertical extent of the COPCs and COPECs is discussed in Section 2.2 above. Data results for selected constituents are shown in Figures C9-2 and C9-3, and data gaps associated with lateral and vertical delineation are discussed in Section 6.0 of the Part A Phase 1 Data Gaps Evaluation Report.

5.2 Waste Characterization Parameters

Only partial waste characterization data are available to characterize the soil and other materials to be potentially removed for remedial action and disposed in an offsite permitted facility. While none of the soils or other materials is considered ignitable, corrosive, or reactive, data are lacking to complete the evaluation of the toxicity characteristic. Total chemical concentrations are available to characterize the soil, certain debris, and white powder material relative to California Title 22 total threshold limit concentrations (TTLCs). The maximum concentrations of these metals for each of the units were compared to the TTLCs, and none of the metal concentrations exceeded the TTLCs, as shown in Table C9-13. The maximum detected concentrations were also compared to the soluble threshold limit concentrations (STLCs), and none of the metal concentrations in UA 2 exceeded 10 times STLC, as shown in Table C9-13. In addition, none of the concentrations exceeded 20 times TCLP, as shown in Table C9-13. Because none of the metals concentrations has the potential to exceed STLC or TCLP thresholds, additional leachability testing is not required if soil excavation and offsite disposal is chosen as a remedy.

5.3 Soil Physical Properties

Soil physical property data collected during the Part A Phase 1 soil investigation were limited to grain size analysis only. Specific soil physical properties data (i.e., porosity, grain size, density, organic carbon content) are required to support the CMS/FS, as described in Table 6-1 in the Part A Phase 1 Data Gaps Evaluation Report. Additional soil physical parameter data are needed to support the CMS/FS.

5.4 Surface and Subsurface Features.

While there is extensive information regarding surface and subsurface features at UA 2, additional information may be required once areas requiring remediation have been defined. Nearby roads and road structures, vegetation, and the location of bedrock are known for UA 2. However, subsurface utilities, including gas transmission pipelines and any other features, may have to be more precisely defined to evaluate the feasibility and cost of certain remedial alternatives and to prepare construction specifications.

6.0 Summary of Data Gaps and Potential Phase 2 Soil Sample Locations to Fill Identified Gaps

Based on the review of the data for UA 2, the nature and extent of all detected COPCs and COPECs has been defined, and no further sampling is required to address data quality objective Decisions 2 and 3. Data regarding soil physical properties will be collected at units where additional samples are required to address data gaps for Decisions 1, 2, and/or 3. The remaining data required to address Decision 4 data gaps will be collected following the completion of the risk assessment. No additional sampling is recommended in the Part A Phase 2 Soil Investigation.

7.0 References

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1.

_________. 2008. *Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil.* May 28.

California Regional Water Quality Control Board (Water Board). 2008 *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*. May 27.

CH2M HILL. 2006. *RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan, Part A, PG&E Topock Compressor Station, Needles, California*. November 16.

___________. 2009. *Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California.* May.

United States Environmental Protection Agency. 2009. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* December. Available online at: http://www.epa.gov/region09/superfund/prg/pdf/composite_sl_table_run_APRIL2009.pdf. September 12.

Trident. 1996a. *Former Pipeline Liquid Closure Plan PG&E Topock Compressor Station, Needles, California.* May 7.

__________. 1996b. *Former Pipeline Liquid oil Tank Closure Certification Report PG&E Topock Compressor Station, Needles, California.* October 10.

Tables

TABLE C9-1
Conceptual Site Model – UA 2
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report, PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Incidental leaks or spills from former aboveground storage tank	Surface Soil	Percolation and/or infiltration	Surface Soil	Wind erosion and atmospheric dispersion of surface soil
			Subsurface Soil	Potential volatilization and atmospheric dispersion/enclosed space accumulation
			Potential Groundwater	Potential extracted groundwater[a]

[a] Quantitative evaluation of the groundwater pathway completed in the groundwater risk assessment (ARCADIS, 2009); Part A Phase 1 data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

TABLE C9-2

Sample Results: Metals
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				**0.285**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**0.0125**	**1.37**	**27.3**	**1.47**	**5.15**	**2.32**	**52.2**	**58**
Residential Regional Screening Levels [2]:				**31**	**0.062**	**15,000**	**160**	**70**	**0.29**	**280**	**23**	**3,100**	**150**	**10**	**390**	**1,500**	**390**	**390**	**5.1**	**390**	**23,000**
Residential DTSC CHHSL [3]:				**30**	**0.07**	**5,200**	**16**	**39**	**17**	**NE**	**660**	**3,000**	**80**	**18**	**380**	**1,600**	**380**	**380**	**5**	**530**	**23,000**
Ecological Comparison Values [4]:				**0.285**	**11.4**	**330**	**23.3**	**0.0151**	**139.6**	**36.3**	**13**	**20.6**	**0.0166**	**0.0125**	**2.25**	**0.607**	**0.177**	**5.15**	**2.32**	**13.9**	**0.164**
Background [5]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
UA2-300B-1	09/23/08	0 - 0.5	N	ND (2) *	14	290	ND (1) *	ND (1)	ND (0.42)	25	7.7	13	7.9	ND (0.1) *	ND (1)	16	ND (1)	ND (1)	ND (2)	28	54
	09/23/08	0.5 - 1	N	ND (2) *	24	280	ND (2) *	ND (1)	ND (0.423)	28	9.1	14	5.8	ND (0.1) *	ND (2) *	19	ND (1)	ND (2)	ND (4) *	31	61
	10/23/08	2.5 - 3	N	ND (2) *	16	300	ND (2) *	ND (1)	ND (0.401)	25	8.8	13	5.6	ND (0.1) *	ND (2) *	18	ND (1)	ND (2)	ND (4) *	29	59
	10/23/08	5.5 - 6	N	ND (2) *	12	150	ND (1) *	ND (1)	ND (0.401)	17	6.7	10	3.2	ND (0.099) *	1.1	13	ND (1)	ND (1)	ND (2)	22	48
UA2-300B-2	10/03/08	0 - 0.5	N	ND (2) *	8	220	ND (1) *	ND (1)	ND (0.404)	17	7	11	6.6	ND (0.1) *	ND (1)	13	ND (1)	ND (1)	ND (2)	27	46
	10/03/08	0.5 - 1	N	ND (2) *	15	520	ND (2) *	ND (1)	ND (0.42)	33	10	15	4.3	ND (0.1) *	ND (2) *	22	ND (1)	ND (2)	ND (4) *	35	62
	10/03/08	2 - 3	N	ND (2) *	11	310	ND (2) *	ND (1)	ND (0.408)	34	11	11	3.4	ND (0.1) *	ND (2) *	23	ND (1)	ND (2)	ND (4) *	36	63
UA2-300B-3	10/03/08	0 - 0.5	N	ND (2) *	9.8	250	ND (2) *	ND (1)	ND (0.403)	21	7.9	11	5.3	ND (0.1) *	ND (2) *	16	ND (1)	ND (2)	ND (4) *	33	52
	10/03/08	0.5 - 1	N	ND (2) *	10	220	ND (2) *	ND (1)	ND (0.409)	26	10	13	6.3	ND (0.099) *	ND (2) *	19	ND (1)	ND (2)	ND (4) *	37	60
	10/03/08	0.5 - 1	FD	ND (2) *	10	220	ND (2) *	ND (1)	ND (0.407)	26	9.5	12	4.5	ND (0.1) *	ND (2) *	19	ND (1)	ND (2)	ND (4.1) *	35	58
	10/03/08	2 - 3	N	ND (2) *	12	180	ND (2) *	ND (1)	ND (0.409)	25	9.9	13	4	ND (0.1) *	ND (2) *	20	ND (1)	ND (2)	ND (4.1) *	34	65
	10/03/08	5 - 6	N	ND (2) *	14	890	ND (2) *	ND (1)	ND (0.409)	32	10	9.4	3.6	ND (0.1) *	ND (2) *	22	ND (1)	ND (2)	ND (4.1) *	37	58
UA2-300B-4	10/03/08	0 - 0.5	N	ND (2) *	9.1	230	ND (2) *	ND (1)	ND (0.405)	22	8.4	11	4.4	ND (0.1) *	ND (2) *	17	ND (1)	ND (2)	ND (4) *	33	53
	10/03/08	0.5 - 1	N	ND (2) *	11	190	ND (1) *	ND (1)	ND (0.408)	20	7.4	11	3.4	ND (0.1) *	ND (1)	14	ND (1)	ND (1)	ND (2)	27	47
	10/03/08	2 - 3	N	ND (2) *	11	220	ND (2) *	ND (1)	ND (0.409)	28	11	15	3.4	ND (0.1) *	ND (2) *	21	ND (1)	ND (2)	ND (4.1) *	38	64
UA2-300B-5	10/03/08	0 - 0.5	N	ND (2) J*	8.4	290 J	ND (1) *	ND (1)	ND (0.405)	22	7	11	13	ND (0.1) *	ND (1)	15	ND (1)	ND (1)	ND (2)	27	62
	10/03/08	0.5 - 1	N	ND (2) *	10	390	ND (2) *	ND (1)	ND (0.41)	33	11	11	3.9	ND (0.1) *	ND (2) *	24	ND (1)	ND (2)	ND (4.1) *	36	65
	10/03/08	2 - 3	N	ND (2) *	9.4	360	ND (2) *	ND (1)	ND (0.411)	35	11	12	3.4	ND (0.1) *	ND (2) *	25	ND (1)	ND (2)	ND (4.1) *	37	62
TODT-1	04/16/96	0 - 4	N	ND (5) *	5.5	224	ND (0.5)	0.86	---	20	7.5	12	8.8	ND (0.2) *	ND (2.5) *	14	ND (0.5)	ND (1)	ND (5) *	37	53

1 Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.
2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.
3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.
4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.
5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C9-3

Sample Results: Contract Laboratory Program Inorganics
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Contract Laboratory Program (CLP) Inorganics (mg/kg)							
Interim Screening Level[1] :				**16,400**	**66,500**	**55,000**	**12,100**	**402**	**4,400**	**2,070**	**0.9**
Residential Regional Screening Levels[2] :				**77,000**	**NE**	**55,000**	**NE**	**1,800**	**NE**	**NE**	**1,600**
Residential DTSC CHHSL[3] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**220**	**NE**	**NE**	**0.9**
Background[5] :				**16,400**	**66,500**	**NE**	**12,100**	**402**	**4,400**	**2,070**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aluminum**	**Calcium**	**Iron**	**Magnesium**	**Manganese**	**Potassium**	**Sodium**	**Cyanide**
UA2-300B-1	09/23/08	0 - 0.5	N	11,000	21,000	20,000	7,400	670	2,900	230	ND (1.05) *
UA2-300B-5	10/03/08	0 - 0.5	N	11,000	26,000	27,000	8,900	840	2,400	210	ND (1.01) *

1 Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil" November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil". May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C9-4

Sample Results: Polycyclic Aromatic Hydrocarbons
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level[1] :				**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**38**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**10,000**	**1,160**	**38**
Residential Regional Screening Levels[2] :				**22,000**	**310,000**	**1,700,000**	**3,400,000**	**17,000,000**	**380**	**15**	**380**	**1,700,000**	**380**	**3,800**	**110**	**2,300,000**	**2,300,000**	**380**	**3,600**	**1,700,000**	**1,700,000**	**NE**	**NE**	**15**
Residential DTSC CHHSL[3] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**38**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**10,000**	**1,160**	**NE**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1-Methyl naphthalene**	**2-Methyl naphthalene**	**Acena phthylene**	**Acenaphthene**	**Anthracene**	**Benzo (a) anthracene**	**Benzo (a) pyrene**	**Benzo (b) fluoranthene**	**Benzo (ghi) perylene**	**Benzo (k) fluoranthene**	**Chrysene**	**Dibenzo (a,h) anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**PAH Low molecular weight**	**PAH High molecular weight**	**B(a)P Equivalent**
UA2-300B-1	09/23/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	09/23/08	0.5 - 1	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/23/08	2.5 - 3	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	6.5	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	11	ND (5)	11	6.5	4.4
	10/23/08	5.5 - 6	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.3	6.2	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	12	4.7
UA2-300B-2	10/03/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/03/08	0.5 - 1	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/03/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
UA2-300B-3	10/03/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/03/08	0.5 - 1	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/03/08	0.5 - 1	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/03/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/03/08	5 - 6	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
UA2-300B-4	10/03/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/03/08	0.5 - 1	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/03/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
UA2-300B-5	10/03/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND	ND	ND (4.4)
	10/03/08	0.5 - 1	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	10/03/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)

1 Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C9-5

Sample Results: VOCs, SVOCs and TPHs
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				SVOCs (µg/kg)		Total Petroleum Hydrocarbons (mg/kg)		
			Interim Screening Level[1] :	500	2,870	540	540	1,800
			Residential Regional Screening Levels[2] :	310,000	35,000	NE	NE	NE
			Residential DTSC CHHSL[3] :	NE	NE	NE	NE	NE
			RWQCB Environmental Screening Levels[4] :	NE	NE	540	540	1,800
			Ecological Comparison Values[5] :	500	2,870	NE	NE	NE
			Background[6] :	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**4-Methylphenol**	**Bis (2-ethylhexyl) phthalate**	**TPH as gasoline**	**TPH as diesel**	**TPH as motor oil**
UA2-300B-1	09/23/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	32.1
	09/23/08	0.5 - 1	N	ND (330)	ND (330)	---	ND (10)	33.6
	10/23/08	2.5 - 3	N	460	1,300	ND (1.4)	140	902
	10/23/08	5.5 - 6	N	ND (330)	ND (330)	ND (1.1)	ND (10)	60.4
UA2-300B-2	10/03/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	15.1 J
	10/03/08	0.5 - 1	N	ND (330)	ND (330)	---	ND (10)	12.2 J
	10/03/08	2 - 3	N	ND (330)	ND (330)	ND (1.4)	ND (10)	13 J
UA2-300B-3	10/03/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	ND (10)
	10/03/08	0.5 - 1	N	ND (330)	ND (330)	---	ND (10)	ND (10)
	10/03/08	0.5 - 1	FD	ND (330)	ND (330)	---	ND (10)	ND (10)
	10/03/08	2 - 3	N	ND (330)	ND (330)	ND (1.6)	ND (10)	ND (10)
	10/03/08	5 - 6	N	ND (330)	ND (330)	ND (1.6)	ND (10) J	ND (10) J
UA2-300B-4	10/03/08	0 - 0.5	N	ND (330)	ND (330)	---	ND (10)	ND (10)
	10/03/08	0.5 - 1	N	ND (330)	ND (330)	---	ND (10)	ND (10)
	10/03/08	2 - 3	N	ND (330)	ND (330)	ND (0.75)	ND (10)	ND (10)
UA2-300B-5	10/03/08	0 - 0.5	N	ND (330)	ND (330)	---	10.5	59.9 J
	10/03/08	0.5 - 1	N	ND (330)	ND (330)	---	ND (10)	29.7 J
	10/03/08	2 - 3	N	ND (340)	ND (340)	ND (1.7)	ND (10)	11.2 J

TABLE C9-5

Sample Results: VOCs, SVOCs and TPHs
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

---

[1] For SVOCs, interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used. For TPHs, interim screening level is the Regional Water Quality Control Board environmental screening level.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites". http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, November 2004 (January 2005 Revision)". January.

[4] Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

[5] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil. May 28 and ARCADIS. 2009. Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil". July 1.

[6] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than the interim screening level are circled.

Only detected VOCs and SVOCs are presented.

SVOCs	semivolatile organic compounds
TPH	total petroleum hydrocarbon
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water Board	Regional Water Quality Control Board
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C9-6

Sample Results: Pesticides
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Pesticides (µg/kg)																				
Residential DTSC CHHSL [1]:				2,300	1,600	1,600	33	NE	430	NE	NE	35	NE	NE	NE	21,000	21,000	21,000	500	430	130	NE	340,000	460
Residential Regional Screening Levels [2]:				2,000	1,400	1,700	29	77	1,600	270	77	30	370,000	370,000	370,000	18,000	18,000	18,000	520	1,600	110	53	310,000	440
Ecological Comparison Values [3]:				2.1	2.1	2.1	NE	NE	470	NE	NE	5	NE	NE	NE	NE	NE	NE	NE	470	NE	NE	NE	NE
Background [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	4,4-DDD	4,4-DDE	4,4-DDT	Aldrin	alpha-BHC	alpha-Chlordane	beta-BHC	delta-BHC	Dieldrin	Endo sulfan I	Endo sulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxy chlor	Toxaphene
UA2-300B-1	09/23/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)
UA2-300B-5	10/03/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)

1 California EPA, Office of Environmental Health Hazard Assessment. 2005. Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, November 2004 (January 2005 Revision). January.

2 US EPA. 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. http://epaprgs.ornl.govchemicals/index.shtml. September 12.

3 ARCADIS. 2008. Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil. May 28.

4 CH2M HILL. 2008. Draft Soil Background Investigation Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California. December.

Results greater than or equal to the Residential DTSC CHHSL or the Residential Regional Screening Level (if Residential DTSC CHHSL were not established) are circled.

EPA Environmental Protection Agency
DTSC California Department of Toxic Substances Control
CHHSL California Human Health Screening Levels
NE not estabilished
µg/kg micrograms per kilogram
ft bgs feet below ground surface
N primary sample
FD field duplicate
--- not analyzed
ND not detected at the listed reporting limit
J concentration or reporting limit estimated by laboratory or data validation

TABLE C9-7

Sample Results: Polychlorinated Biphenyls
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polychlorinated biphenyls (µg/kg)									
Interim Screening Level[1] :				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**204**
Residential Regional Screening Levels[2] :				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**NE**
Residential DTSC CHHSL[3] :				**89**	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**NE**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**204**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**	**Total PCBs**
UA2-300B-1	09/23/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	09/23/08	0.5 - 1	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/23/08	2.5 - 3	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/23/08	5.5 - 6	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
UA2-300B-2	10/03/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	0.5 - 1	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	2 - 3	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
UA2-300B-3	10/03/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	0.5 - 1	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	0.5 - 1	FD	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	2 - 3	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	5 - 6	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
UA2-300B-4	10/03/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	0.5 - 1	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	2 - 3	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
UA2-300B-5	10/03/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	0.5 - 1	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/03/08	2 - 3	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND

[1] Interim screening level is the USEPA residential regional screening level.

[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

[4] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Dectected Chemicals in Soil." July 1.

[5] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C9-8

Constituent Concentrations in Soil Compared to Screening Values
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Background Threshold Value (BTV) [1]		Ecological Comparison Value (ECV) [2]		Residential Screening Level (Res SL) [3]		RWQCB Environmental Screening Levels (ESL) [4]		Commercial Screening Level (Com SL) [5]		Interim Screening Level (Int SL) [6]	
Parameter	**Units**	**Frequency of detection**	**Maximum Detected Value**	**# of Exceedences** [7]	**(BTV)**	**# of Exceedences** [8]	**(ECV)**	**# of Exceedences** [8]	**(Res SL)**	**# of Exceedences** [8]	**(ESL)**	**# of Exceedences** [8]	**(Com SL)**	**# of Exceedences** [8]	**(Int SL)**
Metals															
Antimony	mg/kg	0 / 17 (0%)	ND (2) ‡	NA	(NE)	0	(0.285)	0	(30)	NA	(NE)	0	(380)	0	(0.285)
Arsenic	mg/kg	17 / 17 (100%)	24	7	(11)	7	(11.4)	7	(0.07) *	NA	(NE)	7	(0.24) *	7	(11)
Barium	mg/kg	17 / 17 (100%)	890	2	(410)	2	(330) *	0	(5,200)	NA	(NE)	0	(63,000)	2	(410)
Beryllium	mg/kg	0 / 17 (0%)	ND (2) ‡	0	(0.672)	0	(23.3)	0	(16)	NA	(NE)	0	(190)	0	(0.672)
Chromium	mg/kg	17 / 17 (100%)	35	0	(39.8)	0	(36.3) *	0	(280)	NA	(NE)	0	(1,400)	0	(39.8)
Cobalt	mg/kg	17 / 17 (100%)	11	0	(12.7)	0	(13)	0	(23)	NA	(NE)	0	(300)	0	(12.7)
Copper	mg/kg	17 / 17 (100%)	15	0	(16.8)	0	(20.6)	0	(3,000)	NA	(NE)	0	(38,000)	0	(16.8)
Lead	mg/kg	17 / 17 (100%)	13	1	(8.39)	1	(0.0166) *	0	(80)	NA	(NE)	0	(320)	1	(8.39)
Mercury	mg/kg	0 / 17 (0%)	ND (0.1) ‡	NA	(NE)	0	(0.0125)	0	(18)	NA	(NE)	0	(180)	0	(0.0125)
Molybdenum	mg/kg	1 / 17 (5.9%)	1.1	0	(1.37)	0	(2.25)	0	(380)	NA	(NE)	0	(4,800)	0	(1.37)
Nickel	mg/kg	17 / 17 (100%)	25	0	(27.3)	0	(0.607) *	0	(1,600)	NA	(NE)	0	(16,000)	0	(27.3)
Thallium	mg/kg	0 / 17 (0%)	ND (4.1) ‡	NA	(NE)	0	(2.32)	0	(5)	NA	(NE)	0	(63)	0	(2.32)
Vanadium	mg/kg	17 / 17 (100%)	38	0	(52.2)	0	(13.9) *	0	(390)	NA	(NE)	0	(5,200)	0	(52.2)
Zinc	mg/kg	17 / 17 (100%)	65	10	(58)	10	(0.164) *	0	(23,000)	NA	(NE)	0	(100,000)	10	(58)
Contract Laboratory Program Inorganics															
Aluminum	mg/kg	2 / 2 (100%)	11,000	0	(16,400)	NA	(NE)	0	(77,000)	NA	(NE)	0	(990,000)	0	(16,400)
Calcium	mg/kg	2 / 2 (100%)	26,000	0	(66,500)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(66,500)
Iron	mg/kg	2 / 2 (100%)	27,000	NA	(NE)	NA	(NE)	0	(55,000)	NA	(NE)	0	(720,000)	0	(55,000)
Magnesium	mg/kg	2 / 2 (100%)	8,900	0	(12,100)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(12,100)
Manganese	mg/kg	2 / 2 (100%)	840	2	(402)	2	(220)	0	(1,800)	NA	(NE)	0	(23,000)	2	(402)
Potassium	mg/kg	2 / 2 (100%)	2,900	0	(4,400)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(4,400)
Sodium	mg/kg	2 / 2 (100%)	230	0	(2,070)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(2,070)
Cyanide	mg/kg	0 / 2 (0%)	ND (1.05) ‡	NA	(NE)	0	(0.9)	0	(1,600)	NA	(NE)	0	(20,000)	0	(0.9)
Semivolatile Organic Compounds															
4-Methylphenol	µg/kg	1 / 17 (5.9%)	460	NA	(NE)	0	(500)	0	(310,000)	NA	(NE)	0	(3,100,000)	0	(500)
Bis (2-ethylhexyl) phthalate	µg/kg	1 / 17 (5.9%)	1,300	NA	(NE)	0	(2,870)	0	(35,000)	NA	(NE)	0	(120,000)	0	(2,870)
Polycyclic Aromatic Hydrocarbons															
Benzo (b) fluoranthene	µg/kg	1 / 17 (5.9%)	5.3	NA	(NE)	NA	(NE)	0	(380)	NA	(NE)	0	(1,300)	0	(380)
Benzo (ghi) perylene	µg/kg	1 / 17 (5.9%)	6.2	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Chrysene	µg/kg	1 / 17 (5.9%)	6.5	NA	(NE)	NA	(NE)	0	(3,800)	NA	(NE)	0	(13,000)	0	(3,800)
Phenanthrene	µg/kg	1 / 17 (5.9%)	11	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
PAH Low molecular weight	µg/kg	1 / 17 (5.9%)	11	NA	(NE)	0	(10,000)	NA	(NE)	NA	(NE)	NA	(NE)	0	(10,000)
PAH High molecular weight	µg/kg	2 / 17 (12%)	12	NA	(NE)	0	(1,160)	NA	(NE)	NA	(NE)	NA	(NE)	0	(1,160)
B(a)P Equivalent	µg/kg	2 / 17 (12%)	4.7	NA	(NE)	NA	(NE)	0	(38)	NA	(NE)	0	(130)	0	(38)
Total Petroleum Hydrocarbons															
TPH as diesel	mg/kg	2 / 17 (12%)	140	NA	(NE)	NA	(NE)	NA	(NE)	0	(540)	NA	(NE)	0	(540)
TPH as motor oil	mg/kg	10 / 17 (59%)	902	NA	(NE)	NA	(NE)	NA	(NE)	0	(1,800)	NA	(NE)	0	(1,800)

Notes:

1 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

2 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil" July 1

3 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

4 Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

5 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

6 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.

7 Number of exceedences are the number of detections exceeding the background threshold value (BTV).

8 Number of exceedences are the number of detections that are equal to or exceeds the screening level (ecological comparison value, residential reporting limit, commercial reporting limit or interim screening level) or otherwise noted

* Number of exceedances are calculated using background threshold value because it is greater than the respective screening level.

‡ Maxiumum Reporting Limit greater than or equal to the interim screening level

USEPA regional screening level - USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

CHHSL - California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

mg/kg	miligrams per kilogram
µg/kg	micrograms per kilogram
ng/kg	nanograms per kilogram
NA	not applicable
ND	not detected in any of the samples
NE	not established
SL	screening level

USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water Board	Regional Water Quality Control Board

TABLE C9-9
Central Tendency Comparisons (Site to Background)
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Parameter	Comparison Test Used	Probability that the Observed Differences Would Occur Purely by Chance	Statistical Decision with 0.05 Significance Level	Mean of Site Detects	Mean of Bkgd Detects	Median of Site Detects	Median of Bkgd Detects	Number of Site Detects	Number of Site Samples	Number of Bkgd Detects	Number of Bkgd Samples	Percent Detects Site	Percent Detects Bkgd
Arsenic	Gehan	0.000	Site > Bkgd	12	4.01	11	3.5	17	17	58	59	100	98
Barium	Gehan	0.000	Site > Bkgd	311	165	280	135	17	17	60	60	100	100
Lead	Gehan	0.024	Site > Bkgd	5.15	4.38	4.3	3.5	17	17	59	60	100	98
Zinc	Gehan	0.000	Site > Bkgd	57.7	36.8	60	35.5	17	17	70	70	100	100

Bkgd = background

> = greater than
< = less than

TABLE C9-10
Decision 2 Data Gaps Summary - UA 2
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [1] Y or N	> ECV or Background as Applicable? [1] Y or N	Proposed Sample ID	Notes
Metals							
Arsenic				**11 mg/kg (bckg)**	**11.4 mg/kg**		
0-0.5 ft bgs	N	5 of 5	14 mg/kg	Y	Y	None	Compound exceeds HHCV and ECV. Existing data adequate for EPC with the exception of the 0-0.5 ft bgs exposure interval. Arsenic is believe to be within local background in bedrock for this area as discussed in Sections 2.3 and 2.4 of the text.
0-3 ft bgs	Y	15 of 15	24 mg/kg	Y	Y		
0-6 ft bgs	Y	17 of 17	24 mg/kg	Y	Y		
0-10 ft bgs	Y	17 of 17	24 mg/kg	Y	NA		
Barium				**5200 mg/kg**	**410 mg/kg (bckg)**		
0-0.5 ft bgs	N	5 of 5	290 mg/kg	N	N	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	15 of 15	520 mg/kg	N	Y		
0-6 ft bgs	Y	17 of 17	890 mg/kg	N	Y		
0-10 ft bgs	Y	17 of 17	890 mg/kg	N	NA		
Lead				**80 mg/kg**	**8.39 mg/kg (bckg)**		
0-0.5 ft bgs	N	5 of 5	13 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC with the exception of the 0-0.5 ft bgs exposure interval. While this is insufficient to calculate an EPC using ProUCL for this exposure interval, the maximum concentration is low (i.e., does not exceed two times the lowest comparison value). Therefore, using the maximum result as the EPC is not expected to significantly impact the results of the risk assessment.
0-3 ft bgs	Y	15 of 15	13 mg/kg	N	Y		
0-6 ft bgs	Y	17 of 17	13 mg/kg	N	Y		
0-10 ft bgs	Y	17 of 17	13 mg/kg	N	NA		
Zinc				**23000 mg/kg**	**58 mg/kg (bckg)**		
0-0.5 ft bgs	N	5 of 5	62 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC with the exception of the 0-0.5 ft bgs exposure interval. While this is insufficient to calculate an EPC using ProUCL for this exposure interval, the maximum concentration is low (i.e., does not exceed two times the lowest comparison value). Therefore, using the maximum result as the EPC is not expected to significantly impact the results of the risk assessment.
0-3 ft bgs	Y	15 of 15	65 mg/kg	N	Y		
0-6 ft bgs	Y	17 of 17	65 mg/kg	N	Y		
0-10 ft bgs	Y	17 of 17	65 mg/kg	N	NA		

TABLE C9-10
Decision 2 Data Gaps Summary - UA 2
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

	Adequate EPC?		Maximum Detected	> HHCV or Background as Applicable? [1]	> ECV or Background as Applicable? [1]	Proposed	
Compound/Depth	Y or N	Det/# results	Value	Y or N	Y or N	Sample ID	Notes
Contract Laboratory Program Inorganics							
Manganese				**1800 mg/kg**	**402 mg/kg (bckg)**		
0-0.5 ft bgs	N	2 of 2	840 mg/kg	N	Y	None	Compound exceeds ECV. The small dataset of 2 samples would result in using the maximum concentration, which is approximately two times background, as the EPC for the ERA. Additional sampling is not expected to significantly change the EPC or the outcome of the ERA because manganese at UA2-300B is believed to be naturally occurring; there is no information to indicate that manganese was associated with the operation of the 300B pipeline or above-ground drip tank.
0-3 ft bgs	N	2 of 2	840 mg/kg	N	Y		
0-6 ft bgs	N	2 of 2	840 mg/kg	N	Y		
0-10 ft bgs	N	2 of 2	840 mg/kg	N	NA		

Footnotes:
[1] The higher value of either the HHCV/ECV or background was selected as the screening criteria and are included in these columns for the respective compound in **BOLDED BLUE FONT**. Values based on background are indicated with "(bckg)" next to the value.

Acronyms and Abbreviations:
ECV - ecological comparison values
EPC - exposure point concentration
ERA - ecological risk assessment
ft bgs - feet below ground surface
HHCV - human health comparison values
mg/kg - milligrams per kilogram
N - no
NA - not applicable
Y - yes

TABLE C9-11
Results of Tiered Analysis at UA 2
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report, PG&E Topock Compressor Station, Needles, California

Metal	Step 1 Do COPCs/COPECs Exceed Background?	Step 2 Do COPCs/COPECs Exceed SSL?	Step 3 Does Screening Model Eliminate Potential for Impact to Groundwater?
Arsenic	✓		
Barium	✓		
Lead	✓		
Zinc	✓		

✓ = Constituents concentration exceeds background and/or SSL.

SSL = soil screening level.

TABLE C9-12

Sample Results Compared to the Calculated Soil Screening Levels
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)			
			Soil Screening Levels : [1]	**39**	**2,200**	**1,800**	**66,000**
			Background : [2]	**11**	**410**	**8.39**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Arsenic**	**Barium**	**Lead**	**Zinc**
UA2-300B-1	09/23/08	0 - 0.5	N	14	290	7.9	54
	09/23/08	0.5 - 1	N	24	280	5.8	61
	10/23/08	2.5 - 3	N	16	300	5.6	59
	10/23/08	5.5 - 6	N	12	150	3.2	48
UA2-300B-2	10/03/08	0 - 0.5	N	8	220	6.6	46
	10/03/08	0.5 - 1	N	15	520	4.3	62
	10/03/08	2 - 3	N	11	310	3.4	63
UA2-300B-3	10/03/08	0 - 0.5	N	9.8	250	5.3	52
	10/03/08	0.5 - 1	N	10	220	6.3	60
	10/03/08	0.5 - 1	FD	10	220	4.5	58
	10/03/08	2 - 3	N	12	180	4	65
	10/03/08	5 - 6	N	14	890	3.6	58
UA2-300B-4	10/03/08	0 - 0.5	N	9.1	230	4.4	53
	10/03/08	0.5 - 1	N	11	190	3.4	47
	10/03/08	2 - 3	N	11	220	3.4	64
UA2-300B-5	10/03/08	0 - 0.5	N	8.4	290 J	13	62
	10/03/08	0.5 - 1	N	10	390	3.9	65
	10/03/08	2 - 3	N	9.4	360	3.4	62

TABLE C9-12

Sample Results Compared to the Calculated Soil Screening Levels
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

[1] Soil Screening Level (SSL) calculation was provided in the technical memorandum entitled "Calculation of Soil Screening Levels for Protection of Groundwater at the PGE Topock Compressor Station", CH2MHill 2008.
[2] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the SSL and greater than or equal to the background value are circled.

mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C9-13

Constituent Concentrations in Soil Compared to Total Threshold Limit Concentration (TTLC), Soluble Threshold Limit Concentration (STLC), and Toxic Characteristic Leaching Procedure (TCLP)
UA 2 - Former 300B Pipeline Liquids Tank Area
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Topock Compressor Station, Needles, California

Parameter	Frequency of detection	Maximum Detected Value (mg/kg)	TTLC in mg/kg[1]		STLC in mg/L[1]			TCLP in mg/L[1]		
			# of Exceedences	TTLC	# of Exceedences of STLC x 10	STLC x 10	STLC	# of Exceedences of TCLP x 20	TCLP x 20	TCLP
Antimony	0 / 17 (0%)	ND (2)	0	500	0	150	15	0	NE	NE
Arsenic	17 / 17 (100%)	24	0	500	0	50	5	0	100	5
Barium	17 / 17 (100%)	890	0	10000	0	1000	100	0	2000	100
Beryllium	0 / 17 (0%)	ND (2)	0	75	0	7.5	0.75	0	NE	NE
Cadmium	0 / 17 (0%)	ND (1)	0	100	0	10	1	0	20	1
Chromium	17 / 17 (100%)	35	0	2500	0	50	5	0	100	5
Chromium, Hexavalent	0 / 17 (0%)	ND (0.423)	0	500	0	50	5	0	NE	NE
Cobalt	17 / 17 (100%)	11	0	8000	0	800	80	0	NE	NE
Copper	17 / 17 (100%)	15	0	2500	0	250	25	0	NE	NE
Lead	17 / 17 (100%)	13	0	1000	0	50	5	0	100	5
Mercury	0 / 17 (0%)	ND (0.1)	0	20	0	2	0.2	0	4	0.2
Molybdenum	1 / 17 (5.9%)	1.1	0	3500	0	3500	350	0	NE	NE
Nickel	17 / 17 (100%)	25	0	2000	0	200	20	0	NE	NE
Selenium	0 / 17 (0%)	ND (1)	0	100	0	10	1	0	20	1
Silver	0 / 17 (0%)	ND (2)	0	500	0	50	5	0	100	5
Thallium	0 / 17 (0%)	ND (4.1)	0	700	0	70	7	0	NE	NE
Vanadium	17 / 17 (100%)	38	0	2400	0	240	24	0	NE	NE
Zinc	17 / 17 (100%)	65	0	5000	0	2500	250	0	NE	NE

Notes:

[1] Code of Regulations, Title 22, Chapter 11, Article 3

mg/kg miligrams per kilogram
mg/L milligrams per liter
ND not detected in any of the samples
NE not established
‡ maximum reporting limit greater than or equal to the STLC.

Figures

FIGURE C9-1
Conceptual Site Model for UA 2
Soil Investigation Part A
Phase 1 Data Gaps Evaluation Report
PG&E Topock Compressor Station
Needles, California

ES051410163258BAO UA-2_conceptual_site_model .ai 10-19-10 dash

CH2MHILL

VICINITY MAP

PG&E

LEGEND

- ● Soil Boring
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- UA-2 / 300B Boundary

SSB-7 (08) — Sample Location, Installation Date
20 [1] — Sample Beginning Depth (ft bgs), Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (11 mg/kg) are shown in BLUE.
5. Results greater than or equal to the Ecological Comparison Value (11.4 mg/kg) are shown in PURPLE.
6. J = Estimated Result.
7. California Department of Toxic Substances Control Residential California Human Health Screening Level (0.07 mg/kg) is below background value; therefore, the screening level is set at the background value.

N

0 25 50
Feet

FIGURE C9-2
Arsenic
Soil Sample Results for
UA 2

RCRA Facility Investigation/Remedial Investigation
Soil Investigation Part A,
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

VICINITY MAP

PG&E

LEGEND

- Soil Boring
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- UA-2 / 300B Boundary

SSB-7 (08) — Sample Location; Installation Date
20 [1] — Sample Beginning Depth (ft bgs); Soil Concentration (mg/kg)

Notes:
1. ND = Not Detected (Reporting Limit in parentheses)
2. mg/kg = milligrams per kilogram
3. ft bgs = feet below ground surface
4. Results greater than Background (58 mg/kg) are shown in BLUE.
5. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (23,000 mg/kg) are shown in ORANGE.
6. J = Estimated Result.
7. Ecological Comparison Value (0.164mg/kg) is below background value; therefore, the screening level is set at the background value.

N

0 25 50
Feet

FIGURE C9-3
Zinc
Soil Sample Results for UA 2

RCRA Facility Investigation/Remedial Investigation
Soil Investigation Part A,
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

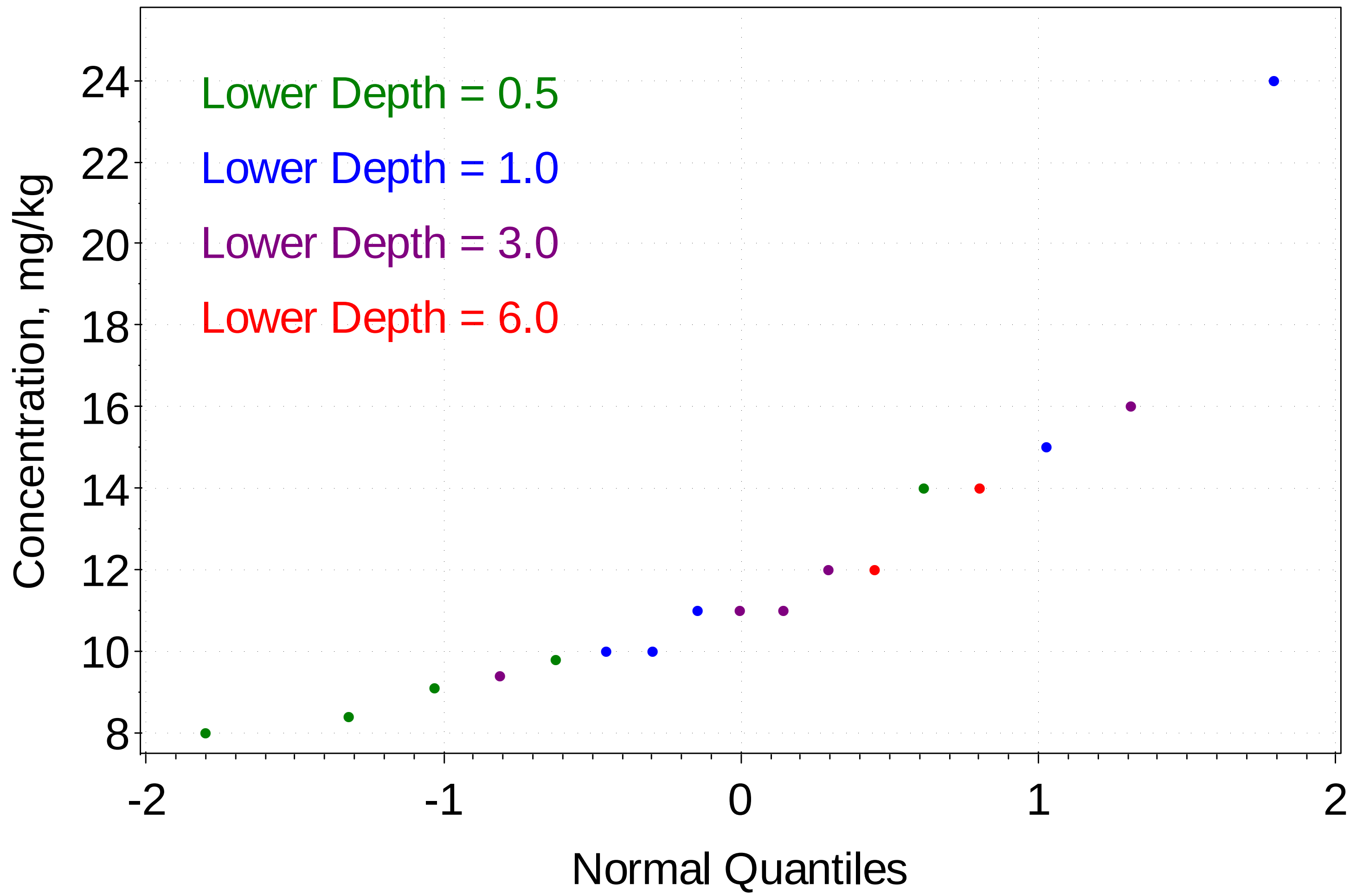


FIGURE C9-4
PROBABILITY PLOTS FOR ARSENIC
UA2 - FORMER 300 B PIPELINE LIQUIDS TANK AREA
SOIL INVESTIGATION PART A, PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY,
TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ES122008001BAO figure_A_8_4.indd 03-24-10 dash

CH2MHILL

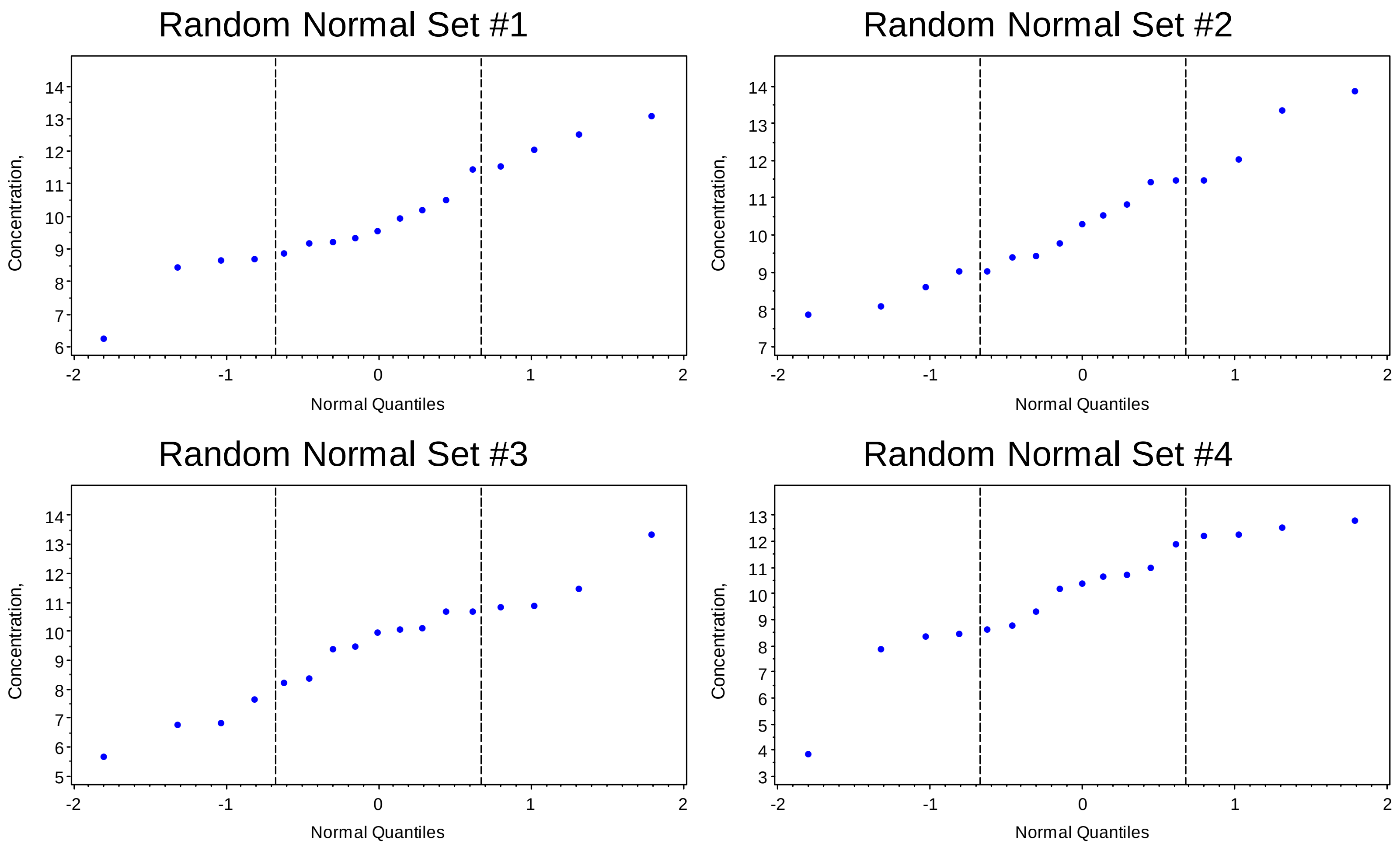


FIGURE C9-5
COMPARATIVE PROBABILITY PLOTS FOR ARSENIC
UA2 - FORMER 300 B PIPELINE LIQUIDS TANK AREA
SOIL INVESTIGATION PART A, PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY,
TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

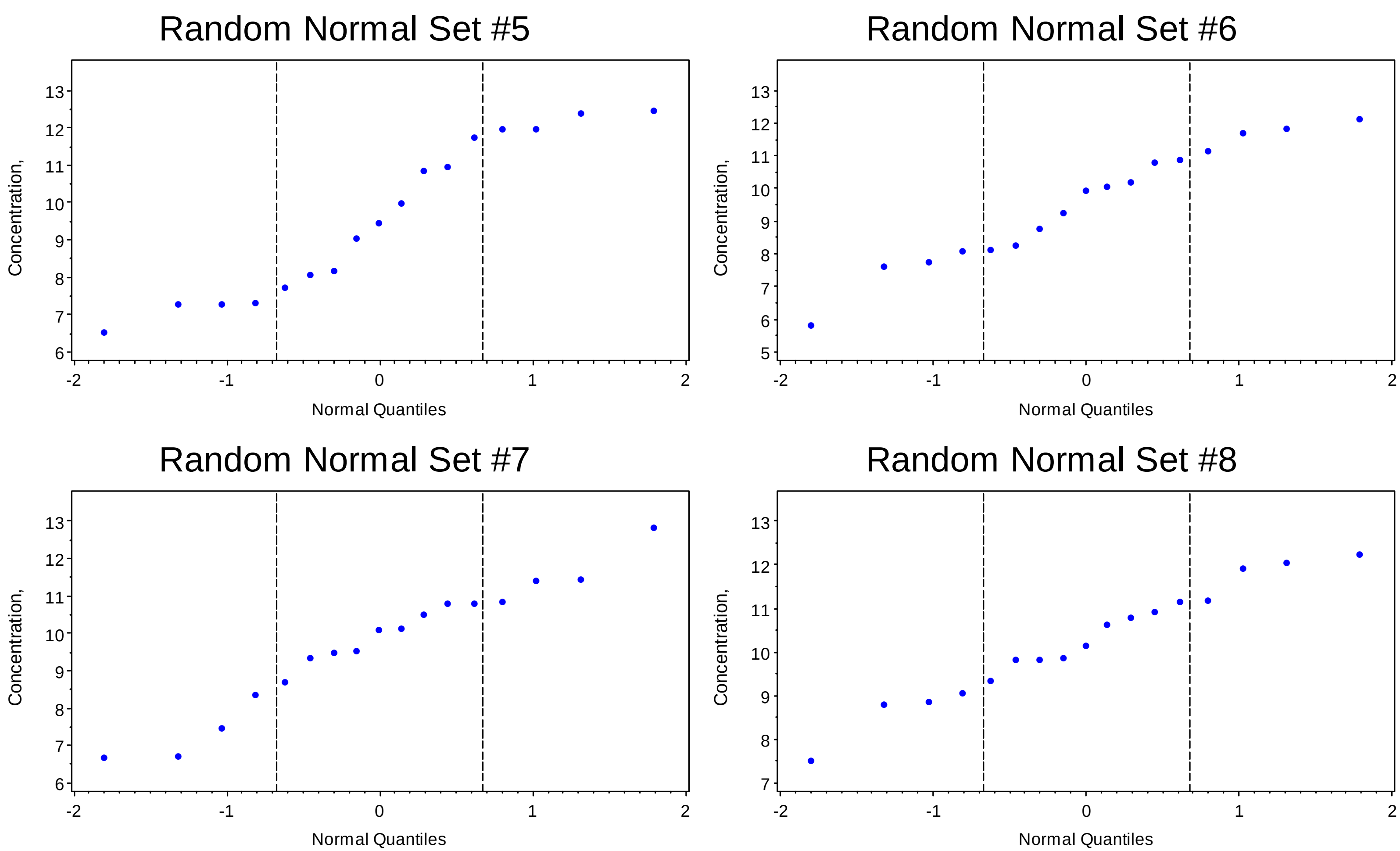


FIGURE C9-5
COMPARATIVE PROBABILITY PLOTS FOR ARSENIC
UA2 - FORMER 300 B PIPELINE LIQUIDS TANK AREA
SOIL INVESTIGATION PART A, PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY,
TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL

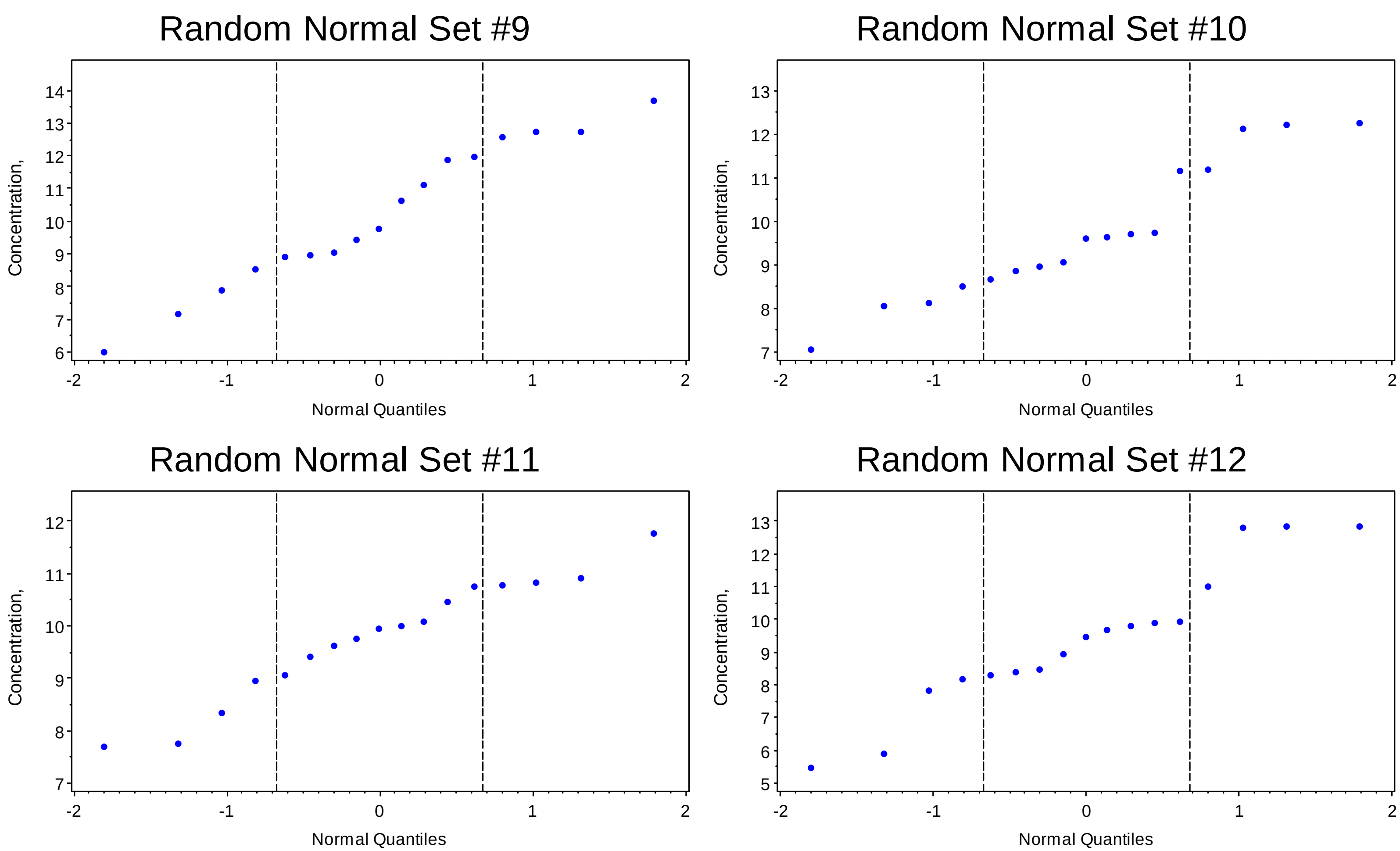


FIGURE C9-5
COMPARATIVE PROBABILITY PLOTS FOR ARSENIC
UA2 - FORMER 300 B PIPELINE LIQUIDS TANK AREA
SOIL INVESTIGATION PART A, PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY,
TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL

Subappendix C10
Area of Concern 4 Data Gaps Evaluation Results

Contents

Tables

Figures

Acronyms and Abbreviations

μg/kg	micrograms per kilogram
AOC	Area of Concern
bgs	below ground surface
BTV	background threshold value
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHHSL	California human health screening level
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
CMS/FS	corrective measures study/feasibility study
DOI	United States Department of the Interior
DQO	data quality objective
ECV	ecological comparison value
EPC	exposure point concentration
mg/kg	milligrams per kilogram
ng/kg	nanograms per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
RCRA	Resource Conservation and Recovery Act
RFI/RI	RCRA facility investigation/remedial investigation
RSL	regional screening level
SPLP	synthetic precipitation leaching procedure
STLC	soluble threshold limit concentrations
TEQ	toxicity equivalent quotient
TAL	Target Analyte List
TCL	Target Compound List
TCRA	time-critical removal action
TTLC	total threshold limit concentrations

TCLP	toxicity characteristic leaching procedure
VOC	volatile organic compound

SUBAPPENDIX C10

Area of Concern 4 Data Gaps Evaluation Results

1.0 Introduction and Background

This attachment presents the results of the data gaps evaluation for Area of Concern (AOC) 4 – Debris Ravine at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. The process for the data gaps evaluation is outlined in Sections 2.0 through 6.0 of the main text of Appendix A, Part A Phase 1 Data Gaps Evaluation Report, to the Soil RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan.

1.1 Background

AOC 4 is located in the southern portion of the Topock Compressor Station immediately south of the facility fence line and is shown in Figure C10-1. AOC 4 is a narrow, steep-sided arroyo that drains into Bat Cave Wash at the southwest corner of the compressor station. AOC 4 is located on PG&E property, except for a small portion of the westernmost end that extends onto Havasu National Wildlife Refuge. The Refuge is managed by the United States Fish and Wildlife Service. Laterally, the western edge of AOC 4 extends from the toe of the western slope of the ravine at a point directly south of the water tanks to the junction with Bat Cave Wash. The eastern edge extends from the water tanks north along the access road to a line parallel with the southern-most fence line of the compressor station, and west along the fence line to the edge of the slope above Bat Cave Wash. AOC 4 includes the slope between the eastern and western boundaries to a point directly downslope of the southwestern corner of the facility fence line. The operational history at AOC 4 is not well documented; however, over the years, fill material and debris have been deposited over the northern and eastern slopes, with some debris accumulating in the bottom of the ravine. It appears that burning of trash occurred within AOC 4. Chemicals of potential concern (COPCs) and chemicals of potential ecological concern (COPECs) for AOC 4 identified in the *Revised Final RCRA Facility Investigation and Remedial Investigation Report. Volume 1 – Site Background and History* (CH2M HILL, 2007) (RFI/RI) Volume 1 include Title 22 metals, hexavalent chromium, polycyclic aromatic hydrocarbons (PAHs), and asbestos. Subsequent to the RFI/RI, dioxins and polychlorinated biphenyls (PCBs) were identified in additional debris samples from AOC 4 and have been identified as COPCs and COPECs.

In June 2009, the United States Department of the Interior (DOI) issued an Action Memorandum time-critical removal action (TCRA) at the AOC 4 - Debris Ravine, at the Topock Compressor Station (DOI, 2009) and directed PG&E to initiate activities necessary to implement and perform TCRA activities at AOC 4. The history of previous investigations and Agency direction leading up to the AOC 4 are described in the approved *Final Work Plan for Time-Critical Removal Action at AOC 4 Debris Ravine, PG&E Topock Compressor Station, Needles, California* (Alisto et al., 2009), hereafter referred to as the Final TCRA Work Plan.

The TCRA was conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and, as an interim remedial action, was intended to stabilize and mitigate the threat of release of contaminated material. The TCRA interim action was not intended as a substitute for additional investigative or remedial activities that may be required under the Resource Conservation and Recovery Act (RCRA) or be the final remedy for AOC 4. An implementation report (Alisto et al., 2011) for the TCRA at AOC 4 has been prepared to document the field work and present the results of the field activities for the project. The conclusions of the TCRA at AOC 4 are summarized below.

The TCRA objectives were met by the removal action. Removal was conducted in safely accessible areas of AOC 4. The excavation, screening, and confirmation approach followed the Final TCRA Work Plan, including the quality criteria established in the data quality objectives (DQO) and quality assurance program addendum. For areas on PG&E property, the TCRA target end point concentrations were based on commercial/industrial CHHSL and/or RSLs. In order to comply with the stated intent and objectives of the AOC 4 TCRA, the Target end point concentrations for native alluvial material were based on ten times the commercial/industrial CHHSL and/or RSLs. This reduced the amount of native alluvium to be removed, but also removed material that may have presented an imminent and substantial endangerment to public health or welfare, or the environment. Table C10-1 presents the TCRA Target end point concentrations for native and non-native material, as well as the Part A RFI/RI interim screening levels. For areas of AOC 4 on Havasu National Wildlife Refuge property, the target endpoints for the removal were background levels for metals and ecological comparison values (ECVs) for organics, which align with the Part A RFI/RI interim screening levels.

Based on the confirmation data set and installation of erosion control measures, the substantial threat of release of contaminated material from AOC 4 has been stabilized and mitigated. AOC 4 confirmation soil data have been carried forward to the RFI/RI process and are used in this data gaps evaluation.

Additional post-construction activities are ongoing at this AOC and include inspection and maintenance of SoilTac® soil stabilization and the gabion at the downstream end of the Debris Ravine. SoilTac® soil stabilizer will be reapplied as necessary, based on inspections. Slopes in the former debris ravine are generally stable and resistant to erosion. Inspection will also include examining steep slopes in native alluvium for indications of slope movement or instability. Run-on controls were left in place above the upper slope. Also above the upper slope, concrete barriers were installed to keep Topock Compressor Station personnel activities at a safe distance from steeper areas of the slope.

The check dam and the gabion below the slot canyon will be maintained under a periodic inspection program, with special attention to pre- and post-rainfall inspections. Soil that accumulates above the dam or the gabion after rainfall events may be characterized for proper disposal and removed.

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 4 based on the above site history and background, as shown in Figure C10-2. Table C10-2 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 4. The conceptual site model represents conditions prior to the TCRA at AOC 4. A detailed discussion of the migration pathways, exposure media, exposure routes, and human and ecological receptors is included in the *Data Quality Objectives – Part A Soil Investigation at the Pacific Gas and Electric Company Topock Compressor Station, Needles, California* (CH2M HILL, 2010), which is included as Appendix A to the Part A Phase 1 Data Gaps Evaluation Report.

The primary sources of contamination at AOC 4 are historical disposal of debris (including asbestos-containing material), and residuals from apparent historical burning of compressor station waste. Much of these primary source materials were removed during the AOC 4 TCRA. The primary release mechanisms are direct releases of contaminated particulates or leaching of contaminants from the historical debris and/or burned material remaining after the AOC 4 TCRA. Contaminants present in these primary source materials could have been deposited on surface soil as particulates or entered surface soil as dissolved constituents through infiltration of rainfall before the primary source materials were removed during the TCRA. Contaminants released from the former debris located on the slopes of AOC 4 could also have been transported into Bat Cave Wash through surface runoff. Primary source media therefore consist of surface and subsurface soils. Contaminants could have leached from surface soils and shallow soil into underlying deeper soils. Potential migration from subsurface soil to groundwater was identified as a potential secondary pathway. If released, volatile organic compounds (VOCs) in surface soils would be expected to have been degraded by heat and light and are likely no longer present.

Windblown dust contamination from small particles of debris or contaminated surface soil within AOC 4 is a potential secondary release mechanism. Windblown contamination, if any, is expected to be limited to surface soils. There is a potential for windblown transportation of contaminants from AOC 4 to nearby areas of the ravine. Surface runoff from AOC 4 to Bat Cave Wash could also have transported small pieces of debris from AOC 4 to Bat Cave Wash.

1.3 AOC 4 Data

One-hundred and sixteen confirmation surface soil samples and three gabion surface soil samples (AOC4-GB10, AOC4-GB11, and AOC4-GB12) were collected to represent soil conditions upon completion of the TCRA, as shown in Figure C10-3. The confirmation and gabion surface soil samples were analyzed for Title 22 metals, mercury, hexavalent chromium, semivolatile organic compounds (SVOCs), PCBs, and dioxins/furans.

In addition, three soil samples collected from one location (AOC4-1) were collected during the 2008 Soil Part A Phase 1 investigation are still representative of existing site conditions. The three samples were collected at 0 to 0.5, 0.5 to 1, and 2 to 3 feet below ground surface (bgs). Samples at this location were analyzed for the full inorganic and organic suites per the CERCLA Target Analyte List and Target Compound List (TAL/TCL), including Title 22 metals, hexavalent chromium, VOCs, SVOCs, PAHs, total petroleum hydrocarbons, pH, pesticides, and PCBs. The soil samples collected between 0 and 1 foot bgs were not analyzed for VOCs.

All TCRA and Part A Phase 1 data are considered Category 1 and were used as inputs to the four DQO decisions for AOC 4.

2.0 Decision 1 – Nature and Extent

This section describes the nature and extent of residual soil concentrations of COPCs and COPECs at AOC 4. Laboratory analytical results for AOC 4 are presented in Tables C10-3 through C10-9. Table C10-10 presents a statistical summary of soil analytical results for COPCs and COPECs that were either detected above laboratory reporting limits or not detected and reporting limits for one or more samples were greater than the interim screening value.

Beryllium, selenium, silver, molybdenum, cyanide, and thallium were not detected in soil samples collected in AOC 4. Table C10-10 lists the 58 detected constituents.

The following twenty-five constituents were detected one or more times at concentrations exceeding their respective interim screening levels: antimony, barium, cadmium, total chromium, hexavalent chromium, cobalt, copper, lead, mercury, nickel, vanadium, zinc, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, total high-molecular-weight PAHs, benzo(a)pyrene equivalents, Aroclor-1254, Aroclor-1260, total PCBs, dioxin toxicity equivalent quotient (TEQ), dioxin TEQ-Avian, and dioxin TEQ-Mammals.

Twenty constituents (barium, total chromium, hexavalent chromium, cobalt, copper, lead, mercury, nickel, vanadium, zinc, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, PAH high-molecular-weight, benzo(a)pyrene equivalents, Aroclor-1254, total PCBs, dioxin TEQ, dioxin TEQ-Avian, and dioxin TEQ-Mammals) were detected at concentrations exceeding the interim screening level four or more times; the distribution of these constituents are shown in Figures C10-3 through C10-17. Benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene, which are being evaluated as components of benzo(a)pyrene equivalent concentrations and total high-molecular-weight PAH concentrations, are not shown on individual constituents figures.

2.1 Nature and Extent Evaluation for Soil

The following subsection discusses the nature and extent of detected COPCs/COPECs detected above interim screening levels at AOC 4. As discussed in Section 3.2 of the Part A Phase 1 Data Gaps Evaluation Report, multiple factors were considered to assess whether the nature and extent of a specific constituent has been adequately delineated. Section 2.3 of this subappendix summarizes the constituents that may require further evaluation, and Section 6.0 of this subappendix provides the recommended follow-up sampling for the Part A Phase 2 soil investigation. The potential Phase 2 sample locations are PG&E's initial assessment of candidate locations for additional characterization. These locations represent sampling that may be needed to fill quantitative data gaps, meet agency requirements, and further progress toward decision-making for soil remediation. PG&E anticipates that all candidate locations identified may not be necessary for such purposes.

During the TCRA at AOC 4, bedrock was exposed in much of the southeast portion of AOC 4; no further vertical delineation is possible in this area. Vertical delineation is also limited by bedrock in many of the areas at AOC-4. Figure C10-1 shows the bedrock contour, native material, and remaining fill locations.

2.1.1 Antimony

Antimony was detected in three of 122 soil samples collected at AOC 4. Detected concentrations of antimony exceeded the interim screening level (0.285 milligrams per kilogram [mg/kg]) ECV) three times (maximum detected concentration of 2.7 mg/kg at AOC4-K05), as shown in Table C10-3. None of the detected concentrations of antimony exceeded the California human health screening level (CHHSL) for residential use (30 mg/kg) or the commercial/industrial CHHSL (380 mg/kg). The lateral and vertical extents of antimony exceeding the interim screening level have been defined.

2.1.2 Arsenic

Arsenic was detected in 30 of 122 soil samples collected at AOC 4. Detected concentrations of arsenic did not exceed the interim screening level (11 mg/kg; background threshold value [BTV]), as shown in Table C10-3. No samples of the detected concentrations of arsenic exceeded the ECV of 11.4 mg/kg. The lateral and vertical extents of arsenic have been defined.

2.1.3 Barium

Barium was detected in 122 of 122 soil samples collected at AOC 4. Detected concentrations of barium exceeded the interim screening level (410 mg/kg; BTV/ECV) 13 times (maximum detected concentration of 1,300 mg/kg at AOC4-B03), as shown in Tables C10-3 and C10-10 and Figure C10-3. None of the detected concentrations of barium exceeded the CHHSL for residential use (5,200 mg/kg) or the commercial/industrial regional screening level (63,000 mg/kg). The lateral and vertical extents of barium exceeding the interim screening level have been defined.

2.1.4 Cadmium

Cadmium was detected in three of 122 soil samples collected at AOC 4. Detected concentrations of cadmium exceeded the interim screening level (1.1 mg/kg; BTV/ECV) twice (with a maximum detected concentration of 1.7 mg/kg at AOC4-B03), as shown in Tables C10-3 and C10-10. None of the detected concentrations of cadmium exceeded the CHHSL for residential use (39 mg/kg) or the commercial/industrial regional screening level (500 mg/kg). The lateral and vertical extents of cadmium exceeding the interim screening level have been defined.

2.1.5 Total Chromium

Total chromium was detected in 123 of 123 soil samples collected at AOC 4. Detected concentrations of total chromium exceeded the interim screening level (39.8 mg/kg (BTV/ECV) 59 times (maximum detected concentration of 160 mg/kg at AOC4-D04), as shown in Tables C10-3 and C10-10 and Figure C10-4. No samples of the detected concentrations of total chromium exceeded the residential screening level (RSL) for residential use (280 mg/kg) or the commercial/industrial regional screening level (1,400 mg/kg). The locations of samples with concentrations exceeding the interim screening level are scattered throughout the AOC. The lateral extent of chromium concentrations exceeding the interim screening level has not been defined in most of the AOC; however, topographic conditions (steep slopes) prevent additional sampling to the west and south. With the exception of a few detections slightly above the BTV, the lateral extent of total chromium in the flat area adjacent to the compressor station, in the northern part of the AOC, has been defined. The vertical extent of total chromium concentrations has not been defined across much of the AOC. Based on the shallow depth to bedrock across most of AOC 4, additional sampling to delineate vertical extent is limited to the northern portion of AOC, where bedrock is not near the surface.

2.1.6 Hexavalent Chromium

Hexavalent chromium was detected in 25 of 122 soil samples collected at AOC 4. Detected concentrations of hexavalent chromium exceeded the interim screening level (0.83 mg/kg BTV) 15 times (maximum detected concentration of 16 mg/kg at AOC4-K05), as shown in Tables C10-3 and C10-10 and Figure C10-5. None of the detected concentrations of hexavalent chromium exceeded the residential screening level (CHHSL) of 17 mg/kg, the commercial/industrial CHHSL of 37 mg/kg, or the ECV (139.6 mg/kg). The lateral extent of hexavalent chromium concentrations above interim screening levels has largely been defined, although contamination at two sample locations (AOC4-P04 and AOC4_Q04) in the northwest area of the AOC has not been bounded to the north, and contamination at two sample locations (AOC4-J06_J07 and AOC4-M10) in the bottom of the ravine are bounded to the south by topography. Vertical delineation is also incomplete in several locations, especially near the west center and at the eastern boundary; however, given the shallow depth to bedrock in these areas, additional sampling is not recommended to delineate vertical extent.

2.1.7 Cobalt

Cobalt was detected in 123 of 123 soil samples collected at AOC 4. Detected concentrations of cobalt exceeded the interim screening level (12.7 mg/kg) (BTV) 19 times (maximum detected concentration of 20 mg/kg at AOC4-D03), as shown in Tables C10-3 and C10-10 and Figure C10-6. Ten samples exceeded the ECV (13 mg/kg). None of the detected concentrations exceeded residential or commercial/industrial CHHSLs (23 mg/kg and 300 mg/kg, respectively). Remaining detected concentrations exceeding the interim screening level ranged from 13 to 20 mg/kg. Lateral extent of cobalt concentrations above interim screening levels have largely been defined, although contamination at four sample locations (AOC4-B-06_07, AOC4-C06_07, AOC4-J06_J07, and AOC4-L07_L08) in the bottom of the ravine has not been bounded to the south, and contamination at three locations (AOC4-K02, AOC4-L01, and AOC4-L02) near the top center of the AOC has not been bounded to the east. However, the values detected at these samples are very close to the BTV and the sample locations are adjacent to the access road to the water tanks. Vertical delineation is also incomplete in several locations; however, given the shallow depth to bedrock in the area of exceedances, additional sampling is not recommended to delineate vertical extent.

2.1.8 Copper

Copper was detected in 123 of 123 soil samples collected at AOC 4. Detected concentrations of copper exceeded the interim screening level (16.8 mg/kg) (BTV) 54 times (maximum detected concentration of 790 mg/kg at AOC4-B03), as shown in Tables C10-3 and C10-10 and Figure C10-7. Forty-two samples exceeded the ECV (20.6 mg/kg). None of the detected concentrations exceeded residential or commercial/industrial CHHSLs (3,000 mg/kg and 38,000 mg/kg, respectively). Remaining detected concentrations exceeding the interim screening level ranged from 17 to 210 mg/kg. The lateral extent of copper concentrations exceeding the interim screening level has been defined in the northern portion of the AOC. The lateral extent of copper is undefined to the south, east, and west; however, topographic conditions (steep slopes) prevent additional sampling to the west and south. Additional sampling is recommended in the southeastern corner of the AOC and along the upper access road. The vertical extent of copper concentrations has also not been defined; however, given the shallow depth to bedrock in areas of exceedances, additional sampling is not recommended to delineate vertical extent.

2.1.9 Lead

Lead was detected in 122 of 123 soil samples collected at AOC 4. Detected concentrations of lead exceeded the interim screening level (8.39 mg/kg) (BTV/ECV) 24 times (maximum detected concentration of 220 mg/kg at AOC4-B03), as shown in Tables C10-3 and C10-10 and Figure C10-8. Two of the detected concentrations exceeded the residential CHHSL and no detected concentrations exceeded the commercial/industrial CHHSL (80 mg/kg and 320 mg/kg, respectively). The lateral extent of lead concentrations above interim screening levels has largely been defined. The vertical extent of lead concentrations has not been defined; however, based on the shallow depth to bedrock across most of AOC 4, additional sampling for delineating vertical extent is limited to the northern portion of AOC, where bedrock is not near the surface.

2.1.10 Mercury

Mercury was detected in five of 122 samples collected at AOC 4. Detected concentrations of mercury exceeded the interim screening level (0.0125 mg/kg; ECV) five times (maximum detected concentration of 0.52 mg/kg at AOC4-B03), as shown in Tables C10-3 and C10-10 and Figure C10-9. None of the detected concentrations exceeded the residential and commercial/industrial CHHSLs (18 mg/kg and 180 mg/kg, respectively). The ECV of 0.0125 mg/kg is below the capability of the instrumentation to detect mercury. As a result, the nondetected sample results had reporting limits that exceeded the ECV. These reporting limits ranged from 0.098 to 0.11 mg/kg. The five sample locations with detectable concentrations of mercury are surrounded by samples with nondetect concentrations. While the precise extent of mercury concentrations above the ECV cannot be determined with the available data, further investigation is unlikely to yield more usable data. The detected mercury concentrations are also collocated with other locations with metals concentrations above background. The uncertainties with regard to mercury will be addressed in the risk assessment and corrective measures study/feasibility study (CMS/FS).

2.1.11 Nickel

Nickel was detected in 122 of 122 soil samples collected from AOC 4. As shown in Tables C10-3 and C10-10 and Figure C10-10, detected concentrations exceeded the interim screening level (27.3 mg/kg) (BTV/ECV) 52 times (maximum detected concentration of 75 mg/kg at AOC4-D02). There were no exceedances of the residential and commercial/

industrial CHHSLs (1,600 mg/kg and 16,000 mg/kg, respectively). The lateral extent of nickel concentrations exceeding the interim screening level has been defined in the south and southeastern corner of the AOC. Topographic conditions (steep slopes) prevent additional sampling to the west and south, and the compressor station is immediately to the north of the AOC. The vertical extent of nickel concentrations has not been defined. Based on the shallow depth to bedrock across most of AOC 4, additional sampling for delineating vertical extent is limited to the northern portion of AOC, where bedrock is not near the surface.

2.1.12 Vanadium

Vanadium was detected in 122 of 122 soil samples collected at AOC 4. Detected concentrations of vanadium exceeded the interim screening level (52.2 mg/kg) (BTV) 38 times (maximum detected concentration of 100 mg/kg at AOC4-D02), as shown in Tables C10-3 and C10-10 and Figure C10-11. Thirty-eight samples exceeded the ECV (13.9 mg/kg). None of the detected concentrations exceeded residential or commercial/industrial CHHSLs (390 mg/kg and 5,200 mg/kg, respectively). Remaining detected concentrations exceeding the interim screening level ranged from 53 to 95 mg/kg. The lateral extent of vanadium concentrations exceeding the interim screening level has not been defined in most of the AOC; however, topographic conditions (steep slopes) prevent additional sampling to the west and south. With the exception of a few detections slightly above the BTV, the lateral extent of vanadium in the flat area adjacent to the compressor station, in the northern part of the AOC has been defined. The vertical extent of vanadium concentrations has also not been defined; however, given the shallow depth to bedrock in areas of exceedances, additional sampling is not recommended to delineate vertical extent.

2.1.13 Zinc

Zinc was detected in 122 of 122 soil samples collected at AOC 4. Detected concentrations of zinc exceeded the interim screening level (58 mg/kg) (BTV/ECV) 13 times (maximum detected concentration of 410 mg/kg at AOC4-B03), as shown in Tables C10-3 and C10-10 and Figure C10-12. None of the detected concentrations exceeded residential and commercial/industrial CHHSLs (23,000 mg/kg and 100,000 mg/kg, respectively). The lateral extent of zinc concentrations exceeding the interim screening level has been defined in most of the AOC. The vertical extent of zinc concentrations has not been defined; however, based on the shallow depth to bedrock across most of AOC 4, additional sampling for delineating vertical extent is limited to the northern portion of AOC, where bedrock is not near the surface.

2.1.14 Benzo(a)pyrene, Benzo(a)pyrene Equivalents, and PAHs

Benzo(a)pyrene was detected in 48 of 122 soil samples collected from AOC 4. Detected concentrations of benzo(a)pyrene exceeded the interim screening level (38 micrograms per kilograms [µg/kg]) (residential CHHSL) 16 times. Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene were also detected at concentrations exceeding the interim screening levels. Benzo(a)anthracene was detected in 52 of 122 soil samples and exceeded the interim screening level (380 µg/kg) (residential CHHSL) six times. Benzo(b)fluoranthene was detected in 60 of 122 soil samples and exceeded the interim screening level (380 µg/kg) (residential CHHSL) six times.

Benzo(k)fluoranthene was detected in 40 of 122 soil samples and exceeded the interim screening level (380 µg/kg) (residential CHHSL) two times. Ideno(1,2,3-cd)pyrene was detected in 45 of 122 soil samples and exceeded the interim screening level (380 µg/kg) (residential CHHSL) one time.

To assist with evaluation of PAHs for human health, benzo(a)pyrene equivalents were calculated for each of the soil samples collected at AOC 4, as shown in Table C10-5. Benzo(a)pyrene equivalents values exceeded the interim screening level of 38 µg/kg (residential CHHSL) 26 times (maximum calculated concentration of 1,110 µg/kg at AOC4-C01), as shown in Tables C10-5 and C10-10 and Figure C10-13. The lateral extent of benzo(a)pyrene equivalent concentrations exceeding the interim screening level has not been defined in the east, south, and southeastern corner of the AOC. The vertical extent of benzo(a)pyrene equivalent concentrations has also not been defined; however, given the shallow depth to bedrock, additional sampling is not recommended to delineate vertical extent.

To assist with evaluation of PAHs for ecological risk, detected concentrations of low-molecular-weight PAHs and high-molecular-weight PAHs were summed and compared to the PAH low-molecular-weight and PAH high-molecular-weight ECVs (10,000 µg/kg and 1,160 µg/kg, respectively). None of the sums of detected concentrations exceeded the PAH low-molecular-weight ECV. Twelve of the sums of detected concentrations exceeded the PAH high-molecular-weight ECV, as shown on Figure C10-14. PAH high-molecular-weight sums exceeding the interim screening level have not been defined in the south-southeastern corner of the AOC. The vertical extent has also not been defined; however, given the shallow depth to bedrock, additional sampling is not recommended to delineate vertical extent.

2.1.14 Polychlorinated Biphenyls

Three PCB isomers were detected in soil samples from AOC 4: Aroclor-1016, Aroclor-1254, and Aroclor-1260, as shown on Tables C10-8 and C10-10. These constituents are discussed below.

Aroclor-1016 was detected in eight of the 120 in the surface soil samples collected from AOC 4. None of the samples was above the interim screening level of 3,900 µg/kg (residential RSL) (maximum detected concentration of 60 µg/kg).

Aroclor-1254 was detected in 70 of the 120 in the surface soil samples collected from AOC 4 (Figure C10-15). Twenty-six samples were above the interim screening level of 220 µg/kg (residential RSL) (maximum detected concentration of 5,900 µg/kg). The remaining detected concentration of Aroclor-1254 ranged from 19 µg/kg to 2,900 µg/kg. The lateral extent of Aroclor-1254 concentrations exceeding the interim screening level has not been defined in the eastern part of the AOC. The vertical extent of Aroclor-1254 concentrations has also not been defined; however, given the shallow depth to bedrock, additional sampling is not recommended to delineate vertical extent.

Aroclor-1260 was detected in 11 of the 120 in the surface soil samples collected from AOC 4. One sample was above the interim screening level of 220 µg/kg (residential RSL); the detected concentration was 640 µg/kg. The remaining detected concentration of Aroclor-1260 ranged from19 µg/kg to 120 µg/kg.

To assist with evaluation of PCBs for ecological risk, detected concentrations of Aroclors were summed and the total PCB values were compared to the ECV. Twenty-six samples were above the interim screening level of 204 µg/kg (ECV). The maximum calculated value for total PCBs was 6,000 µg/kg, as shown in Tables C10-8 and C10-10 and Figure C10-16. The lateral extent of total PCB values exceeding the interim screening level has not been defined in the eastern part of the AOC. The vertical extent of total PCBs has also not been defined; however, given the shallow depth to bedrock, additional sampling is not recommended to delineate vertical extent.

2.1.15 Dioxins and Furans

Dioxins and furans were compared to TEQ, TEQ-Avian, and TEQ-Mammals. Pentadioxin (1,2,3,7,8-PeCDD) and 2,3,7,8 tetracholordibenzo (2,3,7,8-TCCD) are the only two dioxins with individual interim screening levels. Dioxins and furans were detected in 118 of the 119 surface soil samples collected from AOC 4, as shown in Tables C10-9 and C10-10 and Figure C10-17. Thirty-four samples were above the TEQ-Avian interim screening level of 16 nanograms per kilogram (ng/kg) (ECV) (maximum detected concentration of 280 ng/kg). Thirteen samples were above the TEQ human interim screening level of 50 ng/kg (residential RSL) (maximum detected concentration of 250 ng/kg). One hundred and two samples were above the TEQ-Mammals interim screening level of 1.6 ng/kg (ECV) (maximum detected concentration of 250 ng/kg). The lateral extent of dioxin TEQs exceeding the interim screening levels (ECVs) has not been defined; however, the lateral extent of dioxin TEQ values exceeding residential and commercial RSLs has been defined except at the mouth of the ravine near Bat Cave Wash. The vertical extent of TEQ has not been defined; however, given the shallow depth to bedrock in most of the AOC, additional sampling for vertical extent is not recommended except near the mouth of the ravine in Bat Cave Wash.

2.1.16 Target Analyte List/Target Compound List Constituents

TAL/TCL compounds were analyzed in one surface soil sample during the Soil Part A investigation (VOCs and SVOCs were collected from the 2 to 3 feet bgs interval). Aluminum, calcium, iron, magnesium, manganese, potassium, sodium, bis(2ethylhexyl)phthalate, methyl acetate, cyanide, Aroclor-1016, Aroclor 1254, and Aroclor-1260 were detected in the AOC 4 surface soil sample (AOC4-1) the complete TAL/TCL suite of compounds. Aroclor-1016, Aroclor-1254, and Aroclor-1260 are discussed in Section 2.1.14 of this subappendix. The remaining constituents are discussed below.

Aluminum was detected in the one surface soil sample collected. The maximum detected concentration of aluminum was 8,400 mg/kg, which is below the interim screening level (16,400 mg/kg) (BTV), as shown in Tables C10-4 and C10-10. The detected concentration did not exceed the residential and commercial CHHSLs (77,000 mg/kg and 990,000 mg/kg, respectively). An ECV has not been established for aluminum.

Calcium was detected in the one surface soil sample collected. The maximum detected concentration of calcium was 21,000 mg/kg, which is below the interim screening level (66,500 mg/kg) (background value), as shown in Tables C10-4 and C10-10. Residential and commercial/industrial CHHSLs and an ECV have not been established for calcium.

Iron was detected in the one surface soil sample collected. The maximum detected concentration of iron was 20,000 mg/kg, which is below the interim screening level of 55,000 mg/kg (residential RSL), as shown in Tables C10-4 and C10-10. Residential and commercial/industrial CHHSLs and an ECV have not been established for iron.

Magnesium was detected in the one surface soil sample collected. The maximum detected concentration of magnesium was 7,900 mg/kg, which is below the interim screening level (12,100 mg/kg) (background value), as shown in Tables C10-4 and C10-10. Residential and commercial/industrial CHHSLs and an ECV have not been established for magnesium.

Manganese was detected in the one surface soil sample collected. The maximum detected concentration of manganese was 310 mg/kg, which is below the interim screening level (402 mg/kg) (BTV/ECV), as shown in Tables C10-4 and C10-10. The detected concentrations did not exceed residential and commercial/industrial CHHSLs (1,800 mg/kg and 23,000 mg/kg, respectively).

Potassium was detected in the one surface soil sample collected. The maximum detected concentration of potassium was 2,500 mg/kg, which is below the interim screening level of 4,400 mg/kg (BTV), as shown in Tables C10-4 and C10-10. Residential and commercial/industrial CHHSLs, RSLs, and an ECV have not been established for potassium.

Sodium was detected in the one surface soil sample collected. The maximum detected concentration of sodium was 270 mg/kg, which is below the interim screening level of 2,070 mg/kg (BTV), as shown in Tables C10-4 and C10-10. Residential and commercial/industrial CHHSLs, RSLs, and an ECV have not been established for sodium.

Bis(2-ethylhexyl)phthalate and methyl acetate were detected in the soil sample collected at AOC 4 at 2 to 3 feet bgs at location AOC4-1, as shown in Tables C10-6 and C10-10. The detected concentrations were 810 µg/kg and 12 µg/kg, respectively. Both are below respective interim screening levels of 2,870 µg/kg and 22,000,000 µg/kg.

As discussed in Section C.2 of the main text of Appendix C to the Part A Phase 1 Data Gaps Evaluation Report, PG&E recommends that the TAL/TCL metals and organics discussed above not be considered COPCs/COPECs for this AOC, and no further sampling for these constituents is proposed except for the detected Aroclor-1016, Aroclor-1254, and Aroclor-1260. These constituents have been fully discussed in Section C.2 of the main text of Appendix C.

2.2 Central Tendency Comparison to Background Threshold Values

Seventeen metals (antimony, barium, beryllium, cadmium, total chromium, hexavalent chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc) were detected above their respective Topock site-specific BTVs in soil samples collected from AOC 4. A central tendency comparison was performed for eight of these 17 metals (barium, total chromium, cobalt, lead, nickel, vanadium, and zinc) to compare the AOC 4 soil data set for these metals with the corresponding Topock soil background data set to determine whether a difference exists between the two populations and if additional sampling is required for a given metal, as shown in Table C10-11.

Metals in either the AOC 4 data set or background data set that were detected infrequently (less than five detects) or had a limited number of results (less than eight) were not tested. There were insufficient detections of antimony, beryllium, cadmium, molybdenum, selenium, silver and thallium at AOC 4 to conduct the test, and there were insufficient detections of hexavalent chromium and mercury in the background data set to allow for a central tendency comparison.

As shown in Table C10-11 and in plots on Figure 3-1 in the Part A Phase 1 Data Gaps Evaluation Report, results from the Gehan test indicated that site concentrations for barium, total chromium, cobalt, copper, lead, nickel, vanadium, and zinc may exceed background. Additional sampling is being proposed to define the lateral extent of copper and vertical extent of total chromium, lead, nickel, and zinc. The lateral and vertical extents of barium, cobalt, and vanadium have been adequately defined.

2.3 Nature and Extent Conclusions

Based on the site history, background, and conceptual site model, qualitative review indicates that the decision error has been held to an acceptable level. Post-remediation sampling indicates sufficient data of acceptable quality have been attained in areas likely to have been impacted by incidental disposal of debris.

Based on the DQOs, the following data gaps were identified to resolve Decision 1:

- Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans to the east and near the south-southeastern corner of the AOC.
- Data Gaps #2 – Vertical extent of various metals, PCBs, and dioxins/furans across the AOC; however, given the shallow depth to bedrock, additional sampling is limited to the northern portion of AOC, where bedrock is not near the surface.
- Data Gap #3 – Lateral and vertical extents of metals, PAHs, PCBs, and dioxins/furans at the mouth of the ravine near and in Bat Cave Wash.
- Data Gap #4 – Lateral and vertical extents of metals and dioxins/furans just inside the compressor station fence line, along the northern boundary of the AOC.

The potential Phase 2 soil sample locations to fill the identified data gaps are presented in Section 6.0 of this subappendix.

3.0 Decision 2 – Data Sufficient to Estimate Representative Exposure Point Concentrations

For Decision 2, data were evaluated to determine if the AOC 4 data are sufficient to conduct human health and ecological risk assessments based on the criteria described in Section 4.0 of the Part A Phase 1 Data Gaps Evaluation Report. The principal consideration for Decision 2 was whether there were sufficient data to estimate a representative exposure point concentration (EPC). Data reviewed were all available data at AOC 4, including data collected after the TCRA conducted in 2010, data collected during the gabion installations at the confluence of Bat Cave Wash and Area F of AOC 4 in 2010, and historical data remaining in place.

Table C10-12 summarizes the results of the evaluation to determine if data are sufficient to estimate a representative EPC. Data were reviewed for all chemicals that were detected in at least one sample and exceeded at least one comparison value. In general, existing data are adequate to support EPC development for detected chemicals that exceeded one or more comparison values (11 metals, dioxins/furans, PAHs, and PCBs) as described below.

3.1 Metals

Sufficient data (numbers of samples and detections) are available to calculate EPCs for barium, total chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc using ProUCL. For the remaining metals (antimony and cadmium), although sufficient data are not available to calculate EPCs (based on the 95 percent upper confidence limit on the mean), additional data collection is not expected to significantly change the results of the risk assessment because the compounds are very infrequently detected (that is, additional nondetects would be expected).

3.2 Dioxins/Furans

Sufficient data (numbers of samples and detections) are available to calculate EPCs for dioxins/furans (human, bird, and mammal TEQs) using ProUCL.

3.3 Polycyclic Aromatic Hydrocarbons

Sufficient data (numbers of samples and detections) are available to calculate EPCs for benzo(a)pyrene toxic equivalents and high-molecular-weight PAHs using ProUCL.

3.4 Polychlorinated Biphenyls

Sufficient data (numbers of samples and detections) are available to calculate EPCs for total PCBs using ProUCL.

4.0 Decision 3 – Potential Threat to Groundwater from Residual Soil Concentrations

Table C3-13 presents the results of the tiered screening analysis for AOC 4 following debris and soil removal. Ten metals had concentrations in excess of their respective background threshold value. Of those 10, cobalt, hexavalent chromium, and vanadium had one or more concentrations exceeding the calculated soil screening levels.

The hydrogeologic setting at AOC 4 is distinct from other AOCs at Topock because of the presence of shallow bedrock and deep groundwater. Bedrock is present at or near the surface across much of the AOC area, and is present at depths of 40 to 50 feet below ground surface in the northern part. The depth to groundwater is between 130 and 180 feet bgs. Numerical simulation of unsaturated flow and transport through fractured bedrock is a very complex undertaking, and requires a dual domain formulation of the unsaturated flow equations, which requires a large number of parameters that are highly site-specific. Because most of the parameters cannot be measured, parameter estimates would be highly uncertain, resulting in an inherently non-unique solution; that is, solutions to the equations would be highly variable and uncertain. Thus, simulation of a fractured rock domain was not performed. However, vadose zone modeling was performed, assuming the vadose zone at AOC 4 was comprised of soil. Assuming the fractured rock is a porous medium is a conservative approach in this extremely arid environment. At AOC 4, the bedrock is a minimally fractured, competent crystalline metadiorite. Fractures, particularly at depth, are not common, and the apertures relative to the pore scale, are large.

The screening level model was able to rule out the threat to groundwater from hexavalent chromium and cobalt. The potential for vanadium to leach to groundwater could not be ruled out based on the screening level model.

4.1 Vanadium

Because there is no MCL for vanadium, the calculated background threshold value (BTV) of 59.9 µg/L was initially used in the SSL calculation. Although the potential for vanadium to leach to groundwater could not be ruled out, it is highly unlikely that the metal is a threat to groundwater at AOC 4 for the following reasons:

- The depth to water at AOC 4 is at least 130 feet below ground surface. For vanadium to reach the water table, the presence of interconnected fractures in the competent crystalline bedrock would be required through the 130 feet to the water table.
- The modeling assumed that the results of the deepest sample (42 mg/kg) at a depth of 5 feet below ground surface extended to the water table.
- Vanadium has not been identified as a groundwater COPC at the Topock. Vanadium has been detected in Topock monitoring wells at concentrations above the UTL very infrequently. Monitoring wells MW-10 and MW-11 have one sample each (out of 22 and 13 total samples, respectively) that had vanadium detections above the UTL, which is within the statistical limits of the UTL.

5.0 Decision 4 – Data Sufficiency to Support the Corrective Measures Study/Feasibility Study

As discussed in Section 6.0 of the Part A Phase 1 Data Gaps Evaluation Report, various types of data will be needed to support the evaluation of technologies/remedial actions for the CMS/FS. The types of data needed vary somewhat depending on the specific technology to be evaluated. The categories of data required for technologies that may be applicable to the areas outside the fence line include:

- Extent of COPCs and COPECs above action levels (required for all technologies).
- Waste characterization parameters (required if soil may be disposed of offsite), as discussed in Table 6-1 in the Part A Phase 1 Data Gaps Evaluation Report.
- Constituent leachability (required to assess the need for fixation of leachable compounds and/or the feasibility of certain soil washing technologies).
- Soil physical properties (required for all technologies; however, the properties required vary among the different technologies), as discussed in Table 6-1 in the Part A Phase 1 Data Gaps Evaluation Report.

- Surface and subsurface features (required to determine whether there are physical impediments to implementing specific technologies and/or remediating specific areas).

The following is a summary of data for AOC 4 that are currently available to support CMS/FS.

5.1 Extent of COPCs and COPECs

A summary of the nature and extent of detected COPCs/COPECs is presented in Section 2.0 Decision 1 – Nature and Extent. The lateral and vertical extents of the COPCs and COPECs are discussed in Section 2.2, data results for selected constituents are shown in Figures C10-3 through C10-17, and data gaps associated with lateral delineation are discussed in Section 6.0 of this subappendix.

5.2 Waste Characterization Parameters

Partial waste characterization data are available to characterize the soil and other materials for a potential removal action and disposed in an offsite permitted facility. While none of the soils or other materials is considered ignitable, corrosive, or reactive, data are lacking to complete the evaluation of the toxicity characteristic. The maximum concentrations of these metals for each of the units were compared to the TTLCs, and no metals exceeded the TTLCs, as shown in Table C10-14. The maximum detected concentrations were also compared to the soluble threshold limit concentrations (STLCs). Concentrations of barium and copper exceeded 10 times the STLC once, total chromium exceeded 10 times the STLC 37 times, and lead exceeded 10 times the STLC four times, as shown in Table C10-14. In addition, total chromium also exceeded 20 times the toxicity characteristic leaching procedure (TCLP) in four samples and lead also exceeded 20 times the TCLP once, as indicated in Table C10-14. Because these two metals have the potential to exceed STLC or TCLP thresholds, additional leachability testing for waste characterization purposes may be required if soil excavation and offsite disposal is chosen as a remedy. For the purposes of supporting the CMS/FS, the lack of STLC or TCLP analysis is not considered a data gap, for the existing total concentrations are sufficient for the purposes of evaluating various remedial alternatives.

5.3 Soil Physical Properties

Soil physical property data collected during the Part A Phase 1 investigation were limited to grain size analysis only. Specific soil physical property data (that is, porosity, grain size, density, organic carbon content) are required to support the CMS/FS, as described in Table 6-1 of the Part A Phase 1 Data Gaps Evaluation Report.

5.4 Surface and Subsurface Features

There is extensive information regarding surface and subsurface features at AOC 4, but additional information may be required once remaining areas requiring remediation have been defined. Nearby roads and road structures, vegetation, and the location of bedrock are considered part of AOC 4. Similarly, subsurface utilities, including gas transmission pipelines and any culverts or other features, have been defined as part of the TCRA. All areas to be remediated will require a utility clearance prior to intrusive activities; however, no other data gaps pertaining to surface and subsurface features have been identified at this AOC.

Additional soil physical parameter data are needed to support the CMS/FS.

6.0 Summary of Data Gaps and Potential Phase 2 Soil Sample Locations to Fill Identified Gaps

Based on the Part A DQO, data gaps were identified for three of the four decisions and are summarized below by decision:

- **Decision 1 (Nature and Extent)** – the following data gaps were identified to resolve this decision:
  - Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans to the east and near the south-southeastern corner of the AOC
  - Data Gaps #2 – Vertical extent of various metals, PCBs, and dioxins/furans across the AOC; however, given the shallow depth to bedrock, additional sampling is limited to the northern portion of AOC, where bedrock is not near the surface
  - Data Gap #3 – Lateral and vertical extents of metals, PAHs, PCBs, and dioxins/furans at the mouth of the ravine near and in Bat Cave Wash
  - Data Gap #4 – Lateral and vertical extents of metals and dioxins/furans just inside the compressor station fence line, along the northern boundary of the AOC
- **Decision 2 (Data Sufficient to Estimate Representative EPCs).** No data gap was identified for this decision.
- **Decision 3 (Potential Threat to Groundwater from Residual Soil Concentrations).** No data gap was identified for this decision.
- **Decision 4 (Data Sufficient to Support the CMS/FS)**. The following data gap was identified to resolve this decision:
  - Data gap #5 – Soil physical property parameters to support the CMS/FS

Table C10-15 summarizes the potential Phase 2 sample locations, depths, description/ rationale for each location (that is, which data gaps they would address), and analytes. Proposed Phase 2 sample locations are also shown in Figure C10-18. The proposed Phase 2 sample locations are needed to fill quantitative data gaps, meet agency requirements, and further progress toward decision-making for soil remediation.

7.0 References

Alisto, Arcadis, CH2M HILL, NES, and Turnkey. 2009. *Work Plan for Time-Critical Removal Action at AOC 4, Pacific Gas and Electric Company Topock Compressor Station, Needles, California.* December.

__________. 2011. *Implementation Report for the Time-Critical Removal Action at AOC 4, PG&E Topock Compressor Station, Needles, California.* March.

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1.

CH2M HILL. 2007. *Revised Final RCRA Facility Investigation and Remedial Investigation Report. Volume 1 – Site Background and History.* August.

__________. 2010. *Data Quality Objectives – Part A Soil Investigation at the Pacific Gas and Electric Company Topock Compressor Station, Needles, California.* March 12.

United States Department of Interior (DOI). 2009. Action Memorandum. "Request for Time-critical Removal Action Number 4 at AOC 4 Debris Ravine, Pacific Gas and Electric Topock Compressor Station." May 29.

Tables

TABLE C10-1

Time-Critical Removal Action Target Endpoint Concentrations and RI/RFI Soil Interim Screening Levels

AOC 4 – Debris Ravine

Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station Needles, California

Parameter Name	Units	Target Endpoint Concentrations: Native Alluvium[a]	Target Endpoint Concentrations: Disturbed Alluvium[b]	RI/RFI Soil Interim Screening Level[c]
PG&E Property				
Metals				
Antimony	mg/kg	3,800	380	0.285
Arsenic	mg/kg	110	11	11
Barium	mg/kg	63,000	6,300	410
Beryllium	mg/kg	---	---	0.672
Cadmium	mg/kg	8,100	810	1.1
Chromium, Hexavalent	mg/kg	370	37	0.83
Chromium, total	mg/kg	14,000	1,400	39.8
Cobalt	mg/kg	3,000	300	12.7
Copper	mg/kg	380,000	38,000	16.8
Lead	mg/kg	8,000	800	8.39
Mercury	mg/kg	1,800	180	0.0125
Molybdenum	mg/kg	480,000	4,800	1.37
Nickel	mg/kg	160,000	16,000	27.3
Selenium	mg/kg	480,000	4,800	1.47
Silver	mg/kg	---	---	5.15
Thallium	mg/kg	---	---	2.32
Vanadium	mg/kg	520,000	5,200	52.2
Zinc	mg/kg	1,000,000	100,000	58
Semivolatile Organic Compounds				
Pentachloro phenol	ug/kg	90,000	9,000	2,490
Polyaromatic Hydrocarbons				
B(a)P Equivalent	ug/kg	1,300	130	38
Dioxins and Furans				
TEQ Avian	ng/kg	---	---	16
TEQ Human	ng/kg	500	50	50
TEQ Mammals	ng/kg	---	---	1.6
Polychlorinated Biphenyls				
Total PCBs	ug/kg	7,400	740	204
HNWR Property				
Metals				
Antimony	mg/kg	---	---	0.285
Arsenic	mg/kg	---	11	11
Barium	mg/kg	---	410	410
Beryllium	mg/kg	---	---	0.672
Cadmium	mg/kg	---	1.1	1.1
Chromium, Hexavalent	mg/kg	---	0.83	0.83
Chromium, total	mg/kg	---	39.8	39.8
Cobalt	mg/kg	---	12.7	12.7
Copper	mg/kg	---	16.8	16.8
Lead	mg/kg	---	8.39	8.39
Mercury	mg/kg	---	---	0.0125
Molybdenum	mg/kg	---	1.37	1.37

TABLE C10-1

Time-Critical Removal Action Target Endpoint Concentrations and RI/RFI Soil Interim Screening Levels

AOC 4 – Debris Ravine

Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station Needles, California

Parameter Name	Units	Target Endpoint Concentrations		RI/RFI Soil Interim Screening Level [c]
		Native Alluvium [a]	Disturbed Alluvium [b]	
HNWR Property				
Metals				
Nickel	mg/kg	---	27.3	27.3
Selenium	mg/kg	---	1.47	1.47
Silver	mg/kg	---	---	5.15
Thallium	mg/kg	---	---	2.32
Vanadium	mg/kg	---	52.2	52.2
Zinc	mg/kg	---	58	58
Semivolatile Organic Compounds				
Pentachloro phenol	ug/kg	---	2,490	2,490
Polyaromatic Hydrocarbons				
B(a)P Equivalent	ug/kg	---	---	38
Dioxins and Furans				
TEQ Avian	ng/kg	---	16	16
TEQ Human	ng/kg	---	50	50
TEQ Mammals	ng/kg	---	1.6	1.6
Polychlorinated Biphenyls				
Total PCBs	ug/kg	---	204	204

Notes:

[a] Native alluvium concentrations are 10 times the target endpoints

[b] Disturbed Alluvium Target Endpoint Concentrations include: commercial/industrial California human health screening levels and USEPA industrial regional screening levels

[c] Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional 6 screening level is used. The interim screening level is applicable to areas outside the fence line of the compressor station.

mg/kg milligrams per kilogram
ng/kg nanograms per killogram
ug/kg micrograms per kilogram
--- target not identified

TABLE C10-2
Conceptual Site Model – AOC 4 – Debris Ravine
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Disposal of Debris (including asbestos containing material)	Surface and subsurface soil	Percolation and/or infiltration Potential entrainment in stormwater/surface water runoff	Subsurface Soil Potential Groundwater	Wind erosion and atmospheric dispersion of surface soil Potential volatilization and atmospheric dispersion Potential extracted groundwater[a]
Burned Material	Surface and subsurface soil	Percolation and/or infiltration Potential entrainment in stormwater/surface water runoff	Subsurface Soil	Wind erosion and atmospheric dispersion of surface soil

[a] Quantitative evaluation of the groundwater pathway completed in the groundwater risk assessment (ARCADIS, 2009). Part A Phase I data were reviewed on a preliminary basis in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil; a comprehensive evaluation of the potential for constituents in soil to leach to groundwater will be completed after the Part A Phase 2 data are available.

TABLE C10-3
Sample Results: Metals
AOC 4 – Debris Ravine
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				0.285	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	0.0125	1.37	27.3	1.47	5.15	2.32	52.2	58
Residential Screening Level [2]:				30	0.07	5,200	16	39	0.29	280	23	3,000	80	10	380	1,600	380	380	5	390	23,000
Commercial Screening Level [3]:				380	0.24	63,000	190	500	37	1,400	300	38,000	320	180	4,800	16,000	4,800	4,800	63	5,200	100,000
Ecological Comparison Values [4]:				0.285	11.4	330	23.3	0.0151	139.6	36.3	13	20.6	0.0166	0.0125	2.25	0.607	0.177	5.15	2.32	13.9	0.164
Background [5]:				NE	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	NE	1.37	27.3	1.47	NE	NE	52.2	58
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, Hexavalent	Chromium, total	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
AOC4-2	10/03/08	0 - 0.5	N	ND (2)	6	230	ND (2)	ND (1)	8.68	84	12	280	26	0.13	2	34	ND (1)	ND (2)	ND (4)	36	200
	10/03/08	0.5 - 1	N	ND (2)	5.1	230	ND (2)	ND (1)	3.05	79	9.3	71	18	0.16	ND (2)	30	ND (1)	ND (2)	ND (4)	32	89
AOC4-3	08/24/08	0 - 0.5	N	ND (4J)	6.4	140	ND (2)	ND (2)	ND (0.401)	14	4.7	9.2	6.5	ND (0.1)	ND (2)	11	ND (2)	ND (2)	ND (4)	26	32
	08/24/08	0.5 - 1	N	ND (4)	6.9	110	ND (2)	ND (2)	ND (0.403)	11	4.6	8.9	6.5	ND (0.1)	ND (2)	9.2	ND (2)	ND (2)	ND (4)	26	32
AOC4-4	08/24/08	0 - 0.5	N	ND (4)	6	230	ND (2)	ND (2)	3.68	110	10	52	80	0.27	2.6	42	ND (2)	ND (2)	ND (4)	48	96
	08/24/08	0 - 0.5	FD	ND (4)	5.9	190	ND (2)	ND (2)	4.68	89	12	270	31	ND (0.1)	ND (2)	40	ND (2)	ND (2)	ND (4)	48	150
AOC4-5	10/03/08	0 - 0.5	N	ND (2)	6.2	330	ND (2)	ND (1)	6.84	120	13	63	30	ND (0.098)	ND (2)	49	ND (1)	ND (2)	ND (4)	45	120
AOC4-6	08/24/08	0 - 0.5	N	ND (4)	7.3	510	ND (2)	ND (2)	8.45	79	7.6	810	94	ND (0.1)	ND (2)	28	ND (2)	ND (2)	ND (4)	37	150
	08/24/08	0.5 - 1	N	ND (4)	5.9	310	ND (2)	ND (2)	5.03	54	7	350	33	ND (0.1)	ND (2)	23	ND (2)	ND (2)	ND (4)	35	170
	10/03/08	2 - 3	N	ND (2.1)	7	250	ND (2.1)	ND (1)	1.98 J	43	8.6	32	24	ND (0.1)	ND (2.1)	24	ND (1)	ND (2.1)	ND (4.1)	35	69
AOC4-7	10/03/08	0 - 0.5	N	ND (2)	6.3	460	ND (2)	ND (1)	5.5	100	14	450	280	ND (0.1)	ND (2)	47	ND (1)	ND (2)	ND (4)	48	210
AOC4-8	10/03/08	0 - 0.5	N	ND (2)	5.7	240	ND (2)	ND (1)	2.67	84	11	210	33	ND (0.1)	2.1	39	ND (1)	ND (2)	ND (4)	41	110
AOC4-9	08/24/08	0 - 0.5	N	ND (4)	7.4	650	ND (2)	ND (2)	11.4	90	7.3	4,000	54	0.18	2.3	27	ND (2)	ND (2)	ND (4)	40	170
AOC4-10	10/03/08	0 - 0.5	N	ND (2)	5.7	310	ND (2)	ND (1)	2.13	67	12	25	18	ND (0.1)	ND (2)	42	ND (1)	ND (2)	ND (4)	45	76
AOC4-11	10/03/08	0 - 0.5	N	ND (2J)	5.1	200 J	ND (2)	ND (1)	ND (0.402)	69	14	28	7.9	ND (0.1)	ND (2)	45	ND (1)	ND (2)	ND (4)	54	52
AOC4-12	10/03/08	0 - 0.5	N	ND (2)	6.2	200	ND (2)	ND (1)	ND (0.402)	25	7.2	15	6.4	ND (0.1)	ND (2)	21	ND (1)	ND (2)	ND (4)	26	38
	10/03/08	0.5 - 1	N	ND (2)	6.1	180	ND (2)	ND (1)	ND (0.403)	28	8.3	14	5.4	ND (0.1)	ND (2)	25	ND (1)	ND (2)	ND (4)	28	36
AOC4-12A	08/24/08	0 - 0.5	N	ND (4)	6.5	210	ND (2)	ND (2)	ND (0.401)	18	4.2	12	16	ND (0.1)	ND (2)	11	ND (2)	ND (2)	ND (2)	22	50
AOC4-13	08/24/08	0 - 0.5	N	ND (4)	7.3	940	ND (2)	ND (2)	15	92	5.7	93	130	0.49	3	22	ND (2)	ND (2)	ND (4)	26	380
AOC4-14	08/24/08	0 - 0.5	N	ND (4)	6.3	330	ND (2)	ND (2)	5.4	31	5.7	35	28	ND (0.1)	ND (2)	16	ND (2)	ND (2)	ND (4)	27	120
	08/24/08	0 - 0.5	FD	ND (4)	6.2	380	ND (2)	ND (2)	3.21	27	5.4	29	24	ND (0.1)	ND (2)	15	ND (2)	ND (2)	ND (4)	24	95
AOC4-15	09/19/08	0 - 0.5	N	34	9.9	2,900	ND (5)	19	36.6	1,500	21	3,600	11,000	2.6	99	580	ND (5)	ND (5)	ND (10)	26	6,900
	09/19/08	0.5 - 1	N	69	16	1,700	ND (5)	27	66.1	2,100	30	5,900	3,500	3.3	190	380	ND (5)	ND (5)	ND (10)	33	9,900
	09/19/08	2 - 3	N	ND (10)	9.7	2,500	ND (5.2)	5.8	40.9	520	12	4,000	670	0.65	39	230	ND (2.1)	ND (5.2)	ND (10)	40	2,500
AOC4-B10	10/05/08	0 - 0.5	N	ND (2)	10	180	ND (2)	ND (1)	3.37	160	10	70	41	ND (0.1)	ND (2)	23	ND (1)	ND (2)	ND (4)	29	280
AOC4-B20	10/05/08	0 - 0.5	N	ND (2.1)	6.3	150	ND (2.1)	ND (1)	4.09	270	5.1	70	83	0.59	ND (2.1)	14	ND (1)	ND (2.1)	ND (4.2)	20	350
AOC4-B30	10/05/08	0 - 0.5	N	ND (2.7)	2.1	16	ND (1.4)	ND (1.4)	ND (5.25)	44	ND (1.4)	9	8.9	ND (0.14)	ND (1.4)	1.6	ND (1.4)	ND (1.4)	ND (2.7)	2.6	70
AOC4-D10	10/05/08	0 - 0.5	N	ND (2.2)	9.6	180	ND (2.2)	ND (1.1)	38.5	310	9	83	46	2.2	5.3	27	ND (1.1)	ND (2.2)	ND (4.4)	12	210
AOC4-D20	10/05/08	0 - 0.5	N	ND (2.2)	40	240	ND (11)	ND (1.1)	11.8	160	ND (11)	540	59	29	ND (11)	22	ND (1.1)	ND (11)	ND (22)	25	840
AOC4-D30	10/05/08	0 - 0.5	N	ND (2.1)	5.4	400	ND (1)	ND (1)	6.04	160	5.7	79	37	2.9	2.5	20	ND (1)	ND (1)	ND (2.1)	23	130
AOC4-DE5	10/05/08	0 - 0.5	N	ND (2.3J)	1.8	140 J	ND (1.1)	ND (1.1)	201 S	720	6.4	31	23	0.55	ND (1.1)	16	ND (1.1)	ND (1.1)	ND (2.3)	25	850
AOC4-GH10	10/05/08	0 - 0.5	N	ND (2.2)	11	330	ND (4.4)	ND (1.1)	1.52	57	13	55	40	ND (0.11)	ND (4.4)	39	ND (1.1)	ND (4.4)	ND (8.7)	47	59
AOC4-GH30	10/05/08	0 - 0.5	N	3.2	7.4	1,000	ND (2.2)	ND (1.1)	27.9	190	9.9	590	150	0.55	6.9	41	ND (1.1)	ND (2.2)	ND (4.4)	37	300
AOC4-I20	10/05/08	0 - 0.5	N	ND (2.2)	6.9	530	ND (2.2)	ND (1.1)	13.4	94	10	71	34	0.11	2.2	37	ND (1.1)	ND (2.2)	ND (4.3)	36	120
AOC4-I30	10/05/08	0 - 0.5	N	ND (2.2)	6.5	250	ND (2.2)	ND (1.1)	ND (0.432)	60	11	40	6.2	ND (0.11)	ND (2.2)	36	ND (1.1)	ND (2.2)	ND (4.3)	43	48
AOC4-Z25	10/05/08	0 - 0.5	N	ND (2.1)	7.7	110	ND (2.1)	ND (1)	ND (0.405U)	24	8.9	11	6.1	ND (0.1)	ND (2.1)	20	ND (1)	ND (2.1)	ND (4.1)	32	35
AOC4-SS1	09/19/08	0 - 0.5	N	5.5	ND (2)	570	ND (2)	ND (2)	659	3,500	8.4	270	140	0.11	14	59	ND (2)	ND (2)	ND (4)	14	5,400
AOC4-SS2	10/03/08	0 - 0.5	N	ND (2)	3.8	46	ND (1)	3.4	4.1	140	1.4	15	43	ND (0.1)	ND (1)	6.6	ND (1)	ND (1)	ND (2)	4.7	170
AOC4-SS3	10/03/08	0 - 0.5	N	ND (2)	11	270	ND (2)	ND (1)	10.4	410	6.2	130	70	0.78	3.8	41	ND (1)	ND (2)	ND (4)	28	420
AOC4-Stained	10/04/08	0 - 0.5	N	5.3	ND (1)	350	ND (2)	ND (1)	1,560	2,000	9.7	42	62	0.59	4	31	ND (1)	ND (2)	ND (4)	27	110
AOC4-T1a	10/22/08	0 - 0.5	N	ND (2.1)	7.1	700	ND (2.1)	ND (1)	14.8	94	7.9	310	81	0.22	2.2	26	ND (1)	ND (2.1)	ND (4.1)	32	160
	10/22/08	3.5 - 4	N	ND (2.2)	8.8	490	ND (2.2)	ND (1.1)	2.26	80	12	640	50	ND (0.11)	ND (2.2)	41	ND (1.1)	ND (2.2)	ND (4.3)	53	62
AOC4-T2a	10/22/08	3.5 - 4	N	ND (2.3)	11	250	ND (4.5)	ND (1.1)	1.24	51	11	29	18	ND (0.11)	ND (4.5)	36	ND (1.1)	ND (4.5)	ND (9.1)	43	59

TABLE C10-3
Sample Results: Metals
AOC 4 – Debris Ravine
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				**0.285**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**0.0125**	**1.37**	**27.3**	**1.47**	**5.15**	**2.32**	**52.2**	**58**
Residential Screening Level [2]:				**30**	**0.07**	**5,200**	**16**	**39**	**0.29**	**280**	**23**	**3,000**	**80**	**10**	**380**	**1,600**	**380**	**380**	**5**	**390**	**23,000**
Commercial Screening Level [3]:				**380**	**0.24**	**63,000**	**190**	**500**	**37**	**1,400**	**300**	**38,000**	**320**	**180**	**4,800**	**16,000**	**4,800**	**4,800**	**63**	**5,200**	**100,000**
Ecological Comparison Values [4]:				**0.285**	**11.4**	**330**	**23.3**	**0.0151**	**139.6**	**36.3**	**13**	**20.6**	**0.0166**	**0.0125**	**2.25**	**0.607**	**0.177**	**5.15**	**2.32**	**13.9**	**0.164**
Background [5]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
AOC4-T2b	10/22/08	2.5 - 3	N	26	15	2,200	ND (4.1)	6.1	120	700	15	5,300	1,700	1.9	49	130	ND (1)	ND (4.1)	ND (8.2)	20	2,300
	10/22/08	7.5 - 8	N	ND (2.2)	7.1	1,000	ND (2.2)	ND (1.1)	8.09	130	13	62	39	ND (0.11)	2.3	43	ND (1.1)	ND (2.2)	ND (4.3)	57	160
AOC4-T2c	10/22/08	0 - 0.5	N	ND (2.2)	11	220	ND (4.4)	ND (1.1)	11.2	97	11	39	30	0.17	ND (4.4)	36	ND (1.1)	ND (4.4)	ND (8.8)	43	120
	10/22/08	2.5 - 3	N	ND (2.1)	6.4	220	ND (2.1)	ND (1.1)	1.46	86	12	28	15	ND (0.11)	ND (2.1)	40	ND (1.1)	ND (2.1)	ND (4.2)	46	72
AOC4-T3a	10/23/08	2.5 - 3	N	ND (2J)	3.7	140	ND (1)	ND (1)	13.6 J	280 J	3.1	63 J	78 J	0.16	2.5	8.1	ND (1)	ND (1)	ND (2)	12	290 J
	10/23/08	2.5 - 3	FD	ND (2)	3.7	130	ND (1)	ND (1)	10.7 J	210	3.4	29	67	0.18	1.9	8.8	ND (1)	ND (1)	ND (2)	14	230
AOC4-T3b	10/23/08	2.5 - 3	N	ND (2.1)	6.9	170	ND (2.1)	ND (1)	ND (0.412)	28	7.7	14	5.4	ND (0.1)	ND (2.1)	22	ND (1)	ND (2.1)	ND (4.1)	32	35
AOC4-T3c	10/23/08	2.5 - 3	N	ND (2.1)	6.8	170	ND (2.1)	ND (1)	ND (0.413)	39	9.4	36	6.6	ND (0.1)	3.3	31	ND (1)	ND (2.1)	ND (4.1)	36	51
AOC4-T4a	10/23/08	2.5 - 3	N	ND (2)	7.3	200	ND (2)	ND (1)	ND (0.402)	31	7.6	11	6.3	ND (0.1)	ND (2)	24	ND (1)	ND (2)	ND (4.1)	32	35
AOC4-T4b	10/23/08	2.5 - 3	N	ND (2.1)	4.8	130	ND (1)	ND (1)	ND (0.413)	33	7.1	13	4.3	ND (0.1)	ND (1)	23	ND (1)	ND (1)	ND (2.1)	29	31
AOC4-T4c	10/23/08	2.5 - 3	N	ND (2)	7.1	160	ND (2)	ND (1)	ND (0.409)	34	8.4	11	4	ND (0.1)	ND (2)	26	ND (1)	ND (2)	ND (4.1)	36	31
AOC4-Wood1	10/03/08	0	N	ND (10)	ND (5.2)	820	ND (5.2)	ND (5.2)	47.7 J	15,000	ND (5.2)	380	350	5	14	13	ND (5.2)	ND (5.2)	ND (10)	41	1,400
AOC4-Wood2	10/03/08	0	N	ND (11)	ND (5.4)	480	ND (5.4)	ND (5.4)	89.2 J	15,000	ND (5.4)	620	130	ND (0.11)	10	9.1	ND (5.4)	ND (5.4)	ND (11)	28	3,900
DR-1	04/24/97	0 - 0.5	N	ND (5)	3.5	180	0.58	ND (2)	ND (0.1)	31	9.1	23	13	ND (0.02)	ND (2)	28	1.1	---	---	32	71
	04/24/97	0.5 - 1	N	ND (5)	3.6	210	0.73	ND (2)	ND (0.1)	45	13	29	10	ND (0.02)	ND (2)	39	1	---	---	47	59
DR-2	04/24/97	0 - 0.5	N	ND (5)	4	230	0.61	ND (2)	0.13	39	9	30	19	0.07	ND (2)	27	1.1	---	---	35	82
DR-3	04/24/97	0 - 0.5	N	ND (5)	6.9	330	ND (0.5)	ND (2)	0.85	390	5.9	57	43	0.02	2.3	19	1.2	---	---	31	520
	04/24/97	0.5 - 1	N	ND (5)	4.6	180	ND (0.5)	ND (2)	0.43	160	7	43	20	0.02	ND (2)	22	0.58	---	---	30	280
DR-4	04/24/97	0 - 0.5	N	ND (5)	4	340	ND (0.5)	ND (2)	0.17	100	8.5	190	63	0.72	ND (2)	28	1.2	---	---	33	190
DR-5	04/24/97	0 - 0.5	N	ND (5)	2.8	200	ND (0.5)	ND (2)	ND (0.1)	33	5.7	22	24	0.02	ND (2)	14	1.6	---	---	22	94
	04/24/97	0.5 - 1	N	ND (5)	2.8	220	ND (0.5)	ND (2)	0.12	30	6.1	18	16	0.18	ND (2)	16	1.7	---	---	24	66
DR-6	04/24/97	0 - 0.5	N	ND (5)	3.9	360	ND (0.5)	ND (2)	0.29	91	61	54	100	0.73	ND (2)	19	ND (0.5)	---	---	28	160
	04/24/97	0.5 - 1	N	ND (5)	2.8	120	ND (0.5)	ND (2)	0.29	64	4.7	96	35	0.77	ND (2)	17	1.1	---	---	18	130
DR-7	04/24/97	0 - 0.5	N	ND (5)	3.4	180	ND (0.5)	ND (2)	0.4	72	7.2	31	42	0.42	ND (2)	21	ND (0.5)	---	---	29	120
	04/24/97	0.5 - 1	N	ND (5)	3.9	230	0.59	ND (2)	ND (0.1)	47	9.6	35	14	0.2	ND (2)	25	1.4	---	---	39	70
WP-DR	11/23/98	0	N	---	---	---	---	---	ND (0.67)	12.2	---	7.7	---	---	---	2.2 J	---	---	---	---	19.2 J

Notes:

1 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.

2 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used.

3 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

CHHSL = California human health screening levels

-- = not analyzed

FD = Field Duplicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

mg/kg = milligrams per kilogram

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE C10-4

Sample Results: Contract Laboratory Program Inorganics
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Contract Laboratory Program (CLP) Inorganics (mg/kg)							
Interim Screening Level [1]:				16,400	66,500	0.9	55,000	12,100	402	4,400	2,070
Residential Screening Levels [2]:				77,000	NE	1,600	55,000	NE	1,800	NE	NE
Commercial Screening Level [3]:				990,000	NE	20,000	720,000	NE	23,000	NE	NE
Ecological Comparison Values [4]:				NE	NE	0.9	NE	NE	220	NE	NE
Background [5]:				16,400	66,500	NE	NE	12,100	402	4,400	2,070
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aluminum**	**Calcium**	**Cyanide**	**Iron**	**Magnesium**	**Manganese**	**Potassium**	**Sodium**
AOC4-1	10/14/08	0 - 0.5	N	8,400	21,000	ND (1.01)	20,000	7,900	310	2,500 J	270

Notes:

1 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.

2 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used.

3 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

CHHSL = California human health screening levels

-- = not analyzed

FD = Field Dupliicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

mg/kg = milligrams per kilogram

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE C10- 5
Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

Location	Date	Depth (ft bgs)	Sample Type	1-Methyl naphthalene	2-Methyl naphthalene	Acena phthylene	Acenaphthene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	B(a)P Equivalent	PAH High molecular weight	PAH Low molecular weight
				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level [1]:				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	38	1,160	10,000
Residential Screening Levels [2]:				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	38	NE	NE
Commercial Screening Level [3]:				99,000	4,100,000	17,000,000	33,000,000	170,000,000	1,300	130	1,300	17,000,000	1,300	13,000	380	22,000,000	22,000,000	1,300	18,000	17,000,000	17,000,000	130	NE	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1,160	10,000
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
AOC4-1	10/14/08	0 - 0.5	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	14	11	37	12	18	28	ND (5)	37	ND (5)	12	ND (5)	10	24	20	190	10
	10/14/08	0.5 - 1	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND	ND
	10/14/08	2 - 3	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.2)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-A01	03/02/10	0	N	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	190 J	110 J	220 J	82 J	82 J	160 J	21 J	480 J	ND (5.6J)	78 J	ND (5.6J)	30 J	470 J	180	1,900	30
AOC4-A01minus	03/02/10	0	N	ND (5.4J)	ND (5.4J)	ND (5.4J)	ND (5.4J)	ND (5.4J)	130 J	82 J	170 J	66 J	39 J	110 J	17 J	310 J	ND (5.4J)	62 J	ND (5.4J)	39 J	260 J	130	1,200	39
AOC4-A01S	04/21/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	5.7	130 J	70	190	49	44	97	11	290	ND (5.3)	40	ND (5.3)	31	240	120	1,200	37
AOC4-A02	02/24/10	0	N	ND (5.7J)	ND (5.7J)	ND (5.7J)	ND (5.7J)	ND (5.7J)	110 J	71 J	160 J	59 J	39 J	110 J	18 J	190 J	ND (5.7J)	57 J	ND (5.7J)	20 J	190 J	110	1,000	20
AOC4-A03	03/01/10	0	N	ND (5.9J)	ND (5.9J)	ND (5.9J)	ND (5.9J)	12 J	420 J	190 J	520 J	140 J	100 J	260 J	37 J	760 J	ND (5.9J)	130 J	ND (5.9J)	70 J	700 J	320	3,300	82
	03/01/10	0	FD	ND (5.9J)	ND (5.9J)	ND (5.9J)	ND (5.9J)	10 J	290 J	170 J	490 J	120 J	90 J	240 J	33 J	720 J	ND (5.9J)	120 J	ND (5.9J)	55 J	650 J	280	2,900	65
AOC4-A04	07/27/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	6.7	ND (5)	ND (5)	ND (5)	ND (5)	7	ND (5)	ND (5)	ND (5)	ND (5)	6.3	4.8	20	ND
AOC4-A05	07/26/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND	ND
AOC4-A06	07/26/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND	ND
AOC4-A06_A07	08/10/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND	ND
AOC4-B01	03/03/10	0	N	ND (5.9J)	ND (5.9J)	ND (5.9J)	ND (5.9J)	13 J	410 J	170 J	510 J	110 J	97 J	250 J	30 J	770 J	ND (5.9J)	110 J	ND (5.9J)	110 J	640 J	300	3,100	120
AOC4-B01S	04/21/10	0	N	ND (5.6)	ND (5.6)	ND (5.6)	5.9	33 J	160 J	64 J	160 J	40 J	36 J	120 J	8.5	490 J	ND (5.6)	32 J	ND (5.6)	240 J	360 J	110	1,500	280
	04/21/10	0	FD	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5J)	5.5 J	ND (5.5J)	ND (5.5J)	ND (5.5J)	ND (5.5J)	5.9 J	ND (5.5)	18 J	ND (5.5)	ND (5.5J)	ND (5.5)	20 J	13 J	5.1	42	20
AOC4-B02	03/17/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	24	810	620	1,200	550	1,400	750	93	2,100	ND (5.4)	440	ND (5.4)	140	2,200	1,000	10,000	160
AOC4-B03	03/03/10	0	N	ND (5.5J)	ND (5.5J)	ND (5.5J)	ND (5.5J)	10 J	250 J	140 J	430 J	97 J	73 J	220 J	31 J	600 J	ND (5.5J)	97 J	ND (5.5J)	54 J	550 J	240	2,500	64
AOC4-B04	03/12/10	0	N	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	14	12	24	10	9	17	ND (5.6)	35	ND (5.6)	7.5	ND (5.6)	ND (5.6)	34	19	160	ND
AOC4-B05	07/26/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	7	8	19	8.7	6.7	10	ND (5)	21	ND (5)	7	ND (5)	ND (5)	19	13	110	ND
AOC4-B06	07/26/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	21	18	41	18	16	24	5	54	ND (5)	15	ND (5)	12	45	29	260	12
AOC4-B06_B07	08/10/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND	ND
AOC4-C01	03/02/10	0	N	ND (5.6J)	ND (5.6J)	6 J	22 J	95 J	1,000 J	750 J	1,400 J	190 J	380 J	1,200 J	63 J	2,400 J	14 J	200 J	ND (5.6J)	1,200 J	2,100 J	1,100	9,700	1,300
AOC4-C01S	04/22/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	25	14	31	12	8.9	20	ND (5.1)	46	ND (5.1)	8.9	ND (5.1)	6.5	39	22	200	6.5
AOC4-C02	03/29/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	44	380	180	280	87	80	360	24	800	ND (5.5)	79	ND (5.5)	210	740	270	3,000	250
AOC4-C03	03/18/10	0	N	8.8	12	ND (5.1)	ND (5.1)	5.8	170	140	240	94	80	160	22	530	ND (5.1)	76	6.5	37	480	210	2,000	70
AOC4-C04	03/18/10	0	N	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	6.3	6.3	11	ND (5.6)	ND (5.6)	6.7	ND (5.6)	16	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	16	9.6	62	ND
AOC4-C05	07/26/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	12	11	27	10	10	15	ND (5)	32	ND (5)	8.7	ND (5)	ND (5)	31	18	160	ND
AOC4-C06	07/26/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	6.7	ND (5)	ND (5)	ND (5)	ND (5)	6.3	4.4	13	ND
AOC4-C06_C07	08/10/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5	ND (5)	10	ND (5)	ND (5)	7	ND (5)	15	ND (5)	ND (5)	ND (5)	ND (5)	12	5.4	49	ND
	08/10/10	0	FD	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	7.7	ND (5)	ND (5)	6.7	ND (5)	16	ND (5)	ND (5)	ND (5)	ND (5)	13	4.9	43	ND
AOC4-D01	03/24/10	0	N	ND (5.5J)	ND (5.5J)	ND (5.5J)	ND (5.5J)	36 J	870 J	550 J	860 J	390 J	190 J	630 J	90 J	1,200 J	ND (5.5J)	330 J	ND (5.5J)	130 J	1,100 J	810	6,200	170
AOC4-D01S	04/12/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	11 J	6.2	11	5.2	ND (5.2)	9.6	ND (5.2)	17	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	16	9.9	76	ND
AOC4-D02	03/19/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (4.8)	ND	ND
AOC4-D03	03/19/10	0	N	ND (5.8)	ND (5.8)	ND (5.8)	ND (5.8)	ND (5.8)	25	21	31	14	14	19	ND (5.8)	25	ND (5.8)	10	ND (5.8)	ND (5.8)	27	30	190	ND
AOC4-D04	03/19/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (4.8)	ND	ND

TABLE C10-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level [1]:				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	38	1,160	10,000
Residential Screening Levels [2]:				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	38	NE	NE
Commercial Screening Level [3, 4]:				99,000	4,100,000	17,000,000	33,000,000	170,000,000	1,300	130	1,300	17,000,000	1,300	13,000	380	22,000,000	22,000,000	1,300	18,000	17,000,000	17,000,000	130	NE	NE
Ecological Comparison Values :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1,160	10,000
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1-Methyl naphthalene**	**2-Methyl naphthalene**	**Acena phthylene**	**Acenaphthene**	**Anthracene**	**Benzo (a) anthracene**	**Benzo (a) pyrene**	**Benzo (b) fluoranthene**	**Benzo (ghi) perylene**	**Benzo (k) fluoranthene**	**Chrysene**	**Dibenzo (a,h) anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**B(a)P Equivalent**	**PAH High molecular weight**	**PAH Low molecular weight**
AOC4-D05	07/26/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	12	11	28	12	10	15	ND (5)	33	ND (5)	9.7	ND (5)	5.3	30	18	160	5.3
AOC4-D06	07/27/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.7	ND (5)	ND (5)	ND (5)	ND (5)	7	ND (5)	ND (5)	ND (5)	ND (5)	6	4.7	19	ND
AOC4-D06_D07	08/10/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	8	5.7	15	5.3	ND (5)	9.3	ND (5)	19	ND (5)	ND (5)	ND (5)	ND (5)	20	9.4	82	ND
AOC4-E01S	04/22/10	0	N	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	66	41	90	36	25	57	7.1	130	ND (5.6)	27	ND (5.6)	23	110	65	590	23
AOC4-E02	04/16/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (4.7)	ND	ND
AOC4-E03	03/25/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	9.5	8.8	12	7.7	6.6	9.5	ND (5.5)	16	ND (5.5)	6.2	ND (5.5)	ND (5.5)	15	13	91	ND
AOC4-E04	03/25/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	17	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	13	4.8	30	ND
AOC4-E05	07/27/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND	ND
	07/27/10	0	FD	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	8.3	ND (5)	ND (5)	ND (5)	ND (5)	8.7	ND (5)	ND (5)	ND (5)	ND (5)	8	5	25	ND
AOC4-E06	07/27/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (4.4)	ND	ND
AOC4-E06_E07	08/10/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-F01S	04/22/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (4.7)	ND	ND
AOC4-F02	03/31/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	36	30	65	21	16	36	5.2	77	ND (5.2)	19	ND (5.2)	9.8	62	46	370	9.8
AOC4-F03	03/31/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	19	120	59	110	28	26	100	8.5	200	ND (5.3)	26	ND (5.3)	65	190	91	870	84
AOC4-F04	03/31/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	8.9	5.7	14	ND (5.3)	ND (5.3)	7.5	ND (5.3)	17	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	15	9.5	68	ND
AOC4-F05	08/09/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-G01S	04/22/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	88	49	98	40	31	78	8.3	140	ND (5.2)	30	ND (5.2)	23	120	77	680	23
AOC4-G04	08/04/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	34	27	63	31	23	46	6.8	100	ND (5.1)	25	ND (5.1)	15	92	44	450	15
AOC4-G05	08/05/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
AOC4-G06	08/09/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	39	23	45	18	18	37	ND (5)	82	ND (5)	16	ND (5)	13	71	36	350	13
AOC4-GB10	02/10/10	0 - 0.5	N	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	28 J	15 J	33 J	9.6 J	ND (5.6)	25 J	ND (5.6)	45 J	ND (5.6)	10 J	ND (5.6)	13 J	36 J	24	200	13
AOC4-GB11	02/10/10	0 - 0.5	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	13	7.9	16	5.4	ND (5.4)	ND (5.4)	ND (5.4)	21	ND (5.4)	5.4	ND (5.4)	9	19	13	88	9
	02/10/10	0 - 0.5	FD	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	13	11	20	8	ND (5.5)	13	ND (5.5)	28	ND (5.5)	7.6	ND (5.5)	13	23	16	120	13
AOC4-GB12	02/10/10	0 - 0.5	N	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	12	12	19	9	ND (5.6)	ND (5.6)	ND (5.6)	7.8	ND (5.6)	8.6	ND (5.6)	ND (5.6)	7.8	17	76	ND
AOC4-H04	07/27/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	11	6	ND (5)	6.7	ND (5)	16	ND (5)	ND (5)	ND (5)	ND (5)	13	5.3	53	ND
AOC4-H05	08/05/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-I04	05/19/10	0	N	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (4.9)	ND	ND
AOC4-I05	05/24/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	8	ND (5.5)	ND (5.5)	7.7	ND (5.5)	ND (5.5)	7.3	ND (5.5)	ND (5.5)	ND (5.5)	7	23	ND
AOC4-I06	08/11/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (4.7)	ND	ND
AOC4-I06_I07	08/13/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	5.4	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	5.4	4.7	11	ND
AOC4-J02	05/10/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (4.8)	ND	ND
AOC4-J03	05/17/10	0	N	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	5.6 J	ND (5.6J)	9 J	12 J	ND (5.6J)	7.9 J	8.2 J	16 J	ND (5.6J)	9.7 J	ND (5.6J)	6 J	13 J	8.4	81	6
AOC4-J04	06/15/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	17	15	32	13	11	18	ND (5)	42	ND (5)	11	ND (5)	8.3	36	23	200	8.3
AOC4-J05	06/07/10	0	N	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5.7)	ND (5)	ND	ND
AOC4-J06	06/07/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	9.3	7.9	23	9	5.7	13	ND (5.4)	23	ND (5.4)	7.2	ND (5.4)	7.5	20	13	120	7.5
AOC4-J06_J07	08/13/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	6.4	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	6.8	4.7	13	ND

TABLE C10-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level [1]:				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	38	1,160	10,000
Residential Screening Levels [2]:				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	38	NE	NE
Commercial Screening Level [3]:				99,000	4,100,000	17,000,000	33,000,000	170,000,000	1,300	130	1,300	17,000,000	1,300	13,000	380	22,000,000	22,000,000	1,300	18,000	17,000,000	17,000,000	130	NE	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1,160	10,000
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	1-Methyl naphthalene	2-Methyl naphthalene	Acena phthylene	Acenaphthene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	B(a)P Equivalent	PAH High molecular weight	PAH Low molecular weight
AOC4-K02	05/17/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
	05/17/10	0	FD	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
AOC4-K03	05/17/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	6.3	6	13	6.3	5.6	9.5	ND (5.3)	18	ND (5.3)	5.3	ND (5.3)	ND (5.3)	17	10	87	ND
AOC4-K04	06/16/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	34	36	86	34	28	50	7.4	96	ND (5)	28	ND (5)	32	82	57	480	32
AOC4-K05	06/15/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	18	17	34	18	9.9	21	ND (5.1)	32	ND (5.1)	14	ND (5.1)	13	28	26	190	13
AOC4-K06	06/15/10	0	N	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)	ND (4.9)	ND	ND
AOC4-K07	06/15/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (4.8)	ND	ND
AOC4-L01	05/14/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-L02	05/14/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-L03	05/13/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-L04	05/18/10	0	N	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (5.6J)	ND (4.9)	ND	ND
AOC4-L05	06/28/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-L06	06/28/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
	06/28/10	0	FD	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
AOC4-L07	09/16/10	0	N	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (4.8)	ND	ND
	09/16/10	0	FD	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (4.8)	ND	ND
AOC4-L07_L08	09/20/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-M01	09/30/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (4.7)	ND	ND
AOC4-M02	09/30/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	5.2	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	4.5	5.2	ND
AOC4-M03	10/04/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-M04	10/05/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-M05	09/20/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
AOC4-M06	07/08/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-M07	09/22/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
AOC4-M07_M08	09/22/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.8	ND (5.1)	ND (5.1)	5.5	ND (5.1)	12	ND (5.1)	ND (5.1)	ND (5.1)	5.8	9.2	4.8	33	5.8
AOC4-M08	09/22/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	16	13	22	7.2	6.5	15	ND (5.2)	35	ND (5.2)	6.2	ND (5.2)	15	30	19	150	15
AOC4-M08_M09	09/23/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.1	ND (5.1)	8.8	ND (5.1)	ND (5.1)	6.1	ND (5.1)	13	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	11	5.4	44	ND
AOC4-M10	10/01/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	11	7.8	15	5.8	5.1	10	ND (5.1)	23	ND (5.1)	5.1	ND (5.1)	5.4	21	12	100	5.4
AOC4-N01	09/30/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	7.7	9	19	10	ND (5)	14	ND (5)	29	ND (5)	8.4	ND (5)	7	24	14	120	7
AOC4-N02	09/30/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
AOC4-N03	10/04/10	0	N	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (4.7)	ND	ND
AOC4-N04	10/05/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	5.6	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	10	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	7.8	4.9	23	ND
AOC4-N05	10/05/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-N05A	07/08/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-N06	09/23/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	6.3	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	5.6	4.6	12	ND
AOC4-N07	09/23/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND

TABLE C10-5

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level [1]:				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	38	1,160	10,000
Residential Screening Levels [2]:				22,000	310,000	1,700,000	3,400,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	38	NE	NE
Commercial Screening Level [3]:				99,000	4,100,000	17,000,000	33,000,000	170,000,000	1,300	130	1,300	17,000,000	1,300	13,000	380	22,000,000	22,000,000	1,300	18,000	17,000,000	17,000,000	130	NE	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1,160	10,000
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	1-Methyl naphthalene	2-Methyl naphthalene	Acena phthylene	Acenaphthene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	B(a)P Equivalent	PAH High molecular weight	PAH Low molecular weight
AOC4-N08	09/23/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-O02	10/04/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	7	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	5.9	4.5	13	ND
AOC4-O03	10/26/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
	10/26/10	0	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-O04	10/26/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-O05	10/27/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
	10/27/10	0	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-O06	10/07/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-O07	10/01/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	8.1	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.7	4.5	14	ND
AOC4-O08	10/01/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.4	ND (5.1)	7.1	ND (5.1)	ND (5.1)	6.8	ND (5.1)	13	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	12	5.2	44	ND
AOC4-P03	10/04/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	6.9	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	9.3	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	7.9	5	24	ND
AOC4-P04	11/19/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
AOC4-P05	10/27/10	0	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.5)	ND	ND
	10/27/10	0	FD	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	8.6	ND (5.2)	ND (5.2)	ND (5.2)	5.2	5.8	4.5	14	5.2
AOC4-P06	10/25/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.8	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	4.5	5.8	ND
AOC4-P07	10/22/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	9.2	7.5	16	8.2	5.3	12	ND (5.3)	24	ND (5.3)	6.8	ND (5.3)	12	18	12	110	12
AOC4-P08	10/22/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-Q04	10/07/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	22	27	61	29	21	40	ND (5.1)	46	ND (5.1)	24	ND (5.1)	14	40	41	310	14
AOC4-Q05	10/07/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	10	9	20	8	6	15	ND (5)	22	ND (5)	6.7	ND (5)	6.4	18	14	110	6.4
	10/07/10	0	FD	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	11	10	21	8.1	6.4	16	ND (5)	28	ND (5)	6.7	ND (5)	13	23	16	130	13
AOC4-Q06	10/25/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-Q07	10/25/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.5	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	5.1	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	4.8	11	ND
AOC4-Q08	10/22/10	0	N	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)	ND (4.6)	ND	ND
AOC4-R05	10/29/10	0	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
	10/29/10	0	FD	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)	ND	ND
AOC4-R06	10/07/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	6.7	5.7	19	5.4	5	17	ND (5)	27	ND (5)	ND (5)	ND (5)	8.7	18	10	100	8.7
AOC4-R07	10/08/10	0	N	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	14	9	21	6	6	18	ND (5)	42	ND (5)	5.7	ND (5)	23	30	15	150	23

Notes:

1 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.
2 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used.
3 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.
4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.
5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.
Results greater than or equal to the interim screening level are circled.
NE = not established
USEPA = United States Environmental Protection Agency
DTSC = California Department of Toxic Substances Control
CHHSL = California human health screening levels
Calculations:
BaP equivalent = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all PAHs are nondetect, the final qualifier code is U.
PAHLow = Sum of Result of low molecular weight PAHs, zero is used for nondetect values.
PAHHigh= Sum of Result of high molecular weight PAHs, zero is used for nondetect values.
-- = not analyzed
µg/kg = micrograms per kilogram
FD = Field Dupliicate
ft bgs = feet below ground surface
J = concentration or reporting limit estimated by laboratory or data validation
N = Primary Sample
ND = not detected at the listed reporting limit

TABLE C10-6

Sample Results: Total Petroleum Hydrocarbons, Semivolatile Organic Compounds, and Volatile Organic Compounds
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Total Petroleum Hydrocarbons (mg/kg)			Semi-Volatile Organic Compounds (µg/kg)	Volatile Organic Compounds (µg/kg)
			Interim Screening Level[1] :	540	540	1,800	2,870	22,000,000
			Residential Screening Levels[2] :	NE	NE	NE	35,000	22,000,000
			Commercial Screening Level [3] :	NE	NE	NE	120,000	92,000,000
			RWQCB Environmental Screening Levels [4] :	540	540	1,800	NE	NE
			Ecological Comparison Values[5] :	NE	NE	NE	2,870	NE
			Background[6] :	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**TPH as diesel**	**TPH as gasoline**	**TPH as motor oil**	**Bis (2-ethylhexyl) phthalate**	**Methyl acetate**
AOC4-1	10/14/08	0 - 0.5	N	ND (10)	---	ND (10)	ND (330)	---
	10/14/08	0.5 - 1	N	ND (10)	---	ND (10)	ND (330)	---
	10/14/08	2 - 3	N	ND (10)	ND (0.98)	ND (10)	810	12

Notes:

1 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.
2 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used.
3 Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.
4 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.
5 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.
6 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.
Results greater than or equal to the interim screening level are circled.
Only detected SVOCs and VOCs are presented.
NE = not established
USEPA = United States Environmental Protection Agency
DTSC = California Department of Toxic Substances Control
RWQCB = Regional Water Quality Control Board
CHHSL = California human health screening levels
SVOCs = Semi-Volatile Organic Compounds
TPH = Total Petroleum Hydrocarbon
VOCs = Volatile Organic Compounds
-- = not analyzed
µg/kg = micrograms per kilogram
FD = Field Dupliicate
ft bgs = feet below ground surface
J = concentration or reporting limit estimated by laboratory or data validation
mg/kg = milligrams per kilogram
N = Primary Sample
ND = not detected at the listed reporting limit

TABLE C10-7
Sample Results: Pesticides
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Pesticides (µg/kg)																				
Interim Screening Level [1]:				2.1	2.1	2.1	33	77	430	270	77	5	370,000	370,000	370,000	21,000	21,000	21,000	500	430	130	53	340,000	460
Residential Screening Levels [2]:				2,300	1,600	1,600	33	77	430	270	77	35	370,000	370,000	370,000	21,000	21,000	21,000	500	430	130	53	340,000	460
Commercial Screening Level [3]:				9,000	6,300	6,300	130	270	1,700	960	270	130	3,700,000	3,700,000	3,700,000	230,000	230,000	230,000	2,000	1,700	520	190	3,800,000	1,800
Ecological Comparison Values [4]:				2.1	2.1	2.1	NE	NE	470	NE	NE	5	NE	NE	NE	NE	NE	NE	NE	470	NE	NE	NE	NE
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	4,4-DDD	4,4-DDE	4,4-DDT	Aldrin	alpha-BHC	alpha-Chlordane	beta-BHC	delta-BHC	Dieldrin	Endo sulfan I	Endo sulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxy chlor	Toxaphene
AOC4-1	10/14/08	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2J)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (50)

Notes:

1 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.
2 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used.
3 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.
4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.
5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.
Results greater than or equal to the interim screening level are circled.
NE = not established
USEPA = United States Environmental Protection Agency
DTSC = California Department of Toxic Substances Control
CHHSL = California human health screening levels
-- = not analyzed
µg/kg = micrograms per kilogram
FD = Field Dupliicate
ft bgs = feet below ground surface
J = concentration or reporting limit estimated by laboratory or data validation
N = Primary Sample
ND = not detected at the listed reporting limit

TABLE C10-8

Sample Results: Polychlorinated Biphenyls
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polychlorinated biphenyls (µg/kg)									
Interim Screening Level [1]:				3,900	140	140	220	220	220	220	220	220	204
Residential Screening Level [2]:				3,900	140	140	220	220	220	220	220	220	NE
Commercial Screening Level [3]:				21,000	540	540	740	740	740	740	740	740	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	204
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**	**Total PCBs**
AOC4-1	10/14/08	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	24	ND (17)	ND (17)	ND (17)	41
AOC4-A01	03/02/10	0	N	ND (19J)	ND (37J)	ND (19J)	ND (19J)	ND (19J)	120 J	ND (19J)	---	---	140
AOC4-A01minus	03/02/10	0	N	ND (18J)	ND (36J)	ND (18J)	ND (18J)	ND (18J)	150 J	ND (18J)	---	---	170
AOC4-A01S	04/21/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	170	ND (18)	---	---	190
AOC4-A02	02/24/10	0	N	ND (19J)	ND (37J)	ND (19J)	ND (19J)	ND (19J)	23 J	ND (19J)	---	---	42
AOC4-A03	03/01/10	0	N	ND (20J)	ND (39J)	ND (20J)	ND (20J)	ND (20J)	90 J	ND (20J)	---	---	110
	03/01/10	0	FD	ND (19J)	ND (39J)	ND (19J)	ND (19J)	ND (19J)	75 J	ND (19J)	---	---	94
AOC4-A04	07/27/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	19	ND (17)	ND (17)	ND (17)	36
AOC4-A05	07/26/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-A06	07/26/10	0	N	ND (16)	ND (33)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND
AOC4-A06_A07	08/10/10	0	N	ND (16)	ND (33)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND
AOC4-B01	03/03/10	0	N	ND (19J)	ND (39J)	ND (19J)	ND (19J)	ND (19J)	310 J	ND (19J)	---	---	330
AOC4-B01S	04/21/10	0	N	ND (18)	ND (37)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	---	---	ND
	04/21/10	0	FD	ND (18)	ND (37)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	---	---	ND
AOC4-B02	03/17/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	220	ND (18)	---	---	240
AOC4-B03	03/03/10	0	N	ND (18J)	ND (36J)	ND (18J)	ND (18J)	ND (18J)	100 J	ND (18J)	---	---	120
AOC4-B04	03/12/10	0	N	ND (19)	ND (37)	ND (19)	ND (19)	ND (19)	ND (19)	ND (19)	---	---	ND
AOC4-B05	07/26/10	0	N	ND (16)	ND (33)	ND (16)	ND (16)	ND (16)	22	ND (16)	ND (16)	ND (16)	38
AOC4-B06	07/26/10	0	N	ND (16)	ND (33)	ND (16)	ND (16)	ND (16)	53	ND (16)	ND (16)	ND (16)	69
AOC4-B06_B07	08/10/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-C01	03/02/10	0	N	ND (19J)	ND (38J)	ND (19J)	ND (19J)	ND (19J)	410 J	ND (19J)	---	---	430
AOC4-C01S	04/22/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	---	---	ND
AOC4-C02	03/29/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	170	ND (17)	---	---	190
AOC4-C03	03/18/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	400	ND (17)	---	---	420
AOC4-C04	03/18/10	0	N	ND (18)	ND (37)	ND (18)	ND (18)	ND (18)	37	ND (18)	---	---	55
AOC4-C05	07/26/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	120 J	ND (17)	ND (17)	ND (17)	140

TABLE C10-8

Sample Results: Polychlorinated Biphenyls
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polychlorinated biphenyls (µg/kg)									
Interim Screening Level [1]:				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**204**
Residential Screening Level [2]:				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**NE**
Commercial Screening Level [3]:				**21,000**	**540**	**540**	**740**	**740**	**740**	**740**	**740**	**740**	**NE**
Ecological Comparison Values [4]:				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**204**
Background [5]:				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**	**Total PCBs**
AOC4-C06	07/26/10	0	N	ND (16)	ND (33)	ND (16)	ND (16)	ND (16)	18	ND (16)	ND (16)	ND (16)	34
AOC4-C06_C07	08/10/10	0	N	ND (16)	ND (33)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND
	08/10/10	0	FD	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-D01	03/24/10	0	N	ND (18J)	ND (36J)	ND (18J)	ND (18J)	ND (18J)	340 J	ND (18J)	---	---	360
AOC4-D01S	04/12/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	21	ND (17)	---	---	38
AOC4-D02	03/19/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	---	---	ND
AOC4-D03	03/19/10	0	N	ND (19)	ND (38)	ND (19)	ND (19)	ND (19)	160	ND (19)	---	---	180
AOC4-D04	03/19/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	25	ND (18)	---	---	43
AOC4-D05	07/26/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	140	ND (17)	ND (17)	ND (17)	160
AOC4-D06	07/27/10	0	N	ND (16)	ND (33)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND
AOC4-D06_D07	08/10/10	0	N	ND (16)	ND (33)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND
AOC4-E01S	04/22/10	0	N	48	ND (37)	ND (18)	ND (18)	ND (18)	2,500	ND (18)	---	---	2,600
AOC4-E02	04/16/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	510	ND (18)	---	---	530
AOC4-E03	03/25/10	0	N	31	ND (35)	ND (18)	ND (18)	ND (18)	1,800	ND (18)	---	---	1,800
AOC4-E04	03/25/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	500	ND (17)	---	---	520
AOC4-E05	07/27/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	07/27/10	0	FD	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	66	ND (17)	ND (17)	ND (17)	83
AOC4-E06	07/27/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	17	ND (17)	ND (17)	ND (17)	34
AOC4-E06_E07	08/10/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-F01S	04/22/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	34	ND (18)	---	---	52
AOC4-F02	03/31/10	0	N	42	ND (35)	ND (17)	ND (17)	ND (17)	1,600	ND (17)	---	---	1,700
AOC4-F03	03/31/10	0	N	38	ND (35)	ND (18)	ND (18)	ND (18)	1,900	ND (18)	---	---	1,900
AOC4-F04	03/31/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	710	ND (18)	---	---	730
AOC4-F05	08/09/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-G01S	04/22/10	0	N	42	ND (34)	ND (17)	ND (17)	ND (17)	2,900	ND (17)	---	---	3,000
AOC4-G04	08/04/10	0	N	25	ND (34)	ND (17)	ND (17)	ND (17)	2,500	ND (17)	ND (17)	ND (17)	2,500

TABLE C10-8

Sample Results: Polychlorinated Biphenyls
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polychlorinated biphenyls (µg/kg)									
Interim Screening Level [1]:				3,900	140	140	220	220	220	220	220	220	204
Residential Screening Level [2]:				3,900	140	140	220	220	220	220	220	220	NE
Commercial Screening Level [3]:				21,000	540	540	740	740	740	740	740	740	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	204
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total PCBs
AOC4-G05	08/05/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-G06	08/09/10	0	N	30	ND (33)	ND (17)	ND (17)	ND (17)	2,100	640	ND (17)	ND (17)	2,800
AOC4-GB10	02/10/10	0 - 0.5	N	ND (18)	ND (37)	ND (18)	ND (18)	ND (18)	350	ND (18)	---	---	370
AOC4-GB11	02/10/10	0 - 0.5	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	350 J	ND (18)	---	---	370
	02/10/10	0 - 0.5	FD	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	900 J	ND (18)	---	---	920
AOC4-GB12	02/10/10	0 - 0.5	N	ND (18)	ND (37)	ND (18)	ND (18)	ND (18)	420	ND (18)	---	---	440
AOC4-H04	07/27/10	0	N	60	ND (33)	ND (16)	ND (16)	ND (16)	5,900	ND (16)	ND (16)	ND (16)	6,000
AOC4-H05	08/05/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	280	ND (17)	ND (17)	ND (17)	300
AOC4-I04	05/19/10	0	N	ND (19J)	ND (37J)	ND (19J)	ND (19J)	ND (19J)	1,200 J	ND (19J)	ND (19J)	ND (19J)	1,200
AOC4-I05	05/24/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
AOC4-I06	08/11/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
AOC4-I06_I07	08/13/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	77	53	ND (18)	ND (18)	140
AOC4-J02	05/10/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	78	ND (18)	---	---	96
AOC4-J03	05/17/10	0	N	ND (19J)	ND (37J)	ND (19J)	ND (19J)	ND (19J)	320 J	ND (19J)	ND (19J)	ND (19J)	340
AOC4-J04	06/15/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	300	ND (17)	ND (17)	ND (17)	320
AOC4-J05	06/07/10	0	N	ND (19)	ND (38)	ND (19)	ND (19)	ND (19)	ND (19)	ND (19)	ND (19)	ND (19)	ND
AOC4-J06	06/07/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	66	ND (18)	ND (18)	ND (18)	84
AOC4-J06_J07	08/13/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	75	49	ND (18)	ND (18)	130
AOC4-K02	05/17/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	---	---	ND
	05/17/10	0	FD	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	---	---	ND
AOC4-K03	05/17/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	---	---	ND
AOC4-K04	06/16/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	250	ND (17)	ND (17)	ND (17)	270
AOC4-K05	06/15/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	160	ND (17)	ND (17)	ND (17)	180
AOC4-K06	06/15/10	0	N	ND (19)	ND (37)	ND (19)	ND (19)	ND (19)	ND (19)	ND (19)	ND (19)	ND (19)	ND
AOC4-K07	06/15/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
AOC4-L01	05/14/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	---	---	ND

TABLE C10-8

Sample Results: Polychlorinated Biphenyls
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polychlorinated biphenyls (µg/kg)									
Interim Screening Level [1]:				3,900	140	140	220	220	220	220	220	220	204
Residential Screening Level [2]:				3,900	140	140	220	220	220	220	220	220	NE
Commercial Screening Level [3]:				21,000	540	540	740	740	740	740	740	740	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	204
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**	**Total PCBs**
AOC4-L02	05/14/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	---	---	ND
AOC4-L03	05/13/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	33	ND (18)	---	---	51
AOC4-L04	05/18/10	0	N	ND (18J)	ND (36J)	ND (18J)	ND (18J)	ND (18J)	ND (18J)	ND (18J)	ND (18J)	ND (18J)	ND
AOC4-L05	06/28/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
AOC4-L06	06/28/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	06/28/10	0	FD	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-L07	09/16/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
	09/16/10	0	FD	ND (18)	ND (37)	ND (18)	ND (18)	ND (18)	19	ND (18)	ND (18)	ND (18)	37
AOC4-L07_L08	09/20/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-M01	09/30/10	0	N	ND (18)	ND (36)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
AOC4-M02	09/30/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-M03	10/04/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
AOC4-M04	10/05/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	19	ND (17)	ND (17)	ND (17)	36
AOC4-M05	09/20/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-M06	07/08/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-M07	09/22/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-M07_M08	09/22/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	28	ND (17)	ND (17)	ND (17)	45
AOC4-M08	09/22/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	36	ND (17)	ND (17)	ND (17)	53
AOC4-M08_M09	09/23/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	43	ND (17)	ND (17)	ND (17)	60
AOC4-M10	10/01/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	140	29	ND (17)	ND (17)	180
AOC4-N01	09/30/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	160	34	ND (17)	ND (17)	200
AOC4-N02	09/30/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-N03	10/04/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	20	ND (18)	ND (18)	ND (18)	38
AOC4-N04	10/05/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-N05	10/05/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	33	ND (17)	ND (17)	ND (17)	50
AOC4-N05A	07/08/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND

TABLE C10-8

Sample Results: Polychlorinated Biphenyls
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polychlorinated biphenyls (µg/kg)									
Interim Screening Level [1]:				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**204**
Residential Screening Level [2]:				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**NE**
Commercial Screening Level [3]:				**21,000**	**540**	**540**	**740**	**740**	**740**	**740**	**740**	**740**	**NE**
Ecological Comparison Values [4]:				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**204**
Background [5]:				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**	**Total PCBs**
AOC4-N06	09/23/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	58	ND (17)	ND (17)	ND (17)	75
AOC4-N07	09/23/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-N08	09/23/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
AOC4-O02	10/04/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-O03	10/26/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/26/10	0	FD	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-O04	10/26/10	0	N	ND (17)	ND (35)	ND (17)	ND (17)	ND (17)	110	22	ND (17)	ND (17)	140
AOC4-O05	10/27/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/27/10	0	FD	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-O06	10/07/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-O07	10/01/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	28	ND (17)	ND (17)	ND (17)	45
AOC4-O08	10/01/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	100	25	ND (17)	ND (17)	130
AOC4-P03	10/04/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	24	ND (17)	ND (17)	ND (17)	41
AOC4-P04	11/19/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-P05	10/27/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/27/10	0	FD	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-P06	10/25/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-P07	10/22/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND
AOC4-P08	10/22/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-Q04	10/07/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	400	120	ND (17)	ND (17)	530
AOC4-Q05	10/07/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	290	88	ND (17)	ND (17)	390
	10/07/10	0	FD	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	380	100	ND (17)	ND (17)	490
AOC4-Q06	10/25/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-Q07	10/25/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
AOC4-Q08	10/22/10	0	N	ND (18)	ND (35)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND (18)	ND

TABLE C10-8

Sample Results: Polychlorinated Biphenyls
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Polychlorinated biphenyls (µg/kg)									
Interim Screening Level [1]:				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**204**
Residential Screening Level [2]:				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**	**220**	**220**	**NE**
Commercial Screening Level [3]:				**21,000**	**540**	**540**	**740**	**740**	**740**	**740**	**740**	**740**	**NE**
Ecological Comparison Values [4]:				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**204**
Background [5]:				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**	**Total PCBs**
AOC4-R05	10/29/10	0	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND
	10/29/10	0	FD	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	19	ND (17)	ND (17)	ND (17)	36
AOC4-R06	10/07/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	110	34	ND (17)	ND (17)	150
AOC4-R07	10/08/10	0	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	51	17	ND (17)	ND (17)	77

Notes:

1 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.

2 Residential screening level - residential USEPA regional screening levels

3 Commercial screening level - commercial USEPA regional screening levels

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

CHHSL = California human health screening levels

Calculations:

Total PCBs by Area = Sum of Result of PCBs. Detected values are summed plus ½ the RL for nondetect Aroclors if the Aroclor is detected somewhere in the area. If all aroclors in a particular sa

-- = not analyzed

µg/kg = micrograms per kilogram

FD = Field Dupliicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE C10-9
Sample Results: Dioxin and Furans
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Dioxin/Furans (ng/kg)																			
Interim Screening Level [1]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4.6	NE	NE	4.6	NE	50	16	1.6
Residential Regional Screening Levels [2]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	50	NE	NE
Commercial Screening Level [3]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	200	NE	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	16	1.6
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1,2,3,4,6,7,8-HpCDD**	**1,2,3,4,6,7,8-HpCDF**	**1,2,3,4,7,8,9-HpCDF**	**1,2,3,4,7,8-HxCDD**	**1,2,3,4,7,8-HxCDF**	**1,2,3,6,7,8-HxCDD**	**1,2,3,6,7,8-HxCDF**	**1,2,3,7,8,9-HxCDD**	**1,2,3,7,8,9-HxCDF**	**2,3,4,6,7,8-HxCDF**	**OCDD**	**OCDF**	**1,2,3,7,8-PeCDD**	**1,2,3,7,8-PeCDF**	**2,3,4,7,8-PeCDF**	**2,3,7,8-TCDD**	**2,3,7,8-TCDF**	**TEQ Human**	**TEQ Avian**	**TEQ Mammals**
AOC4-A01	03/02/10	0	N	270	19	ND (2.1)	ND (3.2)	ND (3.4)	8.4 J	2.6 J	6.2 J	ND (1.4)	ND (3.1)	3,700	38	ND (2.1)	ND (1.7)	ND (2.2)	ND (0.39)	ND (1.5)	8	5.5	8
AOC4-A01minus	03/02/10	0	N	470	41	ND (2.2)	7 J	ND (6.2)	17	ND (2.7)	14	ND (1.8)	ND (5.4)	5,300	39	ND (3.9)	ND (1.5)	ND (4)	ND (0.96)	ND (2.9)	15	10	15
AOC4-A01S	04/21/10	0	N	ND (27)	ND (2.5)	ND (0.38)	ND (1.1)	ND (0.6)	ND (1.1)	ND (0.34)	ND (1.1)	ND (0.41)	ND (0.39)	180	ND (3.6)	ND (1.4)	ND (0.38)	ND (0.37)	ND (0.21)	ND (1.1)	1.4	1.8	1.4
AOC4-A02	02/24/10	0	N	520	58	ND (1.3)	ND (1.7)	8.4 J	ND (7.4)	ND (2)	ND (2.5)	ND (2.3)	ND (4.1)	10,000	46	ND (1.2)	ND (1.8)	ND (1.5)	ND (0.21)	ND (1)	12	5.6	12
AOC4-A03	03/01/10	0	N	200	23	2.5 J	4.3 J	ND (4.4)	9.1 J	2.7 J	7.7 J	ND (1.3)	4.8 J	1,800	29	ND (2.3)	2.5 J	ND (3.1)	0.59 J	ND (1.8)	8.3	7.2	8.3
	03/01/10	0	FD	150	ND (11)	1.8 J	3.2 J	ND (3.4)	6.6 J	3.1 J	5.5 J	ND (0.36)	3.2 J	1,300	22 J	ND (1.9)	1.9 J	2.4 J	0.47 J	ND (1.5)	6.6	6.7	6.6
AOC4-A04	07/27/10	0	N	68	5.4 J	0.99 J	ND (1)	ND (0.83)	3.2 J	0.87 J	2.2 J	0.62 J	ND (3.1)	430	7.6 J	ND (0.21)	0.47 J	ND (0.26)	ND (0.33)	ND (0.9)	2.2	1.7	2.2
AOC4-A05	07/26/10	0	N	55	3.6 J	ND (0.29)	ND (0.78)	0.62 J	2.1 J	0.47 J	1.5 J	0.2 J	ND (2.5)	450	5.4 J	ND (0.13)	ND (0.3)	ND (0.29)	0.11 J	0.63 J	1.7	1.5	1.7
AOC4-A06	07/26/10	0	N	530	28	1.7 J	ND (2)	ND (1.6)	9.2 J	ND (0.79)	4.3 J	0.6 J	ND (5.3)	10,000 J	83	ND (0.21)	0.46 J	0.42 J	ND (0.078)	0.65 J	11	4.1	11
AOC4-A06_A07	08/10/10	0	N	33	ND (2.5)	ND (0.17)	ND (0.25)	ND (0.17)	1.5 J	ND (0.33)	1.3 J	ND (0.19)	ND (2.6)	280	4 J	ND (0.3)	ND (0.14)	ND (0.14)	ND (0.12)	ND (0.32)	1.1	0.84	1.1
AOC4-B01	03/03/10	0	N	110	9.6 J	0.84 J	ND (1.8)	2.5 J	4.4 J	ND (1.9)	3.1 J	ND (0.99)	1.8 J	1,000	10 J	ND (1)	2.1 J	ND (4.8)	ND (0.16)	2.1 J	4.5	6.6	4.5
AOC4-B01S	04/21/10	0	N	ND (0.98)	ND (0.16)	ND (0.19)	ND (0.29)	ND (0.19)	ND (0.29)	ND (0.17)	ND (0.29)	ND (0.35)	ND (0.2)	ND (7.5)	ND (0.35)	ND (0.42)	ND (0.3)	ND (0.3)	ND (0.18)	ND (0.55)	ND (0.47)	ND (0.81)	ND (0.47)
	04/21/10	0	FD	ND (1.2)	ND (0.29)	ND (0.35)	ND (0.53)	ND (0.25)	ND (0.36)	ND (0.23)	ND (0.36)	ND (0.45)	ND (0.33)	ND (11)	ND (0.34)	ND (0.44)	ND (0.33)	ND (0.32)	ND (0.17)	ND (0.25)	ND (0.51)	ND (0.71)	ND (0.51)
AOC4-B02	03/17/10	0	N	1,400	160	13	22	ND (43)	59	33	43	11 J	48	11,000	120	ND (16)	21	36	3 J	16	67	87	67
AOC4-B03	03/03/10	0	N	5,000	ND (490)	48	87	ND (130)	220	100	170	39	140	35,000	330	56	67	100	14	34	250	280	250
AOC4-B04	03/12/10	0	N	48	ND (3.7)	ND (0.31)	ND (0.93)	ND (1.1)	2.5 J	0.83 J	ND (1.1J)	ND (0.58)	ND (0.88)	330	3.1 J	ND (0.76)	ND (0.91)	1.3 J	ND (0.19)	0.89 J	2.1	3.1	2.1
AOC4-B05	07/26/10	0	N	140	8.7 J	0.9 J	ND (2.2)	1.1 J	6 J	0.87 J	4.3 J	ND (0.47)	ND (7)	1,100	17 J	ND (0.15)	0.59 J	0.56 J	ND (0.37)	0.94 J	4.1	3.3	4.1
AOC4-B06	07/26/10	0	N	350	33	4.1 J	ND (0.14)	4.7 J	ND (10)	2.8 J	ND (7.1)	1.3 J	ND (18)	2,700	55	ND (0.32)	1.3 J	1.8 J	ND (0.087)	ND (1.7)	8.2	6.2	8.2
AOC4-B06_B07	08/10/10	0	N	27	2.1 J	ND (0.21)	ND (0.35)	ND (0.33)	ND (1.2)	ND (0.14)	0.91 J	ND (0.19)	0.22 J	190	ND (2.7)	ND (0.32)	ND (0.14)	ND (0.14)	ND (0.13)	ND (0.3)	0.84	0.68	0.84
AOC4-C01	03/02/10	0	N	1,100	45	6.2 J	17	ND (12)	40	6.5 J	29	3.5 J	7.3 J	7,500	65	ND (7.1)	4.5 J	ND (10)	1.2 J	4.1 J	32	23	32
AOC4-C01S	04/22/10	0	N	12 J	ND (1.4)	ND (0.15)	ND (0.21)	ND (0.3)	ND (0.6)	ND (0.15)	0.53 J	ND (0.22)	ND (0.96)	160	2.5 J	ND (0.34)	ND (0.18)	ND (0.24)	ND (0.23)	0.58 J	0.73	1.2	0.73
AOC4-C02	03/29/10	0	N	690	37	2.2 J	ND (3.9)	ND (5.7)	20	ND (2.9)	9 J	ND (1.2)	3 J	6,700	54	2.7 J	2.4 J	ND (0.86)	ND (0.72)	ND (1.8)	17	8.4	17
AOC4-C03	03/18/10	0	N	8,000	340	28	120	ND (69)	310	36	240	17	51	46,000	310	ND (71)	22	34	15	10	240	160	240
AOC4-C04	03/18/10	0	N	120	7.8 J	ND (0.58)	3.1 J	1.9 J	6 J	1.3 J	5.3 J	0.88 J	1.3 J	810	7.1 J	ND (1.6)	ND (0.78)	1.1 J	ND (0.33)	0.93 J	4.9	4.6	4.9
AOC4-C05	07/26/10	0	N	370	20	2 J	3.9 J	2.5 J	12 J	2.1 J	6.7 J	2 J	ND (17)	2,900	29	ND (0.15)	1.1 J	ND (1.1)	ND (0.052)	ND (1.2)	8.9	4.7	8.9
AOC4-C06	07/26/10	0	N	91	5 J	0.64 J	1.4 J	0.82 J	3.7 J	0.66 J	ND (2.4)	1.5 J	ND (3.8)	530	7.5 J	ND (0.16)	ND (0.51)	ND (0.41)	ND (0.21)	0.85 J	2.6	2.2	2.6
AOC4-C06_C07	08/10/10	0	N	67	3.5 J	ND (0.22)	ND (0.61)	ND (0.4)	2.5 J	ND (0.43)	ND (1.3)	ND (0.21)	ND (4.4)	570	5.6 J	ND (0.34)	ND (0.18)	ND (0.18)	ND (0.14)	ND (0.19)	1.8	0.97	1.8
	08/10/10	0	FD	57	4.5 J	ND (0.29)	ND (0.51)	ND (0.67)	ND (0.52)	ND (0.3)	ND (0.49)	ND (0.38)	ND (5.1)	440	6.6 J	ND (0.54)	ND (0.26)	ND (0.26)	ND (0.14)	ND (0.45)	1.6	1.2	1.6
AOC4-D01	03/24/10	0	N	330 J	32 J	3.1 J	5.5 J	4.5 J	14 J	ND (2J)	ND (5.6J)	ND (1.1J)	ND (78J)	2,900 J	76 J	ND (2.9J)	ND (1.3J)	2.8 J	ND (0.66J)	ND (2.5J)	14	12	14
AOC4-D01S	04/12/10	0	N	ND (6.6)	ND (0.35)	ND (0.42)	ND (0.6)	ND (0.4)	ND (0.4)	ND (0.35)	ND (0.4)	ND (0.43)	ND (1.5)	51	ND (0.98)	ND (0.89)	ND (0.57)	ND (0.55)	ND (0.18)	ND (0.33)	0.9	1.2	0.9
AOC4-D02	03/19/10	0	N	74	ND (6.2)	0.59 J	0.81 J	ND (0.62)	2.8 J	ND (0.2)	ND (0.68)	ND (0.29)	ND (0.25)	870	18 J	ND (0.31)	ND (0.21)	ND (0.2)	ND (0.13)	ND (0.46)	1.8	0.93	1.8
AOC4-D03	03/19/10	0	N	470	39	3.7 J	3.1 J	4.5 J	15 J	1.5 J	6.8 J	ND (0.34)	ND (2.1)	5,800	110	ND (1.5)	ND (0.81)	1.2 J	ND (0.3)	1.6 J	12	6.9	12
AOC4-D04	03/19/10	0	N	150	13	1.2 J	1.4 J	1.6 J	ND (5)	0.68 J	ND (2)	ND (0.24)	ND (1.5)	1,300	26	ND (0.7)	ND (0.56)	ND (0.66)	ND (0.11)	1.4 J	3.5	3.1	3.5

TABLE C10-9

Sample Results: Dioxin and Furans

AOC 4 – Debris Ravine

Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Dioxin/Furans (ng/kg)																			
Interim Screening Level [1]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4.6	NE	NE	4.6	NE	50	16	1.6
Residential Regional Screening Levels [2]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	50	NE	NE
Commercial Screening Level [3]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	200	NE	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	16	1.6
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1,2,3,4,6,7,8 -HpCDD**	**1,2,3,4,6,7,8 -HpCDF**	**1,2,3,4,7,8,9 -HpCDF**	**1,2,3,4,7,8- HxCDD**	**1,2,3,4,7,8- HxCDF**	**1,2,3,6,7,8- HxCDD**	**1,2,3,6,7,8- HxCDF**	**1,2,3,7,8,9- HxCDD**	**1,2,3,7,8,9- HxCDF**	**2,3,4,6,7,8- HxCDF**	**OCDD**	**OCDF**	**1,2,3,7,8- PeCDD**	**1,2,3,7,8- PeCDF**	**2,3,4,7,8- PeCDF**	**2,3,7,8- TCDD**	**2,3,7,8- TCDF**	**TEQ Human**	**TEQ Avian**	**TEQ Mammals**
AOC4-D05	07/26/10	0	N	7,100	490	22	39	37	210	11 J	85	18	25	66,000	240	ND (0.3)	3.1 J	4 J	0.89 J	1.9 J	140	48	140
AOC4-D06	07/27/10	0	N	140	9 J	0.69 J	1.9 J	1.2 J	5.2 J	0.91 J	2.9 J	ND (0.45)	ND (5.5)	1,700	10 J	ND (0.8)	0.7 J	ND (0.62)	0.21 J	0.74 J	4.3	3.1	4.3
AOC4-D06_D07	08/10/10	0	N	180	11 J	ND (0.62)	2.9 J	ND (1.8)	7.4 J	ND (1.3)	4.6 J	ND (0.42)	ND (8.3)	1,500	17 J	ND (0.47)	ND (0.28)	ND (0.69)	ND (0.19)	ND (0.61)	4.9	2.7	4.9
AOC4-E01S	04/22/10	0	N	1,400 J	160 J	ND (13J)	ND (9.1)	ND (20J)	ND (48J)	ND (7.1J)	ND (12J)	ND (0.56J)	ND (310J)	13,000 J	520 J	ND (1.2J)	ND (12)	ND (19)	ND (1.1J)	13 J	46	47	46
AOC4-E02	04/16/10	0	N	1,100	58	7.6 J	3.2 J	3.2 J	14	ND (2.2)	ND (4.4)	ND (0.18)	ND (64)	74,000 J	240	ND (0.22)	ND (1.3)	3 J	ND (0.12)	3.2 J	41	20	41
AOC4-E03	03/25/10	0	N	4,800	360	32	ND (20)	32	110	13	34	ND (0.41)	29	42,000 J	630	ND (8)	8 J	14	ND (1.1)	15	98	60	98
AOC4-E04	03/25/10	0	N	82 J	15	ND (1.2)	ND (1.3)	ND (3.8)	ND (2.4)	ND (1.9)	---	ND (0.43)	1.6 J	520	19 J	ND (0.51)	6.9 J	4.2 J	ND (0.11)	3.8 J	3.9	9.8	3.9
AOC4-E05	07/27/10	0	N	250 J	23	1.5 J	1.7 J	2.9 J	5.8 J	1.3 J	3.1 J	1.1 J	ND (3.3)	4,700 J	26	ND (0.25)	ND (0.67)	ND (0.55)	ND (0.13)	0.76 J	6.3	3.4	6.3
	07/27/10	0	FD	99 J	7.4 J	0.56 J	1.5 J	1.3 J	4 J	1.1 J	2.9 J	ND (0.53)	ND (5.1)	780 J	8.5 J	ND (0.2)	ND (0.57)	ND (0.62)	0.17 J	2.9 J	3.3	4.7	3.3
AOC4-E06	07/27/10	0	N	120	8.2 J	0.88 J	2.1 J	1.3 J	5.1 J	1 J	3.1 J	2.6 J	ND (2.9)	1,000	9.1 J	ND (0.2)	0.96 J	ND (0.57)	ND (0.21)	ND (0.81)	3.6	2.4	3.6
AOC4-E06_E07	08/10/10	0	N	76	5.7 J	ND (0.21)	1.2 J	1 J	2.8 J	0.64 J	ND (1.6)	ND (0.15)	ND (5.6)	580	7.2 J	ND (0.31)	ND (0.15)	ND (0.3)	ND (0.081)	0.54 J	2.2	1.7	2.2
AOC4-F01S	04/22/10	0	N	ND (11)	2.6 J	0.34 J	ND (0.34)	ND (0.68)	0.83 J	ND (0.63)	ND (0.36)	ND (0.17)	ND (2.2)	120	5.1 J	ND (0.17)	ND (0.14)	ND (0.81)	0.41 J	ND (1.2)	1.1	1.8	1.1
AOC4-F02	03/31/10	0	N	810	81	10 J	ND (3.5)	ND (13)	ND (5.7)	ND (4.4)	ND (6.7)	ND (0.6)	ND (5.7)	11,000	230	ND (1.6)	8.1 J	12 J	ND (0.28)	8.8	20	27	20
AOC4-F03	03/31/10	0	N	710	90	ND (10)	ND (5.4)	ND (19)	ND (18)	10 J	---	ND (3.3)	9.5 J	6,700	240	ND (2.7)	15	26	ND (0.58)	17	26	52	26
AOC4-F04	03/31/10	0	N	250 J	38	ND (4.5)	ND (1.7)	5.9 J	ND (8.9)	4.2 J	---	ND (0.91)	ND (2.5)	1,500	82	ND (0.96)	ND (3.3)	ND (13)	ND (0.25)	11	8.8	20	8.8
AOC4-F05	08/09/10	0	N	4.7 J	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	30	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.072	0.031	0.072
AOC4-G01S	04/22/10	0	N	800	120	9.3 J	ND (0.73)	ND (24)	ND (0.77)	19	ND (0.72)	ND (0.43)	7.7 J	8,100	280	ND (2)	12 J	48	ND (0.51)	27	35	84	35
AOC4-G04	08/04/10	0	N	1,300	170	13	23	35	48	ND (0.01)	ND (0.01)	5.2 J	ND (0.01)	9,300	210	ND (0.01)	ND (0.01)	48	ND (0.01)	35	47	93	47
AOC4-G05	08/05/10	0	N	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	18 J	0.53 J	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.021	0.025	0.021
AOC4-G06	08/09/10	0	N	430	67	7.3 J	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	3,300	190	ND (0.01)	6.6 J	ND (0.01)	ND (0.01)	ND (0.01)	6.3	2.2	6.3
AOC4-GB10	02/10/10	0 - 0.5	N	4,200	140	14	16	ND (21)	88	ND (13)	29	ND (12.5)	ND (12.5)	52,000	260	ND (12.5)	ND (12.5)	6.5 J	ND (5)	ND (5)	87	37	87
AOC4-GB11	02/10/10	0 - 0.5	N	4,700	180	ND (12.5)	ND (13)	ND (28)	110	ND (17)	34	ND (12.5)	ND (14)	33,000	610	ND (12.5)	3.7 J	6.7 J	1.2 J	ND (5)	87	35	87
	02/10/10	0 - 0.5	FD	5,300	230	ND (12.5)	21	ND (43)	160	ND (23)	39	ND (12.5)	22	30,000	440	ND (12.5)	ND (12.5)	14	1.7 J	ND (5)	110	48	110
AOC4-GB12	02/10/10	0 - 0.5	N	490	26	ND (12.5)	5.5 J	ND (12.5)	14	ND (12.5)	ND (12.5)	ND (12.5)	ND (12.5)	4,400	66	ND (12.5)	ND (12.5)	1.4 J	ND (5)	ND (5)	21	18	21
AOC4-H04	07/27/10	0	N	190	110	11 J	ND (0.27)	38	ND (0.29)	35	ND (0.26)	ND (0.22)	18	1,600	110	ND (0.83)	22	67	ND (0.075)	49	39	130	39
AOC4-H05	08/05/10	0	N	12 J	6.8 J	0.89 J	ND (0.01)	2 J	ND (0.01)	1.6 J	ND (0.01)	ND (0.01)	0.93 J	90	8.1 J	ND (0.01)	1.1 J	2.7 J	ND (0.01)	2.4 J	1.8	5.8	1.8
AOC4-I04	05/19/10	0	N	110	25	ND (3)	ND (0.47)	8.6 J	ND (0.52)	9.4 J	ND (0.51)	ND (0.42)	3.7 J	920	43	ND (0.74)	5.9 J	22	ND (1)	11	13	37	13
AOC4-I05	05/24/10	0	N	27	ND (5.6)	ND (3.9)	1.8 J	1.7 J	ND (2.9)	ND (1.4)	2.9 J	ND (4.2)	2 J	250	ND (12)	ND (1)	ND (0.76)	ND (1)	1.9 J	ND (2.5)	4.3	5.3	4.3
AOC4-I06	08/11/10	0	N	29	3.1 J	0.43 J	ND (0.01)	ND (0.01)	ND (0.01)	0.51 J	ND (0.01)	ND (0.01)	ND (0.01)	330	6.1 J	ND (0.01)	ND (0.01)	0.63 J	ND (0.01)	0.98 J	0.78	1.8	0.78
AOC4-I06_I07	08/13/10	0	N	160	14	ND (1.2)	1.9 J	ND (0.27)	6.2 J	ND (1.2)	2.9 J	ND (0.31)	ND (28)	1,500	34	ND (0.55)	ND (1.4)	1.8 J	0.25 J	1.5 J	6	6.3	6
AOC4-J02	05/10/10	0	N	210	21	2.6 J	1.4 J	ND (1.4)	6 J	ND (3.2)	3.1 J	ND (0.96)	ND (0.78)	2,500	120	ND (0.48)	ND (0.4)	0.59 J	0.33 J	ND (0.47)	5.3	2.9	5.3
AOC4-J03	05/17/10	0	N	4,400	390	34	26	ND (26)	110	ND (63)	42	ND (0.4)	ND (770)	50,000	1,900	ND (0.7)	ND (0.35)	ND (8.2)	1.9 J	ND (3.9)	130	72	130
AOC4-J04	06/15/10	0	N	1,400	140	ND (7.7)	17	ND (10)	47	ND (4.5)	29	ND (0.48)	ND (140)	12,000	370	ND (14)	ND (0.78)	ND (0.65)	ND (0.64)	3 J	44	27	44

TABLE C10-9
Sample Results: Dioxin and Furans
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Dioxin/Furans (ng/kg)																			
Interim Screening Level [1]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4.6	NE	NE	4.6	NE	50	16	1.6
Residential Regional Screening Levels [2]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	50	NE	NE
Commercial Screening Level [3]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	200	NE	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	16	1.6
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1,2,3,4,6,7,8 -HpCDD**	**1,2,3,4,6,7,8 -HpCDF**	**1,2,3,4,7,8,9 -HpCDF**	**1,2,3,4,7,8-HxCDD**	**1,2,3,4,7,8-HxCDF**	**1,2,3,6,7,8-HxCDD**	**1,2,3,6,7,8-HxCDF**	**1,2,3,7,8,9-HxCDD**	**1,2,3,7,8,9-HxCDF**	**2,3,4,6,7,8-HxCDF**	**OCDD**	**OCDF**	**1,2,3,7,8-PeCDD**	**1,2,3,7,8-PeCDF**	**2,3,4,7,8-PeCDF**	**2,3,7,8-TCDD**	**2,3,7,8-TCDF**	**TEQ Human**	**TEQ Avian**	**TEQ Mammals**
AOC4-J05	06/07/10	0	N	55	ND (6.5)	ND (0.81)	ND (0.43)	ND (0.91)	1.8 J	ND (0.95)	1.3 J	ND (0.4)	0.62 J	580	20 J	ND (0.28)	ND (0.25)	ND (0.25)	ND (0.32)	ND (0.63)	1.6	1.2	1.6
AOC4-J06	06/07/10	0	N	1,600	150	13	12 J	ND (19)	57	ND (8.5)	27	ND (0.53)	14	14,000	450	ND (0.4)	ND (0.39)	ND (0.38)	ND (0.48)	ND (5.3)	35	15	35
AOC4-J06_J07	08/13/10	0	N	340	23	ND (1.8)	3.6 J	ND (0.27)	12 J	1.6 J	7.4 J	ND (0.31)	ND (49)	2,900	57	ND (0.63)	ND (0.28)	ND (1.4)	ND (0.17)	ND (1.4)	10	6.4	10
AOC4-K02	05/17/10	0	N	120 J	26	2.7 J	ND (0.93)	2.1 J	5.8 J	ND (1.3)	ND (2.1)	ND (0.28)	ND (1.6)	960 J	54	ND (0.92)	ND (0.37)	ND (0.21)	ND (0.29)	0.54 J	3.6	2.3	3.6
	05/17/10	0	FD	440 J	43	5.3 J	6 J	4.5 J	17	3 J	11 J	ND (2.6)	3 J	5,100 J	110	ND (0.4)	3 J	4.3 J	1 J	3.8 J	14	14	14
AOC4-K03	05/17/10	0	N	110	26	2.9 J	ND (1.1)	1.8 J	ND (4.8)	ND (1.7)	ND (2)	ND (1.2)	ND (44)	910	55	ND (0.91)	ND (0.28)	0.82 J	ND (0.14)	ND (0.5)	5.4	4.8	5.4
AOC4-K04	06/16/10	0	N	1,300	81	7.8 J	11 J	9.8 J	42	7.2 J	24	ND (1.2)	6.7 J	8,600	200	ND (0.82)	5.5 J	ND (0.84)	0.94 J	4.7 J	29	16	29
AOC4-K05	06/15/10	0	N	1,700	350	32	19	ND (46)	68	32	34	12 J	50	14,000	770	ND (0.54)	24	ND (0.57)	ND (1.7)	ND (19)	52	37	52
AOC4-K06	06/15/10	0	N	53	ND (2.8)	ND (0.47)	ND (0.63)	ND (0.49)	1.8 J	ND (0.34)	ND (0.98)	ND (0.33)	ND (10)	450	15 J	ND (0.36)	ND (0.21)	ND (0.31)	ND (0.37)	ND (0.32)	1.9	1.4	1.9
AOC4-K07	06/15/10	0	N	210	18	ND (1.2)	ND (1.6)	ND (1.7)	7.9 J	1 J	ND (3.9)	ND (0.4)	ND (29)	1,900	48	ND (0.93)	ND (0.42)	ND (0.42)	ND (0.25)	ND (0.88)	6.3	3.8	6.3
AOC4-L01	05/14/10	0	N	44	ND (5.6)	ND (2.7)	1.3 J	ND (1.1)	ND (2.1)	ND (1.3)	ND (1.9)	ND (2.6)	1 J	430	15 J	ND (0.16)	1 J	1.2 J	1.3 J	1.7 J	3.2	5	3.2
AOC4-L02	05/14/10	0	N	25	4.4 J	2.9 J	1.3 J	1.2 J	ND (2)	ND (0.87)	2.1 J	ND (3.2)	1.4 J	210	10 J	ND (0.17)	1.2 J	1.3 J	1.4 J	ND (1.6)	3.3	4.6	3.3
AOC4-L03	05/13/10	0	N	81	8 J	ND (1.4)	1.6 J	1.4 J	3.6 J	ND (0.99)	3.5 J	ND (1.1)	ND (0.6)	780	17 J	ND (0.44)	1 J	ND (0.79)	ND (0.18)	ND (1)	2.8	2.3	2.8
AOC4-L04	05/18/10	0	N	67	ND (6.3)	ND (2)	ND (1.1)	ND (0.87)	ND (3.1)	0.71 J	ND (1.8)	ND (2)	ND (1)	630	24 J	ND (0.48)	ND (0.75)	ND (0.8)	ND (0.67)	ND (1)	2.2	2.1	2.2
AOC4-L05	06/28/10	0	N	58	ND (5.4)	ND (0.62)	0.7 J	0.82 J	ND (2.2)	ND (0.3)	ND (1.2)	ND (0.42)	ND (7.2)	990	ND (11)	ND (0.26)	ND (0.3)	ND (0.3)	ND (0.097)	ND (0.067)	1.9	1.1	1.9
AOC4-L06	06/28/10	0	N	760 J	61	ND (0.43)	ND (1.2)	ND (5.7)	24	ND (2.8)	3.9 J	2.8 J	ND (100)	17,000 J	160	ND (0.21)	ND (0.61)	ND (1.6)	ND (0.24)	ND (0.71)	22	11	22
	06/28/10	0	FD	340 J	32	ND (0.3)	ND (0.53)	ND (1.5)	7.7 J	ND (0.89)	ND (1.5)	ND (0.28)	ND (41)	7,000 J	180	ND (0.15)	ND (0.41)	0.7 J	ND (0.13)	ND (0.92)	9.3	5	9.3
AOC4-L07	09/16/10	0	N	290	20	ND (0.74)	0.82 J	ND (0.26)	9.3 J	ND (1.9)	ND (1.4)	ND (0.32)	ND (57)	4,900	60	ND (0.18)	ND (0.21)	ND (0.61)	ND (0.16)	ND (0.24)	8.9	4.8	8.9
	09/16/10	0	FD	410	25	ND (0.38)	ND (0.61)	ND (0.29)	11 J	ND (1.9)	1.8 J	ND (0.35)	ND (65)	7,100	74	ND (0.23)	ND (0.26)	ND (0.26)	ND (0.12)	ND (0.33)	11	5.5	11
AOC4-L07_L08	09/20/10	0	N	1,400	100	8.2 J	2 J	9.2 J	35	ND (4.9)	5.4 J	5.1 J	ND (210)	25,000	310	ND (0.35)	ND (0.3)	ND (2)	ND (0.13)	ND (0.25)	40	20	40
AOC4-M01	09/30/10	0	N	15	2.7 J	ND (0.15)	ND (0.18)	ND (0.32)	ND (0.73)	ND (0.38)	ND (0.17)	ND (0.19)	ND (3.5)	140	9.8 J	ND (0.17)	ND (0.22)	ND (0.085)	ND (0.11)	ND (0.38)	0.67	0.68	0.67
AOC4-M02	09/30/10	0	N	95	ND (1.2)	ND (1.8)	ND (0.58)	ND (0.57)	ND (0.6)	ND (0.51)	ND (0.57)	ND (0.68)	ND (0.6)	960	ND (1.9)	ND (0.39)	ND (0.4)	ND (0.38)	ND (0.26)	ND (0.39)	1.9	1.1	1.9
AOC4-M03	10/04/10	0	N	12 J	ND (1)	ND (0.32)	ND (0.37)	ND (0.18)	ND (0.38)	ND (0.16)	ND (0.36)	ND (0.21)	ND (1.3)	120	ND (2.8)	ND (0.31)	ND (0.17)	ND (0.17)	ND (0.095)	ND (0.26)	0.55	0.58	0.55
AOC4-M04	10/05/10	0	N	45	4.1 J	0.6 J	ND (0.47)	0.82 J	2.8 J	ND (0.29)	1.6 J	ND (0.39)	ND (4.3)	450	ND (6.4)	ND (0.49)	ND (0.38)	ND (0.36)	ND (0.17)	ND (0.38)	1.8	1.4	1.8
AOC4-M05	09/20/10	0	N	41	2.5 J	ND (0.26)	0.33 J	ND (0.24)	1.2 J	ND (0.15)	ND (0.21)	ND (0.2)	ND (4.5)	680	5.9 J	ND (0.14)	ND (0.059)	ND (0.057)	ND (0.091)	ND (0.2)	1.2	0.68	1.2
AOC4-M06	07/08/10	0	N	1,600	110	6 J	2.3 J	9.6 J	39	ND (0.12)	5.9 J	5 J	ND (160)	38,000	270	0.5 J	1.1 J	2.6 J	ND (0.19)	0.59 J	44	21	44
AOC4-M07	09/22/10	0	N	140	8.4 J	ND (0.35)	ND (0.33)	ND (0.24)	3.3 J	ND (0.76)	ND (0.38)	ND (0.29)	ND (22)	2,900	26	ND (0.24)	ND (0.11)	ND (0.11)	ND (0.16)	ND (0.27)	4.1	2.1	4.1
AOC4-M07_M08	09/22/10	0	N	1,900	100	ND (0.73)	3.8 J	ND (8.9)	46	ND (5.5)	ND (9.2)	ND (0.43)	ND (170)	33,000	230	ND (0.34)	ND (1.5)	ND (2.3)	ND (0.3)	0.61 J	45	19	45
AOC4-M08	09/22/10	0	N	2,600	160	13	3.5 J	ND (16)	62	ND (9.7)	ND (8.7)	7.8 J	ND (310)	41,000	400	ND (0.45)	1.4 J	3.4 J	ND (0.31)	ND (0.45)	66	31	66
AOC4-M08_M09	09/23/10	0	N	1,600	74	6.7 J	7 J	ND (6.9)	38	2.4 J	13	ND (0.5)	ND (140)	27,000	210	ND (0.48)	ND (1.5)	2.1 J	ND (0.22)	ND (0.88)	39	18	39
AOC4-M10	10/01/10	0	N	2,200	97	14	18	ND (14)	77	ND (13)	ND (21)	ND (1.1)	ND (0.94)	22,000	230	ND (1.2)	ND (0.77)	5.1 J	ND (0.85)	ND (1.4)	44	17	44
AOC4-N01	09/30/10	0	N	510	37	3.1 J	5.1 J	ND (3.3)	17	2.6 J	10 J	ND (0.73)	ND (37)	4,500	65	ND (0.72)	ND (0.56)	1.5 J	ND (0.23)	ND (1.3)	13	7.8	13
AOC4-N02	09/30/10	0	N	5.3 J	ND (0.14)	ND (0.23)	ND (0.23)	ND (0.15)	ND (0.23)	ND (0.14)	ND (0.22)	ND (0.18)	ND (1.3)	50	ND (1.3)	ND (0.24)	ND (0.089)	ND (0.086)	ND (0.18)	ND (0.12)	0.42	0.44	0.42

TABLE C10-9

Sample Results: Dioxin and Furans
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

				Dioxin/Furans (ng/kg)																			
Interim Screening Level [1]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4.6	NE	NE	4.6	NE	50	16	1.6
Residential Regional Screening Levels [2]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	50	NE	NE
Commercial Screening Level [3]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	200	NE	NE
Ecological Comparison Values [4]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	16	1.6
Background [5]:				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	1,2,3,4,6,7,8 -HpCDD	1,2,3,4,6,7,8 -HpCDF	1,2,3,4,7,8,9 -HpCDF	1,2,3,4,7,8- HxCDD	1,2,3,4,7,8- HxCDF	1,2,3,6,7,8- HxCDD	1,2,3,6,7,8- HxCDF	1,2,3,7,8,9- HxCDD	1,2,3,7,8,9- HxCDF	2,3,4,6,7,8- HxCDF	OCDD	OCDF	1,2,3,7,8- PeCDD	1,2,3,7,8- PeCDF	2,3,4,7,8- PeCDF	2,3,7,8- TCDD	2,3,7,8- TCDF	TEQ Human	TEQ Avian	TEQ Mammals
AOC4-N03	10/04/10	0	N	140	ND (9.1)	ND (1.3)	ND (0.78)	ND (1.2)	5.1 J	ND (0.58)	ND (1.7)	ND (0.34)	ND (23)	1,400	31	ND (0.43)	ND (0.35)	ND (0.58)	ND (0.2)	ND (0.55)	4.2	2.6	4.2
AOC4-N04	10/05/10	0	N	230	15	ND (0.58)	ND (0.64)	ND (1.8)	8.3 J	ND (0.89)	ND (0.62)	ND (0.59)	ND (0.52)	2,700	43	ND (0.48)	ND (0.28)	ND (0.78)	ND (0.39)	ND (0.44)	4.9	2	4.9
AOC4-N05	10/05/10	0	N	140	15	ND (0.32)	ND (1)	ND (1.4)	4.6 J	ND (0.47)	2.1 J	ND (0.48)	ND (0.37)	1,700	40	ND (0.5)	ND (0.32)	ND (0.31)	ND (0.42)	0.54 J	3.5	2.1	3.5
AOC4-N05A	07/08/10	0	N	1,100	87	ND (0.27)	2.3 J	6.9 J	30	ND (0.087)	4.8 J	3.3 J	ND (120)	34,000	290	ND (0.16)	ND (0.89)	2.2 J	ND (0.14)	ND (0.49)	34	16	34
AOC4-N06	09/23/10	0	N	2,300	170	ND (0.86)	5.8 J	ND (13)	62	ND (6.8)	13	6.8 J	ND (270)	50,000	410	ND (0.36)	1.6 J	3.2 J	ND (0.36)	ND (0.77)	64	31	64
AOC4-N07	09/23/10	0	N	200	12 J	ND (0.53)	ND (0.46)	ND (0.51)	4.7 J	ND (0.99)	ND (1.1)	ND (0.61)	ND (29)	3,500	57	ND (0.27)	ND (0.18)	ND (0.27)	ND (0.16)	0.49 J	5.6	3.2	5.6
AOC4-N08	09/23/10	0	N	20	ND (0.97)	ND (0.34)	ND (0.25)	ND (0.43)	ND (0.38)	ND (0.12)	ND (0.25)	ND (0.17)	ND (3.4)	240	3.4 J	ND (0.19)	ND (0.085)	ND (0.082)	ND (0.1)	ND (0.36)	0.71	0.65	0.71
AOC4-O02	10/04/10	0	N	67	7.1 J	ND (0.95)	ND (1)	ND (0.68)	ND (2.4)	ND (0.6)	ND (1.1)	ND (0.81)	ND (6.6)	630	11 J	ND (0.39)	ND (0.46)	ND (0.45)	ND (0.33)	ND (0.34)	2	1.5	2
AOC4-O03	10/26/10	0	N	38	5.3 J	ND (1.2)	ND (2.4)	ND (1.7)	ND (2.8)	ND (1.6)	ND (2.8)	ND (2)	ND (1.2)	370	ND (11)	ND (1.1)	ND (0.58)	ND (1.1)	ND (0.82)	ND (0.72)	2.4	2.6	2.4
	10/26/10	0	FD	33	ND (3.5)	2 J	ND (1.6)	ND (1.7)	ND (2.2)	ND (1.3)	ND (1.6)	ND (1.3)	ND (0.66)	330	ND (9.9)	ND (0.67)	ND (0.63)	ND (0.94)	ND (0.59)	ND (0.36)	1.8	1.8	1.8
AOC4-O04	10/26/10	0	N	480	49	ND (4.2)	ND (5.1)	4.2 J	16	ND (2.9)	9.7 J	ND (0.99)	ND (2.1)	4,200	100	ND (0.62)	ND (0.63)	ND (2.1)	0.77 J	1.4 J	12	7	12
AOC4-O05	10/27/10	0	N	5 J	2.1 J	ND (1.1)	ND (0.34)	ND (0.63)	ND (0.58)	ND (0.34)	ND (0.61)	1.2 J	ND (0.28)	35	2.5 J	ND (0.29)	ND (0.41)	ND (0.12)	ND (0.23)	ND (0.65)	0.66	0.93	0.66
	10/27/10	0	FD	4.3 J	1.9 J	ND (1.1)	ND (0.43)	ND (0.36)	0.63 J	ND (0.32)	ND (0.95)	ND (0.61)	ND (0.1)	35	2.5 J	ND (0.36)	ND (0.41)	ND (0.31)	ND (0.14)	ND (0.51)	0.61	0.85	0.61
AOC4-O06	10/07/10	0	N	680	21	2.6 J	6.4 J	2.7 J	17	1.8 J	11 J	2.2 J	ND (37)	5,900	41	ND (0.23)	ND (0.35)	ND (0.34)	0.17 J	0.41 J	15	6.5	15
AOC4-O07	10/01/10	0	N	570	36	ND (1.1)	1.1 J	4.4 J	17	ND (4.7)	ND (2.3)	ND (0.41)	ND (0.36)	9,300	120	ND (0.38)	ND (0.43)	ND (0.42)	ND (0.19)	ND (0.29)	12	3.6	12
AOC4-O08	10/01/10	0	N	390	23	2.3 J	ND (0.68)	ND (0.27)	11 J	ND (2)	ND (2.4)	ND (0.32)	ND (67)	6,900	84	ND (0.25)	ND (0.53)	ND (0.68)	ND (0.17)	ND (0.34)	11	5.8	11
AOC4-P03	10/04/10	0	N	170	11 J	ND (0.73)	ND (1)	ND (1.4)	5 J	1.6 J	2.8 J	ND (0.37)	ND (14)	1,900	27	ND (0.44)	ND (0.46)	ND (0.44)	ND (0.22)	ND (0.48)	4.6	2.6	4.6
AOC4-P04	11/19/10	0	N	4.4 J	ND (2.5)	1.5 J	0.82 J	ND (0.87)	ND (1.1)	ND (1.1)	ND (1.4)	1.3 J	ND (0.75)	ND (23)	3.2 J	0.91 J	1.2 J	ND (0.5)	ND (0.36)	ND (0.95)	1.8	2.4	1.8
AOC4-P05	10/27/10	0	N	32	ND (0.092)	0.93 J	0.93 J	ND (0.87)	1.5 J	0.74 J	ND (1.4)	0.92 J	ND (0.42)	270	6.5 J	ND (0.24)	ND (0.52)	ND (0.26)	ND (0.16)	ND (0.56)	1.2	1.1	1.2
	10/27/10	0	FD	43	ND (0.21)	ND (2.2)	ND (1)	ND (1.4)	ND (1.7)	1.1 J	ND (1.4)	1.7 J	0.69 J	320	9.2 J	ND (0.41)	ND (0.81)	ND (0.43)	ND (0.091)	ND (0.91)	1.5	1.6	1.5
AOC4-P06	10/25/10	0	N	25	3 J	ND (0.55)	ND (1.9)	ND (1.1)	ND (1.4)	ND (1.2)	ND (1.2)	ND (1.4)	ND (0.65)	190	5.8 J	1.7 J	1.6 J	ND (1)	ND (0.45)	0.53 J	3	3.5	3
AOC4-P07	10/22/10	0	N	390	ND (19)	4.7 J	62	ND (0.98)	17	ND (5.2)	ND (6.9)	ND (1.5)	ND (93)	3,900	57	5.6 J	ND (0.97)	ND (1.7)	ND (3.9)	ND (1.1)	26	19	26
AOC4-P08	10/22/10	0	N	37	3.6 J	ND (1.3)	ND (1.5)	ND (0.66)	ND (0.98)	ND (0.58)	ND (1.1)	ND (1)	ND (0.71)	560	ND (2.5)	ND (1.3)	ND (1.1)	1.3 J	ND (0.53)	0.7 J	2.3	3.4	2.3
AOC4-Q04	10/07/10	0	N	2,000	140	12 J	25	14	64	9.3 J	42	ND (0.35)	ND (140)	15,000	280	ND (0.48)	4.5 J	11 J	ND (0.6)	8.9	53	41	53
AOC4-Q05	10/07/10	0	N	2,400	150	14	24	15	66	8.1 J	36	ND (0.43)	ND (210)	12,000	380	ND (0.56)	3.4 J	7.8 J	ND (0.59)	3.9 J	58	36	58
	10/07/10	0	FD	2,300	150	ND (12)	21	15	66	ND (6.8)	36	ND (0.27)	ND (200)	14,000	370	ND (0.53)	3.9 J	ND (6.3)	ND (0.82)	4 J	55	31	55
AOC4-Q06	10/25/10	0	N	15	2.6 J	ND (2.1)	ND (1.1)	1.5 J	ND (2)	ND (2)	ND (2.2)	ND (0.73)	2 J	89	ND (0.77)	ND (1)	0.94 J	1.3 J	0.71 J	0.67 J	2.7	4	2.7
AOC4-Q07	10/25/10	0	N	970	36	ND (3.5)	12 J	5.1 J	34	ND (3.6)	19	ND (0.94)	ND (53)	5,700	ND (53)	ND (3.4)	ND (2)	ND (1.7)	ND (0.96)	1.7 J	24	13	24
AOC4-Q08	10/22/10	0	N	69	6.5 J	ND (1.8)	ND (1.7)	ND (1.8)	ND (4.1)	ND (1.3)	ND (1.8)	ND (1.5)	ND (1.6)	760	ND (13)	ND (0.3)	ND (1.8)	ND (1.2)	ND (1.1)	0.95 J	2.7	3	2.7
AOC4-R05	10/29/10	0	N	20	ND (2.6)	ND (1.8)	1.5 J	ND (3.6)	ND (2.5)	ND (1.9)	2.9 J	ND (3)	1.3 J	160	9.8 J	ND (2.8)	ND (6.5)	ND (3.3)	ND (1.6)	ND (2)	4.3	6.2	4.3
	10/29/10	0	FD	31	13	ND (7.2)	3.1 J	ND (0.26)	4.8 J	3.6 J	ND (6.8)	7.2 J	2.3 J	180	27	2.5 J	3.3 J	ND (1.1)	ND (0.25)	ND (0.68)	5.9	5.9	5.9
AOC4-R06	10/07/10	0	N	710 J	41	4.2 J	13	5.3 J	24	4 J	19 J	1.1 J	ND (29)	5,200	80	ND (0.43)	1.5 J	2.3 J	ND (0.79)	2.1 J	19	12	19
AOC4-R07	10/08/10	0	N	1,600	67	5.2 J	24	6.8 J	55	ND (6.9)	39	2.3 J	ND (44)	11,000	90	ND (0.46)	3 J	ND (2.7)	1.2 J	2 J	37	18	37

Notes:

1 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.
2 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used.
3 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.
4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil."
May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil." July 1.
5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.
Results greater than or equal to the interim screening level are circled.
NE = not established
NA = not applicable
USEPA = United States Environmental Protection Agency
DTSC = California Department of Toxic Substances Control
CHHSL = California human health screening levels
Calculations:
Teq = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is U.
TeqBird = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is U.
TeqMammals = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is U.
-- = not analyzed
FD = Field Dupliicate
ft bgs = feet below ground surface
J = concentration or reporting limit estimated by laboratory or data validation
N = Primary Sample
ND = not detected at the listed reporting limit
ng/kg = nanograms per kilogram
R = rejected by laboratory or data validation

TABLE C10-10

Constituent Concentrations in Soil Compared to Screening Values
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

Parameter	Units	Frequency of detection	Maximum Detected Value	Background Threshold Value (BTV) [1]		Ecological Comparison Value (ECV) [2]		Residential Screening Level (Res SL) [3]		RWQCB Environmental Screening Levels (ESL) [4]		Commercial Screening Level (Com SL) [5]		Interim Screening Level (Int SL) [6]	
				# of Exceedences [7]	(BTV)	# of Exceedences [8]	(ECV)	# of Exceedences [8]	(Res SL)	# of Exceedences [8]	(ESL)	# of Exceedences [8]	(Com SL)	# of Exceedences [8]	(Int SL)
Dioxins and Furans															
TEQ Avian	ng/kg	118 / 119 (99%)	280	NA	(NE)	34	(16)	NA	(NE)	NA	(NE)	NA	(NE)	34	(16)
TEQ Human	ng/kg	118 / 119 (99%)	250	NA	(NE)	NA	(NE)	13	(50)	NA	(NE)	2	(200)	13	(50)
TEQ Mammals	ng/kg	118 / 119 (99%)	250	NA	(NE)	102	(1.6)	NA	(NE)	NA	(NE)	NA	(NE)	102	(1.6)
Metals															
Antimony	mg/kg	3 / 122 (2.5%)	2.7	NA	(NE)	3	(0.285)	0	(30)	NA	(NE)	0	(380)	3	(0.285)
Arsenic	mg/kg	30 / 122 (25%)	7.6	0	(11)	0	(11.4)	0	(0.07) *	NA	(NE)	0	(0.24) *	0	(11)
Barium	mg/kg	122 / 122 (100%)	1,300	13	(410)	13	(330) *	0	(5,200)	NA	(NE)	0	(63,000)	13	(410)
Beryllium	mg/kg	0 / 122 (0%)	ND (5.5) ‡	0	(0.672)	0	(23.3)	0	(16)	NA	(NE)	0	(190)	0	(0.672)
Cadmium	mg/kg	3 / 122 (2.5%)	1.7	2	(1.1)	2	(0.0151) *	0	(39)	NA	(NE)	0	(500)	2	(1.1)
Chromium	mg/kg	123 / 123 (100%)	160	59	(39.8)	59	(36.3) *	0	(280)	NA	(NE)	0	(1,400)	59	(39.8)
Chromium, Hexavalent	mg/kg	25 / 122 (20%)	16	15	(0.83)	0	(139.6)	0	(17)	NA	(NE)	0	(37)	15	(0.83)
Cobalt	mg/kg	123 / 123 (100%)	20	19	(12.7)	10	(13)	0	(23)	NA	(NE)	0	(300)	19	(12.7)
Copper	mg/kg	123 / 123 (100%)	790	54	(16.8)	42	(20.6)	0	(3,000)	NA	(NE)	0	(38,000)	54	(16.8)
Lead	mg/kg	122 / 123 (99%)	220	24	(8.39)	24	(0.0166) *	2	(80)	NA	(NE)	0	(320)	24	(8.39)
Mercury	mg/kg	5 / 122 (4.1%)	0.52	NA	(NE)	5	(0.0125)	0	(18)	NA	(NE)	0	(180)	5	(0.0125)
Molybdenum	mg/kg	0 / 122 (0%)	ND (5.5) ‡	0	(1.37)	0	(2.25)	0	(380)	NA	(NE)	0	(4,800)	0	(1.37)
Nickel	mg/kg	122 / 122 (100%)	75	52	(27.3)	52	(0.607) *	0	(1,600)	NA	(NE)	0	(16,000)	52	(27.3)
Selenium	mg/kg	0 / 122 (0%)	ND (5.5) ‡	0	(1.47)	0	(0.177) *	0	(380)	NA	(NE)	0	(4,800)	0	(1.47)
Silver	mg/kg	0 / 122 (0%)	ND (5.5) ‡	NA	(NE)	0	(5.15)	0	(380)	NA	(NE)	0	(4,800)	0	(5.15)
Thallium	mg/kg	0 / 122 (0%)	ND (11) ‡	NA	(NE)	0	(2.32)	0	(5)	NA	(NE)	0	(63)	0	(2.32)
Vanadium	mg/kg	122 / 122 (100%)	100	38	(52.2)	38	(13.9) *	0	(390)	NA	(NE)	0	(5,200)	38	(52.2)
Zinc	mg/kg	122 / 122 (100%)	410	13	(58)	13	(0.164) *	0	(23,000)	NA	(NE)	0	(100,000)	13	(58)
Contract Laboratory Program Inorganics															
Aluminum	mg/kg	1 / 1 (100%)	8,400	0	(16,400)	NA	(NE)	0	(77,000)	NA	(NE)	0	(990,000)	0	(16,400)
Calcium	mg/kg	1 / 1 (100%)	21,000	0	(66,500)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(66,500)
Iron	mg/kg	1 / 1 (100%)	20,000	NA	(NE)	NA	(NE)	0	(55,000)	NA	(NE)	0	(720,000)	0	(55,000)
Magnesium	mg/kg	1 / 1 (100%)	7,900	0	(12,100)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(12,100)
Manganese	mg/kg	1 / 1 (100%)	310	0	(402)	0	(220)	0	(1,800)	NA	(NE)	0	(23,000)	0	(402)
Potassium	mg/kg	1 / 1 (100%)	2,500	0	(4,400)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(4,400)
Sodium	mg/kg	1 / 1 (100%)	270	0	(2,070)	NA	(NE)	NA	(NE)	NA	(NE)	NA	(NE)	0	(2,070)
Cyanide	mg/kg	0 / 1 (0%)	ND (1.01) ‡	NA	(NE)	0	(0.9)	0	(1,600)	NA	(NE)	0	(20,000)	0	(0.9)
Organics															
Bis (2-ethylhexyl) phthalate	µg/kg	1 / 3 (33%)	810	NA	(NE)	0	(2,870)	0	(35,000)	NA	(NE)	0	(120,000)	0	(2,870)
Methyl acetate	µg/kg	1 / 1 (100%)	12	NA	(NE)	NA	(NE)	0	(22,000,000)	NA	(NE)	0	(92,000,000)	0	(22,000,000)
Polycyclic Aromatic Hydrocarbons															
1-Methyl naphthalene	µg/kg	1 / 122 (0.82%)	8.8	NA	(NE)	NA	(NE)	0	(22,000)	NA	(NE)	0	(99,000)	0	(22,000)
2-Methyl naphthalene	µg/kg	1 / 122 (0.82%)	12	NA	(NE)	NA	(NE)	0	(310,000)	NA	(NE)	0	(4,100,000)	0	(310,000)
Acena phthylene	µg/kg	1 / 122 (0.82%)	6	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Acenaphthene	µg/kg	2 / 122 (1.6%)	22	NA	(NE)	NA	(NE)	0	(3,400,000)	NA	(NE)	0	(33,000,000)	0	(3,400,000)
Anthracene	µg/kg	11 / 122 (9.0%)	95	NA	(NE)	NA	(NE)	0	(17,000,000)	NA	(NE)	0	(170,000,000)	0	(17,000,000)
Benzo (a) anthracene	µg/kg	52 / 122 (43%)	1,000	NA	(NE)	NA	(NE)	6	(380)	NA	(NE)	0	(1,300)	6	(380)

TABLE C10-10

Constituent Concentrations in Soil Compared to Screening Values
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

Parameter	Units	Frequency of detection	Maximum Detected Value	Background Threshold Value (BTV) [1] # of Exceedences [7]	(BTV)	Ecological Comparison Value (ECV) [2] # of Exceedences [8]	(ECV)	Residential Screening Level (Res SL) [3] # of Exceedences [8]	(Res SL)	RWQCB Environmental Screening Levels (ESL) [4] # of Exceedences [8]	(ESL)	Commercial Screening Level (Com SL) [5] # of Exceedences [8]	(Com SL)	Interim Screening Level (Int SL) [6] # of Exceedences [8]	(Int SL)
Polycyclic Aromatic Hydrocarbons															
Benzo (a) pyrene	µg/kg	48 / 122 (39%)	750	NA	(NE)	NA	(NE)	16	(38)	NA	(NE)	8	(130)	16	(38)
Benzo (b) fluoranthene	µg/kg	60 / 122 (49%)	1,400	NA	(NE)	NA	(NE)	6	(380)	NA	(NE)	1	(1,300)	6	(380)
Benzo (ghi) perylene	µg/kg	49 / 122 (40%)	550	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Benzo (k) fluoranthene	µg/kg	40 / 122 (33%)	1,400	NA	(NE)	NA	(NE)	2	(380)	NA	(NE)	1	(1,300)	2	(380)
Chrysene	µg/kg	53 / 122 (43%)	1,200	NA	(NE)	NA	(NE)	0	(3,800)	NA	(NE)	0	(13,000)	0	(3,800)
Dibenzo (a,h) anthracene	µg/kg	22 / 122 (18%)	93	NA	(NE)	NA	(NE)	0	(110)	NA	(NE)	0	(380)	0	(380)
Fluoranthene	µg/kg	70 / 122 (57%)	2,400	NA	(NE)	NA	(NE)	0	(2,300,000)	NA	(NE)	0	(22,000,000)	0	(2,300,000)
Fluorene	µg/kg	1 / 122 (0.82%)	14	NA	(NE)	NA	(NE)	0	(2,300,000)	NA	(NE)	0	(22,000,000)	0	(2,300,000)
Indeno (1,2,3-cd) pyrene	µg/kg	45 / 122 (37%)	440	NA	(NE)	NA	(NE)	1	(380)	NA	(NE)	0	(1,300)	1	(380)
Naphthalene	µg/kg	1 / 122 (0.82%)	6.5	NA	(NE)	NA	(NE)	0	(3,600)	NA	(NE)	0	(18,000)	0	(3,600)
Phenanthrene	µg/kg	40 / 122 (33%)	1,200	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
Pyrene	µg/kg	67 / 122 (55%)	2,200	NA	(NE)	NA	(NE)	0	(1,700,000)	NA	(NE)	0	(17,000,000)	0	(1,700,000)
PAH Low molecular weight	µg/kg	40 / 122 (33%)	1,300	NA	(NE)	0	(10,000)	NA	(NE)	NA	(NE)	NA	(NE)	0	(10,000)
PAH High molecular weight	µg/kg	71 / 122 (58%)	10,000	NA	(NE)	12	(1,160)	NA	(NE)	NA	(NE)	NA	(NE)	12	(1,160)
B(a)P Equivalent	µg/kg	71 / 122 (58%)	1,100	NA	(NE)	NA	(NE)	20	(38)	NA	(NE)	10	(130)	20	(38)
Polychlorinated biphenyls															
Aroclor 1016	µg/kg	8 / 120 (6.7%)	60	NA	(NE)	NA	(NE)	0	(3,900)	NA	(NE)	0	(21,000)	0	(3,900)
Aroclor 1254	µg/kg	70 / 120 (58%)	5,900	NA	(NE)	NA	(NE)	26	(220)	NA	(NE)	10	(740)	26	(220)
Aroclor 1260	µg/kg	11 / 120 (9.2%)	640	NA	(NE)	NA	(NE)	1	(220)	NA	(NE)	0	(740)	1	(220)
Total PCBs	µg/kg	70 / 120 (58%)	6,000	NA	(NE)	26	(204)	NA	(NE)	NA	(NE)	NA	(NE)	26	(204)

TABLE C10-10

Constituent Concentrations in Soil Compared to Screening Values
AOC 4 – Debris Ravine
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station Needles,California

Notes

1 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

2 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil" July 1

3 Residential screening level - residential DTSC CHHSL. If the residential DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

4 Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

5 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used. (PCBs are an exception to this rule since their final screening levels are equal to the EPA regional screening levels).

6 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values and DTSC CHHSL is used, if the DTSC CHHSL is not available, the USEPA regional screening level is used.

7 Number of exceedences are the number of detections exceeding the background threshold value (BTV).

8 Number of exceedences are the number of detections that are equal to or exceeds the screening level (ecological comparison value, residential reporting limit, commercial reporting limit or interim screening level) or otherwise noted.

* Number of exceedances are calculated using background threshold value because it is greater than the respective screening level.

‡ Maxiumum Reporting Limit greater than or equal to the interim screening level

USEPA regional screening level - USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

CHHSL - California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

mg/kg	miligrams per kilogram
µg/kg	micrograms per kilogram
ng/kg	nanograms per kilogram
NA	not applicable
ND	not detected in any of the samples
NE	not established
SL	screening level

USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water Board	Regional Water Quality Control Board

Calculations:

Regional Water Quality Control Board
Total PCBs by Area = Sum of Result of PCBs. Detected values are summed plus ½ the RL for nondetect Aroclors if the Aroclor is detected somewhere in the area. If all aroclors in a particular sample are nondetect the PCB Total is 0.
PAHLow = Sum of Result of low molecular weight PAHs, zero is used for nondetect values
PAHHigh= Sum of Result of high molecular weight PAHs, zero is used for nondetect values
BaP equivalent = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all PAHs are nondetect, the final qualifier code is U.
Teq = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is U.
TeqBird = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is U.
TeqMammals = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is U.

TABLE C10-11
Central Tendency Comparisons (Site to Background)
AOC 4 - Debris Ravine
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Parameter	Comparison Test Used	Probability that the Observed Differences Would Occur Purely by Chance	Statistical Decision with 0.05 Significance Level	Mean of Site Detects	Mean of Bkgd Detects	Median of Site Detects	Median of Bkgd Detects	Number of Site Detects	Number of Site Samples	Number of Bkgd Detects	Number of Bkgd Samples	Percent Detects Site	Percent Detects Bkgd
Barium	WRS	0.000	Site > Bkgd	257	165	210	135	125	125	60	60	100	100
Chromium	WRS	0.000	Site > Bkgd	43.3	22.3	37	21.9	125	125	70	70	100	100
Cobalt	WRS	0.000	Site > Bkgd	9.47	7.85	9	7.61	125	125	58	59	100	98
Copper	WRS	0.000	Site > Bkgd	28.1	10.5	15	10.1	125	125	70	70	100	100
Lead	Gehan	0.000	Site > Bkgd	10.4	4.38	5.7	3.5	124	125	59	60	99	98
Nickel	WRS	0.000	Site > Bkgd	27.3	15.4	26	15	125	125	70	70	100	100
Vanadium	WRS	0.000	Site > Bkgd	45	34	42	34.1	125	125	60	60	100	100
Zinc	WRS	0.000	Site > Bkgd	51.6	36.8	43	35.5	125	125	70	70	100	100

Bkgd = background

nsd = no statistical difference
< = less than

TABLE C10-12
Decision 2 Data Gaps Summary - AOC4
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California.

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [a] Y or N	> ECV or Background as Applicable? [a] Y or N	Proposed Sample ID	Notes
Metals							
Antimony				**30 mg/kg**	**0.285 mg/kg**		
0-0.5 ft bgs	N	3 of 117	2.7 mg/kg	N	Y	None	Compound exceeds ECV. Although there are insufficient detections to allow calculation of a 95% UCL on the mean, additional data collection is not expected to yield sufficient detections to strongly influence the EPC as additional sampling would likely result in additional non-detect values
0-3 ft bgs	N	3 of 119	2.7 mg/kg	N	Y		
0-6 ft bgs	N	3 of 122	2.7 mg/kg	N	Y		
0-10 ft bgs	N	3 of 122	2.7 mg/kg	N	NA		
Barium				**5200 mg/kg**	**410 mg/kg (bckg)**		
0-0.5 ft bgs	Y	117 of 117	1300 mg/kg	N	Y	None	Compound exceeds ECV and background. Existing data adequate for EPC.
0-3 ft bgs	Y	119 of 119	1300 mg/kg	N	Y		
0-6 ft bgs	Y	122 of 122	1300 mg/kg	N	Y		
0-10 ft bgs	Y	122 of 122	1300 mg/kg	N	NA		
Cadmium				**39 mg/kg**	**1.1 mg/kg (bckg)**		
0-0.5 ft bgs	N	3 of 117	1.7 mg/kg	N	Y	None	Compound exceeds ECV. Although there are insufficient detections to allow calculation of a 95% UCL on the mean, additional data collection is not expected to yield sufficient detections to strongly influence the EPC as additional sampling would likely result in additional non-detect values.
0-3 ft bgs	N	3 of 119	1.7 mg/kg	N	Y		
0-6 ft bgs	N	3 of 122	1.7 mg/kg	N	Y		
0-10 ft bgs	N	3 of 122	1.7 mg/kg	N	NA		
Chromium-Total				**280 mg/kg**	**39.8 mg/kg (bckg)**		
0-0.5 ft bgs	Y	118 of 118	160 mg/kg	N	Y	None	Compound exceeds ECV and background. Existing data adequate for EPC.
0-3 ft bgs	Y	120 of 120	160 mg/kg	N	Y		
0-6 ft bgs	Y	123 of 123	160 mg/kg	N	Y		
0-10 ft bgs	Y	123 of 123	160 mg/kg	N	NA		
Cobalt				**23 mg/kg**	**13 mg/kg**		
0-0.5 ft bgs	Y	118 of 118	20 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	120 of 120	20 mg/kg	N	Y		

TABLE C10-12
Decision 2 Data Gaps Summary - AOC4
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California.

Compound/Depth	Adequate EPC?		Maximum Detected Value	> HHCV or Background as Applicable? [a]	> ECV or Background as Applicable? [a]	Proposed Sample ID	Notes
	Y or N	Det/# results		Y or N	Y or N		
0-6 ft bgs	Y	123 of 123	20 mg/kg	N	Y		
0-10 ft bgs	Y	123 of 123	20 mg/kg	N	NA		

TABLE C10-12
Decision 2 Data Gaps Summary - AOC4
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California.

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [a] Y or N	> ECV or Background as Applicable? [a] Y or N	Proposed Sample ID	Notes
Copper				**3000 mg/kg**	**20.6 mg/kg**		
0-0.5 ft bgs	Y	118 of 118	790 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	120 of 120	790 mg/kg	N	Y		
0-6 ft bgs	Y	123 of 123	790 mg/kg	N	Y		
0-10 ft bgs	Y	123 of 123	790 mg/kg	N	NA		
Lead				**80 mg/kg**	**8.39 mg/kg (bckg)**		
0-0.5 ft bgs	Y	117 of 118	220 mg/kg	Y	Y	None	Compound exceeds HHCV, ECV and background. Existing data adequate for EPC.
0-3 ft bgs	Y	119 of 120	220 mg/kg	Y	Y		
0-6 ft bgs	Y	122 of 123	220 mg/kg	Y	Y		
0-10 ft bgs	Y	122 of 123	220 mg/kg	Y	NA		
Mercury				**18 mg/kg**	**0.0125 mg/kg**		
0-0.5 ft bgs	Y	5 of 117	0.52 mg/kg	N	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	5 of 119	0.52 mg/kg	N	Y		
0-6 ft bgs	Y	5 of 122	0.52 mg/kg	N	Y		
0-10 ft bgs	Y	5 of 122	0.52 mg/kg	N	NA		
Nickel				**1600 mg/kg**	**27.3 mg/kg (bckg)**		
0-0.5 ft bgs	Y	117 of 117	75 mg/kg	N	Y	None	Compound exceeds ECV and background. Existing data adequate for EPC.
0-3 ft bgs	Y	119 of 119	75 mg/kg	N	Y		
0-6 ft bgs	Y	122 of 122	75 mg/kg	N	Y		
0-10 ft bgs	Y	122 of 122	75 mg/kg	N	NA		

TABLE C10-12

Decision 2 Data Gaps Summary - AOC4

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station, Needles, California.

Compound/Depth	Adequate EPC?		Maximum Detected Value	> HHCV or Background as Applicable? [a]	> ECV or Background as Applicable? [a]	Proposed Sample ID	Notes
	Y or N	Det/# results		Y or N	Y or N		
Vanadium				**390 mg/kg**	**52.2 mg/kg (bckg)**		
0-0.5 ft bgs	Y	117 of 117	100 mg/kg	N	Y	None	Compound exceeds ECV and background. Existing data adequate for EPC.
0-3 ft bgs	Y	119 of 119	100 mg/kg	N	Y		
0-6 ft bgs	Y	122 of 122	100 mg/kg	N	Y		
0-10 ft bgs	Y	122 of 122	100 mg/kg	N	NA		
Zinc				**23000 mg/kg**	**58 mg/kg (bckg)**		
0-0.5 ft bgs	Y	117 of 117	410 mg/kg	N	Y	None	Compound exceeds ECV and background. Existing data adequate for EPC.
0-3 ft bgs	Y	119 of 119	410 mg/kg	N	Y		
0-6 ft bgs	Y	122 of 122	410 mg/kg	N	Y		
0-10 ft bgs	Y	122 of 122	410 mg/kg	N	NA		

TABLE C10-12
Decision 2 Data Gaps Summary - AOC4
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California.

Compound/Depth	Adequate EPC? Y or N	Adequate EPC? Det/# results	Maximum Detected Value	> HHCV or Background as Applicable? [a] Y or N	> ECV or Background as Applicable? [a] Y or N	Proposed Sample ID	Notes
Dioxins/Furans							
TEQ Human				**50 ng/kg**	**NA**		
0-0.5 ft bgs	Y	115 of 116	250 ng/kg	Y	NA	None	Compound exceeds HHCV. Existing data adequate for EPC.
0-3 ft bgs	Y	115 of 116	250 ng/kg	Y	NA		
0-6 ft bgs	Y	118 of 119	250 ng/kg	Y	NA		
0-10 ft bgs	Y	118 of 119	250 ng/kg	Y	NA		
TEQ Bird				**NA**	**16 ng/kg**		
0-0.5 ft bgs	Y	115 of 116	280 ng/kg	NA	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	115 of 116	280 ng/kg	NA	Y		
0-6 ft bgs	Y	118 of 119	280 ng/kg	NA	Y		
TEQ Mammals				**NA**	**1.6 ng/kg**		
0-0.5 ft bgs	Y	115 of 116	250 ng/kg	NA	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	115 of 116	250 ng/kg	NA	Y		
0-6 ft bgs	Y	118 of 119	250 ng/kg	NA	Y		
Polycyclic Aromatic Hydrocarbons							
PAHs (BaP TEQ)				**38 µg/kg**	**NA**		
0-0.5 ft bgs	Y	68 of 117	1100 µg/kg	Y	NA	None	Compound exceeds HHCV. Existing data adequate for EPC.
0-3 ft bgs	Y	68 of 119	1100 µg/kg	Y	NA		
0-6 ft bgs	Y	71 of 122	1100 µg/kg	Y	NA		
0-10 ft bgs	Y	71 of 122	1100 µg/kg	Y	NA		
HMW PAHs				**NA**	**1160 µg/kg**		
0-0.5 ft bgs	Y	68 of 117	10000 µg/kg	NA	Y	None	Compound exceeds ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	68 of 119	10000 µg/kg	NA	Y		
0-6 ft bgs	Y	71 of 122	10000 µg/kg	NA	Y		

TABLE C10-12
Decision 2 Data Gaps Summary - AOC4
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California.

Compound/Depth	Adequate EPC?		Maximum Detected Value	> HHCV or Background as Applicable? [a]	> ECV or Background as Applicable? [a]	Proposed Sample ID	Notes
	Y or N	Det/# results		Y or N	Y or N		
Polychlorinated Biphenyls							
Total PCBs				**220 µg/kg**	**204 µg/kg**		
0-0.5 ft bgs	Y	67 of 117	6000 µg/kg	Y	Y	None	Compound exceeds HHCV and ECV. Existing data adequate for EPC.
0-3 ft bgs	Y	67 of 117	6000 µg/kg	Y	Y		
0-6 ft bgs	Y	70 of 120	6000 µg/kg	Y	Y		
0-10 ft bgs	Y	70 of 120	6000 µg/kg	Y	NA		

Footnotes:

a. The higher value of either the HHCV/ECV or background was selected as the screening criteria and are included in these columns for the respective compound in **BOLDED BLUE FONT**. Values based on background are indicated with "(bckg)" next to the value.

Acronyms and Abbreviations:

AOC - area of concern
BaP TEQ - benzo(a)pyrene toxic equivalents
ECV - ecological comparison values
EPC - exposure point concentration
ft bgs - feet below ground surface
HHCV - human health comparison values
HMW PAH - high molecular weight polycyclic aromatic hydrocarbons
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
N - no
NA - not applicable
TEQ - toxic equivalents
Y - yes

TABLE C10-13
Results of Tiered Analysis at AOC 4
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Metal	Step 1 Do COPCs/COPECs Exceed Background?	Step 2 Do COPCs/COPECs Exceed SSL?	Step 3 Does Screening Model Eliminate Potential for Leaching to Groundwater?
Barium	√		
Cadmium	√		
Chromium	√		
Chromium, Hexavalent	√	√	√
Cobalt	√	√	√
Copper	√		
Lead	√		
Nickel	√		
Vanadium	√	√	
Zinc	√		

SSL = soil screening level.

TABLE C10-14

Constituent Concentrations in Soil Compared to Total Threshold Limit Concentration (TTLC), Soluble Threshold Limit Concentration (STLC), and Toxic Characteristic Leaching Procedure (TCLP)
AOC 4 - Debris Ravine
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Topock Compressor Station, Needles, California

Parameter	Frequency of detection	Maximum Detected Value (mg/kg)	TTLC in mg/kg[1]		STLC in mg/L[1]			TCLP in mg/L[1]		
			# of Exceedences	TTLC	# of Exceedences of STLC x 10	STLC x 10	STLC	# of Exceedences of TCLP x 20	TCLP x 20	TCLP
Antimony	3 / 122 (2.5%)	2.7	0	500	0	150	15	0	NE	NE
Arsenic	30 / 122 (25%)	7.6	0	500	0	50	5	0	100	5
Barium	122 / 122 (100%)	1,300	0	10000	1	1000	100	0	2000	100
Beryllium	0 / 122 (0%)	ND (5.5)	0	75	0	7.5	0.75	0	NE	NE
Cadmium	3 / 122 (2.5%)	1.7	0	100	0	10	1	0	20	1
Chromium, Hexavalent	25 / 122 (20%)	16	0	500	0	50	5	0	NE	NE
Chromium, total	123 / 123 (100%)	160	0	2500	37	50	5	4	100	5
Cobalt	123 / 123 (100%)	20	0	8000	0	800	80	0	NE	NE
Copper	123 / 123 (100%)	790	0	2500	1	250	25	0	NE	NE
Lead	122 / 123 (99%)	220	0	1000	4	50	5	1	100	5
Mercury	5 / 122 (4.1%)	0.52	0	20	0	2	0.2	0	4	0.2
Molybdenum	0 / 122 (0%)	ND (5.5)	0	3500	0	3500	350	0	NE	NE
Nickel	122 / 122 (100%)	75	0	2000	0	200	20	0	NE	NE
Selenium	0 / 122 (0%)	ND (5.5)	0	100	0	10	1	0	20	1
Silver	0 / 122 (0%)	ND (5.5)	0	500	0	50	5	0	100	5
Thallium	0 / 122 (0%)	ND (11)	0	700	0	70	7	0	NE	NE
Vanadium	122 / 122 (100%)	100	0	2400	0	240	24	0	NE	NE
Zinc	122 / 122 (100%)	410	0	5000	0	2500	250	0	NE	NE

Notes:

[1] Code of Regulations, Title 22, Chapter 11, Article 3
mg/kg miligrams per kilogram
mg/L milligrams per liter
ND not detected in any of the samples
NE not established
‡ maximum reporting limit greater than or equal to the STLC x 10.

TABLE C10-15
Potential Phase 2 Soil Sample Locations at AOC 4 – Southeast Fence Line
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Method[a]
AOC4-BCW1	0, 2, 5, and 9	To resolve Data Gap #3 – Lateral and vertical extents of metals, PAHs, PCBs, and dioxins/furans at the mouth of the ravine near and in Bat Cave Wash	Title 22 metals, hexavalent chromium, PAHs, PCBs, dioxins/furans	Rotosonic
AOC4-BCW2	0, 2, 5, and 9	To resolve Data Gap #3 – Lateral and vertical extents of metals, PAHs, PCBs, and dioxins/furans at the mouth of the ravine near and in Bat Cave Wash	Title 22 metals, hexavalent chromium, PAHs, PCBs, dioxins/furans	Rotosonic
AOC4-BCW3	0, 2, 5, and 9	To resolve Data Gap #3 – Lateral and vertical extents of metals, PAHs, PCBs, and dioxins/furans at the mouth of the ravine near and in Bat Cave Wash	Title 22 metals, hexavalent chromium, PAHs, PCBs, dioxins/furans	Rotosonic
AOC4-BCW4	0, 2, 5, and 9	To resolve Data Gap #3 – Lateral and vertical extents of metals, PAHs, PCBs, and dioxins/furans at the mouth of the ravine near and in Bat Cave Wash	Title 22 metals, hexavalent chromium, PAHs, PCBs, dioxins/furans	Rotosonic
AOC4-BCW5	0, 2, 5, and 9	To resolve Data Gap #3 – Lateral and vertical extents of metals, PAHs, PCBs, dioxins/furans, and asbestos at the mouth of the ravine near and in Bat Cave Wash	Title 22 metals, hexavalent chromium, PAHs, PCBs, dioxins/furans, asbestos (surface soil sample only)	Rotosonic
AOC4-BCW6	0, 2, 5, and 9	To resolve Data Gap #3 – Lateral and vertical extents of metals, PAHs, PCBs, and dioxins/furans at the mouth of the ravine near and in Bat Cave Wash	Title 22 metals, hexavalent chromium, PAHs, PCBs, dioxins/furans	Rotosonic
AOC4-17	2, 5, and 9	To resolve Data Gaps #2 – Vertical extent of various metals, PCBs, and dioxin/furans across the AOC; however, given the shallow depth to bedrock additional sampling is limited to the northern portion of AOC, where bedrock is not near the surface	Title 22 metals, hexavalent chromium, PCBs, dioxins/furans	Rotosonic
AOC4-18	2, 5, and 9	To resolve Data Gaps #2 and #5 – Vertical extent of various metals, PCBs, and dioxin/furans across the AOC; however, given the shallow depth to bedrock additional sampling is limited to the northern portion of AOC, where bedrock is not near the surface, and soil physical property parameters to support the CMS/FS	Title 22 metals, hexavalent chromium PCBs, dioxins/furans; soil physical parameters (Atterberg limits, relative compaction, alkalinity, cation exchange, capacity, and particle size distribution) – three samples from boring	Rotosonic

TABLE C10-15
Potential Phase 2 Soil Sample Locations at AOC 4 – Southeast Fence Line
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Method[a]
AOC4-19	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans near south, southeastern corner of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-20	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans near south, southeastern corner of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-21	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans near south, southeastern corner of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-22	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans near south, southeastern corner of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-23	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans along eastern edge of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-24	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans along eastern edge of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-25	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans along eastern edge of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-26	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans along eastern edge of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-27	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans along eastern edge of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools
AOC4-28	0 and 2, if feasible	To resolve Data Gap #1 - Lateral extent of various metals, PAHs, PCBs, and dioxins/furans along eastern edge of the AOC	Title 22 metals, PAHs, PCBs, dioxins/furans	Hand tools

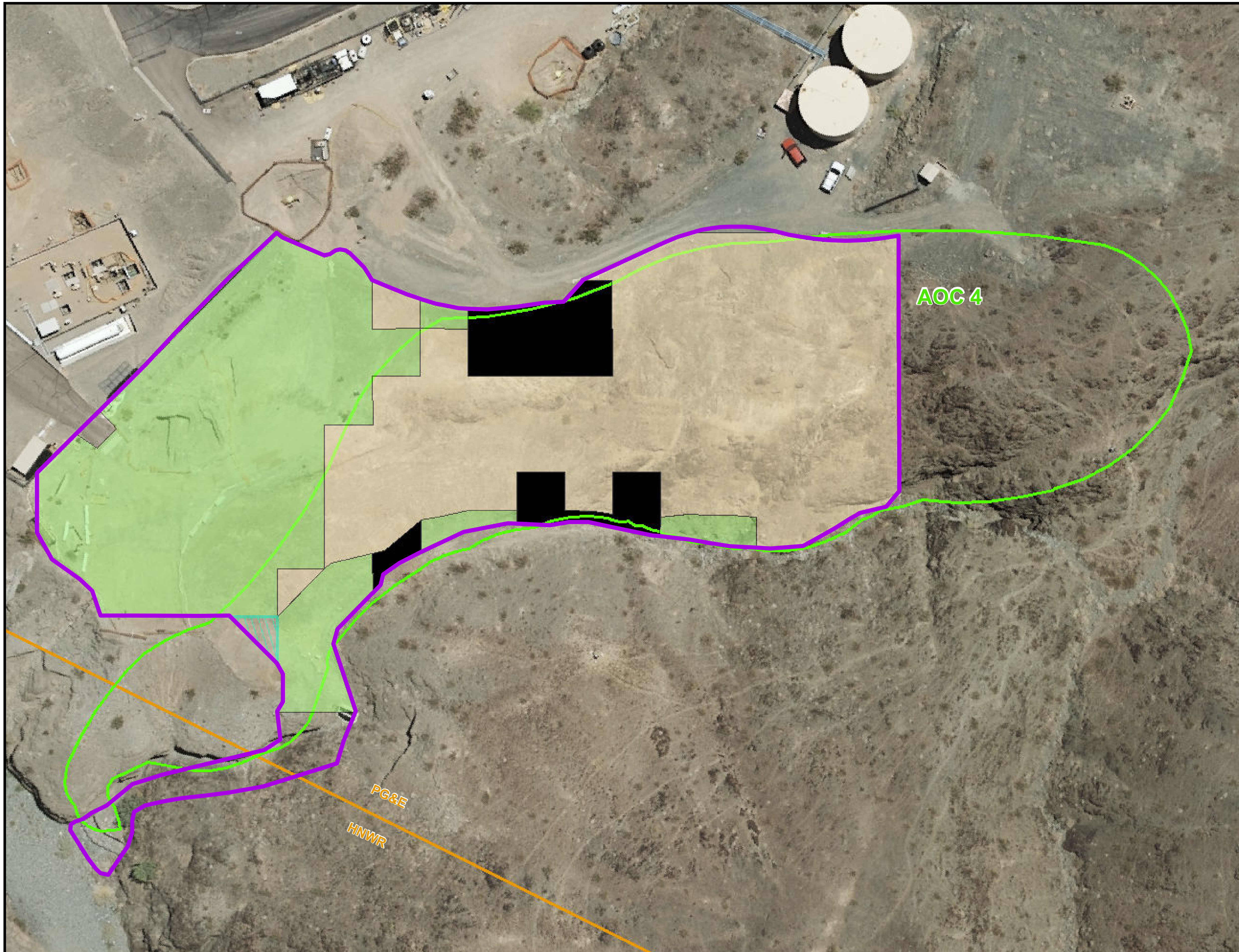
TABLE C10-15
Potential Phase 2 Soil Sample Locations at AOC 4 – Southeast Fence Line
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Method[a]
AOC4-29	0, 2, 5, and 9, if feasible	To resolve Data Gap #4 – Lateral and vertical extents of metals and dioxins/furans just inside the compressor station fence line, along the northern boundary of the AOC	Title 22 metals, hexavalent chromium, dioxins/furans	Hydrovac
AOC 4-30	0, 2, 5, and 9, if feasible	To resolve Data Gap #4 – Lateral and vertical extents of metals and dioxins/furans just inside the compressor station fence line, along the northern boundary of the AOC	Title 22 metals, hexavalent chromium, dioxins/furans	Hydrovac
AOC 4-31	0, 2, 5, and 9, if feasible	To resolve Data Gap #4 – Lateral and vertical extents of metals and dioxins/furans just inside the compressor station fence line, along the northern boundary of the AOC	Title 22 metals, hexavalent chromium, dioxins/furans	Hydrovac
AOC 4-32	0, 2, 5, and 9, if feasible	To resolve Data Gap #4 – Lateral and vertical extents of metals and dioxins/furans just inside the compressor station fence line, along the northern boundary of the AOC	Title 22 metals, hexavalent chromium, dioxins/furans	Hydrovac

Notes:

[a] Proposed collection methods listed on this table are based on experience and knowledge of the site; actual collection method will be chosen in the field based on field conditions and site access restrictions.

Figures



LEGEND

- AOC 4 Boundary
- TCRA Work Area Boundary
- Area Not Accessed Due to Health and Safety Limitations
- Remaining Material is Native Alluvium
- Remaining Material is Non-Native Alluvium
- Vacuum Removal Conducted to Bedrock
- Property Boundary

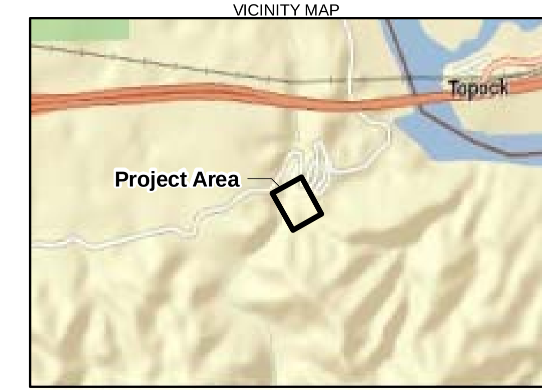
N

0 25 50 100 Feet

FIGURE C10-1
SITE MAP SHOWING BEDROCK, NATIVE MATERIAL, AND FILL
SOIL INVESTIGATION PART A PHASE 1
DATA GAPS EVALUATION REPORT
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CA

CH2MHILL

VICINITY MAP



LEGEND

- Existing Soil Sample Location
- Gabion

Potential Release Mechanisms

- Infrequent Surface Water Runoff
- Infiltration (Site-wide)
- Windblown Dispersion of Soil (Site-wide)
- Volatilization (Site-wide)
- Degradation by Heat/Light (Site-wide)
- Surface Soil Scouring & Redeposition (Possible Throughout the Wash)
- Downstream Movement During Flow Events

N

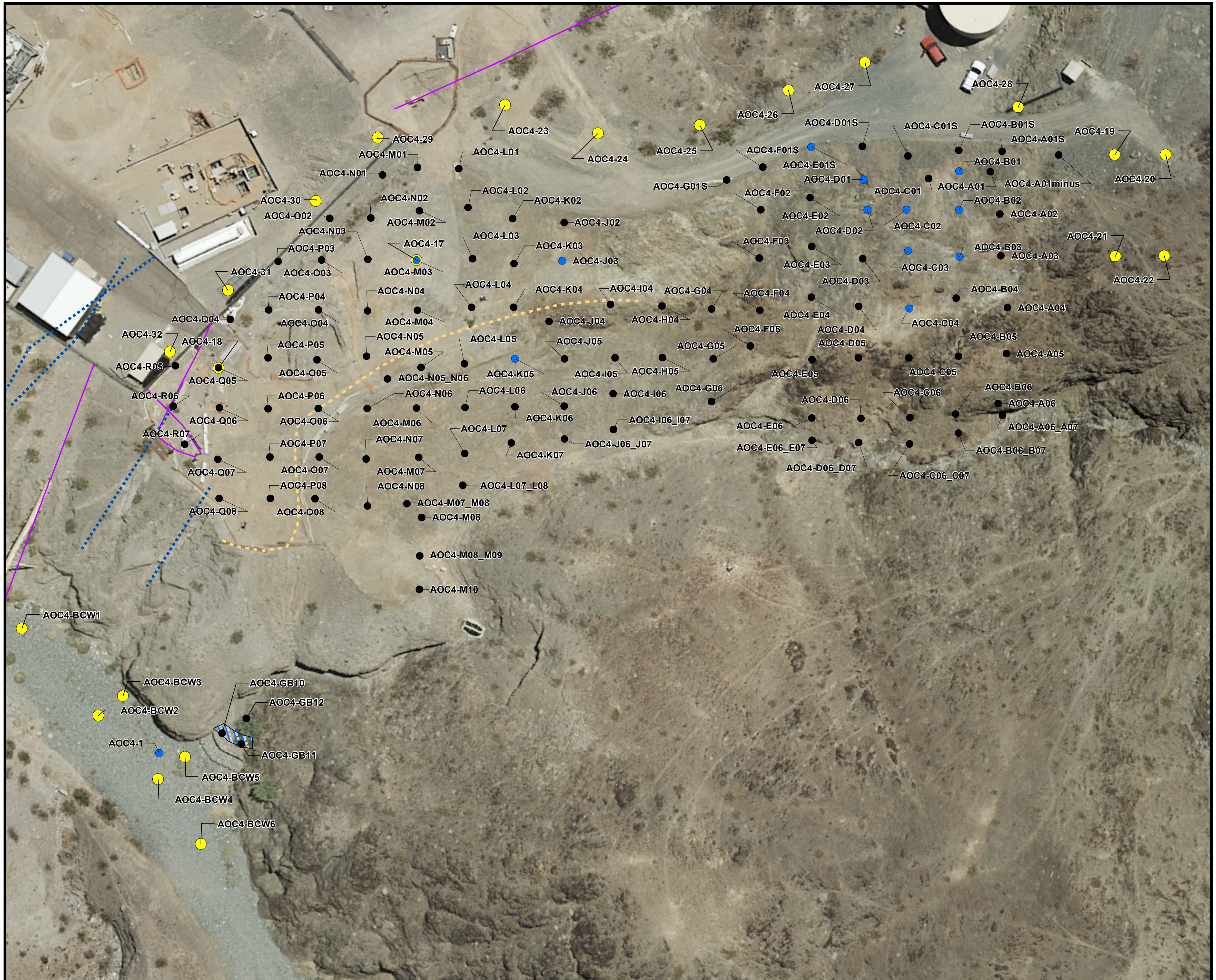
0 25 50 100 Feet

FIGURE C10-2
CONCEPTUAL SITE MODEL
AOC4 DEBRIS RAVINE

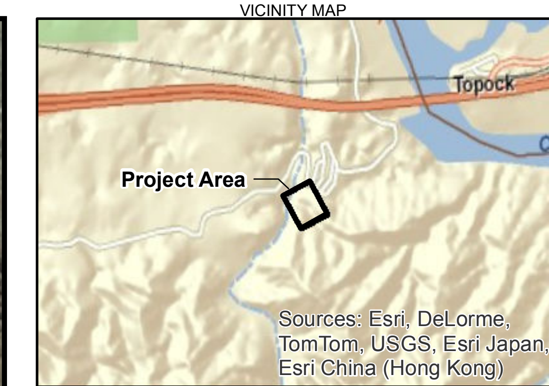
AOC4 -DEBRIS RAVINE
SOIL INVESTIGATION PART A PHASE 1
DATA GAPS EVALUATION REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

D:\GIS\Projects\Topock\MapFiles\2011\AOC4\CSM
ES031511093239BAO CSM_ConceptualSiteModel_AOC4_Debris.ai 04-22-11 lho



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than background (410 mg/kg) are in BLUE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (5,200 mg/kg) are shown in ORANGE..
4. Ecological Comparison Value (330 mg/kg) is below background value; therefore, the screening level is set at the background value.
5. Proposed samples collocated with existing locations, will be sampled at depth.

N

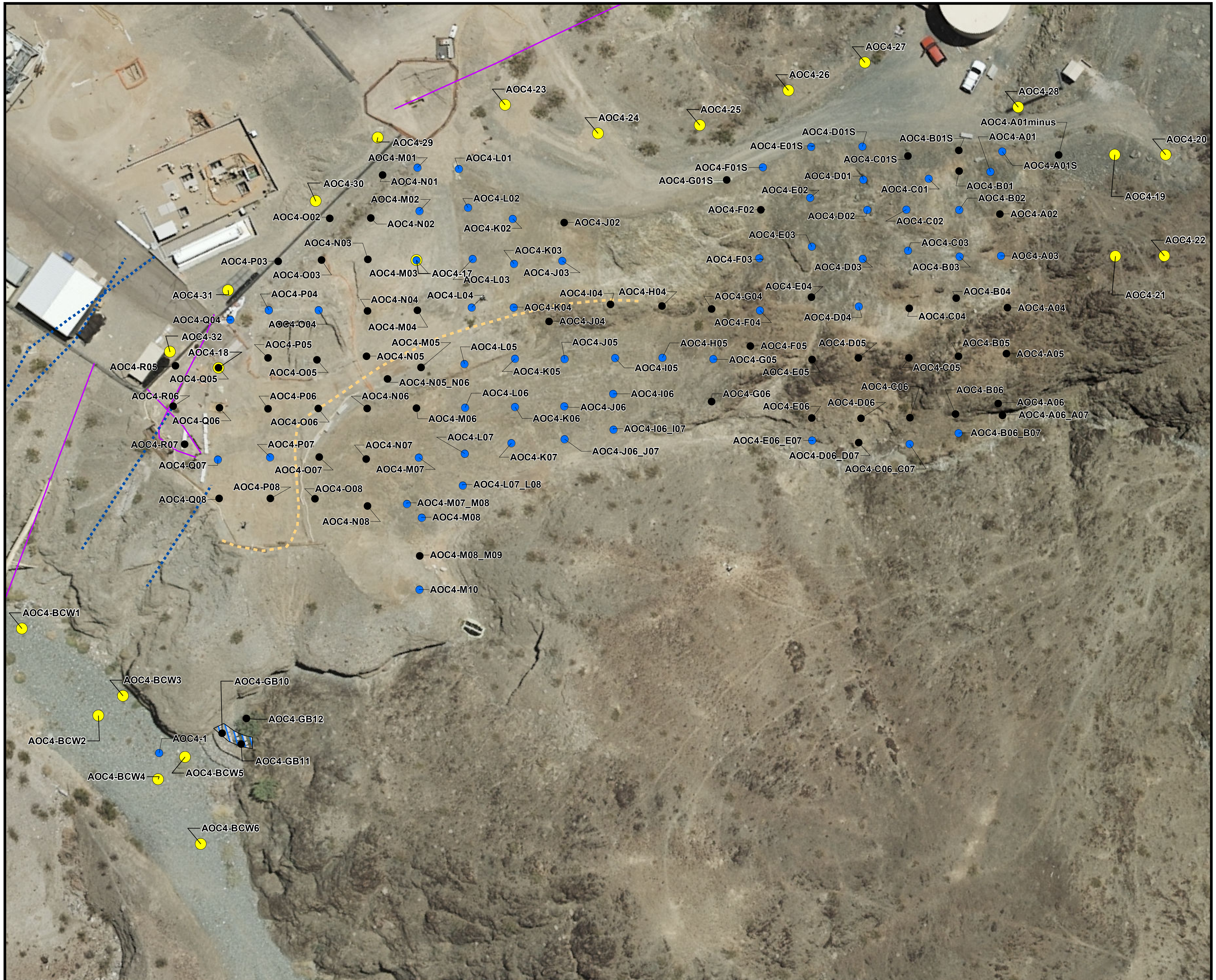
0 25 50 100 Feet

FIGURE C10-3
BARIUM SOIL SAMPLE LOCATIONS

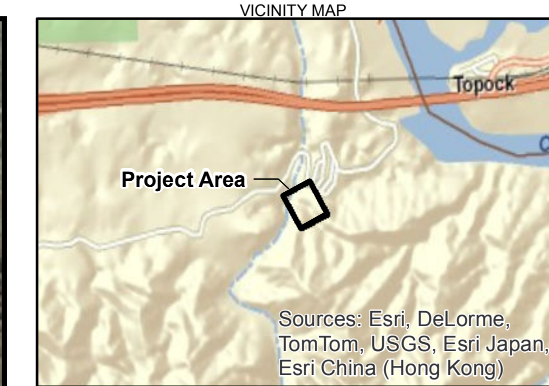
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS_New\MapFiles\2011\AOC4_BARIUM_PTS_B



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than background (39.8 mg/kg) are in BLUE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (280 mg/kg) are shown in ORANGE.
4. Ecological Comparison Value (36.3) is below background value; therefore, the screening level is set at the background value.
5. Proposed samples collocated with existing locations, will be sampled at depth.

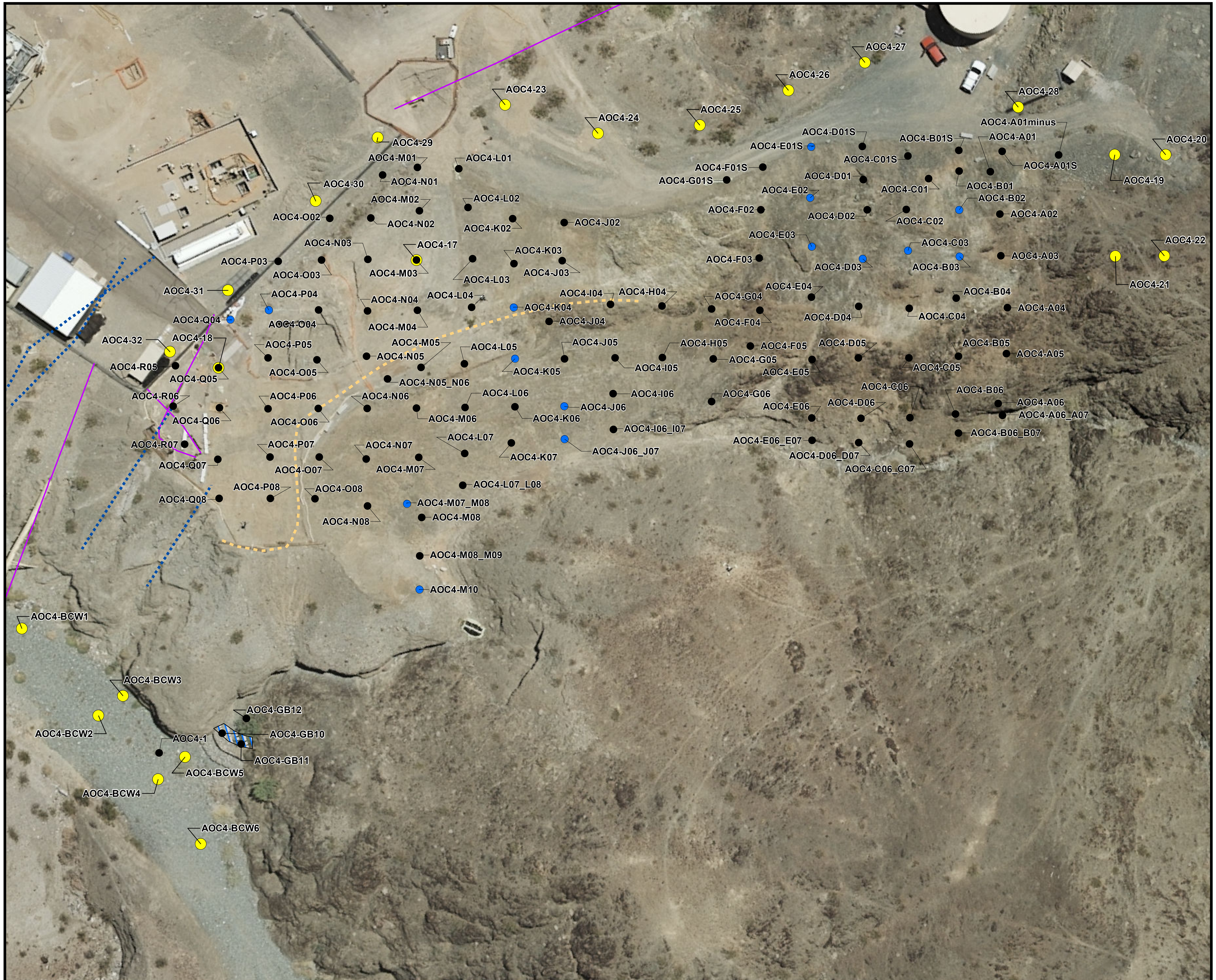
N

0 25 50 100 Feet

FIGURE C10-4
TOTAL CHROMIUM SOIL SAMPLE LOCATIONS

AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



VICINITY MAP

LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than background (0.83 mg/kg) are in BLUE.
3. Results greater than or equal to the Ecological Comparison Value (139.6 mg/kg) are in PURPLE.
4. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (17 mg/kg) are shown in ORANGE.
5. Proposed samples collocated with existing locations, will be sampled at depth.

N

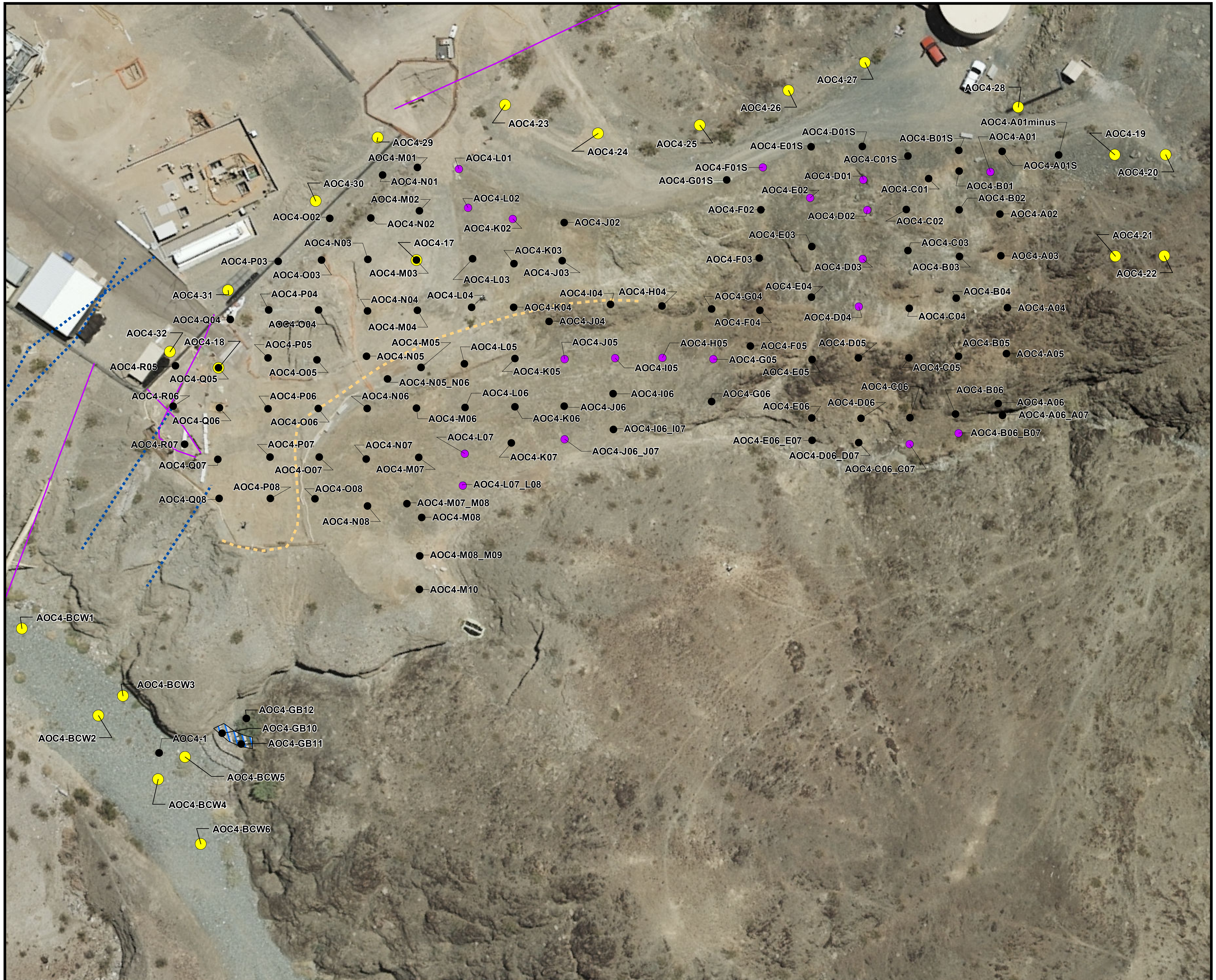
0 25 50 100 Feet

FIGURE C10-5
HEXAVALENT CHROMIUM SOIL SAMPLE LOCATIONS

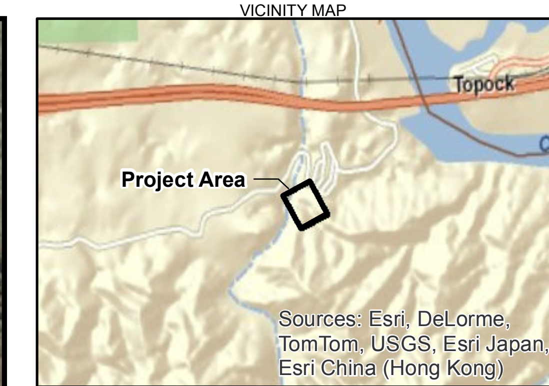
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS_New\MapFiles\2011\AOC4_HEXCHROM_PTS_B



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than Background (12.7) are shown in BLUE.
2. Results greater than or equal to the Ecological Comparison Value (13 mg/kg) are in PURPLE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (23 mg/kg) are shown in ORANGE.
4. Proposed samples collocated with existing locations, will be sampled at depth.

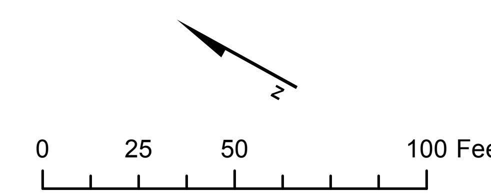
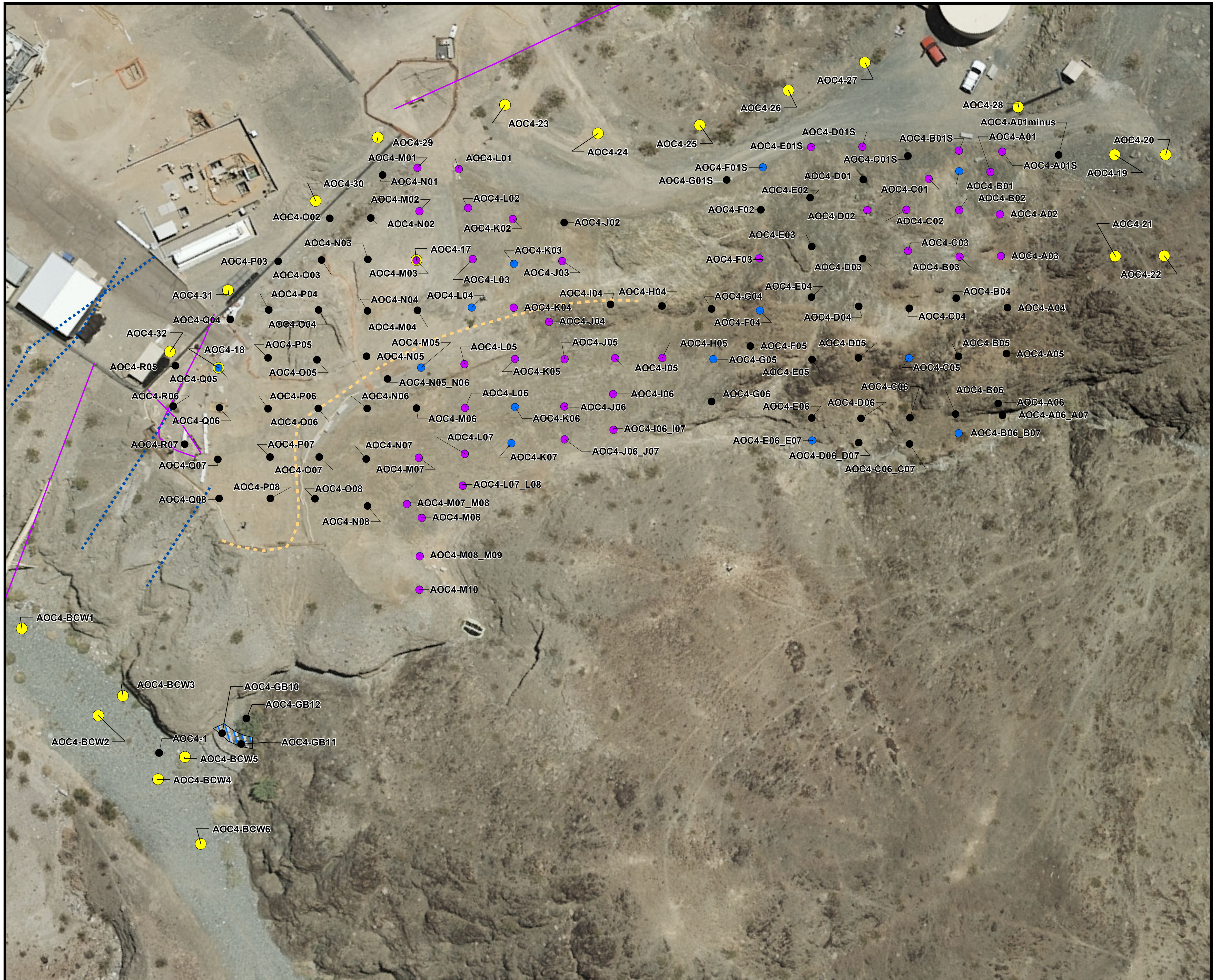


FIGURE C10-6
COBALT SOIL SAMPLE LOCATIONS

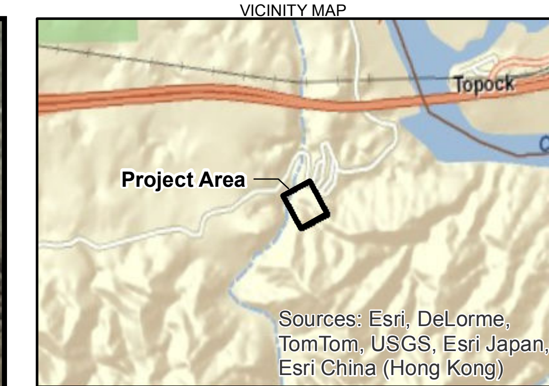
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS_New\MapFiles\2011\AOC4_COBALT_PTS_B



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than background (16.8 mg/kg) are in BLUE.
3. Results greater than or equal to the Ecological Comparison Value (20.6 mg/kg) are in PURPLE.
4. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (3,000 mg/kg) are shown in ORANGE.
5. Proposed samples collocated with existing locations, will be sampled at depth.

N

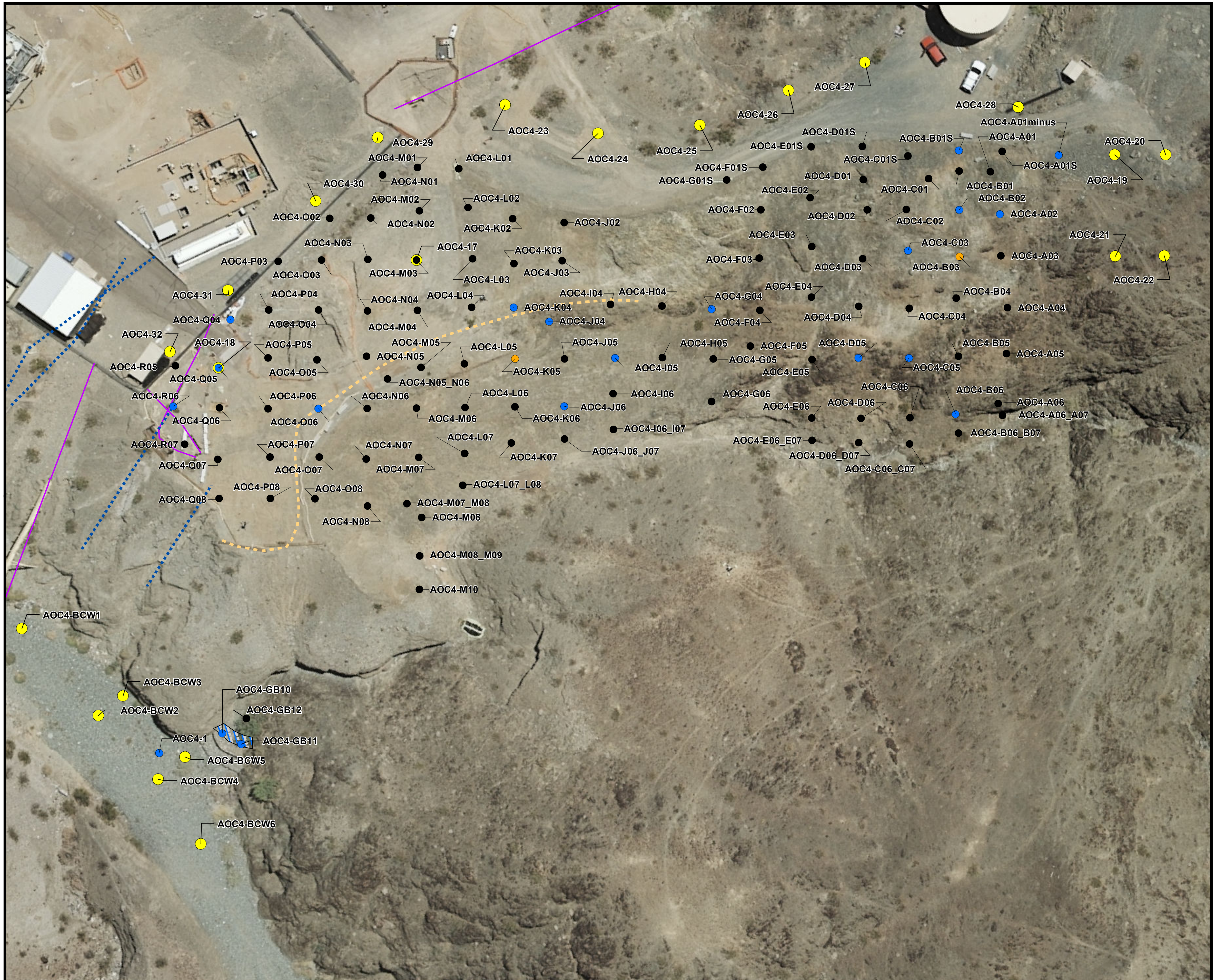
0 25 50 100 Feet

FIGURE C10-7
COPPER SOIL SAMPLE LOCATIONS

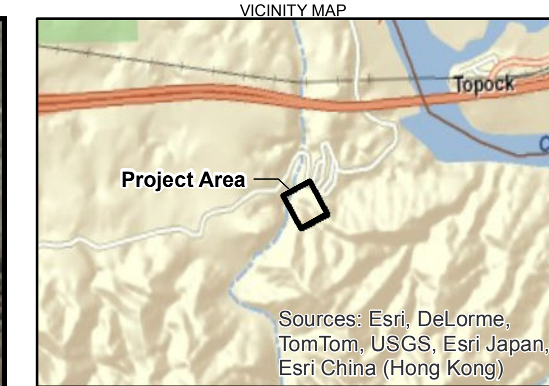
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS_New\MapFiles\2011\AOC4_COPPER_PTS_B



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than background (8.39 mg/kg) are in BLUE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (80 mg/kg) are shown in ORANGE.
4. Ecological Comparison Value (0.0166) is below background value; therefore, the screening level is set at the background value.
5. Proposed samples collocated with existing locations, will be sampled at depth.

N

0 25 50 100 Feet

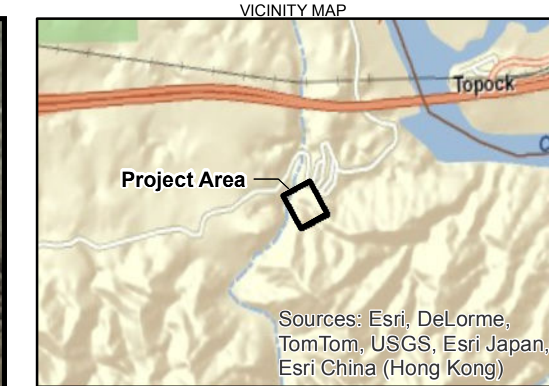
FIGURE C10-8
LEAD SOIL SAMPLE LOCATIONS

AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS_New\MapFiles\2011\AOC4_LEAD_PTS_B

VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than or equal to the Ecological Comparison Value (0.0125 mg/kg) are in BLUE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (18 mg/kg) are shown in ORANGE.
4. 116 Non-detects displayed have a reporting limit exceeding listed screening levels.
5. Proposed samples collocated with existing locations, will be sampled at depth.

N

0 25 50 100 Feet

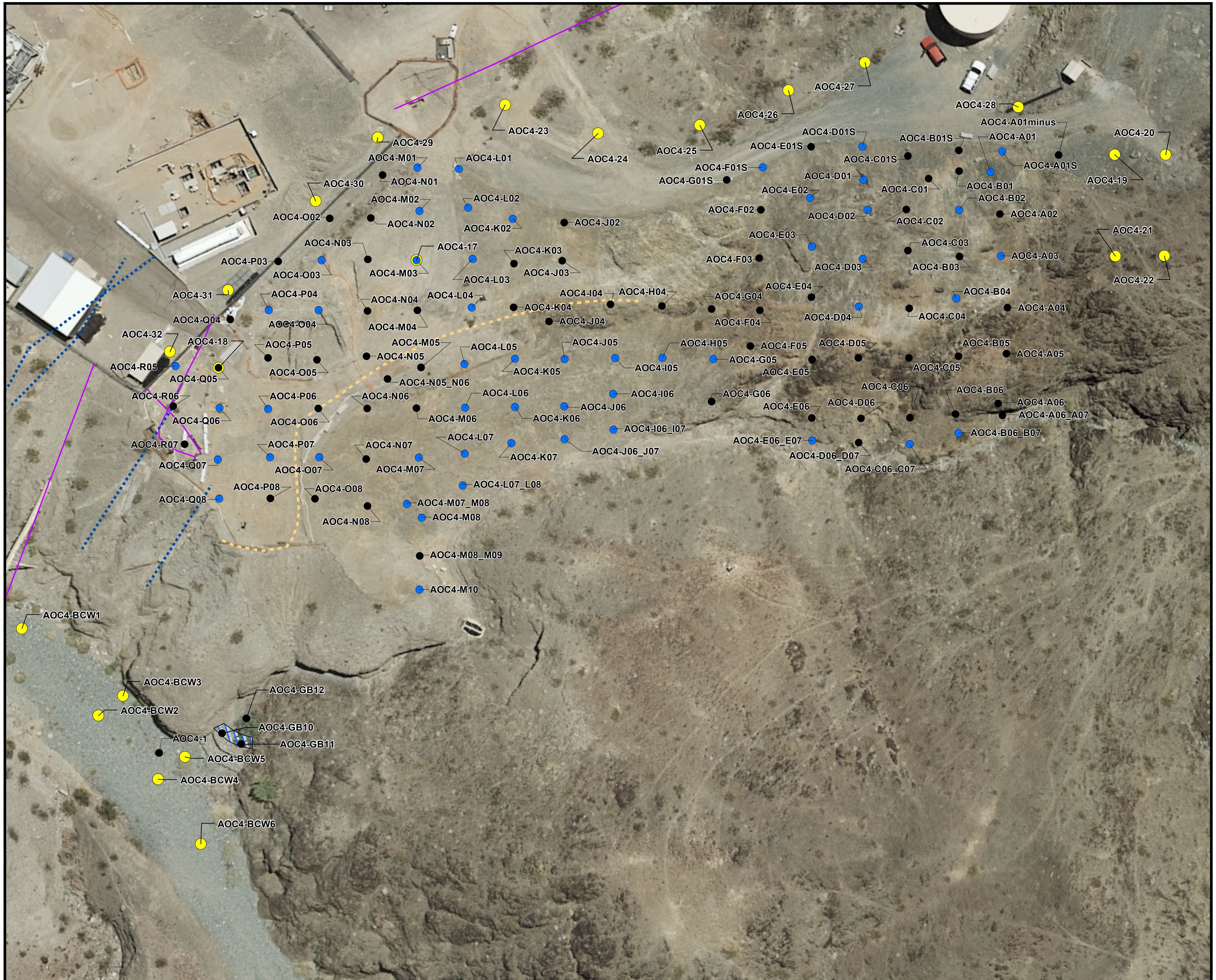
FIGURE C10-9 MERCURY SOIL SAMPLE LOCATIONS

AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS_New\MapFiles\2011\AOC4_MERCURY_PTS_B

VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

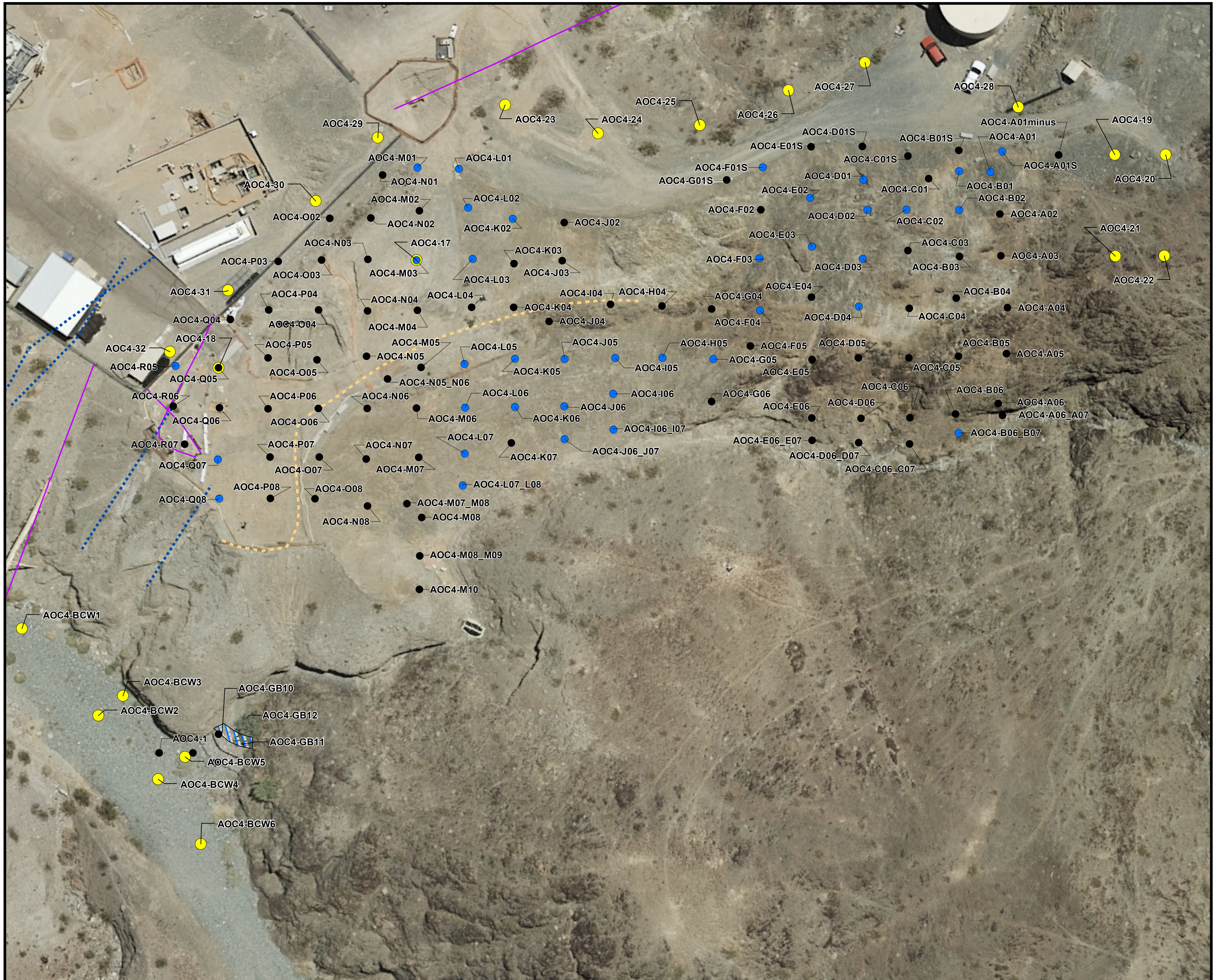
1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than background (27.3 mg/kg) are in BLUE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (1,600 mg/kg) are shown in ORANGE.
4. Ecological Comparison Value (0.607) is below background value; therefore, the screening level is set at the background value.
5. Proposed samples collocated with existing locations, will be sampled at depth.

N

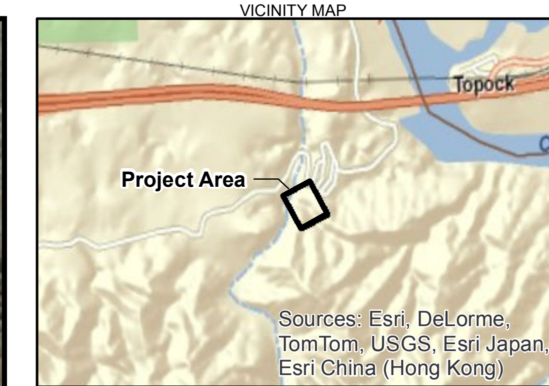
0 25 50 100 Feet

FIGURE C10-10
NICKEL SOIL SAMPLE LOCATIONS
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Gabion
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than background (52.2 mg/kg) are in BLUE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (390 mg/kg) are shown in ORANGE.
4. Ecological Comparison Value (13.9) is below background value; therefore, the screening level is set at the background value.
5. Proposed samples collocated with existing locations, will be sampled at depth.

N

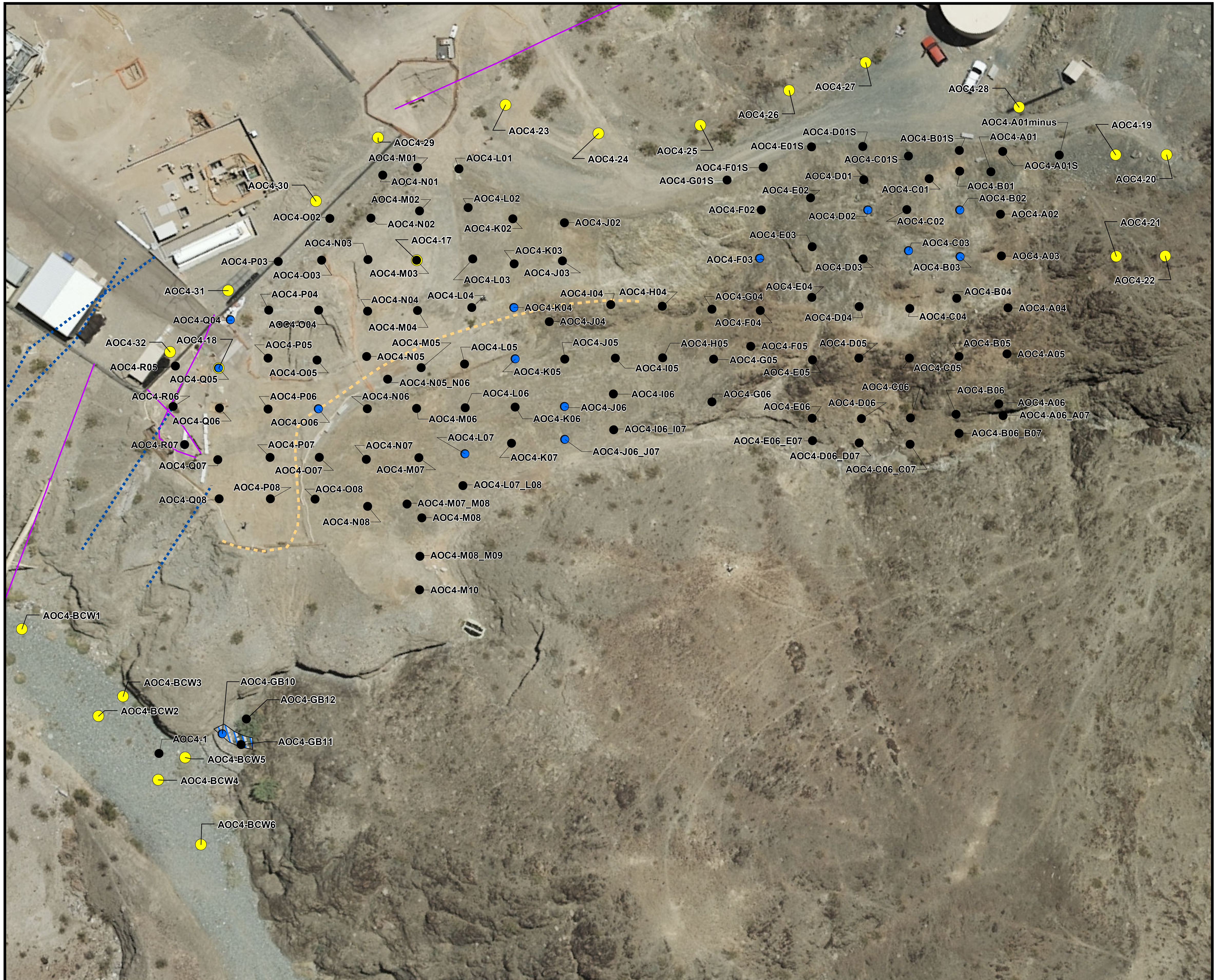
0 25 50 100 Feet

FIGURE C10-11
VANADIUM SOIL SAMPLE LOCATIONS

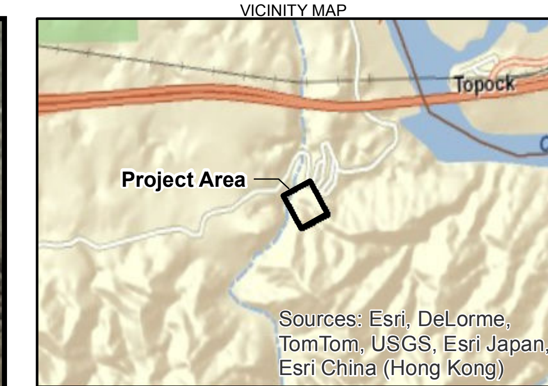
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

BAO \\COYOTECREST\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC4\AOC4_VANADIUM_PTS_B.MXD AOC4_VANADIUM_PTS_B.MXD JLAMANTI 4/22/2011 15:09:53



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than background (58 mg/kg) are in BLUE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (23,000 mg/kg) are shown in ORANGE.
4. Ecological Comparison Value (0.164) is below background value; therefore, the screening level is set at the background value.
5. Proposed samples collocated with existing locations, will be sampled at depth.

N

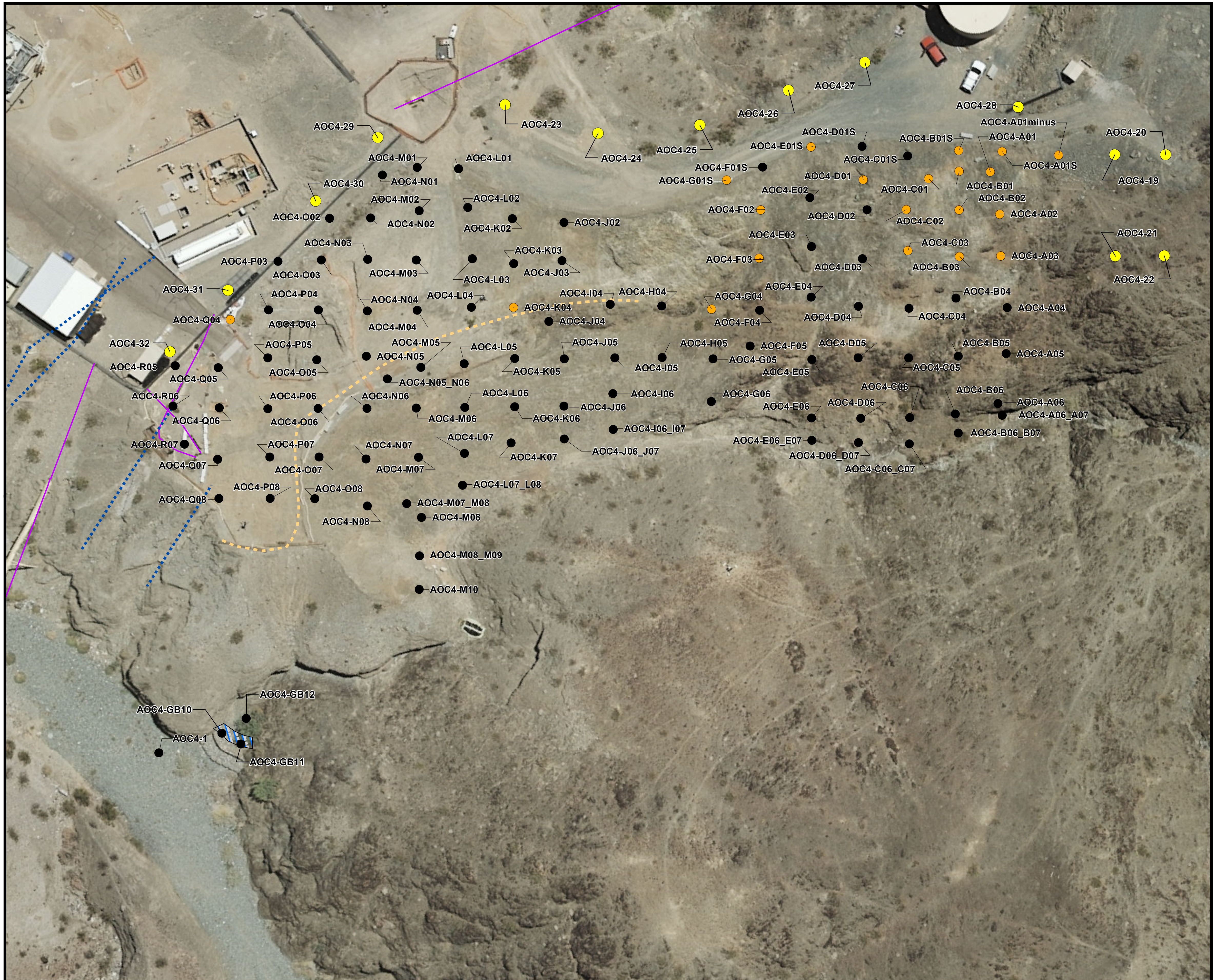
0 25 50 100 Feet

FIGURE C10-12
ZINC SOIL SAMPLE LOCATIONS

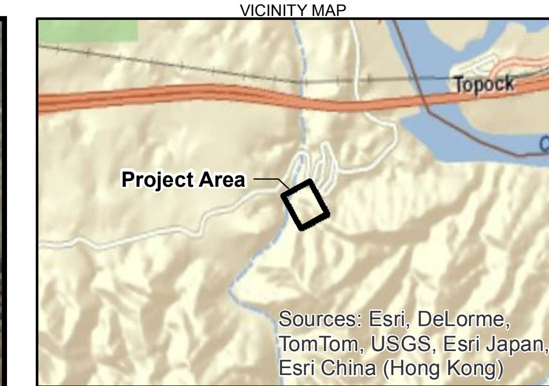
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

\\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS_New\MapFiles\2011\AOC4_ZINC_PTS_B

CH2MHILL



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.

2. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (38 µg/kg) are shown in ORANGE.

N

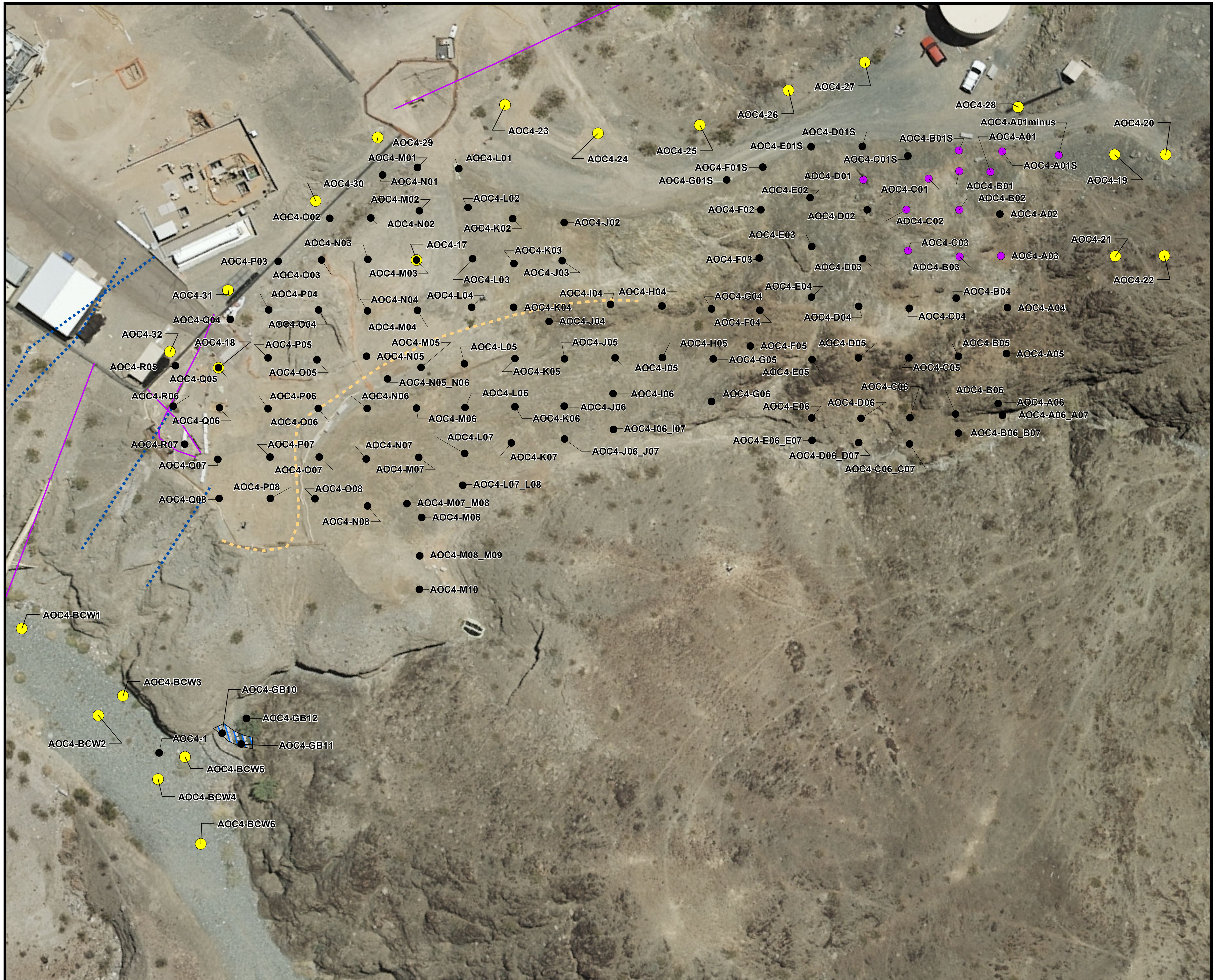
0 25 50 100 Feet

FIGURE C10-13
BENZO(A)PYRENE EQUIVALENT SOIL SAMPLE LOCATIONS

AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

BAO \\COYOTECREST\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC4\AOC4_BAP_PTS_B.MXD AOC4_BAP_PTS_B.MXD JLAMANTI 4/22/2011 15:13:14



VICINITY MAP

LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than or equal to the Ecological Comparison Value (1,160 µg/kg) are in PURPLE.
3. Proposed samples collocated with existing locations, will be sampled at depth.

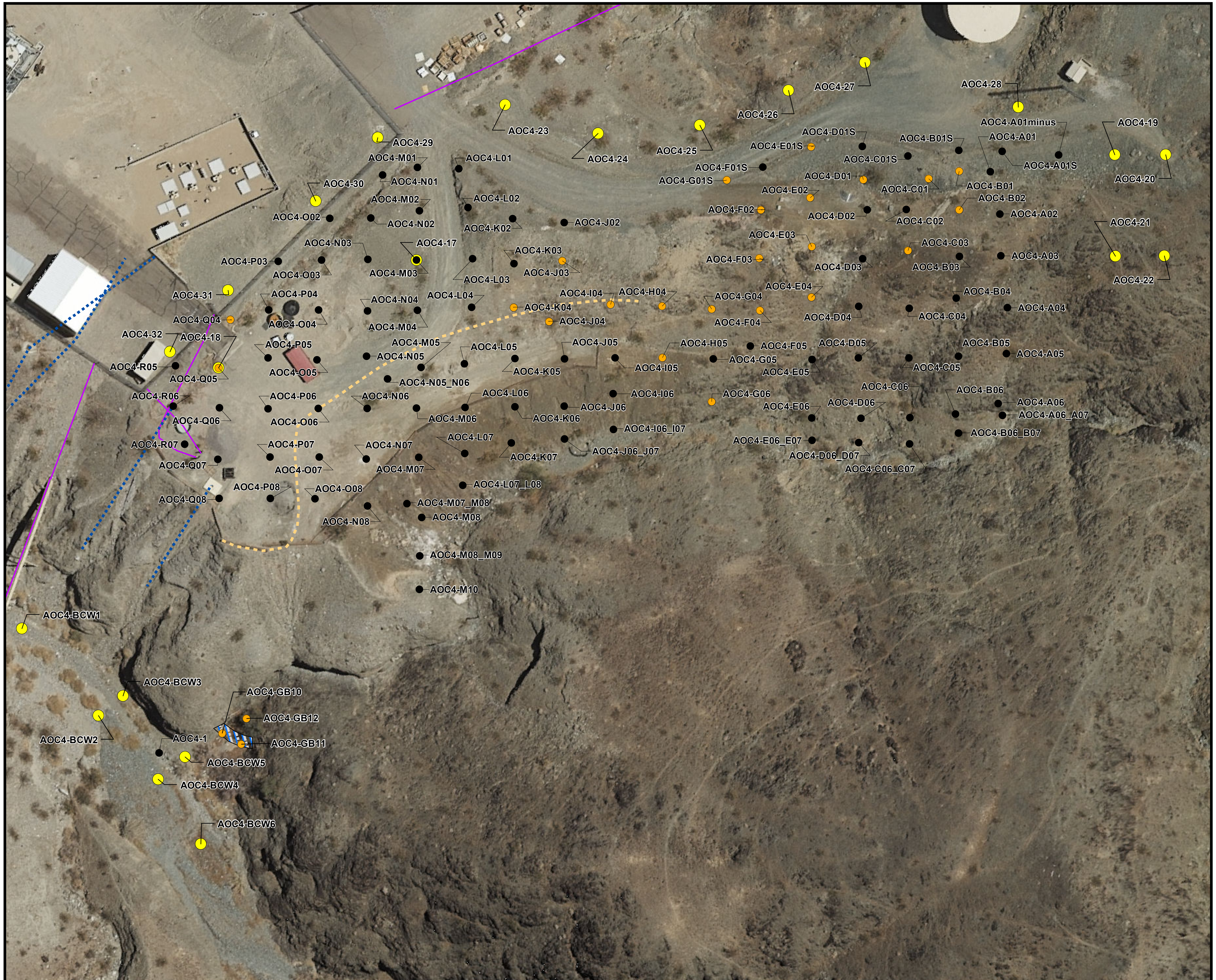
N

0 25 50 100 Feet

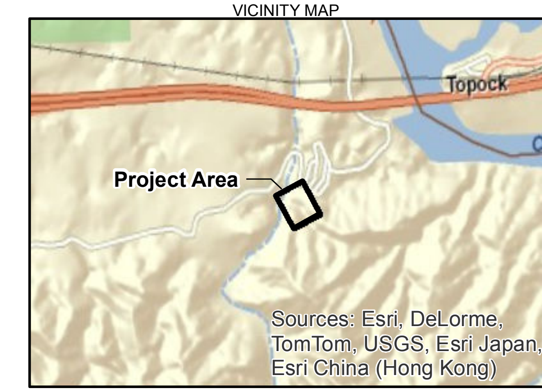
FIGURE C10-14
POLYCYCLIC AROMATIC HYDROCARBON HIGH MOLECULAR WEIGHT SOIL SAMPLE LOCATIONS

AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (220 µg/kg) are shown in ORANGE.
3. Proposed samples collocated with existing locations, will be sampled at depth.

N

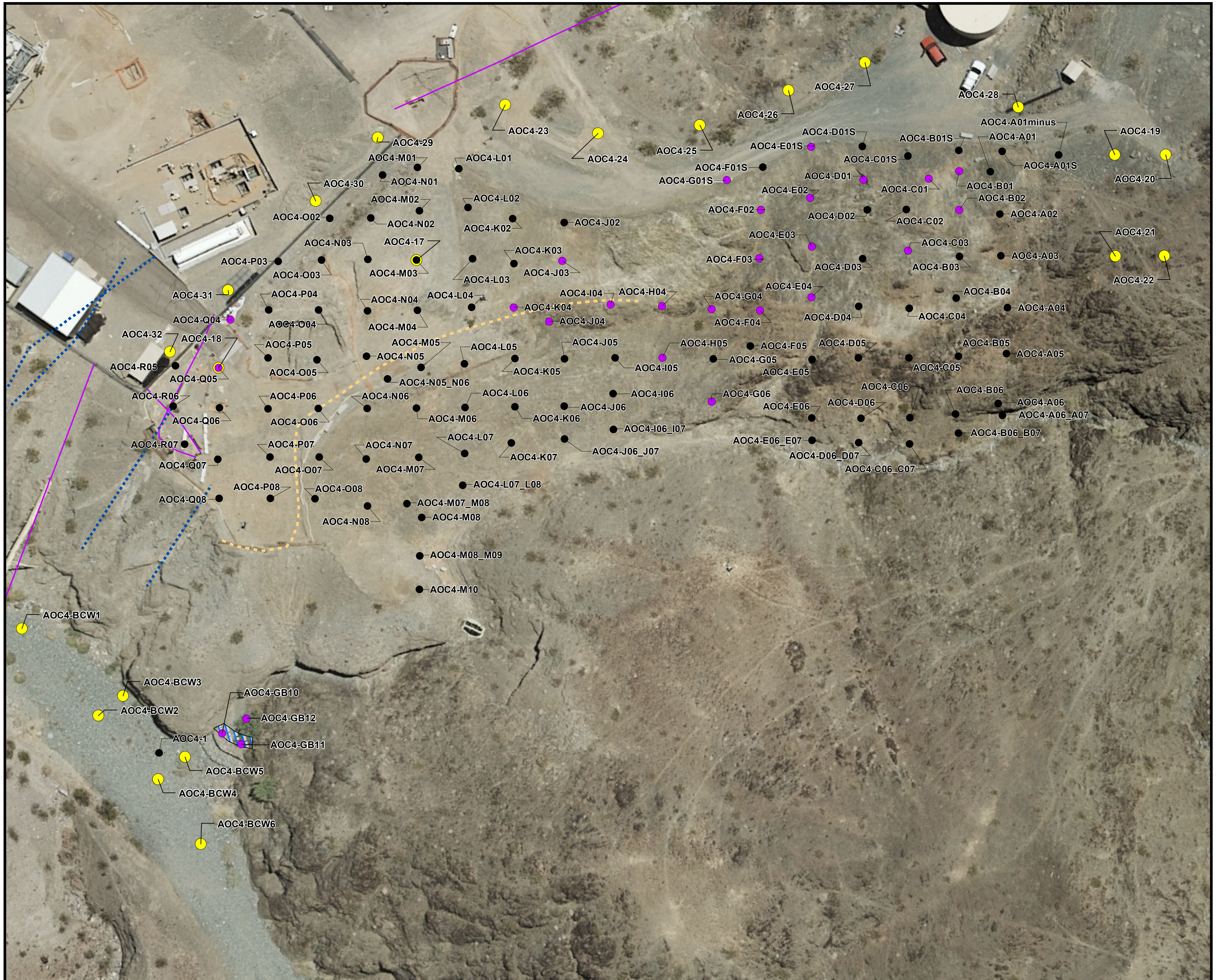
0 25 50 100 Feet

FIGURE C10-15
AROCLOR-1254 SOIL SAMPLE LOCATIONS

AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

BAO \\COYOTECREST\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC4\AOC4_A-1254_PTS_B.MXD AOC4_A-1254_PTS_B.MXD JLAMANTI 4/22/2011 15:27:38



VICINITY MAP

LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than or equal to the Ecological Comparison Value (204 µg/kg) are in PURPLE.

N

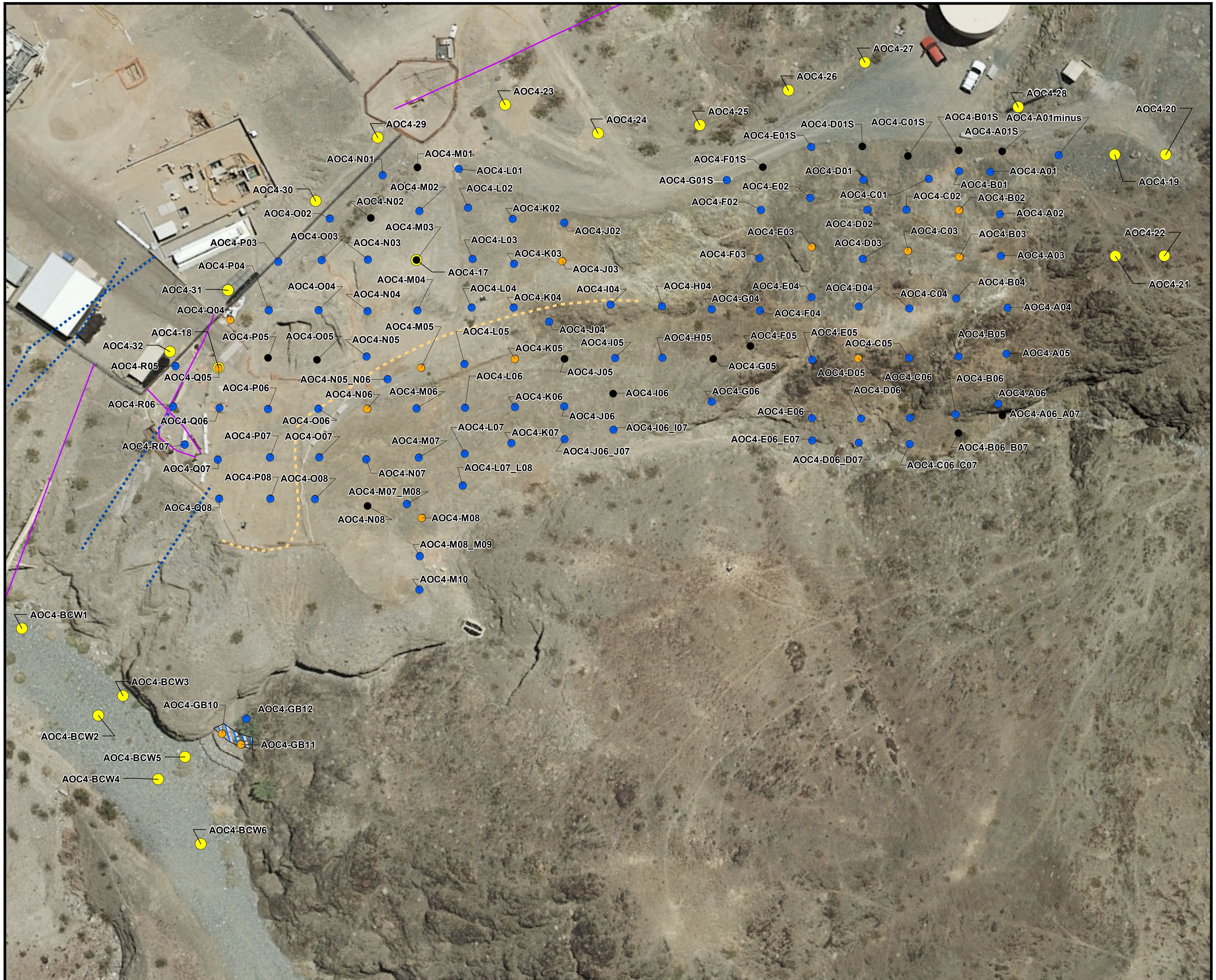
0 25 50 100 Feet

FIGURE C10-16
TOTAL PCBs SOIL SAMPLE LOCATIONS

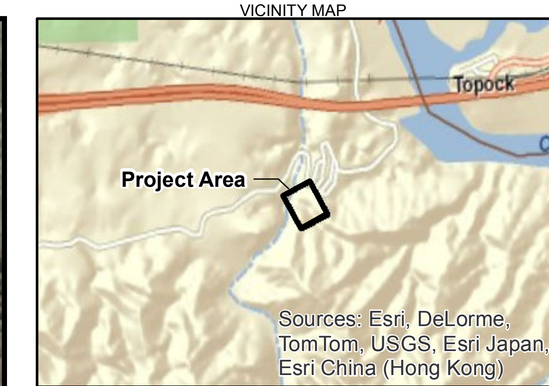
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

BAO \\COYOTECREST\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2011\AOC4\AOC4_TPCB_PTS_B.MXD AOC4_TPCB_PTS_B.MXD JLAMANTI 4/22/2011 15:34:26



VICINITY MAP



LEGEND

- Sample Location
- Proposed Sample Location
- Top of Slope After TRCA Grading
- Approximate Location of Stormwater Piping Below Ground
- PG&E Pipeline
- Gabion

Notes:

1. Results not detected above screening levels, or if detected are below screening levels are shown in BLACK.
2. Results greater than or equal to the Ecological Comparison Value (16 ng/kg for TEQ Avian, 1.6 ng/kg for TEQ Mammal) are in BLUE.
3. Results greater than or equal to the California Department of Toxic Substances Control Residential California Human Health Screening Level (50 ng/kg for TEQ Human) are shown in ORANGE.
4. Proposed samples collocated with existing locations, will be sampled at depth.

N

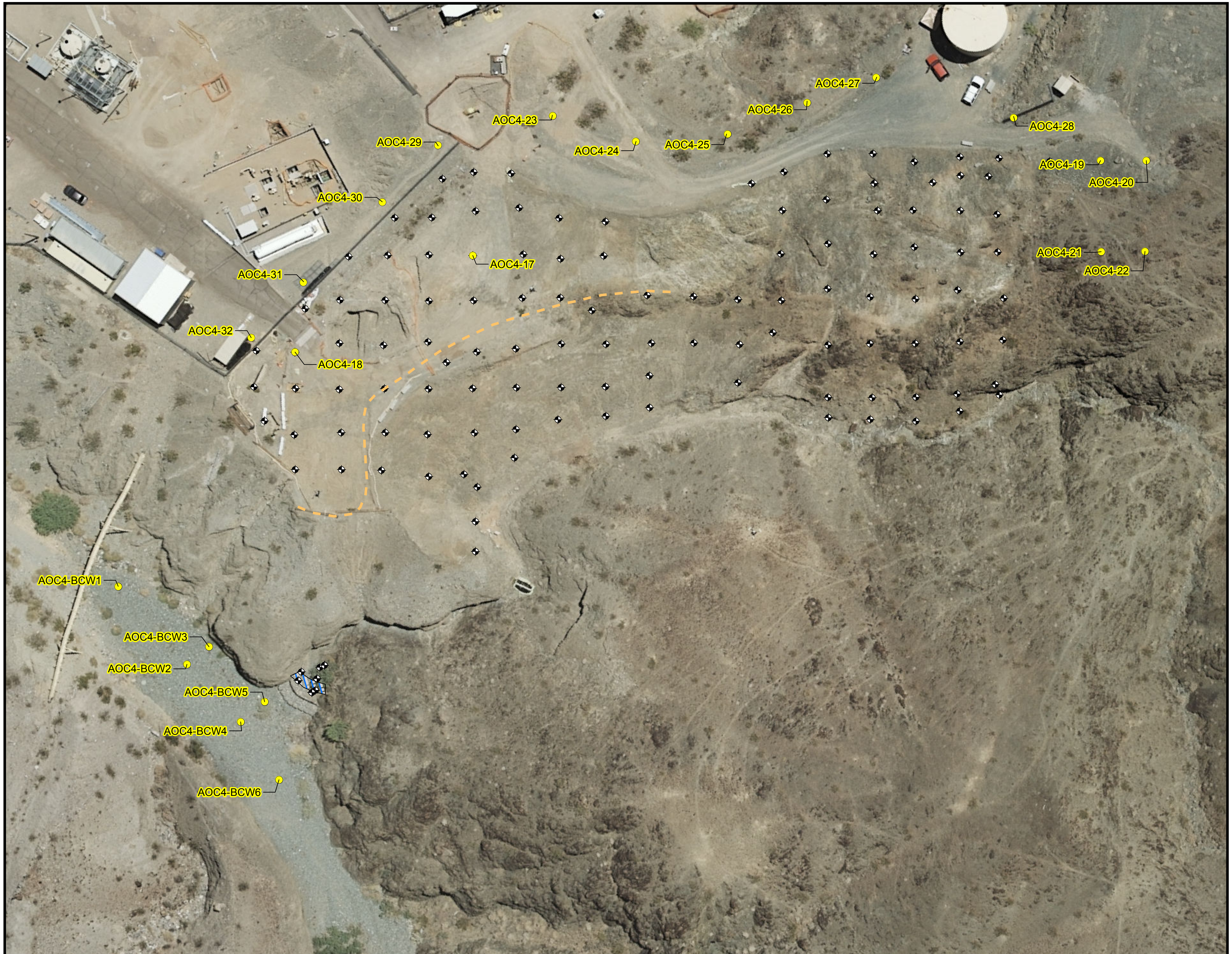
0 25 50 100 Feet

FIGURE C10-17
DIOXIN/FURANS TOXICITY EQUIVALENCY QUOTIENT SAMPLE LOCATIONS

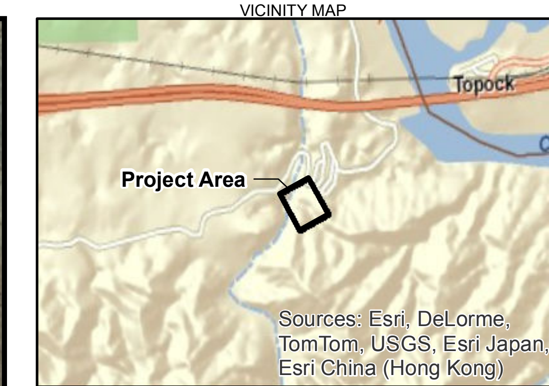
AOC4 – DEBRIS RAVINE
PHASE 1 DATA GAPS EVALUATION REPORT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS_New\MapFiles\2011\AOC4_DIOXIN_PTS_B



VICINITY MAP



LEGEND

- Proposed Phase 2 Soil Sample Location
- Existing Soil Sample Location
- Top of Slope After TCRA Grading
- Gabion

N

0 25 50 100 Feet

FIGURE C10-18
AOC4 PROPOSED PHASE 2 SOIL SAMPLE LOCATIONS
AOC4 -DEBRIS RAVINE
SOIL INVESTIGATION PART A PHASE 1
DATA GAPS EVALUATION REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: \\Zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS\MapFiles\2012\SWP_A\AOC4\SampleLocations.mxd

Subappendix C11
Area of Concern 27 Data Gaps
Evaluation Results

Contents

Tables

Figures

Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
BTV	background threshold value
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
CMS/FS	corrective measures study/feasibility study
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
mg/kg	milligrams per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
XRF	x-ray fluorescence

SUBAPPENDIX C11

Area of Concern 27 Evaluation Results

1.0 Introduction and Background

This subappendix presents the results of the data gaps evaluation and the proposed sampling program for Area of Concern (AOC) 27 – MW-24 bench at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. The process for the data gaps evaluation is outlined in Sections 2.0 through 6.0 of the main text of Appendix A – Part A Phase 1 Data Gaps Evaluation Report.

1.1 Background

During employee interviews conducted by PG&E in late 2009 and early 2010, a former PG&E Topock Compressor Station employee indicated the area north of the compressor station and south of I-40, informally known as the MW-24 bench (named because monitoring well MW-24 is located in this area), was used as a waste disposal area. Prior to the construction of Interstate 40, this area was contiguous with AOC 14 – Railroad Debris Site. Miscellaneous construction debris is present in AOC 27. In January 2008, during trenching activities in AOC 27 associated with installation of a control panel related to the upland in situ pilot test, debris consisting mostly of treated wood, concrete, and scrap steel/ tin (including a possible fragment of a storage tank) were encountered at a depth of approximately 3 feet below ground surface (bgs). The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and the United States Department of the Interior were notified of this discovery in an e-mail dated January 12, 2008. Three samples of the debris and two soil samples were subsequently collected.

In March 2011, DTSC identified potential burn waste in the eastern edge of the road cut on the road from AOC 27 to Bat Cave Wash and directed PG&E in a March 24, 2011 email to collect samples of the waste material. The e-mail also directed PG&E to define the lateral and vertical extents of waste and any associated contamination observed in the in situ pilot study trench.

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 27 based on the above site background, as shown in Figure C11-1. Table C11-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 27.

The primary source of contamination at AOC 27 is disposal of debris. The primary release mechanisms are direct releases of contaminated particulates or leaching of contaminants from the debris and/or burned material. Contaminants present in these materials could have been deposited on surface soil as particulates or could have entered surface soil as dissolved constituents through infiltration of rainfall. Because some material is buried, constituents could also have affected shallow and subsurface soils in the immediate vicinity of the debris. Contaminants released from debris and burn material located in AOC 27 could also have been transported to the lower portions of the unit and potentially to AOC 1 (Bat Cave Wash) through surface runoff. Primary source media therefore consist of surface, shallow, and subsurface soils. Contaminants could have leached from surface soils and shallow soil into underlying deeper soils. Potential migration from subsurface soil to groundwater was identified as a potential secondary pathway. If released, volatile organic compounds (VOCs) in surface soils would be expected to have been degraded by heat and light and are likely no longer present.

1.2.1 AOC 27 Data

Soil samples were collected from approximately 3 feet bgs at two locations (24soil-01 and 24soil-02) within the upland in situ pilot study trench in AOC 27, as shown on Figure C11-2. The samples were not collected following sample collection and handling protocols outlined in the PG&E Program Quality Assurance Project Plan and were analyzed for metals, VOCs, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) (soil samples only), and pH. Three debris samples were collected at locations 24debris-01, 24debris-02 and 24debris-03 and were analyzed for metals, pH, and PAHs. VOCs and SVOCs other than PAHs were not detected. Because the soil samples were not collected following the standard sample collection procedures, these data are considered Category 3.

2.0 Decision 1 – Nature and Extent

This section describes the nature and extent of residual soil concentrations of chemicals of potential concern (COPCs) and chemicals of potential ecological concern (COPECs) at AOC 27. Laboratory analytical results for soil and debris samples are presented in Tables C11-2 through C11-4.

2.1 Summary of AOC 27 Soil Data

Eighteen constituents, including three calculated quantities (total low-molecular-weight PAHs, total high-molecular-weight PAHs, benzo(a)pyrene equivalents), were detected in soil samples collected in AOC 27. The detected constituents included:

- Twelve metals (arsenic, barium, cadmium, total chromium, cobalt, copper, lead, molybdenum, nickel, selenium, vanadium, and zinc)
- Two PAHs (fluoranthene and phenanthrene)
- Total low-molecular-weight PAHs and total high-molecular-weight PAHs,
- Benzo(a)pyrene equivalents
- TPH as diesel

Fifteen of the constituents detected in soil samples collected at AOC 27 (arsenic, barium, cadmium, total chromium, cobalt, copper, molybdenum, nickel, vanadium, zinc, fluoranthene, phenanthrene, TPH as diesel, and total low-molecular-weight PAHs, and total high-molecular-weight PAHs) were detected at concentrations below their respective interim screening levels. Three constituents were detected one or more times at concentrations exceeding the interim screening levels, including lead, selenium, and the calculated quantity benzo(a)pyrene equivalents. These are discussed below.

Lead and selenium were detected in both soil samples collected at AOC 27. The maximum detected concentration of lead was 8.7 milligrams per kilogram (mg/kg), which barely exceeds the interim screening level (8.39 mg/kg) (background threshold value [BTV]), as shown in Table C11-2. This exceedance is slightly above the BTV. The maximum detected concentration of selenium was 6.2 mg/kg, which exceeds the interim screening level (1.47 mg/kg) (BTV).

Calculated benzo(a)pyrene equivalents for both soil sample locations are 290 mg/kg, which exceeds the interim screening level (38 mg/kg) (residential DTSC California human health screening level). Carcinogenic PAHs were not detected above interim screening levels at these sample locations. Consistent with the *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil* (ARCADIS, 2009), half the reporting limits for those PAHs not detected above the reporting limits were used to calculate the benzo(a)pyrene equivalents. Therefore, the calculated benzo(a)pyrene equivalents are conservative values.

2.2 Summary of AOC 27 Debris Data

Fourteen metals were detected in one or more of the three debris samples: antimony, arsenic, barium, cadmium, total chromium, hexavalent chromium, cobalt, copper, lead, molybdenum, nickel, selenium, vanadium, and zinc. No PAHs were detected in the debris samples; however, detection limits were elevated. Of those compounds detected, antimony (1.38 mg/kg, 3.8 mg/kg) total chromium (190 mg/kg), copper (17 mg/kg), lead (66 mg/kg, 830 mg/kg), molybdenum (1.5 mg/kg), nickel (100 mg/kg), selenium (8 mg/kg, 8.9 mg/kg), vanadium (120 mg/kg), and zinc (170 mg/kg) were detected above their respective interim screening levels, as shown in Table C11-2.

2.3 Nature and Extent Conclusions

Based on review of the data and the Part A data quality objectives, one data gap was identified to resolve Decision 1 – Nature and Extent, and sampling is recommended to fill the following data gap:

- Data Gap #1 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area
- Data Gap #2 – Nature and extent of debris

The potential soil sample locations and other investigation activities to fill this data gap are presented in Section 6.0 of this subappendix.

3.0 Decision 2 – Data Sufficient to Estimate Representative Exposure Point Concentrations

Nature and extent (Decision 1) must be defined to fully assess Decision 2. Insufficient data are available to calculate exposure point concentrations. The Decision 2 evaluation will be conducted after the collection of data from the proposed soil sample locations presented in Section 6.0. Results from the Decision 2 evaluation will be presented in the Soil RCRA Facility Investigation/Remedial Investigation Volume 3 Report.

4.0 Decision 3 – Potential Threat to Groundwater from Residual Soil Concentrations

Nature and extent (Decision 1) must be defined to fully assess Decision 3. Insufficient information is available to calculate soil screening levels protective of groundwater and to support screening-level groundwater modeling results, where necessary. After the collection of data from the proposed soil sample locations presented in Section 6.0 of this subappendix, the new data will be used to conduct the Decision 3 evaluation. The combined data set will then be evaluated for data gaps, and further conclusions regarding the threat to groundwater will be provided to the agencies and stakeholders for review prior to submittal of the RFI/RI Volume 3.

5.0 Decision 4 – Data Sufficiency to Support the Corrective Measures Study/Feasibility Study

As discussed in Section 6.0 of the Part A Phase 1Data Evaluation Report, various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study (CMS/FS). The types of data needed vary somewhat depending on the specific technology to be evaluated. The categories of data required for technologies that may be applicable include:

- Extent of COPCs and COPECs above action levels (required for all technologies).
- Waste characterization parameters (required if soil may be disposed of offsite).
- Constituent leachability (required to assess the need for fixation of leachable compounds and/or the feasibility of certain soil-washing technologies).
- Soil physical properties (required for all technologies; however, the properties required vary among the different technologies).
- Surface and subsurface features (required to determine whether there are physical impediments to implementing specific technologies and/or remediating specific areas).
- Volumes and types/characteristics of debris.

The extent of COPCs and COPECs above action levels will be adequately characterized once Decision 1 is satisfied. Constituent leachability data will be collected as part of the nature and extent evaluation; supplemental information may be collected during the CMS/FS. Soil physical property data collected during the Part A Phase 1 soil investigation was limited to grain size analysis only, and no data have been collected at this unit. Specific soil physical properties data (that is, porosity, grain size, density, organic carbon content) are required to support the CMS/FS, as described in Table 6-1 in the Part A Phase 1 Data Gaps Report. Additional soil physical parameter data are needed to support the CMS/FS. Waste characterization data will be collected once the quantity and location of wastes requiring removal, if any, have been determined in the CMS/FS.

There is only limited information regarding surface and subsurface features at AOC 27, and additional information may be required once areas requiring remediation have been defined. Nearby roads and road structures, vegetation, and the location of bedrock are known for AOC 27. However, subsurface utilities, including gas transmission pipelines and any culverts or other features, may have to be more precisely defined to evaluate the feasibility and cost of certain remedial alternatives and to prepare construction specifications.

Available data are not sufficient to support the CMS/FS. Additional evaluations will be performed, as appropriate, as data are collected to resolve the Decision 1. The following data gaps were identified for Decision 4:

- Data Gap #3 - Soil physical parameters to support the CMS/FS.
- Data Gap #4 - Volumes and types/characteristics of debris.

6.0 Summary of Data Gaps Evaluation to Fill the Identified Gaps

Based on the Part A data quality objectives, a data gap was identified for Decision 1 and is summarized below.

- **Decision 1 (Nature and Extent)**: The following data gaps were identified to resolve this decision:
  - Data Gap #1 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area
  - Data Gap #2 – Nature and extent of debris
- **Decision 2 (Data Sufficient to Estimate Representative Exposure Point Concentrations)**: Insufficient data to complete Decision 2 evaluation. The evaluation will be conducted after the implementation of the sampling program proposed in this work plan has been completed.
- **Decision 3 (Potential Threat to Groundwater from Residual Soil Concentrations)**: Insufficient data to complete Decision 3 evaluation. The evaluation will be conducted after the implementation of the sampling program proposed in this work plan has been completed.

- **Decision 4 (Data Sufficient to Estimate Soil Properties and Contaminant Distribution in Support of the CMS/FS):** The following data gap was identified to resolve this decision:
  - Data Gap #3 - Soil physical parameters to support the CMS/FS.
  - Data Gap #4 - Volumes and types/characteristics of debris.

7.0 AOC 27 – Investigation and Sampling Program

The evaluation of AOC 27 MW-24 bench area was developed in collaboration with DTSC and the United States Department of the Interior and other stake holders. The evaluation will consist of the following:

1. Asbestos survey of debris
2. Debris mapping of large debris across the area.
3. Geophysical surveying across the bench area to further characterize buried waste. Magnetic and conductivity surveys will be performed along parallel traverses spaced 5 to 10 feet apart as access and site conditions allow, and measurements will be taken along the traverses at approximately 5-foot spacing. Additional details of geophysical surveying are presented in Section 2.2.4 of the main text of this work plan. If the geophysical survey equipment leaves visible tracks, the tracks will hand graded.
4. An x-ray fluorescence (XRF) analyzer will be used to assess surface soils in the bench area. Figure C11-2 shows a 50-foot grid over the bench area; one XRF sample will be collected from each grid cell, as shown on Figure C11-2. Corrected XRF results will be compared to applicable screening levels on Table 2-1 in the Soil RFI/RI Work Plan on a point-by-point basis.
5. PG&E, the agencies, and the Tribes will meet to review the results of the geophysical survey and XRF results prior to making determinations about the need for and locations of intrusive activities such as trenching within AOC 27. If these intrusive activities are required, soil samples will be collected at 0 to 0.5, 2 to 3, 5 to 6, and 9 to 10 feet bgs at each area of interest and will be submitted to the laboratory for analysis for pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, polychlorinated biphenyls (PCBs), TPH, and pH. No more than 20 trenches/potholes will be conducted within the boundaries of this AOC.

In addition, DTSC directed PG&E (email date March 24, 2011) to:

- Define the lateral and vertical extents of waste and any associated contamination at the MW-24 bench waste pit observed in January 2008 during implementation of upland in situ pilot study.
- Collect soil samples in an area that DTSC identified as a potential burn waste outcrop along the western ramp up from Bat Cave Wash.

Trenching is proposed to define the lateral and vertical extents of buried debris discovered during the upland in situ pilot study. The trenching may extend up to 20 feet bgs, depending on field conditions and observations, and will not extend beyond the AOC boundary, as shown on Figure C11-2. Five soil samples (AOC27-1 through AOC27-5) will be collected from the bottom of the trenches (one centered in the former trench and laterally at the end reaches of debris). The soil samples will be analyzed for PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pesticides, and pH. Apparent burn-like material and 10 percent of other soil samples will be analyzed for dioxins and furans. PG&E proposes to collect three surface soil samples (AOC27-6 through AOC27-8) in the potential burn waste outcrop. Soil samples will be analyzed for hexavalent chromium, Title 22 metals, PAHs, TPH, PCBs, and dioxins/furans.

7.1 Access Restrictions

AOC 27 – MW-24 bench is bordered by Interstate 40 to the north, former Route 66 and a slight ridge to the east, the compressor station to the south, and Bat Cave Wash to the west. The site can be accessed by a steep dirt road leading from the compressor station. Several underground natural gas transmission lines cross AOC 27, and other unknown utilities may also be present.

8.0 References

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. 2005. *Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil*. November 2004 (January 2005 Revision). January.

California Regional Water Quality Control Board (Water Board). 2008. *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*. May 27

United States Environmental Protection Agency. 2009. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* December. Available online at: http://www.epa.gov/region09/superfund/prg/pdf/composite_sl_table_run_APRIL2009.pdf. September 12.

Tables

TABLE C11-1
Conceptual Site Model, AOC 27 – MW-24 Bench
Soil Investigation Part A Phase 1 Data Gaps Evaluation Results,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Disposal of Debris	Surface Soil	Percolation and/or infiltration	Subsurface Soil	Wind erosion and atmospheric dispersion of surface soil
		Potential entrainment in stormwater/ surface water runoff	Potential Groundwater	Potential volatilization and atmospheric dispersion
				Potential extracted groundwater[a]
Burned Material	Surface Soil	Percolation and/or infiltration	Subsurface Soil	Wind erosion and atmospheric dispersion of surface soil
		Potential entrainment in stormwater/ surface water runoff		

[a] Quantitative evaluation of the groundwater pathway completed in the groundwater risk assessment (ARCADIS, 2009); Part A Phase I data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

TABLE C11-2

Sample Results: Metals
AOC 27 - MW 24 Bench
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
Interim Screening Level [1]:				**0.285**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**0.0125**	**1.37**	**27.3**	**1.47**	**5.15**	**2.32**	**52.2**	**58**
Residential Regional Screening Levels [2]:				**31**	**0.062**	**15,000**	**160**	**70**	**0.29**	**280**	**23**	**3,100**	**150**	**10**	**390**	**1,500**	**390**	**390**	**5.1**	**390**	**23,000**
Residential DTSC CHHSL [3]:				**30**	**0.07**	**5,200**	**16**	**39**	**17**	**NE**	**660**	**3,000**	**80**	**18**	**380**	**1,600**	**380**	**380**	**5**	**530**	**23,000**
Ecological Comparison Values [4]:				**0.285**	**11.4**	**330**	**23.3**	**0.0151**	**139.6**	**36.3**	**13**	**20.6**	**0.0166**	**0.0125**	**2.25**	**0.607**	**0.177**	**5.15**	**2.32**	**13.9**	**0.164**
Background [5]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
24debris-01	01/18/08	Unknown	N	1.3	4.1	89	ND (0.1)	0.49	0.43	9.6	2.9	17	66	ND (0.1) *	0.42	7.3	8	ND (0.25)	ND (1)	16	26
24debris-02	01/18/08	Unknown	N	3.8	0.89	43	ND (0.1)	ND (0.1)	ND (0.4)	190	0.7	3.9	830	ND (0.1) *	0.56	1.4	8.9	ND (0.25)	ND (1)	1.9	170
24debris-03	01/18/08	Unknown	N	ND (0.4) *	4.6	45	ND (0.1)	0.74	ND (0.4)	16	2.7	5.1	20	ND (0.1) *	1.5	100	6.6	ND (0.25)	ND (1)	120	41
24soil-01	01/31/08	Unknown	N	ND (0.4) *	3.1	130	ND (0.1)	0.71	ND (0.4)	15	3.5	7.2	6.4	ND (0.1) *	0.63	6.8	6.2	ND (0.25)	ND (1)	17	16
24soil-02	01/31/08	Unknown	N	ND (0.4) *	2.9	89	ND (0.1)	0.3	ND (0.4)	15	3.4	9.1	8.7	ND (0.1) *	0.7	7.2	1.4	ND (0.25)	ND (1)	18	17

1 Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C11-3

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 27 - MW 24 Bench
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level[1] :				22,000	310,000	3,400,000	1,700,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	10,000	1,160	38
Residential Regional Screening Levels[2] :				22,000	310,000	3,400,000	1,700,000	17,000,000	380	15	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	NE	NE	15
Residential DTSC CHHSL[3] :				NE	NE	NE	NE	NE	NE	38	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	38
Ecological Comparison Values[4] :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	10,000	1,160	NE
Background[5] :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	1-Methyl naphthalene	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	PAH Low molecular weight	PAH High molecular weight	B(a)P Equivalent
24debris-01	01/18/08	Unknown	N	---	ND (3,300)	ND (3,300)	ND (3,300)	ND (3,300)	ND (3,300) *	ND (3,300) *	ND (3,300) *	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300)	ND (3,300)	ND	ND	ND (2,900) *
24debris-02	01/18/08	Unknown	N	---	ND (3,300)	ND (3,300)	ND (3,300)	ND (3,300)	ND (3,300) *	ND (3,300) *	ND (3,300) *	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300)	ND (3,300) *	ND (3,300)	ND (3,300)	ND (3,300)	ND	ND	ND (2,900) *
24debris-03	01/18/08	Unknown	N		ND (160,000)	ND (160,000)	ND (160,000)	ND (160,000)	ND (160,000) *	ND (160,000) *	ND (160,000) *	ND (160,000)	ND (160,000) *	ND (160,000) *	ND (160,000) *	ND (160,000)	ND (160,000)	ND (160,000)	ND (160,000) *	ND (160,000)	ND (160,000)	ND	ND	ND (140,000) *
24soil-01	01/31/08	Unknown	N	---	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)	ND (330) *	ND (330)	ND (330)	ND (330)	ND (330)	ND (330) *	ND (330)	ND (330)	ND (330)	ND (330)	450	ND (330)	450	ND	290
24soil-02	01/31/08	Unknown	N	---	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)	ND (330) *	ND (330)	ND (330)	ND (330)	ND (330)	ND (330) *	370	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)	ND	370	290

1 Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C11-4

Sample Results: VOCs, SVOCs, TPHs, and pH

AOC 27 - MW 24 Bench

Soil Investigation Part A Phase 1 Data Gaps Evaluation Report

Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Total Petroleum Hydrocarbons (mg/kg)	General Chemistry
			Interim Screening Level[1] :	540	NE
			Residential Regional Screening Levels[2] :	NE	NE
			Residential DTSC CHHSL[3] :	NE	NE
			Ecological Comparison Values[4] :	NE	NE
			Background[5] :	NE	0
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**TPH as diesel**	**pH**
24debris-01	01/18/08	Unknown	N	---	11
24debris-02	01/18/08	Unknown	N	---	4.6
24debris-03	01/18/08	Unknown	N	---	8
24soil-01	01/31/08	Unknown	N	13	8.8
24soil-02	01/31/08	Unknown	N	160	9.1

1 Interim screening level is equal to the appropriate background value, if a background value is not available then the lesser of the soil ecological comparison values, the EPA Regional Screening Level, or DTSC CHHSL is used.

2 US EPA. 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. http://epaprgs.ornl.govchemicals/index.shtml. September 12.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil. May 28.

5 CH2M HILL. 2009. Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California. May.

6 White Powder Sample

7 Volatile organic compounds and semivolatile organic compounds were not detected above laboratory reporting limits.

Results greater than the Interim Screening Level are circled.

TPH	Total Petroleum Hydrocarbon
EPA	Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California Human Health Screening Levels
NE	not estabilished
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C11-5
Proposed Soil Sampling Locations, AOC 27 – MW-24 Bench
Soil Investigation Part A Phase 1 Data Gaps Evaluation Results,
PG&E Topock Compressor Station, Needles, California

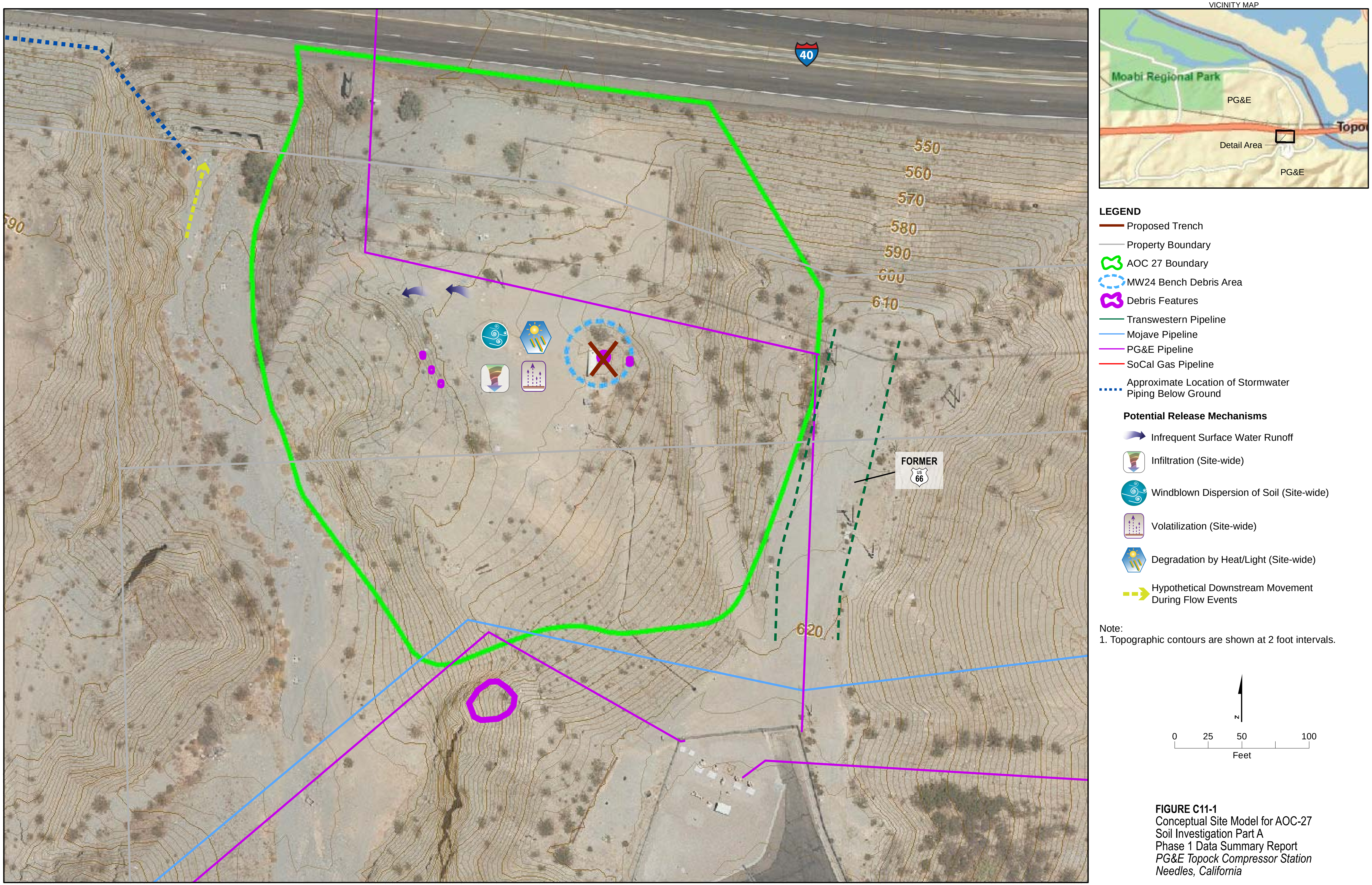
Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Methods[a]
AOC27-1	Bottom of trench	To resolve Data Gaps #1 through #4 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area. Limited data exist for this area, and data are needed to define extent of debris and collect information to support the CMS/FS.	Dioxins and furans, pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pH, soil physical parameters (Atterberg limits, relative compaction, alkalinity, cation exchange, capacity, and particle size distribution) – three samples from boring	Backhoe
AOC27-2	Bottom of trench	To resolve Data Gaps #2 and #4 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area. Limited data exist for this area, and data are needed to define extent of debris.	Pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pH	Backhoe
AOC27-3	Bottom of trench	To resolve Data Gaps #2 and #4 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area. Limited data exist for this area, and data are needed to define extent of debris.	Pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pH	Backhoe
AOC27-4	Bottom of trench	To resolve Data Gaps #1 through #4 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area. Limited data exist for this area, and data are needed to define extent of debris and collect information to support the CMS/FS.	Pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pH, soil physical parameters (Atterberg limits, relative compaction, alkalinity, cation exchange, capacity, and particle size distribution) – three samples from boring	Backhoe
AOC27-5	Bottom of trench	To resolve Data Gaps #1, #2, and #4 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area. Limited data exist for this area, and data are needed to define extent of debris.	Pesticides, PAHs, VOCs, SVOCs, Title 22 metals, hexavalent chromium, PCBs, TPH, pH	Backhoe
AOC27-6	0	To resolve Data Gap #1 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area	Hexavalent chromium, PAHs, Title 22 metals, TPH, PCBs, dioxin and furans	Hand tools
AOC27-7	0	To resolve Data Gap #1 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area	Hexavalent chromium, PAHs, Title 22 metals, TPH, PCBs, dioxin and furans	Hand tools
AOC27-8	0	To resolve Data Gap #1 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area	Hexavalent chromium, PAHs, Title 22 metals, TPH, PCBs, dioxin and furans	Hand tools

TABLE C11-5
Proposed Soil Sampling Locations, AOC 27 – MW-24 Bench
Soil Investigation Part A Phase 1 Data Gaps Evaluation Results,
PG&E Topock Compressor Station, Needles, California

Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Methods[a]
50 foot grid across AOC 27		To resolve Data Gap #1 – Nature and extent of contamination in the newly identified debris area in the MW-24 bench area	XRF screen	Hand tools

[a] Proposed collection methods listed on this table are based on experience and knowledge of the site; actual collection method will be chosen in the field based on field conditions and site access restrictions.

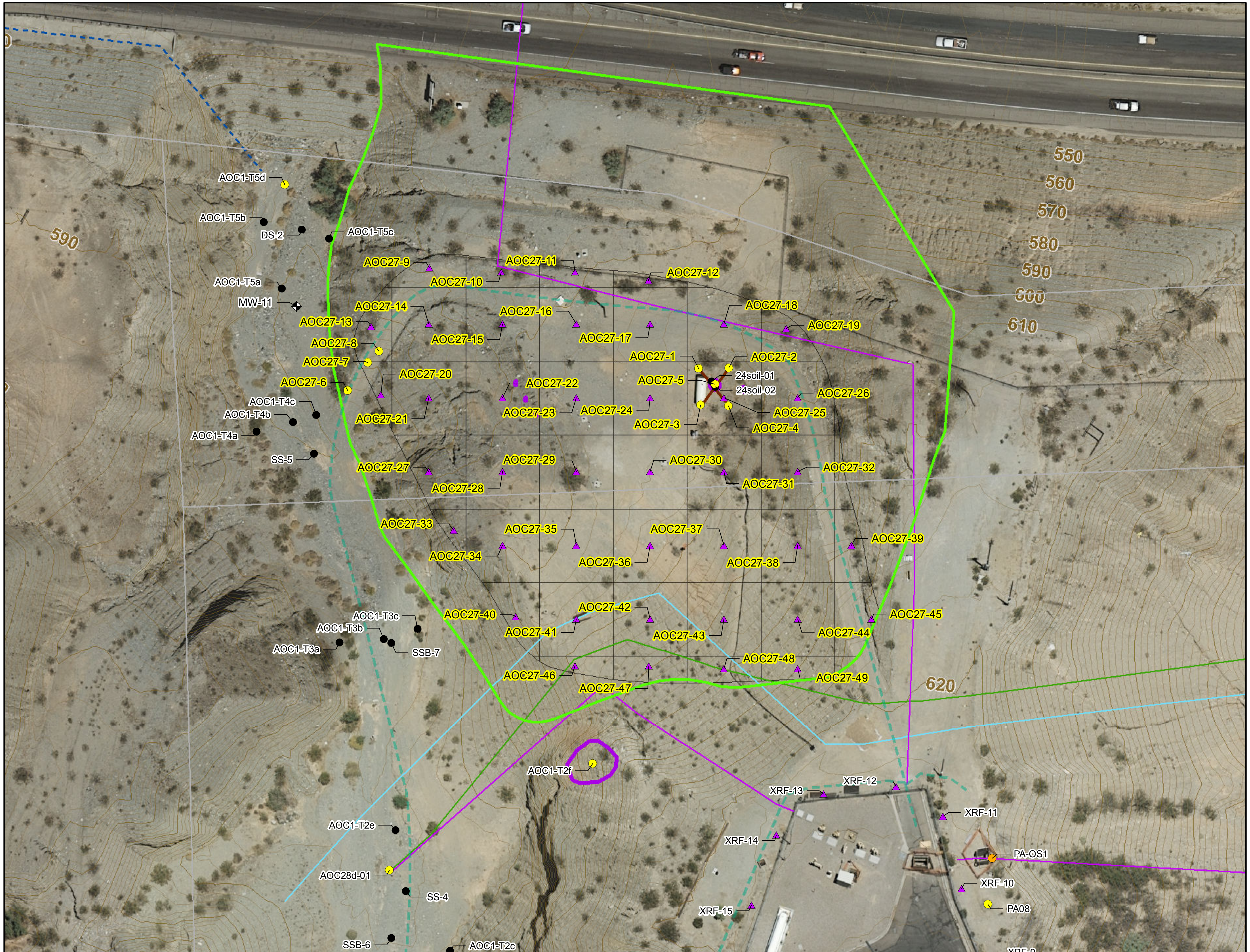
Figures



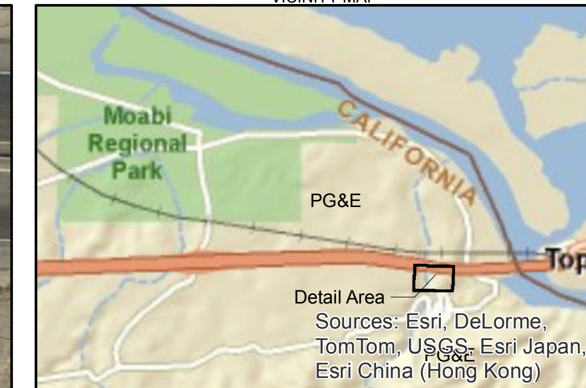
Note:
1. Topographic contours are shown at 2 foot intervals.

FIGURE C11-1
Conceptual Site Model for AOC-27
Soil Investigation Part A
Phase 1 Data Summary Report
PG&E Topock Compressor Station
Needles, California

CH2MHILL



VICINITY MAP



LEGEND

- Proposed Soil Sample Location
- Proposed XRF Screening Location
- Soil Boring
- MW
- Proposed Trench
- Access Routes
- Property Boundary
- AOC Boundary
- Debris Features
- Transwestern Pipeline
- Mojave Pipeline
- PG&E Pipeline
- SoCal Gas Pipeline
- 50-Foot Sampling Grid
- Stormwater Piping Below Ground

Note:
1. Topographic contours are shown at 2 foot intervals.

2. An additional 20 trenches/potholes may be conducted in this area, pending geophysical surveys and XRF sampling results

N

0 25 50 100
Feet

FIGURE C11-2
Proposed Phase 2
Soil Sample Locations
AOC 27 - MW-24 Bench
Soil Investigation Part A
Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

CH2MHILL

Path: \\Zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS\MapFiles\2012\SWP_A\AOC27\AOC27_DG_Additional_Locs.mxd

Subappendix C12
Area of Concern 28 Data Gaps Evaluation Results

Contents

Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
CMS/FS	corrective measures study/feasibility study
mg/kg	milligrams per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
STLC	Soluble threshold limit concentration
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

APPENDIX C12

Areas of Concern 28 Evaluation Results

1.0 Introduction and Background

This subappendix presents the results of the data gaps evaluation and prior opportunistic sampling for Area of Concern (AOC) 28, which includes AOC 28a: 300A Pipeline Drip 1 (Off-set Drip East of Compressor Station), AOC 28b: 300A Pipeline Drip 2 (East of Compressor Station), AOC 28c: 300B Pipeline Drip East of Compressor Station, and AOC 28d: 300B Drip in Bat Cave Wash at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station in Needles, California. The process for the data gaps evaluation is outlined in Sections 2.0 through 6.0 of the main text of Appendix A – Part A Phase 1 Data Gaps Evaluation Report.

1.1 Background

Four drip legs (two each on the 300A and 300B main gas pipelines) have been added as new AOCs (AOC 28a through AOC 28d) at the request of the California Environmental Protection Agency, Department of Toxic Substances Control during comment resolution on the Soil RCRA Facility Investigation/Remedial Investigation Work Plan. Three drip legs are on the 300A and 300B pipelines to the east of the compressor station, and one drip leg for the 300B pipeline is on the 300B pipeline west of the compressor station in Bat Cave Wash, as shown on Figure C12-1. The 300A pipeline drip legs AOC 28a and AOC 28b, were installed in the early 1950s. The drip leg associated with AOC 28c: 300B Pipeline Drip East of Compressor Station was installed the mid-1950s, and the drip leg associated with AOC 28d: 300B Drip in Bat Cave Wash was installed in the late 1990s.

A drip leg is typically a separate section of pipe connected to and located below the main gas pipeline. The drip leg collects pipeline liquids by gravity. It is connected to a valve used to drain the pipeline liquids to a fixed or portable tank. The drip legs on the east side of the compressor station consist of a dog-leg drip on the 300B pipeline, an offset drip on the 300A pipeline, and a bottom drip associated with a raised section of pipe on the 300A pipeline. The 300B dog-leg drip was formerly connected to the 300B Pipeline Liquids Tank, which was investigated separately as Undesignated Area 2. The drip leg on the 300B pipeline in Bat Cave Wash is also a bottom tap. Drip legs are also referred to by their location on the pipeline, as measured in miles from the start of the PG&E-owned pipeline, which is at the state line. AOC 28a is therefore MP 0.13A, AOC28b is MP 0.21B, AOC 28c is MP0.64A, and AOC 28d is MP 0.55B.

All drip legs are currently drained to portable tanks monthly basis. A historical procedure for draining pipeline drips confirms this frequency (PG&E, 1989). It is possible that some spillage could occur or may have historically occurred during the transfer process (for example, if the hose from the valve is not connected properly to the portable tank). All potential releases at the drip legs would be surface releases, and the releases would be confined to a very small area in the immediate vicinity of the drip legs.

Since the early 1980s, PG&E has been conducting annual polychlorinated biphenyls (PCBs) testing on the collected pipeline liquids from the incoming 300A and 300B transmission pipelines. No PCBs have been detected (at detection limits ranging from 0.005 to 5 milligrams per kilograms) coming into the compressor station through those pipelines. As defined in Volume 1 Topock RFI/RI, a portion of the Transwestern Gas Pipeline that lies offsite and to the east of the facility was contaminated with PCBs in the 1990s. After PG&E discovered the presence of PCBs in some pipeline liquids from Transwestern at Topock in the late 1990s, PG&E installed protective equipment and cleaned portions of the pipeline system to remove PCB contamination. Subsequently, PG&E implemented a monthly PCB monitoring program along the entire downstream Line 300 gas pipeline system. Since the initiation of this testing protocol, only low levels of PCBs have been detected in the downstream pipelines.

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 28 based on the above site history and background, as shown in Figure C12-2. Table C12-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 28.

The primary sources of contamination in AOC 28 consisted of potential historic or current spills while transferring the contents of the drip legs to the portable tanks. Any constituents released would have been released in liquid form and released to surface soil. Surface soil is therefore the primary source medium. Because the materials that would have released in this area were pipeline liquids, they would have limited migration potential; however, some contaminants could have infiltrated from surface soil into underlying shallow soil. Potential migration from subsurface soil to groundwater was identified as a potential secondary pathway. During extreme wet-weather events, it is possible that some constituents may have been transported from the unit to the adjacent pipeline road in surface runoff. If released, volatile organic compounds (VOCs) in surface soils would be expected to have been degraded by heat and light and are likely no longer present.

1.2.1 AOC 28 Data

Soil sampling has not occurred in AOC 28 to assess the drip legs specifically; however, opportunistic sample samples have been collected at two locations (AOC28-OS1 and AOC28-OS2) in the vicinity of AOC 28a and AOC 28c, respectively, as shown on Figure C12-1. Opportunistic samples were collected at 0 to 0.5, 2.5 to 3, 5.5 to 6, and 9 to 9.5 feet below ground surface (bgs) and were analyzed for polycyclic aromatic hydrocarbons (PAHs), VOCs, semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPHs), PCBs, and pH. In addition, three soil samples collected at certain depths were analyzed for one or more metals based on X-ray fluorescence screening. Sample AOC28-OS1 at 9 to 9.5 feet bgs was analyzed for hexavalent chromium, total chromium, and molybdenum. Sample AOC-OS2 at 2.5 to 3 feet bgs was analyzed for hexavalent chromium only. Sample AOC-OS2 at 8.5 to 9 feet bgs was analyzed for the full Title 22 suite of metals and hexavalent chromium. Laboratory analytical results for the eight opportunistic samples are presented in Tables C12-2 through C12-5.

No data was collected at AOC 28b and AOC 28d. However, four borings previously have been advanced in the vicinity of the AOC 28d in Bat Cave Wash: AOC1-T2a is approximately 80 feet to the south, AOC1-T2b is approximately 70 feet to the southeast, AOC1-T2e is approximately 30 feet to the north, and SS-4 is approximately 20 feet to the east. Soil samples were collected at 0 to 0.5, 2 to 3, 5 to 6, and 9 to 10 feet bgs from AOC1-T2a, AOC1-T2b and at AOC1-T2e at 1, 3, 6, and 0.5 feet bgs from SSB-6. AOC1-T2a, AOC1-T2b, and AOC1-T2e were analyzed for TPH and PAHs TPH-motor-oil was the only TPH constituent detected, with a maximum concentration of 40.9 milligrams per kilogram (mg/kg) compared to the interim screening level of 1,800 mg/kg. Fluorene was the only detected PAH, with a concentration of 5.8 micrograms per kilogram (µg/kg) in AOC1-T2a compared to the interim screening level of 2,300,000 µg/kg. AOC1-T2b was also analyzed for PCBs and pesticides; no PCBs or pesticides were detected. These data are not considered representative of AOC28d since they were collected 20 feet or more away from the AOC; therefore, these data will not be used as inputs for the four Data Quality Objective Decisions.

2.0 Decision 1 – Nature and Extent

This section describes the nature and extent of soil concentrations of compounds of potential concern (COPCs) and compounds of potential ecological concern (COPECs) at AOC 28. Laboratory analytical results for opportunistic soil samples at AOC 28 are presented in Tables C12-2 through C12-5.

2.1 Summary of AOC 28 Soil Data

Nineteen constituents, including metals, TPH, and three calculated quantities (benzo(a)pyrene equivalents, total low-molecular-weight PAHs, and total high-molecular-weight PAHs) were detected in one or more locations near AOC 28. VOCs, TPH as gasoline, SVOCs other than PAHs, and PCBs were not reported above laboratory limits in the opportunistic soil samples collected near AOC 28.

Seventeen of the 19 detected constituents and calculated quantities (arsenic, barium, total chromium, cobalt, lead, nickel, vanadium, TPH as diesel, TPH as motor oil, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, naphthalene, pyrene, benzo(a)pyrene equivalents, total low-molecular-weight PAHs, and total high-molecular-weight PAHs) were detected at concentrations below their respective interim screening levels.

Two constituents (molybdenum and zinc) were detected one or more times at concentrations exceeding interim screening levels. Molybdenum was detected in two of two samples analyzed, at concentrations of 3.7 and 5 milligram per kilogram (mg/kg), respectively, which is above the interim screening level (1.37 mg/kg)(background threshold value). Zinc was only analyzed in one soil sample collected at 8.5 to 9 feet bgs and had a detected concentration of 70 mg/kg, which exceeds the interim screening level (58 mg/kg) (background threshold value).

2.2 Nature and Extent Evaluation

Insufficient data have been collected at this AOC to conduct the nature and extent evaluation. The following data gap has been identified for this AOC:

- Data Gap #1 – Nature and extent of potential contamination in the immediate vicinity of each drip leg

The proposed soil sample locations to fill the data gaps are presented in Section 6.0 of this subappendix.

3.0 Decision 2 – Data Sufficient to Estimate Representative Exposure Point Concentrations

Nature and extent (Decision 1) must be defined to fully assess Decision 2. Insufficient data are available to calculate exposure point concentrations. After the collection of data from the proposed soil sample locations presented in Section 6.0, the new data will be combined with the existing opportunistic data, and the Decision 2 evaluation will be conducted. Results from the Decision 2 evaluation will be presented in the Soil RCRA Facility Investigation/Remedial Investigation Volume 3 Report.

4.0 Decision 3 – Potential Threat to Groundwater from Residual Soil Concentrations

Insufficient data are available to resolve Decision 3. Data collected to satisfy Decision 1 – Nature and Extent Evaluation will provide the final representative data set that will be used to assess the threat to groundwater.

5.0 Decision 4 – Data Sufficiency to Support the Corrective Measures Study/Feasibility Study

As discussed in Section 6.0 of the Part A Phase 1 Data Summary Report, various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study (CMS/FS). The types of data needed vary somewhat depending on the specific technology to be evaluated. The categories of data required for technologies that may be applicable include:

- Extent of COPCs and COPECs above action levels (required for all technologies). This data need is addressed if Decision 1 is satisfied.
- Waste characterization parameters (required if soil may be disposed of offsite).
- Constituent leachability (required to assess the need for fixation of leachable compounds and/or the feasibility of certain soil-washing technologies).
- Soil physical properties (required for all technologies; however, the properties required vary among the different technologies).
- Surface and subsurface features (required to determine whether there are physical impediments to implementing specific technologies and/or remediating specific areas).

Waste characterization parameters, detailed leachability data, and surface and subsurface features potentially affecting remedial technologies will be determined during the CMS/FS phase, as needed. Concentrations of metals detected in the soil samples to date are all below their respective total threshold limit concentrations and 10 times their respective soluble threshold limit concentrations (10 x STLCs). New data collected from this AOC will also be compared to their respective total threshold limit concentrations and 10 times their respective 10xSTLCs. Further characterization of samples with concentrations exceeding their respective 10xSTLCs will be conducted as needed to support the CMS/FS. No data regarding soil physical properties are available for this unit. Available data are not sufficient to support the CMS/FS.

6.0 Summary of Data Gaps Evaluation and Potential Phase 2 Soil Sample Locations to Fill the Identified Gaps

Based on the Part A data quality objectives, two data gaps were identified and are summarized below:

- **Decision 1 (Nature and Extent)**: The following data gap was identified to resolve this decision:
  - Data Gap #1 – Nature and extent of potential contamination in the immediate vicinity of each drip leg
- **Decision 2 (Data Sufficient to Estimate Representative Exposure Point Concentrations)**: Existing data are insufficient to complete the Decision 2 evaluation. The Decision 2 evaluation will be conducted after the collection of data from sample locations proposed in the main text of Appendix A.
- **Decision 3 (Potential Threat to Groundwater from Residual Soil Concentrations)**: Existing data are insufficient to complete the Decision 3 evaluation. The Decision 3 evaluation will be conducted after the collection of data from sample locations proposed in this Appendix A.
- **Decision 4 (Data Sufficient to Estimate Soil Properties and Contaminant Distribution in Support of the CMS/FS):** The following data gap was identified to resolve this decision:
  - Data Gap #2 - Soil physical parameters to support the CMS/FS

Table C12-6 summarizes the proposed sample locations, depths, rationale for each location, and analytes. Proposed sample locations are also shown on Figure C12-2.

7.0 Access Restrictions

Three of the four drip legs are located along the eastern pipeline road and can be accessed easily. The fourth drip leg is located in Bat Cave Wash near the bottom of the access road leading from the compressor station to the bottom of the wash and can be accessed easily.

The drip legs are located directly beneath and/or adjacent to the main high-pressure natural gas pipelines entering or exiting the compressor station. Therefore, all sampling will be by hand or by hydrovac.

8.0 References

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1.

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. 2005. *Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil*. November 2004 (January 2005 Revision). January.

California Regional Water Quality Control Board, San Francisco Bay Region (Water Board). 2008. *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*. May 27

Pacific Gas and Electric Company. 1989. *Procedure for Draining Line Drips, Line 300A & 300B, Needles District*. October 11.

United States Environmental Protection Agency. 2009. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* December. Available online at: http://www.epa.gov/region09/superfund/prg/pdf/composite_sl_table_run_APRIL2009.pdf. September 12.

Tables

TABLE C12-1
Conceptual Site Model – AOC 28
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Incidental leaks during transfer process	Surface Soil	Percolation and/or infiltration	Surface Soil	Wind erosion and atmospheric dispersion of surface soil
			Subsurface Soil	Potential volatilization and atmospheric dispersion
			Potential Groundwater	Potential extracted groundwater[a]

[a] Quantitative evaluation of the groundwater pathway completed in the groundwater risk assessment (ARCADIS, 2009); Part A Phase 1 data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

TABLE C12-2
Sample Results: Metals
AOC 28 - Drip Legs
Soil Investigation Part A Phase 1 Data Gaps Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Metals (mg/kg)																	
			Interim Screening Level [1]:	0.285	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	0.0125	1.37	27.3	1.47	5.15	2.32	52.2	58
			Residential Regional Screening Levels [2]:	31	0.062	15,000	160	70	0.29	280	23	3,100	150	10	390	1,500	390	390	5.1	390	23,000
			Residential DTSC CHHSL [3]:	30	0.07	5,200	16	39	17	NE	660	3,000	80	18	380	1,600	380	380	5	530	23,000
			Ecological Comparison Values [4]:	0.285	11.4	330	23.3	0.0151	139.6	36.3	13	20.6	0.0166	0.0125	2.25	0.607	0.177	5.15	2.32	13.9	0.164
			Background [5]:	NE	11	410	0.672	1.1	0.83	39.8	12.7	16.8	8.39	NE	1.37	27.3	1.47	NE	NE	52.2	58
Location	Date	Depth (ft bgs)	Sample Type	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, Hexavalent	Chromium, total	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
AOC28-OS1	04/06/11	9 - 9.5	N	---	---	---	---	---	ND (0.41) J	17	---	---	---	---	3.7	---	---	---	---	---	---
AOC28-OS2	04/06/11	2.5 - 3	N	---	---	---	---	---	ND (0.4) J	---	---	---	---	---	---	---	---	---	---	---	---
	04/06/11	8.5 - 9	N	ND (2.1) J*	9.3	240	ND (1) J*	ND (1) J	ND (0.41) J	24	9.1	ND (10)	7.2	ND (0.1) J*	5	17	ND (1) J	ND (1)	ND (2.1) J	45	70

[1] Interim screening level is background value. If background value is not available then the lesser of the DTSC residential CHHSL or the ecological comparison value is used. If CHHSL is not available, it is the lesser of the USEPA residential regional screening level or the ecological comparison value.
[2] USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.
[3] California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.
[4] ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.
[5] CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled; however, if the interim screening level is equal to the background value, only results greater than the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C12-3

Sample Results: Polycyclic Aromatic Hydrocarbons
AOC 28 - Drip Legs
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																				
Interim Screening Level[1] :				22,000	310,000	3,400,000	1,700,000	17,000,000	380	38	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	10,000	1,160	38
Residential Regional Screening Levels[2] :				22,000	310,000	3,400,000	1,700,000	17,000,000	380	15	380	1,700,000	380	3,800	110	2,300,000	2,300,000	380	3,600	1,700,000	1,700,000	NE	NE	15
Residential DTSC CHHSL[3] :				NE	NE	NE	NE	NE	NE	38	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	38
Ecological Comparison Values[4] :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	10,000	1,160	NE
Background[5] :				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	Date	Depth (ft bgs)	Sample Type	1-Methyl naphthalene	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	PAH Low molecular weight	PAH High molecular weight	B(a)P Equivalent
AOC28-OS1	04/06/11	0 - 0.5	N	ND (5)	ND (50)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (50)	ND (5)	ND (5)	ND	ND	ND (4.4)
	04/06/11	2.5 - 3	N	ND (5.1)	ND (51)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (8.3)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	04/06/11	5.5 - 6	N	ND (5.1)	ND (51)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (6.9)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)
	04/06/11	9 - 9.5	N	ND (5.1)	ND (51)	ND (5.1)	ND (5.1)	ND (5.1)	8.8	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	37	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.8)	ND (5.1)	20	ND	66	5.4
AOC28-OS2	04/06/11	0 - 0.5	N	ND (5)	ND (50)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	6	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (50)	5.7	ND (5)	ND (5)	5.7	6	7
	04/06/11	2.5 - 3	N	ND (5)	ND (50)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (6.6)	ND (5)	ND (5)	ND	ND	ND (4.4)
	04/06/11	5.5 - 6	N	ND (5)	ND (50)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (7.8)	ND (5)	ND (5)	ND	ND	ND (4.4)
	04/06/11	8.5 - 9	N	ND (5.1)	ND (51)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (6)	ND (5.1)	ND (5.1)	ND	ND	ND (4.5)

1 Interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C12-4

Sample Results: VOCs, SVOCs, TPHs, and pH
AOC 28 - Drip Legs
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Total Petroleum Hydrocarbons (mg/kg)			General Chemistry
			Interim Screening Level[1] :	**540**	**540**	**1,800**	**NE**
			Residential Regional Screening Levels[2] :	**NE**	**NE**	**NE**	**NE**
			Residential DTSC CHHSL[3] :	**NE**	**NE**	**NE**	**NE**
			RWQCB Environmental Screening Levels [4] :	**540**	**540**	**1,800**	**NE**
			Ecological Comparison Values[5] :	**NE**	**NE**	**NE**	**NE**
			Background[6] :	**NE**	**NE**	**NE**	**0**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**TPH as gasoline**	**TPH as diesel**	**TPH as motor oil**	**pH**
AOC28-OS1	04/06/11	0 - 0.5	N	---	32	150	8.9
	04/06/11	2.5 - 3	N	ND (1.1)	16	15	8.8
	04/06/11	5.5 - 6	N	ND (1.3)	17	34	8.1
	04/06/11	9 - 9.5	N	ND (1.2)	160	700	9.8
AOC28-OS2	04/06/11	0 - 0.5	N	---	ND (10)	ND (10)	8.4
	04/06/11	2.5 - 3	N	ND (1.3)	17	37	8.2
	04/06/11	5.5 - 6	N	ND (1.8)	ND (10)	ND (10)	8.4
	04/06/11	8.5 - 9	N	ND (1.2)	12	39	8.1

1 For SVOCs, interim screening level is DTSC residential CHHSL. If CHHSL is not available, the USEPA residential regional screening level is used. If an ecological comparison value has been calculated, then the lowest between the ecological comparison value or the CHHSL/regional screening level is used. For TPHs, interim screening level is the Regional Water Quality Control Board environmental screening level.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites". http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, November 2004 (January 2005 Revision)". January.

4 Water Board. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

5 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil. May 28 and ARCADIS. 2009. Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil". July 1.

6 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California". May.

Results greater than the interim screening level are circled.

Only detected VOCs and SVOCs are presented.

SVOCs	semivolatile organic compounds
TPH	total petroleum hydrocarbon
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
Water Board	Regional Water Quality Control Board
NE	not established
mg/kg	milligrams per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C12-5

Sample Results: Polychlorinated Biphenyls
AOC 28 - Drip Legs
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
Pacific Gas and Electric Company Topock Compressor Station, Needles, California

				Polychlorinated biphenyls (µg/kg)						
Interim Screening Level[1] :				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**
Residential Regional Screening Levels[2] :				**3,900**	**140**	**140**	**220**	**220**	**220**	**220**
Residential DTSC CHHSL[3] :				**89**	**89**	**89**	**89**	**89**	**89**	**89**
Ecological Comparison Values[4] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Background[5] :				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**
AOC28-OS1	04/06/11	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	04/06/11	2.5 - 3	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	04/06/11	5.5 - 6	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	04/06/11	9 - 9.5	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
AOC28-OS2	04/06/11	0 - 0.5	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	04/06/11	2.5 - 3	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	04/06/11	5.5 - 6	N	ND (17)	ND (33)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	04/06/11	8.5 - 9	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)

1 Interim screening level is the USEPA residential regional screening level.

2 USEPA. 2009. "Regional Screening Levels for Chemical Contaminants at Superfund Sites." http://epaprgs.ornl.govchemicals/index.shtml. December.

3 California EPA, Office of Environmental Health Hazard Assessment. 2005. "Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil." November 2004 (January 2005 Revision). January.

4 ARCADIS. 2008. "Technical Memorandum 3: Ecological Comparison Values for Metals and Polycyclic Aromatic Hydrocarbons in Soil." May 28. ARCADIS. 2009. "Topock Compression Station - Final Technical Memorandum 4: Ecological Comparison Values for Additional Dectected Chemicals in Soil." July 1.

5 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the interim screening level are circled.

*	Reporting limits greater than or equal to the interim screening level.
USEPA	United States Environmental Protection Agency
DTSC	California Department of Toxic Substances Control
CHHSL	California human health screening levels
NE	not established
µg/kg	micrograms per kilogram
ft bgs	feet below ground surface
N	primary sample
FD	field duplicate
---	not analyzed
ND	not detected at the listed reporting limit
J	concentration or reporting limit estimated by laboratory or data validation

TABLE C12-6
Proposed Phase 2 Soil Sample Locations, AOC 28
Soil Investigation Part A Phase 1 Data Gaps Evaluation Report
PG&E Topock Compressor Station, Needles, California

Location ID	Depths (ft bgs)	Description/Rationale	Analytes	Proposed Collection Method[a]
AOC28a-01	0.5 and 3, if feasible	To resolve Data Gap #1– Insufficient data have been collected in this AOC. Collect data to assess nature and extent of potential contamination. Sample will be collected between the drip leg and the pipeline road.	TPH, PAHs, and PCBs	Hydrovac
AOC28b-01	0.5 and 3, if feasible	To resolve Data Gaps #1 and #2– Insufficient data have been collected in this AOC. Collect data to assess nature and extent of potential contamination and collect parameters to support the CMS/FS. Sample will be collected between the drip leg and the pipeline road.	TPH, PAHs, PCBs, and soil physical parameters (Atterberg limits, relative compaction, alkalinity, cation exchange, capacity, and particle size distribution) – both samples	Hydrovac
AOC28c-01	0.5 and 3, if feasible	To resolve Data Gap #1– Insufficient data have been collected in this AOC. Collect data to assess nature and extent of potential contamination. Sample will be collected between the drip leg and the pipeline road.	TPH, PAHs, PCBs	Hydrovac
AOC28d-01	0.5, 3 and 5, if feasible	To resolve Data Gap #1– Insufficient data have been collected in this AOC. Collect data to assess nature and extent of potential contamination. Samples will be collected along the east side of the drip leg and a sample will be collected at 5 feet bgs to account for scour.	TPH, PAHs, PCBs	Hydrovac

Notes:

[a] Proposed collection methods listed on this table are based on experience and knowledge of the site; actual collection method will be chosen in the field based on field conditions and site access restrictions.

Figures

FIGURE C12-1
PROPOSED SOIL SAMPLE LOCATIONS, AOC 28

SOIL INVESTIGATION PART A PHASE 1
DATA GAPS EVALUATION REPORT
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA.

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\SWP_A\AOC28\AOC28_DripLegs.mxd Date Saved: 8/14/2012 1:17:44 PM

VICINITY MAP

LEGEND

- Proposed Soil Sample Location
- AOC Boundary

Potential Release Mechanisms

- Infrequent Surface Water Runoff
- Infiltration (Site-wide)
- Volatilization (Site-wide)
- Degradation by Heat/Light (Site-wide)

0 45 90 180 Feet

N

FIGURE C12-2
Conceptual Site Model
AOC-28
Soil Investigation Part A
Phase 1 Data Summary Report
PG&E Topock Compressor Station
Needles, California

CH2MHILL