Topock Project Executive Abstract

Document Title:

Soil RCRA Facility Investigation/Remedial Investigation Work Plan, Pacific Gas and Electric Company Topock Compressor Station, Needles, California

Submitting Agency: DTSC, DOI

Final Document? ☒ Yes ☐ No

Date of Document: September 5, 2012; Revised Submittal: January 14, 2013

Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other)

PG&E

Priority Status: HIGH X MED LOW
Is this time critical? ☒ Yes ☐ No

Type of Document:

☐ Draft X Report ☐ Letter Memo

☐ Other / Explain:

Action Required:

☒ Information Only

Other / Explain:
Return to: _____

By Date:__ _____

What does this information pertain to?
☐ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA)
☒ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment)
☐ Corrective Measures Study (CMS)/Feasibility Study (FS)
☐ Corrective Measures Implementation (CMI)/Remedial Action
☐ California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR)
☐ Interim Measures
Other / Explain

Is this a Regulatory Requirement?
☒ Yes
☐ No
If no, why is the document needed?

What is the consequence of NOT doing this item?
Would not be able to collect soil data needed to support the decisions identified in the Data Quality Objectives (DQOs) for investigation areas located outside the compressor station fence line and investigation areas located within the compressor station fence line.

What is the consequence of DOING this item?
Collect needed data to support the DQO decisions.

Other Justification/s:
☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

The purpose of this work plan is to summarize available soil data for the areas inside and outside the fence line, and to propose potential sample locations for collection of additional data to support the DQO decisions. The soil investigation program addresses 15 Solid Waste Management Unit (SWMU), Areas of Concern (AOCs), and other Undesignated Areas (UAs) outside the compressor station fence line. This work plan recommends additional sampling in 10 of the 15 areas, and only un-intrusive investigation in one of the 10 areas. The soil investigation program also addresses 27 SWMU and AOCs within the compressor station fence line. This work plan recommends additional sampling in 25 of the 27 areas. In addition, this work plan addresses two additional areas: 1) perimeter area, the area extending from the compressor station fence line to the toe of the slope, outside the fence line, and 2) the compressor station storm drains.

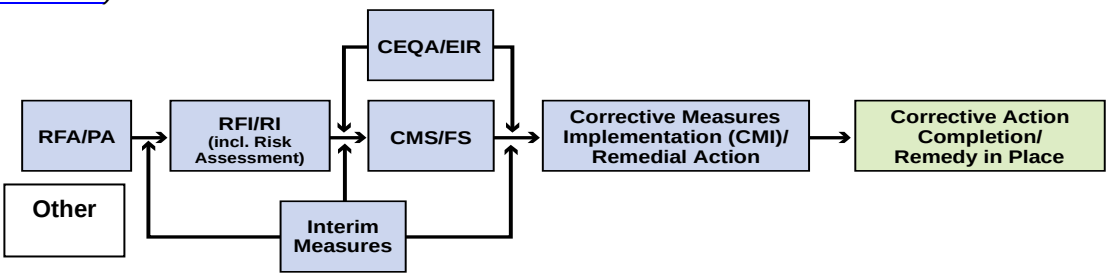
Written by: PG&E

Recommendations:

How is this information related to the Final Remedy or Regulatory Requirements:
Completion of the proposed soil investigation is required to proceed with the risk assessment and corrective measures study/feasibility study for soil inside and outside the compressor station fence line. The risk assessment and CMS/FS are required to determine the appropriate remedy.

Other requirements of this information?
None.

Related Reports and Documents:
Click any boxes in the Regulatory Road Map (below) to be linked to the Documents Library on the DTSC Topock Web Site (www.dtsc-topock.com).



Legend
RFA/PA – RCRA Facility Assessment/Preliminary Assessment
RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)
CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study
CEQA/EIR – California Environmental Quality Act/Environmental Impact Report

Final Report

Soil RCRA Facility Investigation/Remedial Investigation Work Plan,

PG&E Topock Compressor Station, Needles, California

Prepared for

California Environmental Protection Agency, Department of Toxic Substances Control and United States Department of the Interior

September 2012
Revised Submittal: January 2013

On behalf of

Pacific Gas and Electric Company

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Final

Soil RCRA Facility Investigation/Remedial Investigation Work Plan,

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September 2012

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Acronyms and Abbreviations

AOC	Area of Concern
APE	Area of Potential Effect
bgs	below ground surface
BMP	best management practice
BNSF	Burlington Northern Santa Fe Railway
Caltrans	California Department of Transportation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS/FS	corrective measures study/feasibility study
DOI	United States Department of the Interior
DQO	data quality objective
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EM	electromagnetic induction
ESA	Endangered Species Act
EIR	Environmental impact report
GPR	ground-penetrating radar
HNWR	Havasu National Wildlife Refuge
IDW	investigation-derived waste
PBA	programmatic biological assessment
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
PST	planned sampling table
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RFI/RI	Soil RCRA facility investigation/remedial investigation
SOP	standard operating procedure
SWMU	solid waste management unit

TPH	total petroleum hydrocarbons
UA	undesignated area
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VMG	vertical magnetic gradient
VOC	volatile organic compound
XRF	x-ray fluorescence

1.0 Introduction

Pacific Gas and Electric Company (PG&E) is conducting investigative and remedial activities at the Topock Compressor Station in Needles, California. These investigative and remedial activities are being performed under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), pursuant to agreements with the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and United States Department of the Interior (DOI), respectively. The Topock Compressor Station is located in San Bernardino County, approximately 15 miles to the southeast of Needles, California. Figure 1-1 presents the site location map. (All figures are located at the end of this main report.)

This Soil RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan (work plan) presents the proposed soil and related investigation activities for all areas of the site. It comprises two geographically adjacent areas: Part A (areas outside the compressor station fence line) and Part B (areas inside the compressor station fence line). The perimeter areas adjacent to the compressor station fence line and the storm drains leading from the compressor station to areas outside the fence line are also included in this work plan. A DTSC letter dated January 4, 2011 (DTSC, 2011a) provided direction for preparing a combined Part A and Part B work plan.

The *Draft Soil RCRA Facility Investigation/Remedial Investigation Work Plan, Pacific Gas and Electric Company (PG&E) Topock Compressor Station, Needles, California* (CH2M HILL 2011b),Draft Soil RFI/RI Work Plan) (CH2M HILL, 2011a) was submitted to DTSC and DOI in May 2011 and is referred to as the 2011 Draft Soil RFI/RI Work Plan. Comments on the 2011 Draft Soil RFI/RI Work Plan were received from the following:

1. Karen Baker/DTSC Geological Services Unit, August 19, 2011
2. Pamela S. Innis/DOI, August 16,2011
3. Leo S. Leonhart/Hargis + Associates, Inc., on behalf of the Fort Mojave Indian Tribe, August 1, 2011
4. Loretta Jackson-Kelly/Hualapai Department of Cultural Resources, July 21, 2011

Stakeholder comments and responses to comments are also provided in table format and have been incorporated into this revised Final Soil RFI/RI Work Plan.

1.1 History of the Soil Investigation Program

The *Revised Final RFI/RI Volume 1, PG&E Topock Compressor Station, Needles, California* (Revised Final RFI/RI Volume 1) (CH2M HILL, 2007a) identified 19 solid waste management units (SWMUs), areas of concern (AOCs), and other undesignated areas (UAs) at the Topock Compressor Station to be carried forward in the soil RFI/RI. These areas included:

- SWMU 1 – Former Percolation Bed
- AOC 1 – Area Around Former Percolation Bed
- AOC 4 – Debris Ravine
- AOC 5 – Cooling Tower A
- AOC 6 – Cooling Tower B
- AOC 7 – Hazardous Materials Storage Area
- AOC 8 – Paint Locker
- AOC 9 – Southeast Fence Line (Outside Visitor Parking Area)
- AOC 10 – East Ravine
- AOC 11 - Topographic Low Areas
- AOC 12 – Fill Area
- AOC 13 – Unpaved Areas within the Compressor Station
- AOC 14 – Railroad Debris Site
- AOC 15 – Auxiliary Jacket Cooling Water Pumps
- AOC 16 – Sandblast Shelter
- AOC 17 – Onsite Septic System
- AOC 19 – Former Cooling Liquid Mixing Area and Former Hotwell
- AOC 20 – Industrial Floor Drains
- UA-1 – Potential Pipe Disposal Area

The Revised Final RFI/RI Volume 1 also identified eight additional units and one UA (UA-2) requiring further investigation. These eight units consist of five units associated with the former hazardous waste management system (SWMUs 5, 6, 8, and 9, and AOC 18) closed by DTSC in 1995 and three units associated with the former oily water treatment system (Units 4.3, 4.4, and 4.5) also closed by DTSC in 1995. In a letter dated July 13, 2006, DTSC requested that additional sampling be conducted at these units (DTSC, 2006). Similarly, UA-2, the Former 300B Pipeline Liquids Tank, was previously closed by San Bernardino County, and DTSC requested additional sampling for this area in the same July 13, 2006 letter. In the comments on the Draft Soil RFI/RI Work Plan, DTSC requested that eight additional units (SWMU 11 and AOCs 27 through 33) be investigated pursuant to this work plan.

An addendum to the Topock RFI/RI Volume 1 Report will be prepared and submitted along with the Topock RFI/RI Volume 3 Report. The addendum will include a listing and description of the new investigation units (SWMU 11, AOCs 21 through 33, and any other units that may be identified as a result of this soil investigation) that have or will have been added to the investigation program since the Revised Final RFI/RI Volume 1 was prepared. SWMU 11 and AOCs 21 through 33 were added at the direction of DTSC and DOI. These units are as follows:

- SWMU 11 – Former Sulfuric Acid Tanks
- AOC 21 – Round Depression near Sludge Drying Bed
- AOC 22 – Unidentified Three-Sided Structure in Upper Yard
- AOC 23 – Former Water Conditioning Building
- AOC 24 – Stained Area and Former API Oil/Water Separator
- AOC 25 – Station Compressor and Generator Engine Basements
- AOC 26 - Former Scrubber Oil Sump

- AOC 27 – MW-24 Bench
- AOC 28 – Pipeline Drip Legs
- AOC 29 – IM-Interim Measure No. 3 Treatment Plant
- AOC 30 – MW-20 Bench
- AOC 31 – Former Teapot Dome Oil Pit
- AOC 32 – Oil Storage Tanks and Waste Oil Sump
- AOC 33 – Potential Former Burn Area near AOC 17

Two draft work plans were prepared to describe collection of additional soil data to complete site characterization activities at the SWMUs, AOCs, and UAs identified in the Revised Final RFI/RI Volume 1. Investigation areas outside the compressor station fence line were addressed in the *Draft RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan Part A, PG&E Topock Compressor Station, Needles, California* (Draft Soil Part A Work Plan) (CH2M HILL, 2006). Investigation areas within the compressor station fence line were addressed in the *Draft RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan Part B, PG&E Topock Compressor Station, Needles, California* (Draft Part B Work Plan) (CH2M HILL, 2007b).

Based on a DTSC letter dated January 4, 2011 (DTSC, 2011a), the Part A and Part B investigations have been combined into this single work plan.

The Soil Part A Phase 1 Data Gaps Evaluation Report (which includes the agreed-upon Part A Phase 2 sampling locations) is included as Appendix A of this work plan. The Soil Part B investigation is described in detail in Appendix B of this work plan.

1.1.1 Soil Part A Investigation History

DTSC and DOI conditionally approved the Draft Soil Part A Work Plan on August 10, 2007 (DTSC, 2007) and June 4, 2008 (DOI, 2008), respectively. Clarification of DTSC's conditional approval was documented in an email containing the table titled "Clarification to Responses to PG&E Topock Compressor Station Soil Investigation Part A Work Plan August 10, 2007 Conditional Approval Letter" (CH2M HILL, 2007c).

DTSC's conditional approval letter specifically rejected the data quality objectives (DQOs) and associated data gaps evaluation process presented in Sections 3.0 and 4.0 of the Draft Soil Part A Work Plan, while directing PG&E to implement Phase 1 of soil sampling. In August 2008, the Draft Soil Part A Work Plan was implemented. Items of note for the Part A field implementation included:

- At DOI's direction, no intrusive sampling was performed at UA-1 (Potential Pipe Disposal Area).
- Two areas located near UA-1, called UA-1B and UA-1C Alternate, were identified by PG&E as a potential alternate locations for the Potential Pipe Disposal Area.
- Investigation work at AOC 4 was not conducted in 2008 due to the then-pending AOC 4 time-critical removal action, which was completed in December 2010. Subsequently, the AOC 4 time-critical removal action confirmation soil samples were used to conduct a data gaps evaluation; the results of the evaluation are included in Appendix A of this document.

From June 2008 to February 2010, DTSC, DOI, and PG&E convened a series of meetings to draft the DQO Steps 1 through 5 for the Soil Part A investigation. The steps are presented in the technical memorandum *Data Quality Objectives – Part A Soil Investigation at the Pacific Gas and Electric Company Topock Compressor Station, Needles, California* (CH2M HILL, 2010a) (referred to as the Soil Part A DQO Tech Memo, which is included in Appendix A). Between May 2009 and January 2010, through additional employee interviews and site reconnaissance after a major storm event, three new investigation areas were identified. Two investigation areas are located near AOC 11 and were incorporated into AOC 11; the other new investigation area is AOC 27 – MW-24 Bench. These new areas were added to the Part A data gaps evaluation.

A data gaps evaluation was conducted for each of the Part A investigation areas, using the Part A DQO process, to ensure that data collected are of sufficient quantity and quality to enable the specified decisions to be made. The data gaps evaluation was initially completed through Step 5 of the DQO process. DQO Steps 6 and 7 were completed through a series of meetings with DTSC, DOI, Tribes, other stakeholders, and PG&E in 2010. Specifically, two meetings were held at the Topock Compressor Station on October 6 and 7, 2010 and November 2 and 3, 2010. In these meetings, data were reviewed with stakeholders, the AOCs were visited, and preliminary data gaps evaluations were discussed. A meeting was held on December 7, 2010 between DOI, DTSC, and Tribes to discuss UA-1/UA-1 Alternate, combining the soil investigation into one document, and sampling at the mouth of Bat Cave Wash. On December 13, 2010, DTSC issued direction to PG&E on UA-1 and UA-1 Alternate (DTSC, 2010a). On December 15, 2010, DOI issued direction to PG&E on sampling at the mouth of Bat Cave Wash (DOI, 2010). On January 13, 2011, a meeting was held to discuss Tribes' comments on the preliminary data gaps evaluation. Additional direction to PG&E on the Part A data gaps evaluation was issued in a joint letter from DTSC and DOI dated February 25, 2011 (included as Attachment 1 in Appendix A).

Based on the Part A data gaps evaluation, no further investigations are needed at two areas (AOC 12, Fill Areas and UA-2 – Former 300B Pipeline Liquids Tank). Based on the Part A data gaps evaluation (Subappendices C6 and C9, respectively), sufficient data are available for both units to address Decisions 1 through 3 of the DQOs. Any remaining data required to satisfy Decision 4 will be collected either at other units (soil physical parameters) or following the risk assessment.

Subsequent to the data gaps evaluation, DTSC and DOI requested the addition of four new AOCs outside the fence line: AOC 28 – Pipeline Drip Legs, AOC 29 – Interim Measure No. 3 Treatment Plant, AOC 30 – MW-20 Bench, and AOC 31 – Teapot Dome Oil Pit. There are no or only very limited data for these units.

Eleven investigation areas located outside of the compressor station fence line are proposed for further investigation in this work plan and are shown on Figure 1-2. The Part A investigation areas are:

- SWMU 1 – Former Percolation Bed
- AOC 1 – Area Around Former Percolation Bed
- AOC 4 – Debris Ravine

- AOC 9 – Southeast Fence Line
- AOC 10 – East Ravine
- AOC 11 – Topographic Low Areas, including the two new areas
- AOC 14 – Railroad Debris Area
- AOC 27 – MW-24 Bench
- AOC 28 – Pipeline Drip Legs
- AOC 31 – Former Teapot Dome Oil Pit
- UA-1 – Potential Pipe Disposal Area

Sampling at AOC 29 – Interim Measure No. 3 Treatment Plant and AOC 30 – MW-20 Bench is not proposed in this appendix. Investigation of these AOCs will be conducted as part of the decommissioning and removal activities for these areas, as proposed in the forthcoming Interim Measures No. 3 Decommissioning, Removal, and Restoration Work Plan, and as part of the baseline sampling during the Topock groundwater remedy system installation, as proposed in the forthcoming Groundwater Remedy Implementation – Baseline Sampling and Analysis Plan. A portion of AOC 30 MW-20 Bench will be used to support the groundwater remedy, so this AOC will not be fully investigated until groundwater remedy decommissioning sampling is conducted. AOC 31 – the Former Teapot Dome Oil Pit will be investigated in conjunction with the Perimeter Area sampling program (see Appendix C of this work plan). The identified data gaps for these areas and Soil Part A Phase 2 Soil sample locations are presented in Appendix A of this report.

1.1.2 Soil Part B Investigation History

DTSC and DOI provided comments on the Draft Part B Soil Investigation Work Plan in March 2008. PG&E requested clarification of several of the agencies' comments on April 21, 2008. DTSC and DOI provided clarification and direction on March 10, 2010 (DTSC, 2010b) after a hiatus related to PG&E's request to defer the Part B investigation (PG&E, 2008). DTSC's letter informed PG&E that no responses were necessary to DTSC's previous comments on the DQOs for the Draft Part B Work Plan, but it did require responses to all other comments to the Draft Part B Work Plan, as summarized in DTSC's March 26, 2008 letter. DOI's letter requested that PG&E not respond to DOI's previous comments on the Draft Part B Work Plan. Both DTSC and DOI letters directed PG&E to develop a Soil Part B DQO Technical Memorandum (similar to the Soil Part A DQO Tech Memo) and—once the Soil Part B DQO Tech Memo had been prepared and approved by DTSC and DOI—to develop a new Part B Work Plan.

The Soil Part B DQO Steps 1 through 5 are presented in the technical memorandum *Data Quality Objectives – Part B Soil Investigation at the Pacific Gas and Electric Company Topock Compressor Station, Needles, California* (Soil Part B DQO Tech Memo) (CH2M HILL, 2011b), included as Appendix B. DTSC and DOI provided comments on initial drafts of the data gaps evaluation flow charts and the draft of the Soil Part B DQO Tech Memo, and the final Soil Part B DQO Tech Memo was revised in accordance with the agencies' input. Steps 6 and 7 will be completed as part of the phased approach to the Soil Part B investigation described

in Section 4.0 of Appendix B. The Soil Part B DQO Tech Memo, the Soil Part B Investigation Program (Soil Part B Work Plan), and responses to DTSC comments on the 2007 Draft Part B Work Plan are included as Appendix B of this work plan. In DTSC's July 20, 2010 comments on PG&E's "Response to Comments to the Draft Soil Part B Work Plan"(DTSC, 2010c), DTSC requested the addition of seven additional areas located inside the compressor station fence line, including one new SWMU and six new AOCs (SWMU 11 and AOCs 21 through 26). In its August 19, 2011 comments on the 2011 Draft Soil RFI/RI Work Plan, DTSC requested the addition of two further units inside the fence line, AOCs 32 and 33.

Twenty-seven investigation areas inside the compressor station fence line are therefore proposed for investigation in this work plan, as shown on Figure 1-3. Another area of potential concern included in the August 19, 2011 DTSC comments on the 2011 Draft Soil RFI/RI Work Plan was identified based on employee interviews. This new investigation area is the Teapot Dome Restaurant oil pit, shown on Figure 1-3. The Former Teapot Dome Oil Pit has been designated AOC 31 and will be investigated in conjunction with the Perimeter Area (discussed in Section 2.4.2). The Part B investigation areas are:

- SWMU 5 – Sludge Drying Beds
- SWMU 6 – Chromate Reduction Tank
- SWMU 8 – Process Pump Tank
- SWMU 9 – Transfer Sump
- SWMU 11 – Former Sulfuric Acid Tanks
- AOC 5 – Cooling Tower A
- AOC 6 – Cooling Tower B
- AOC 7 – Hazardous Materials Storage Area
- AOC 8 – Paint Locker
- AOC 13 – Unpaved Areas within the Compressor Station
- AOC 15 – Auxiliary Jacket Cooling Water Pumps
- AOC 16 – Sandblast Shelter
- AOC 17 – Onsite Septic System
- AOC 18 – Combined Hazardous Waste Transference Pipelines
- AOC 19 – Former Cooling Liquid Mixing Area and Former Hotwell
- AOC 20 – Industrial Floor Drains
- AOC 21 – Round Depression near Sludge Drying Bed
- AOC 22 – Unidentified Three-sided Structure
- AOC 23 – Former Water Conditioning Building

- AOC 24 – Stained Area and Former API Oil/Water Separator
- AOC 25 –Compressor and Generator Engine Basements
- AOC 26 – Former Scrubber Oil Sump
- AOC 32 – Oil Storage Tanks and Waste Oil Sump (this is an active unit)
- AOC 33 – Potential Former Burn Area near AOC 17 (will be investigated as part of AOC 17)
- Unit 4.3 – Oil/Water Holding Tank
- Unit 4.4 – Oil/Water Separator
- Unit 4.5 – Portable Waste Oil Storage Tank

The Soil Part B sampling program, including sampling locations, is provided in Appendix B of this report.

1.1.3 Other Investigation Areas

In addition to the specific units described above, two other investigation program components are included in this work plan: the Perimeter Area and the storm drain system. The Soil Part A and Part B investigations overlap in the Perimeter Area and are also potentially connected through the storm drains that discharge into SWMU 1, AOC 1, AOC 10, and AOC 11. The Perimeter Area is defined as the area outside the immediate fence line of the compressor station to the bottom of the slope. The storm drain system consists of active and abandoned storm drain lines within the compressor station and outfalls from the system outside the fence line.

Table 1-1 lists investigation areas, whether the area is inside or outside the compressor station fence line, approximate size, and where to find additional information for the area in this work plan. Existing AOC and SWMU boundaries are approximate; soil data will ultimately dictate the extent of each unit.

1.1.4 Perimeter Area Investigation

Previous investigations have not been conducted within the Perimeter Area. DTSC identified the Perimeter Area as a potential concern during the development of the Draft Part B Work Plan in 2007. On October 18, 2007, DTSC and PG&E conducted a site walk to identify appropriate perimeter sampling locations. Fifteen perimeter sample locations were identified and incorporated into the Draft Part B Soil Work Plan. The proposed Perimeter Area investigation program is included as Appendix C of this document. The following is a summary of the Perimeter Area investigation program.

The Perimeter Area investigation program was developed to evaluate the potential effects from contamination at SWMUs and AOCs inside the facility on areas outside the fence line. The 2007 Perimeter Area site walk focused on potential concerns (such as drainages) apparent at the time of the site walk; locations were subsequently modified during meetings with DTSC, DOI, and the Tribes. Sampling will be conducted in a phased manner, as directed by DTSC and DOI, and consistent with the phased sampling approach for the

investigation within the fence line. To focus sampling at areas with the highest potential for contamination and to minimize the total number of samples, x-ray fluorescence (XRF) screening will be performed every 50 feet in all areas along the perimeter, except in the following areas:

- Between PA01 and Storm Drain Line 12 because the spacing of sample locations PA01and PA02, in combination with sample locations AOC 13-20, AOC13-21, and AOC 13-23, adequately addresses that perimeter segment
- Between XRF-17 and XRF-18 because sample locations AOC16-1 and AOC 16-2 adequately address that perimeter segment
- Between PA03 and PA04 because the spacing of these sample locations adequately addresses that perimeter segment
- Along the northern, eastern, and southern boundaries near the main office because compressor station operations have not historically occurred and are not currently occurring in this area
- Along the southern boundary of the site, except the soil (orange) berm pictured in Figure C-1 in Appendix C, because the topography slopes upward from the station along the southern boundary of the station

XRF screening and evaluation of XRF data will be conducted as described in Section 2.2 of this work plan. If the XRF results exceed screening levels for the area outside the fence line (Part A screening levels), as modified for detection capability of the instrument, then a conventional soil sample will be collected for laboratory analysis. If screening levels are not exceeded, a sample will still be collected at least every 100 feet along the perimeter, except as outlined above. The locations for soil samples required as a result of XRF screening will be determined in conjunction with the agencies.

The need for step-out samples further downslope will be based on initial perimeter sample results. Perimeter Area sample locations, sample depths, and the analytical suite are presented in Appendix C.

The Perimeter Area investigation data will be used to help evaluate whether human and ecological receptors outside the fence line could be exposed to surface soil impacted by chemicals originating within the fence line of the compressor station through the offsite migration pathway. The specific pathways through which receptors outside the fence line could be exposed to constituents that have migrated outside the facility fence line are defined in the *Remedial Action Work Plan, PG&E Topock Compressor Station Needles, California* (ARCADIS, 2008) and the Soil Part A DQO Tech Memo (CH2MHILL, 2010a). The decision process for the offsite migration evaluation is described in the Soil Part B DQO Tech Memo (CH2M HILL, 2011b).

The location of the former Teapot Dome oil pit (AOC 31) overlaps with the Perimeter Area investigation. To simplify review of this work plan and planning of the investigation effort, investigation of AOC 31 will initially be conducted as part of the Perimeter Area investigation, as discussed in Appendix C.

1.1.5 Storm Drain System Investigation

DTSC directed PG&E to conduct a comprehensive evaluation of the facility storm drain system in its October 5, 2010 comments on the Draft Soil Part B DQO Tech Memo (DTSC, 2010d). DTSC directed PG&E to conduct a storm drain investigation program because no physical investigation has been conducted to specifically target the storm drains at the Topock Compressor Station.

Prior investigation associated with the storm drain system has been limited to investigation conducted at AOC 9, AOC 10a, and low areas that would receive stormwater runoff outside the fence line. A records review for storm drain locations was conducted for the Revised Final RFI/RI Volume 1 and during subsequent phases of soil investigation work plan preparation. The proposed storm drain system investigation program is included as Appendix D of this document. This subsection is a summary of the storm drain system investigation.

Two types of information will be generated by the storm drain investigation: information on the alignments of various storm drain lines and soil sample information outside the fence line. Information on storm drain line alignments is required to satisfy Decision 4 of the Part B DQOs (CH2M HILL, 2011b). Because storm drains provide a potential transport pathway for constituents released within the fence line to areas outside fence lines, the potential for constituents in soil and spilled liquids to migrate to areas outside the fence line is better addressed with information regarding which catch basins discharge to the various outfalls.

In addition, to satisfy Part A and Part B DQO Decision 1, data are needed to characterize potential discharges from storm drains to soil. These data are also required to address assessment of Part A human and ecological risk decisions (Decision 2). Finally, both types of information are required to satisfy Part A Decision 4 and Part B DQO Decisions 4 and 5 (that is, to ensure that there is sufficient information to evaluate the potential for offsite migration via the storm drains and proceed with the development of the corrective measures study/ feasibility study [CMS/FS], remedial design, and/or interim measures). The primary transport pathway associated with the storm drain system would be discharge of contaminants into the storm drains, followed by runoff from the storm drains to areas outside the fence line. It is possible that constituents were released to soil within the fence line at poor joints or breaks in the storm drain lines. These constituents in soil could be leached to groundwater more quickly than at other areas of the facility to due to periodic flushing events with rain or facility generated fluids. Consequently, drainage pathways are an important consideration in the storm drain alignment investigation to allow evaluation of which storm drains discharge to specific outfalls.

The storm drain system investigation process, proposed storm drain outfall sampling locations, sample depths, and analytical suite are presented in Appendix D. Steps 1 and 2 of the storm drain investigation (consisting of an expanded records search and visual field verification of the information from the records search, to the degree feasible) have been completed, and are incorporated into the information presented in Appendix D.

1.2 Objectives

Data collected from implementation of this work plan will be combined with the existing data set to use as inputs to DQO decisions or confirm unit closure. All proposed sampling locations are shown in Figure 1-4. Additional sampling may be necessary if data gaps are identified. The combined data set will be presented in the Final RFI/RI Volume 3 (Soil). The objectives of the Soil Part A and Part B investigation programs are presented in the Soil Part A DQO Tech Memo (Appendix A) and Soil Part B DQO Tech Memo (Appendix B).

1.3 Report Organization

This Soil RFI/RI Work Plan is organized as follows:

- **Section 1.0, Introduction**, contains background information, objectives, and report organization.
- **Section 2.0, Field Investigation Activities**, provides an overview of various field activities including site preparation, access and staging, standard operating procedures, site restoration, and investigation program.
- **Section 3.0, Quality Control, Data Management, and Data Validation**, presents the sampling and analysis plan, analytical methods and associated quality control samples, summary of the data management process, and data validation.
- **Section 4.0, Data Evaluation**, presents summary of the overall data evaluation process for those investigation areas in Part A and Part B, as well as for the Perimeter Area and storm drain system investigation programs.
- **Section 5.0, Approvals and Authorizations**, presents the anticipated approvals needed to implement this work plan, as well as the biological evaluation and archeological surveys, reviews, and consultations.
- **Section 6.0, References,** presents a list of works cited when preparing this document.
- **Appendix A, Part A Data Gaps Investigation Program,** contains the Part A data gaps investigation program, which presents identified data gaps and additional samples needed to resolve the data gaps and also presents the Soil Part A DQO Tech Memo.
- **Appendix B, Part B Data Gaps Investigation Program,** contains the Part B data gaps investigation program, which describes additional data needs and proposed sample locations and also includes the Soil Part B DQO Tech Memo.
- **Appendix C, Perimeter Area Investigation Program**, presents the proposed sampling approach to evaluate soil conditions along the perimeter of the compressor station.
- **Appendix D, Storm Drain System Investigation Program**, presents the proposed evaluation and sampling approach for the storm drain system at the compressor station.
- **Appendix E, Preliminary Implementation Schedule for Complete Soil Work Plan**, contains the preliminary implementation schedule for completing the Soil RFI/RI Work Plan.

- **Appendix F, Summary of Proposed Sampling Program (Planned Sampling Table)**, contains the planned sample table for Part A, Part B, Perimeter Area, and storm drain system samples.
- **Appendix G, Standard Operating Procedures**, contains standard operating procedures (SOPs). This appendix is provided on CD only.
- **Appendix H, PG&E Program QAPP and QAPP Addendum**, contains the PG&E Program Quality Assurance Project Plan (QAPP) and Addendum to the Program Quality Assurance Plan for the RCRA Facility Investigation/Remedial Investigation (QAPP Addendum). This appendix is provided on CD only.
- **Appendix I, Response to Comments,** provides the responses to comments on the 2011 Draft Soil RFI/RI Work Plan.
- **Appendix J, Displaced Soil and Hazardous Waste Management Procedures**, provides the procedures for characterizing displaced soil, and hazardous waste management.
- **Appendix K, PG&E Engineering Drawings Referenced in the Work Plan**, provides a listing of the engineering drawings cited in this work plan and contains scans of the engineering drawings. Drawing scans are provided on CD only.

1.4 Schedule

The preliminary implementation schedule for the complete soil work plan is presented in Appendix E.

2.0 Field Investigation Activities

This section describes the field investigation activities associated with implementation of the Part A, Part B, Perimeter Area, and storm drain system investigation programs. Topics addressed in this section include site preparation, access, and staging; applicable SOPs; site restoration activities; and the investigation programs. Detailed discussions of the Part A and Part B investigation programs, including sampling locations, are provided in Appendices A and B, respectively. The Perimeter Area and storm drain system investigation programs are provided in Appendices C and D, respectively. Specific sample information for all proposed sample locations (for example, sample depth, analytical suites, etc.) is provided in the planned sampling table (PST) included as Appendix F.

As a general policy, work at Topock Compressor Station must be approved by station management and follows strict project-specific health and safety procedures for utility clearance to protect the safety of the workers and the underground facilities. The basic procedures include preventing airborne dust by wetting the soil if necessary and evaluating the excavation for the presence of unusual conditions that may pose health and safety concerns. It is station policy to minimize operational and safety risks by limiting subsurface intrusion as much as possible; thus, abandoned utilities are typically left in place. Because positive identification of all active and abandoned underground utilities prior to any intrusive activity within the station fence line is impossible, compressor station procedure requires all intrusive work be performed by hydrovac or hand-excavation methods.

PG&E policy requires all excavations in the vicinity of existing infrastructure to be cleared by hand-digging or hydrovac excavation to *a minimum* of 3 feet below ground surface (bgs). Depending on the location, density of utilities encountered, and available information regarding a specific location, hand excavation or clearing using the hydrovac may be required as deep as 10 feet bgs. No power equipment may be used until the excavation has been physically cleared for utilities. A station employee must observe each excavation effort and provide clearance that is it safe to proceed with more intrusive methods.

2.1 Preconstruction Activities

This section presents activities to be conducted prior to intrusive work.

2.1.1 Project Initiation Meeting

Consistent with other phases of work conducted at the Topock site, PG&E will invite agency representatives and other stakeholders (including representatives of Native American Indian tribes involved with the Topock project) to the site for a project initiation meeting. This meeting will be scheduled to occur prior to the start of intrusive activities; however, it is anticipated that various site preparation activities will be conducted prior to this meeting. PG&E will offer interested Native American Tribes the opportunity to provide a traditional healing/cleansing ceremony (or ceremonies) before and after ground disturbing activities occur. During the meeting, PG&E will present an overview of the activities that will be

conducted as part of this work plan, discuss various cultural and biological sensitivities associated with the project, introduce key project team members (including subcontractors), identify certifications required for site visitors, describe applicable site safety and communication protocols, and review plans for project communications with the agency and stakeholders during work.

Prior to mobilization to the site, relevant documents will be developed and reviewed by field personnel (for example, work plan, site-specific health and safety plan, site security plan, SOPs, schedule). Appropriate personnel will be designated for the project (for example, qualified biologist, disturbance coordinator, qualified cultural resources consultant); will possess necessary training certificates (for example, hazardous waste operations); and will be educated in best management practices (BMPs) (discussed in Section 2.2.1) to perform project activities. Required certifications will be verified for all workers on the project, and all workers will receive the appropriate orientation to ensure that they are knowledgeable about the BMPs applicable to their activities.

2.1.2 Surveys

Pre-investigation surveys to be conducted include biological, archeological, utility, asbestos, and video surveys.

In accordance with the programmatic biological assessment (PBA), a qualified biologist will conduct a pre-construction biological survey of all work areas outside of the compressor station fence line prior to ground-disturbing activities, a preconstruction survey for special-status birds will be conducted immediately prior to vegetation removal in the mouth of Bat Cave Wash, and any sediment and pore-water sampling activities along the western shore of the Colorado River in the vicinity of the East Ravine, if that work is to be accomplished during the nesting season (March 15 through October 1). If any plants of traditional cultural significance that are listed in Appendix PLA of the *Final Environmental Impact Report Topock Compressor Station Groundwater Remediation Project* (EIR) (DTSC, 2011b) are identified during these surveys, PG&E will implement the conservation measures outlined in the EIR, as appropriate.

A pre-project archeological survey field verification will also be conducted prior to ground-disturbing activities. The Tribes will be notified in advance of the planned surveys. Areas covered with vegetation will be surveyed after the vegetation is cleared for access. If archaeological materials are disturbed or discovered during the soil investigation, the materials will be repatriated or curated as appropriate. Further, any archaeological site discovered during investigation activities associated with this work plan will be subject to either data recovery or capping. If data recovery is pursued, a research design following California Office of Historic Preservation guidelines or federal guidelines, as applicable, will be prepared and reviewed and approved by DTSC.

Prior to starting site preparation, a survey of aboveground and underground utilities will be conducted within all work areas. An asbestos survey will be performed by State of California-certified asbestos professional in the AOC 27 – MW-24 Bench area. The survey will include a visual inspection of surface materials and debris and collection of material and debris samples to determine asbestos content and friability.

Video surveys will be used to investigate storm drain lines and potentially to assess industrial lines (AOC 20). Because some storm drain lines and most industrial lines are 4 inches or less in diameter, standard video survey equipment cannot be used. During the pre-investigation phase, PG&E will test the experimental methodology described below to assess whether it is feasible for video surveys of small diameter pipelines.

1. Guide stiff fish tape (also known as draw wire or draw tape) through the line being investigated to an exit point.
2. Once at the exit point, attach a long rope to the loose end, and attach a down-hole camera (with built-in LED lights).
3. Recoil the fishing tape, and carefully pull the camera through the drain.

Due to the size of the lines, any obstructions in the lines are likely to be significant barriers to continuing the survey.

2.1.3 Site Access and Demarcation

The proposed access routes and drilling sites will be field-checked and will be clearly delineated before equipment mobilization. Culturally sensitive locations that require specific protective devices and are located in the vicinity of proposed soil investigation activities will be marked with temporary fencing, flagging, or other type of demarcation prior to implementation of the work in the area. Proposed access routes are shown on Figure 2-1.

Minor road improvements and/or minor grading might be necessary to access a few sample locations in AOC 1 and the lower check berm in AOC 11. Topographic low areas modified during the 2008 Part A field sampling event may require further modifications to access proposed samples in the upper reaches of AOC 11. Access to the areas at the mouth of Bat Cave Wash within AOC 1 will require extensive pruning of the vegetation in this area to allow access for sampling personnel and sampling equipment. Access to sediment and pore-water sampling locations along the western shore of the Colorado River in the vicinity of the East Ravine will require limited cutting or pruning of vegetation. Access will require the use of a boat to reach several of the sediment and pore-water sampling locations. Detailed discussions of site-specific access restrictions are presented Appendices A and B. Access routes for the Part A investigation are also shown on the sampling figures; access for the Part B investigation will be to the compressor station via the plant access road.

2.1.4 Staging Areas

Staging areas previously used for other projects will be used for this soil investigation. Staging areas for the Part A investigation are shown on the sampling figures for the individual units. The proposed equipment decontamination area and primary staging area for drilling equipment and investigation-derived waste (IDW) and displaced soil management will be on PG&E property, as shown on Figure 2-2; all staging areas for the Part B investigation are also shown on Figure 2-2. Displaced soil resulting from activities presented in this work plan and identified for long-term storage will be stored within the Topock Compressor Station parcel (if soil originated from within the compressor station fence line) and at the new evaporation ponds (if the soil originated from outside the

compressor station fence line.). Soil will be stored in drums or rolloff bins. Details regarding displaced soil evaluation and handling are provided in Appendix J.

Drill rigs will be cleaned before mobilization to the site and following completion of drilling at the site if visible grease, oil, or other contamination is present on the equipment. After the drill rigs have been mobilized into place, the localized staging areas will be established in the drilling work area. Plastic sheeting will be laid on the ground surface in the staging areas to keep the drilling materials and equipment clean and to minimize impacts to the ground surface from the drilling materials and equipment. In accordance with Occupational Safety and Health Administration requirements, the exclusion zones for the drilling sites will be demarcated.

Drilling will conform to state and local regulations. PG&E will obtain all necessary authorizations required for drilling. The specific drilling locations within the areas indicated on individual investigation areas figures in Appendices A, B, C, and D will be based on the results of utility clearance surveys, including hand-digging where needed, to ensure safe working distances from overhead and underground utility hazards. Approvals and authorizations are discussed in Section 4.0. Additional site-specific access restrictions, site preparation, and access routes are presented in Appendices A and B.

2.2 Standard Operating Procedures

Soil sample collection and handling activities will follow SOPs from the *Topock Program Sampling, Analysis, and Field Procedures Manual, PG&E Topock Compressor Station, Needles, California* (CH2M HILL, 2005). The SOPs relevant for the investigation activities for this project are included in Appendix G. The methods, equipment, and procedures for borehole drilling requirements, surface soil sampling, subsurface soil sampling, debris sampling, geophysical surveys, XRF screening, soil vapor sampling, potholing/trenching and sampling, surveying, vegetation removal, waste management, and decontamination are briefly described in the following subsections.

2.2.1 Best Management Practices

BMPs will be implemented as part of the soil investigation activities described below. BMPs are designed to help control dust, reduce noise, and limit other potentially undesirable effects associated with the investigation, as well as to enhance worker safety. Access routes within the investigation areas will be assessed daily to determine the safest route to sample locations. General access routes to the investigation areas area shown in Figure 2-1. Vehicle speeds will be controlled (for example, limited to 15 miles per hour or slower) to limit generation of dust on unpaved surfaces. Dust may also be created from soil sampling activities. Fugitive dust emissions resulting from vehicle traffic or soil sampling activities will be controlled by wetting surfaces or spraying approved dust suppressants. Appropriate dust control measures will be implemented to avoid visible dust from any earthmoving activities, and/or any earthmoving activities may be curtailed if dust control measures are not sufficient to reduce visible dust during high winds.

Housekeeping practices will be implemented to properly dispose of trash in designated containers and store IDW in appropriate containers and locations and keep equipment clean, as discussed in Section 2.2.9. Equipment will be maintained in good working

condition and will be operated under the manufacturer specifications. It will also be fitted with the best available noise suppression devices (for example, mufflers, silencers, wraps). All impact tools will be shrouded or shielded, and all intake and exhaust ports on power equipment will also be muffled or shielded. Equipment will not be allowed to idle for more than 15 minutes when not being used.

Vehicle fueling will be conducted only in approved locations. Fueling activities associated with the soil investigation will be performed in accordance with SOP-B19, *Remote Equipment Refueling*, in Appendix G).

2.2.2 Installation of Boreholes and Soil Sample Collection

Four methods of subsurface soil collection may be used during implementation of this work plan. Methods for collecting soil samples include drilling, potholing/trenching, hydrovac potholing, and hand sampling.

2.2.2.1 Drilling

The drilling and core/borehole logging will be performed under the supervision of a California Professional Geologist. The methods, equipment, and procedures for drilling and core logging are described in the following subsections.

Drilling Requirements. The drilling methods used may vary depending on the conditions encountered. The preferred drilling method is rotosonic (SOP-B9, *Drilling – Sonic Method*). Rotosonic methods are preferred for drilling through unconsolidated materials above bedrock. This method involves advancing a rotating and vibrating drill casing or core barrel through the subsurface. Rotosonic drilling can produce a continuous core from the ground surface to the target drilling depths; generates minimal drilling wastes; and typically can drill through gravel, cobble, and softer bedrock formations. Rotosonic boreholes drilled for sample collection will be a minimum of 4 inches in diameter but may be up to 6 inches in diameter, as necessary. Alternative drilling methods, including GeoProbe and hollow-stem auger, have been attempted in the past and are generally not effective in the rocky soils encountered at Topock.

Rotosonic drilling activities will be conducted using either standard truck-mounted or a track-mounted rotosonic drilling rig. Outside the fence line, a tracked or balloon-tired vehicle will be used to support the drilling rig by transporting cuttings, tools, and excess core generated from the drilling sites to the staging area. Given the proximity of most drilling locations outside the fence line to National Trails Highway, one or more standard highway vehicles or small all-terrain vehicles may be used to transport crew, equipment, and materials from the staging area to the drill sites. Disposal procedures for IDW are discussed in Section 2.2.8.2.

Core Logging and Preservation. Lithologic descriptions of each borehole will be logged based on visual inspection of the retrieved core under the supervision of a California Professional Geologist and will follow the SOPs for Topock drilling investigations (SOP-B3, *Borehole Sampling and Logging of Soil Borings*). At a minimum, the field log will document the information listed below.

General

- Unique boring identification
- Purpose of the boring (for example, soil sample collection)
- Location in relation to an easily identifiable landmark
- Names of the drilling subcontractor and logger
- Start and finish dates and times
- Drilling method
- Drilling rate and rig reactions, such as chatter, rod drops, and bouncing

Soil Core Logging

- Lithologic descriptions (based on the Unified Soil Classification System)
- Sampling interval depths
- Zones of caving or heaving
- Depth at which saturated conditions were first encountered (if applicable)
- Debris or staining

The results of the continuous core logging of the boreholes will be summarized in boring logs, which will be included in the RFI/RI Volume 3.

Soil Sample Collection for Laboratory Analysis. Soil samples will be collected from drilled boreholes at predesignated depth intervals, as discussed in the PST provided as Appendix F, in accordance with sample collection and handling procedures described in Section 2.2.4. Once drilling and sampling activities are complete, the boreholes will be filled and site will be restored, as discussed in Section 2.3.

2.2.2.2 Potholing/Trenching

An excavator or backhoe will be used to install potholes to evaluate the presence, nature, and extent of white powder material in certain investigation areas and to collect soil samples in areas where site conditions are unsuitable for drilling (for example, on steep slopes) or debris may be present (for example, AOC 27 – MW-24 Bench). Potholes/trenches will be deepened gradually so that subtle changes in lithology and/or white powder material can be documented in the logs.

Soil samples will be collected directly from the excavator or backhoe bucket at predesignated depth intervals, as shown in the PST provided as Appendix F, in accordance with sample collection and handling procedures described in Section 2.2.4. Excavated material will be used to backfill the excavation from which it originated.

2.2.2.3 Hydrovac Potholing

Hydrovac excavation consists of using a vacuum truck to suction soil from a small-diameter pothole directly into the vacuum truck. If necessary, soil may be wetted to loosen it. Soil samples will be collected at the predesignated depth intervals from undisturbed soil by hand or by using a decontaminated hand auger. All potholes will be backfilled following sample collection. Bentonite chips will be used to seal the each pothole. The surface will be repaired to match existing surface, for example, potholes installed in asphalt will be repaired with asphalt patch; potholes in concrete will be repaired with premix concrete. The

hydrovac process can only be used for unconsolidated materials; utility of this method is likely to be limited in many areas due to the presence of bedrock or large gravel.

2.2.2.4 Hand Tools

Hand tools, which include stainless-steel trowels, slide hammers, hand augers, and shovels, will be used for samples collected between 0 and 3 feet bgs in areas that cannot be accessed by drilling or potholing equipment or where hand-digging is required for safety reasons. Soil samples collected in the depth interval from 0 to 1 foot bgs may be collected using a stainless-steel trowel. Soil samples collected in the depth interval from 1 to 3 feet bgs may be collected using a hand auger or a slide hammer to drive a core sampler into the undisturbed soil to the desired sampling depth. In areas where pre-excavation is required to provide adequate utility clearance, soil samples may be collected with hand tools up to 6 feet bgs. Soil samples will be collected at pre-designated depth intervals, as shown in the PST provided as Appendix F, in accordance with the sample collection and handling procedures described in Section 2.2.4.

Each hole created using hand tools will be backfilled using the material removed from that hole. Pavement will be restored where needed.

2.2.3 Installation of Soil Vapor Probes and Soil Vapor Sample Collection

Permanent single-depth soil gas probes and nested soil gas probes will be installed in various AOCs, as specified in Appendix B. The soil gas probes will be installed and sampled in accordance with SOP B18, *Collection of Soil Gas Samples from Temporary and Permanent Probes Using Canisters and helium leak check* and SOP B17, *Installation of Permanent Soil Gas Sampling Probes*.

The soil vapor probes will be implants constructed specifically for soil gas sampling. The probes have a 0.5-foot screen interval and are constructed of stainless-steel mesh screen. Teflon tubing will extend from the probe to the ground surface. Sand filter pack (#2/12 or equivalent) will extend from the bottom of the boring to 0.5 to 1 foot above the top of the probe screen. Dry granular bentonite will extend 1 foot above each sand filter pack. The probe will be grouted with hydrated bentonite slurry from the dry bentonite granules to 1 foot from the ground surface. The probe tubing will be sealed at the surface with a stainless-steel Swagelok fitting (or equivalent) with a plug and will be enclosed in a traffic-rated, flush-mounted, well box set in a cement pad. Nested probes will be collocated in the same well box. An example of soil vapor probe is shown on Figure 2-3.

Samples will be collected in certified, precleaned 6-liter SUMMA canisters using helium leak check and screening procedures listed in the SOP noted above.

2.2.4 X-ray Fluorescence Field Screening

In an effort to reduce intrusive sampling, a portable XRF analyzer will be used to assist with identifying and optimizing possible sample locations in debris areas located in AOC 10 (Subappendix C4 in Appendix A), AOC 14 (Subappendix C7 in Appendix A), and AOC 27 (Subappendix C12 in Appendix A); in the Perimeter Area just outside the compressor station fence line (Appendix C); and during Step 1 of the phased sampling approach for

proposed sample locations in unpaved areas inside the compressor station fence line (Appendix B).

All XRF analyses will be performed in accordance SOP-B16, *Field-portable X-Ray Fluorescence Soil Sampling*. Corrected XRF results will be compared to applicable screening levels on Table 2-1 on a point-by-point basis. (For field-screening purposes, XRF concentration readings will be adjusted using least-square regression equations calculated from the RFI/RI samples analyzed in the lab and by XRF.)

XRF screening may also be used to evaluate debris encountered during intrusive investigation. SOP-B16 describes the procedure for XRF screening of nonsoil materials. Unlike the process used for soil screening, nonsoil materials will preferentially be screened in situ. If the item of debris is sufficiently large, readings will be taken from a minimum of three locations and will be averaged. XRF concentration readings will be adjusted using least-square regression to correct for site variation.

2.2.5 Sample Collection and Handling

This section describes the procedures for the collection and handling of soil, debris, and white powder material samples.

2.2.5.1 Soil, White Powder Material, and Debris Sample Collection for Inorganic, Semivolatile Organic Compounds, Total Petroleum Hydrocarbons-diesel/-motor-oil, Pesticides, and Polychlorinated Biphenyls Analyses

Soil and white powder samples requiring inorganic, semivolatile organic compound, total petroleum hydrocarbons (TPH) as -diesel and as -motor-oil, pesticide, dioxin/furan, and polychlorinated biphenyl (PCB) analyses will be collected directly from the drilling core or backhoe/excavator bucket or surface soil using stainless-steel trowels. The collected material will then be put through a stainless-steel sieve to remove any rocks and other debris prior to being homogenized in a stainless-steel bowl, as directed in SOP-B7, *Homogenization of Soil and Sediment Samples*. After homogenization, the soil will be transferred to unpreserved glass sample jars and labeled. Samples of white powder material will not be homogenized.

Debris (for example, wood or metal) samples will be collected using stainless-steel trowels, as appropriate, and depending on the size of the debris, either will be placed into glass sample jars or large plastic zip-top bags.

2.2.5.2 Soil Sample Collection for Volatile Organic Compounds and Total Petroleum Hydrocarbons-gasoline Analyses

Soil sample aliquots designated for volatile organic compound (VOC) and TPH-gasoline analyses will be collected immediately upon opening the relatively undisturbed drilling core or recovery from a pothole (that is, before geologic logging or the collection of other soil sample aliquots) to minimize the potential for volatilization of compounds to the atmosphere. VOC and TPH-gasoline aliquots will be collected using dedicated plastic syringes, as directed in SOP-B15, *Volatile Organic Compound* (*VOC) Soil Sampling Protocols*. Using the syringes, a specific volume of sample, which correlates to an approximate target mass, will be transferred directly from the drilling core or backhoe/excavator bucket into

pre-preserved sample vials. The sample vials will be chilled prior to use to minimize evaporation of the preservative when opened. Syringes cannot be used to collect sample from soils consisting of loose sand and gravel. In this case, stainless-steel trowels will be used to transfer the soil into the vials for volume measurement prior to preservation.

2.2.5.3 Sample Management and Storage

Samples will be placed immediately into field coolers with ice; VOC and TPH-gasoline containers will be arranged in the sample cooler standing upright. The field coolers will be taken to the sample management area, where the samples will be transferred into a refrigerator and/or freezer. If transport of a sample to the laboratory is scheduled for a pickup more than 24 hours after sampling, samples will be stored in the freezer.

2.2.5.4 Shipping

Samples collected for chemical analysis will be transported to the laboratory via courier, generally daily. Samples collected for geotechnical analyses will be shipped via Federal Express or a similar carrier. Chain-of-custody forms will accompany all samples to the laboratory.

2.2.6 Geophysical Surveying

Geophysical surveys will be conducted at three investigation areas to identify potential buried pipe at UA-1, buried debris at AOC 27, and to more precisely locate the septic system leach field in AOC 17. A geophysical survey will also be performed as Step 3 of the storm drain system investigation program to attempt to trace lines between catch basins and outfall pipes (Appendix D). Geophysical surveying will be conducted using electromagnetic induction (EM) and vertical magnetic gradient (VMG) scans in all areas, and ground-penetrating radar (GPR) will be used in localized areas as necessary. GPR will be used at all areas within UA-1. There are likely to be some surface obstructions to the geophysical survey. The survey will avoid areas where access or other conditions (for example, sparks) could create a hazard.

A survey grid will be established first to provide horizontal control for data acquisition. The grid size will be determined based on the size of the area being surveyed, presence of surface obstructions, and expected density of all subsurface utilities. Potential buried pipes, debris, and leach fields will be identified using VMG and EM scans and may be confirmed using GPR.

VMG surveys are used to determine the presence of buried ferrous objects. VMGs provide better resolution of near-surface objects and are less affected by surface objects than total field magnetometers that measure only total magnetic intensity. The distribution and configuration of VMG contours depict the distribution and intensity of VMG values within the surveyed area. Areas where contours are closely spaced indicate steep magnetic gradients caused by buried objects. If the source of a steep gradient is linear, then the contours tend to parallel the linear feature; if a buried object is localized (for example, tank, drum, etc.), the contours tend to enclose the object. Lower values may indicate the presence of nonferrous buried objects.

EM scans are used to delineate variations in the electrical conductivity of the shallow subsurface. These variations can be caused by variations in lithology or moisture content, as well as buried metallic objects. EM scans also provide contour maps that are analyzed to identify magnetic anomalies that may be due to buried ferrous metal. Contours take similar forms as VMG scans. The larger the object and closer it is to the instrument (that is, ground surface), the more contours are present in the area.

GPR is used to locate the depth and position of metallic and nonmetallic objects. The system works by sending a small pulse of energy from an antenna into the surveyed material and recording the strength and the time required for the return of any reflected signal. The strength, or amplitude, of the reflection is determined by the contrast in the dielectric constants of the two materials. Antenna frequency is a major factor in depth penetration. The higher the frequency of the antenna, the shallower into the ground it will penetrate. A higher-frequency antenna will also identify smaller targets. GPR data are used to provide a plan view through the area scanned. GPR equipment may leave minor tracks in the soil; PG&E will groom the soil by hand to remove these tracks, if necessary.

GPR and magnetometry equipment is relatively portable; all of the equipment can fit into the back of a pickup truck. Both proposed methods are capable of rapidly locating underground anomalies such as pipes. Using a magnetometer or GPR requires establishing survey stations at relatively close intervals of 5- to 50-foot spacing along closely spaced (10- to 50-foot) parallel lines.

2.2.7 Surveying

Following sample collection, the horizontal location and elevation of each sample location will be documented using an industry-standard (Trimble or similar), resource-grade, handheld global positioning system unit capable of 1-meter accuracy. A sketch of the sampling location will also be entered into the logbook, with any reference points labeled including distances to the sampling location.

2.2.8 Vegetation Removal

Due to the thick vegetation in the tamarisk thicket area near the mouth of Bat Cave Wash in AOC 1, a path will need to be cut through the vegetation to allow passage of necessary sampling equipment. The vegetation removal will be completed using small excavators (that is, Bobcat or similar) fitted with rubber tracks to minimize soil disturbance. The vegetation will be cut above the roots as close to the ground surface as possible to establish an even path for the drilling equipment and crew, while maintaining soil stability and allowing for vegetation regrowth. Chainsaws or similar equipment may be used to cut larger limbs; however, every effort will be made to preserve large tree specimens and plant species of interest (as identified in the preconstruction biological survey discussed in Section 2.1.2) during the vegetation removal. Vegetation removal activities will be performed in consultation with and/or under supervision of a qualified biologist. A qualified biologist will review the preconstruction survey to determine potential impacts to existing site vegetation and determine the need for a revegetation plan, if any.

As directed by DOI, the vegetation removed from the tamarisk thicket in AOC 1 will be left in place (most likely after being chipped, which may be used for bedding for the

sampling routes). If the vegetation is chipped, consideration will be given to retaining some of the larger logs for erosion control during the period when vegetation is reestablished.

Limited cutting of riparian vegetation along the western shore of the Colorado River in the vicinity of the East Ravine may also be required to allow access to some of the sediment and pore-water sampling locations. Vegetation would be cut using hand tools (maintaining the roots) and the cuttings would be left in place.

2.2.9 Equipment Decontamination and Displaced Soil and Waste Management

The project approach for equipment decontamination and displaced soil and IDW management is presented in the following subsections.

2.2.9.1 Equipment Decontamination

Downhole drilling tools, excavator and backhoe buckets, tracks on track rigs, and the back ends of the drilling rigs will be decontaminated prior to arrival at the site and will be cleaned between investigation areas as determined necessary by the field team leader. In addition, downhole drilling tools, excavator and backhoe buckets, core barrel, drill stem, and drive casings will be decontaminated between boring locations. Decontamination will be accomplished by steam cleaning or pressure-washing the equipment, and back of the drilling rig. Equipment may also be cleaned using dry methods prior to leaving an excavation area to prevent the tracking of material out of the area. The backs of drill rigs and downhole drilling tools will be decontaminated before arrival at the site. Drilling equipment will be decontaminated prior to removal from the site. Equipment will also be inspected, and any soil will be removed from the equipment prior to moving the equipment via any publicly maintained roads.

The steam-cleaning will be conducted on a temporary decontamination pad (lined with plastic sheeting) located on PG&E compressor station property, shown on Figure 2-2. Rinsate from the decontamination operation will be collected on the containment pad and will be transferred to the cuttings bin/drum or portable storage tank. Decontamination is described in SOP-B5, *Decontamination of Personnel and Equipment, Well Drilling and Subsurface Sampling and Investigations.*

2.2.9.2 Displaced Soil and Investigation-derived Waste Management

IDW generated during soil sampling activities will include soil cuttings and equipment decontamination rinsate (described above). IDW will be stored, handled, and transported in accordance with applicable local, state, and federal laws. Displaced soil will be handled in accordance to the Displaced Soil and Hazardous Waste Management Procedures provided in Appendix J. These procedures were developed following guidelines and protocols of the *Management Protocol for Handling and Disposition of Displaced Site Material, Topock Remediation Project, Needles, California.*

Displaced soil will be contained in Department of Transportation-compliant drums or lined rolloff bins at the staging areas during the drilling and sampling activities. Water generated during equipment decontamination will be collected in covered portable storage tanks temporarily located in staging areas near the decontamination pad as needed. Secondary containment will be set up for the portable storage tanks. The displaced soil will be

characterized as described in Appendix J and will be identified as one of the following categories based on the characterization results:

- **RCRA and non-RCRA hazardous waste** –The IDW will be removed from the site within 90 days of generation and will be disposed of offsite in accordance with applicable laws and regulations and the procedures outlined in Appendix J.
- **Nonhazardous clean soil** – This category consists of soil that is not classified as a hazardous waste and has chemical concentrations equal to or below the interim screening levels. It is suitable for immediate return, reuse, or replacement within the Topock Area of Potential Effects (APE), as defined in the Programmatic Agreement.
- **Nonhazardous Soil for Long-term Storage.** This category includes soil that is not classified as a hazardous waste, and contains constituents at concentrations greater than the interim screening level. It will be stored in rolloff bins or drums within the fence line (for soils generated within the fence line) or in rolloff bins or drums at the new evaporations ponds (for soils generated by activities outside the fence line) until the project-specific cleanup goals are established. Until these goals are established, soil that falls into this intermediate category will be retained for long--term storage.

Additional IDW materials that will be generated include incidental trash and equipment decontamination water.

Incidental trash will be collected at the end of each drilling shift and will be hauled from the drill site to an appropriate offsite disposal facility.

Water generated during equipment decontamination will be collected in bins or portable storage tanks temporarily located in staging areas near the drilling sites or at the PG&E Topock Compressor Station as needed. Secondary containment will be set up at the drilling area for the portable storage tanks or bins.

2.3 Post-construction Activities

Post-construction activities will consist of survey, site restoration, and reporting.

In accordance with the PBA (CH2M HILL, 2007d), a post-investigation survey will be conducted by a qualified biologist at each site after completion of site activity. With the exception of the proposed sampling near the mouth of Bat Cave Wash and near the mouth of East Ravine, all areas of the proposed Part A Phase 2, proposed Part B Perimeter Area, and storm drain system investigation area have been previously disturbed and contain limited to no vegetation. No more than 2 acres of vegetation combined are proposed to be removed in the tamarisk area near the mouth of Bat Cave Wash and the riparian area near the mouth of East Ravine.

Given the proposed limited impacts to vegetation near the mouth of Bat Cave Wash and mouth of East Ravine and vigorous growth habit of the tamarisk vegetation in the mouth of Bat Cave Wash it is unlikely that a revegetation plan will be required for these areas. Given the short duration of investigation activities in the mouth of the East Ravine (currently anticipated to be less than 2 weeks), relatively low-impact activities (localized cutting of riparian vegetation), and the resilience of riparian vegetation in an area with variable water

levels and periodic flooding, vegetation is expected to recover within one to two growing seasons. A revegetation plan is not anticipated for work conducted in the other proposed work areas due to the sparse vegetation in the other proposed work areas. Nonetheless, a qualified biologist will review the post-construction survey results from the mouth of Bat Cave Wash and the mouth of the East Ravine to determine the extent of impacts to vegetation in the work areas. If substantial adverse effects to vegetation resulted from any work activities, a revegetation plan may be implemented. In the unlikely event that a revegetation plan will be required as a result of the soil investigation activities, it will be reviewed by an architect, landscape architect, or allied design professional licensed in the State of California.

Temporary signage or other items that may be put in place during borehole drilling, or pothole or hand excavation activities will be removed upon completion of the sampling activities. Roads used for access during the investigation will be returned to pre-investigation conditions. After sampling activities at the sites located on federal property are completed, PG&E will work with DOI to evaluate the need for any additional restoration activities.

3.0 Quality Control, Data Management, and Data Validation

3.1 Sampling and Analysis Plan

Before each field sampling event, the project manager or designated representative will coordinate the organization of field personnel and preparations for field activities. The project chemist will notify the laboratory of the pending sampling event and arrange for the appropriate type and number of sample containers. The PST, listing each location to be sampled and the analysis to be performed at each location, is provided in Appendix F. The frequency of field duplicates and equipment blanks and with other quality assurance/ quality control requirements will follow the PG&E Program QAPP, Revision 2 (CH2M HILL, 2012a) or the QAPP Addendum (CH2M HILL, 2012b), provided as Appendix H. Field duplicates are listed in the PST. Field sampling instruction will be given to the field teams and will include the PST; number, size, and type of containers required for each sample location; map of sample locations; SOPs; chain-of-custody forms; soil sampling logs; brief summary of the purpose of the sampling; and any special protocols required for this sampling event.

3.2 Analytical Methods

Soil samples collected during this effort will be analyzed for parameters listed in the PST using the methods specified in Appendix H. All field quality control measures data will follow the PG&E Program QAPP, Revision 2 (CH2M HILL, 20012a) and the QAPP Addendum (CH2M HILL, 2012b).

The PG&E Program QAPP, Revision 2 and the QAPP Addendum also outline quality control requirements for laboratory analyses to be conducted for all PG&E Topock projects. The QAPP addresses DQOs; method detection limits, reporting limits, and instrument calibration requirements; laboratory quality control samples; laboratory data management procedures; performance evaluations; preventive maintenance; corrective action; and quality assurance reports. Project chemists will review laboratory analytical data generated from soil sampling to assess data quality and identify deviations from analytical requirements.

3.3 Data Management

The electronic data will be used to generate validation reports, data summary tables, and figures. Management of data generated from soil sampling will be conducted in accordance with QAPP. This program will follow standard procedures for environmental data collection listed in the QAPP. The QAPP provides procedures that give data users rapid access to stored data; provide methods of data entry with known accuracy and efficiency; apply well-documented validation procedures to an electronic database; manage sample data using unique sample identification numbers; establish a sample inventory of new data

collected and provide methods of sample inventory reconciliation; store and provide sample-specific attributes, including location identifiers, sample type and media, and sample date; and provide reporting and delivery formats to support data analysis and reduction.

3.4 Data Validation

Data validation will be performed when data packages and electronic data deliverables are received from the laboratory. Validation will be conducted using a combination of manual review and automated software. Validation will be performed on an analytical batch basis, using the summary results of calibration and laboratory quality control, as well as those of associated field samples. Data packages will be reviewed for all analytes. Data validation will include:

- Review of the data package for completeness.
- Review of chain-of-custody records for discrepancies that might degrade data quality.
- Review for compliance with holding time and quality control frequency requirements.
- Evaluation of all calibration and quality control summary results against project requirements.
- Verification of analyte identification and calculations for at least 10 percent of the data.
- Qualification of data using appropriate qualifier flags, as necessary, to reflect data usability limitations.
- Initiation of corrective actions, as necessary, based on data review findings.

Data validation will be patterned after the United States Environmental Protection Agency (USEPA) *Contract Laboratory National Functional Guidelines for Inorganic Data Review* (USEPA, 2002) and *Contract Laboratory National Functional Guidelines for Organic Data Review* (USEPA, 1999), substituting the qualifiers, the calibration and quality control requirements specified in the PG&E Program QAPP, Revision 2 (CH2M HILL, 20012a), and the QAPP Addendum (CH2M HILL, 20012b), (Appendix H).

4.0 Data Gaps Evaluation

The Soil Part A and B investigation programs employ the DQO process to ensure that data collected at each stage of the investigation process are of sufficient quantity and quality to enable the specified decisions to be made. The DQO process is a recognized procedure for defining project objectives and decisions and for optimizing sampling and other information-gathering programs to balance uncertainty, site disturbances, and cost in an acceptable manner.

The data evaluation process is designed to determine whether the sampling objectives outlined in the Part A DQO Tech Memo (CH2M HILL, 2010a) and Part B DQO Tech Memo (CH2M HILL, 2007b) have been met. The sampling objectives will have been met if the decision rules for all problem statements presented in the Soil Part A DQO Tech Memo (Appendix A) and Soil Part B DQO Tech Memo (Appendix B) indicate that no further sampling is required, and the previously identified Part A and B data gaps have been resolved. If sampling objectives have not been met (that is, data gaps have been identified) or previously identified data gaps have not been resolved, additional sampling will be conducted, if feasible. If sampling is not feasible, remaining uncertainties will be addressed in the risk assessment and/or CMS/FS or interim measures.

The following subsections summarize the results of the data gaps evaluation process for Part A and the forthcoming data gaps evaluation process for Part B data.

4.1 Soil Part A Data Evaluation Process

After implementation of the Soil Part A Phase 2 Investigation Program (see Appendix A), the new validated data meeting the criteria set forth in the QAPP will be combined with existing Soil Part A data. The combined data set will be used to assess if the data are sufficient to resolve the Part A Phase 1 data gaps. Summaries of the Part A Phase 1 data gaps by Part A DQO decision are presented in Table 4-1; complete lists of data gaps for each investigation area for each decision are presented in Subappendix C to Appendix A of this work plan.

4.2 Soil Part B Data Evaluation Process

Section 4.0 of Appendix B describes the proposed phased sampling approach for areas with the compressor station fence line (Soil Part B investigation), which begins with XRF screening and is followed by intrusive soil sampling to various depths. After implementation of the Soil Part B investigation program is complete, the new validated data meeting the criteria set forth in the QAPP will be combined with existing Category 1 and 2 Soil Part B data. Category 1 and 2 data will be used to delineate the nature and extent of contamination (Decision 1), potential threat to groundwater from residual soil concentrations (Decision 3), and to assess whether sufficient information is available to complete the CMS/FS and remedial design and/or interim measures (Decision 5).

However, only Category 1 data can be used for risk assessment (Decision 2) and for the evaluation of potential risks to offsite receptors via the offsite migration pathway (Decision 4). The data analysis for Decision 4 requires evaluating whether the chemicals of potential concern detected pose a potential risk to human and/or ecological receptors outside the fence line. Risk determinations can only be made using Category 1 data. However, other data, such as XRF results, may also be used to evaluate potential offsite migration pathways.

The following evaluations will be completed for each of the five DQO decisions:

- **Decision 1**. The nature and extent of contamination at the Part B investigation areas will be described and evaluated to determine whether the nature and extent of contamination are adequately understood. The evaluation will follow the Decision 1 rules outlined in Part B DQO Tech Memo, as shown on Figure 2 in Subappendix B1.
- **Decision 2**. A data sufficiency evaluation will be conducted to determine if sufficient data exist within the fence line to calculate representative exposure point concentrations for each applicable exposure interval for human health receptors. The evaluation will follow the Decision 2 Rules outlined in Part B DQO Tech Memo, as shown on Figure 3 in Subappendix B1.
- **Decision 3**. Soil screening levels will be calculated for any metal exceeding background concentrations at one or more locations within the individual Part B investigation areas. For constituents where the detected concentrations exceed the soil screening levels, vadose zone modeling will be conducted to further evaluate the potential threat to groundwater. If organic compounds are detected in one or more locations within the investigation areas, vadose zone modeling will be conducted to evaluate the potential threat to groundwater from detected organic compounds. The evaluation will follow the Decision 3 rules outlined in Part B DQO Tech Memo, as shown on Figure 4 in Subappendix B1.
- **Decision 4**. An offsite migration evaluation will be conducted to estimate potential risks to offsite receptors due to potential migration of contaminants, in a surface migration pathway, from areas within the fence line to areas outside the fence line. This evaluation will use Category 1 soil concentrations in shallow soil in areas where soil may be transported to areas outside the fence line; soil physical and chemical property information; potential mechanisms, directions, and rates of migration; information on structures; and other features that may prevent or facilitate offsite migration. This evaluation will also use non-Category 1 data (such as XRF results) to help evaluate potential offsite migration pathways from the compressor station to areas outside the fence line. The evaluation will follow the Decision 4 rules outlined in Part B DQO Tech Memo, as shown on Figure 5 in Subappendix B1.
- **Decision 5**. A data sufficiency evaluation will be conducted to determine whether sufficient data exist at the Part B Investigation Areas to determine the site-specific soil property, contaminant distribution, and transport pathway information required to support development of the CMS/FS (specifically, remedial technology feasibility assessment and estimation of soil and debris volumes potentially requiring remediation), remedial design, and Interim Measures, if required. If full determination

of site-specific soil property, contaminant distribution, and transport pathway information based on sample data is not feasible, the impediments will be documented and uncertainties will be addressed in the risk assessment and/or CMS/FS or Interim Measures. The evaluation will follow the Decision 5 rules outlined in Part B DQO Tech Memo, as shown on Figure 6 in Subappendix B1.

The investigation of the Perimeter Area and storm drains will also be phased. Once these investigation efforts have been completed, data collected for the Perimeter Area and storm drain investigation programs will be assessed in the same manner as data from new units to evaluate whether contamination is present and, if so, the nature and extent of contamination have been adequately delineated.

Once data collection has been completed pursuant to this work plan, data generated from the Perimeter Area and storm drain system investigation programs will first be reviewed to determine whether any constituents exceed background or applicable screening levels for organic compounds. Areas with exceedances of background concentrations and/or applicable screening levels for organic compounds will be assigned to the applicable Part A or Part B unit(s), if appropriate, or to a new individual unit/hotspot if detected contamination does not appear to be related to nearby existing units. Assignment of data to existing units would occur only after all data collection is complete (that is, at the time that the boundaries of established units may be adjusted and/or the need for additional units may be identified). A description of the data evaluation process for the Perimeter Area and the storm drain system investigation is provided in Appendices C and D, respectively.

5.0 Approvals and Authorizations

5.1 Anticipated Approvals

Implementation of work plan activities will require prior approval from DTSC and DOI pursuant to their authority under RCRA and CERCLA, respectively. Because the soil investigation is a CERCLA response action, activities conducted onsite are covered under the permit exemption codified in Section 121(e)(1) of CERCLA. While the permit exemption applies to the administrative or procedural elements (e.g., preparing and submitting permit applications and obtaining permits), the substantive requirements of the applicable laws remain. Anticipated approvals and authorizations for implementation of the soil investigation outlined in this work plan are listed in Table 5-1.

As discussed further in Section 5.2, BLM has requested that USFWS extend the 2007 Programmatic Biological Assessment (PBA), which expires on December 31, 2012, for an additional five years and also requested certain other revisions to the PBA. If BLM's request for an extension and revision of the PBA is granted, all proposed activities will be conducted in a manner consistent with the PBA and therefore will be in compliance with requirements of the federal Endangered Species Act (ESA).

Compliance with Section 106 of the National Historic Preservation Act will involve compliance with the requirements and mitigation measures contained in the *Programmatic Agreement (PA)* (BLM, 2010)and *Cultural and Historic Properties Management Plan (CHPMP)* (BLM, 2012). and United States Bureau of Land Management (BLM) consultation with the Tribes, other signatories, and invited signatories to the Programmatic Agreement pursuant to the requirements of the Programmatic Agreement's consultation protocol.

Approval from the DTSC is subject to a review pursuant to the California Environmental Quality Act. DTSC is preparing an Environmental Impact Report (EIR) for this work plan.

Portions of the work plan activities are within the jurisdiction of the California Department of Fish and Game, pursuant to Section 1600 et seq. of the Fish and Game Code. Compliance with Section 1600 requirements has been provided via the existing California Department of Fish and Game Streambed Alteration Agreement (SAA) No. 1600-2005—0140-R6, as amended in January 2007. Subsequent to the termination of this SAA in December 2012, work plan activities will be performed in compliance with the substantive requirements of California Fish and Game Code Section 1602.

Portions of the work plan activities are within the right-of-way maintained by the California Department of Transportation (Caltrans). Caltrans approval is required for work in AOC 14 and in the AOC 27, MW-24 Bench area. Given the limited access to AOC 14, drilling equipment (that is, the drill rig) may need to be lifted by crane onto AOC 14. If lifting this equipment is necessary, a lane of Interstate 40 will need to be closed. Lane closure will require Caltrans approval and coordination with the California Highway Patrol and may require coordination with the Arizona Department of Transportation.

To access AOC 14, personnel and equipment will need to cross the Burlington Northern Santa Fe (BNSF) railroad tracks. To access the area of Bat Cave Wash between the Interstate 40 and BNSF railroad culverts, a drill rig will need to pass through the BNSF culvert. The crossing of the railroad tracks and passing through the BNSF culvert will require approval from BNSF.

Pipeline infrastructure owned and/or maintained by private entities is located at and near the project site; approximate locations are shown on Figure 2-2. Prior to field work, the precise rights of way associated with any nearby pipelines will be determined. Coordination with the affected pipeline company will occur as needed to obtain prior approval and comply with applicable requirements. In addition, prior to implementation of the subject activities, Underground Service Alert notifications will be made so that utility companies can locate and mark the locations of their underground facilities.

5.2 Biological Evaluation

5.2.1 Introduction

The current PBA expires in December 2012; the BLM has reinitiated consultation with the USFWS to extend the coverage period of the PBA for an additional 5 years and to make certain other revisions to the PBA, including modifying the allowable upland habitat disturbance acreage to 8 acres, in part for supplemental soil sampling. -

The current PBA addresses a variety of PG&E Topock remedial and investigative actions, including those identified in the soil investigation work plan. The intent of the PBA is to provide programmatic coverage of these actions up to the final remedy and avoid the need for individual project-specific consultations under ESA. The purpose of this biological evaluation is to outline the soil investigation activities as they relate to federally listed species in the area and to determine if the actions are within the context and boundaries of the PBA as requested by the BLM. Sections 5.2.2 through 5.2.7 discuss project timing, project location and habitat sensitivity, habitat loss, conservation measures, listed species determinations, and conclusion, respectively. The federally listed species being considered and evaluated include the southwestern willow flycatcher (*Empidonax traillii extimus*), Yuma clapper rail (*Rallus longirostris yumanensis*), Mojave desert tortoise (*Gopherus agassizii*), bonytail chub (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*).

5.2.2 Project Timing

The soil investigation activities are anticipated to be conducted between November 2013 and August 2014. The start date is dependent upon receipt of necessary approvals and authorizations. The anticipated start of the avian nesting season is defined as March 15 to September 30 in the PBA. Additionally, May 1 has been identified as the start of the southwestern willow flycatcher nesting season. It is anticipated that the work activities in roosting and foraging habitats in the tamarisk thicket at the mouth of Bat Cave Wash and the riparian area near the mouth of East Ravine will be completed in December 2013, prior to these dates; thus, the investigation will not disturb nesting habitat of southwestern willow flycatcher and Yuma clapper rail during nesting season. However, necessary approvals and authorizations may prolong the start date. Should the activities be delayed

and occur within the avian migration or nesting season, the required work windows and buffers outlined in the PBA will be implemented for any migratory or nesting birds that may be affected. DOI and USFWS will be notified if any investigation delays occur in areas designated as sensitive species habitat.

5.2.3 Project Location and Habitat Sensitivity

The soil investigation sites within the compressor station are in an industrialized area upland from the Colorado River floodplain that do not include any sensitive biological habitats. Most of the soil investigation sites outside the compressor station are located within either creosote bush scrub or Mojave wash scrub habitats. Suitable habitat for birds and other wildlife, including the federally listed southwestern willow flycatcher, as well as other migratory bird species protected by the Migratory Bird Treaty Act, is found within the tamarisk thicket area near the mouth of Bat Cave Wash and near the base of the East Ravine. Because southwestern willow flycatchers may use the tamarisk habitat for roosting and foraging during the spring and fall migration seasons, it is possible that operational activities and loss of tamarisk could alter the behavior of migrating birds. The tamarisk thicket within Bat Cave Wash and adjacent to the National Trails Highway is considered a potential habitat for this species and is surveyed annually per USFWS protocol, as required by the PBA. The soil investigation will involve cutting an access road up to 25-foot-wide and sampling within the thicket but will disturb less than 2.5 acres of tamarisk habitat and will be below the threshold disturbance established in the PBA. The emergent marsh habitat along base of the East Ravine provides suitable habitat for the federal endangered Yuma clapper rail. The proposed sediment sampling in this area will be accomplished by a hand auger and pore-water collected via a drive-point piezometer.

The desert tortoise is the only federally listed species that may occur within the creosote bush scrub or Mojave wash scrub habitats at the proposed soil investigation sites. The desert tortoise critical habitat does not exist within the Action Area however the project is within the known range for desert tortoise. The habitat in the area is considered marginal due to limited suitable plants and soils for forage and cover sites, past habitat disturbance and fragmentation, and natural and man-made barriers that deter this species from entering the site.

Other listed species that may potentially occur or are known to occur within the Action Area include the California black rail, bonytail chub, and razorback sucker. Project activities will occur along the western shore of the Colorado River in the vicinity of the East Ravine, within potential habitat for sensitive species. Work activities will result in pruning riparian vegetation for access to sampling sites, and temporary disturbance of the shoreline for collection of sediment and pore-water samples. Work activities will be similar to the 2005 pore-water study that was issued a no effect determination by the USFWS. The remaining sites are not within or directly adjacent to any sensitive habitat for the southwestern willow flycatcher or desert tortoise.

During the protocol survey conducted in 2012, mousetail suncup (*Chylismia arenaria*), a California Rare Plant Ranked (CRPR 2.2) species was identified in the Action Area in California. Since mousetail suncup has been observed in Bat Cave Wash, it could potentially be impacted by remediation activities (for example, trenching for pipelines, building of new access roads, and the accessing of injection wells). However, its locations above the wash

floor on almost vertical rock faces mean that it is not likely to be in the path of investigation activities. Since this survey was conducted during a documented drought year (year without normal rainfall and growing season), if additional sensitive plant species are identified during preconstruction surveys, these individuals will be evaluated as appropriate for risk of impact as a result of project activities as well as minimization and mitigation measure to protect these species. Therefore, no impacts to sensitive habitats will occur as a result of the soil investigation activities.

5.2.4 Habitat Loss

Other than the disruption to the tamarisk habitat near the mouth of Bat Cave Wash and disturbance of the emergent marsh habitat at the base of the East Ravine, very little, if any, additional habitat loss will occur during the soil investigation activities. Any vegetation removal will be coordinated with the project biologist and documented as outlined in the PBA. The biologist will ensure that the 8-acre upland vegetation loss threshold requested in the PBA re-initiation (3-acres under the current PBA) and the 2.5-acre threshold for disturbance in floodplain are not exceeded. It is expected that some vegetation may need to be pruned or crushed for equipment access to some sites. The pruning or crushing of vegetation is not considered habitat loss as defined in the PBA. Any pruned or crushed vegetation is expected to recover. If mitigation for mousetail suncup, is necessary due to impacts to this population, duff (the top 4 inches of topsoil) will be collected and stored prior to the disturbance. After construction, the duff, which contains the plant seed and organic material, will be reapplied to the disturbed area where the plant previously occurred.

5.2.5 Conservation Measures

The conservation measures identified in the PBA for listed species and habitat will be implemented. Any habitat loss is expected to be below the 8-acre upland threshold requested in the PBA re-initiation and the 2.5-acre disturbance threshold for floodplain established in the PBA.

The project biologist will perform pre- and post-activity surveys to document any habitat loss and to ensure the sites are clear of desert tortoises and any nesting birds as deemed necessary. Revegetation of the soil investigation sites is considered unnecessary in the context of the PBA.

5.2.6 Listed Species Determinations

Annual surveys conducted since 2005 have not identified nesting pairs of the southwestern flycatchers within the Action Area , either in California and Arizona. Notable observations during these surveys were western yellow-billed cuckoo, (*Coccyzus americanus*), Yuma clapper rail, Arizona Bell's vireo, (*Vireo bellii arizonae*), and brown-headed cowbird (*Molothrus ater*) that were at call points located in the Arizona survey area. A single western yellow-billed cuckoo has been observed three years in a row, indicating they may be breeding in the area. In 2012, solitary southwestern flycatchers were identified at the mouth of Bat Cave wash in California, as well as in the Topock Marsh. Yuma clapper rails were detected during surveys conducted in 2012 along the Arizona side in the emergent habitat near the marina.

Southwestern willow flycatcher: This action may have a minimal indirect affect upon this species based on marginal disturbance of habitat at the soil investigation sites. Construction activities are scheduled to occur during the winter season (October 1 to March 15) to avoid impacting this species. The temporary habitat loss (removal of Tamarisk at ground level) as a result of the soil investigation activities in the floodplain, would stay below the 2.5-acre disturbance threshold. However, should any proposed drilling activities occur after May 1 near suitable habitat for this species, a "may affect, but is not likely to adversely affect" determination for this species could be made. The rationale for this determination accounts for the species expected arrival in the area in May. The behavior of this species during the spring migration may be affected by project-related activities. In addition, USFWS protocol surveys were performed from 2005 through 2010 and again in 2012; these surveys resulted in no positive confirmation of species nesting within the Action Area. Therefore, any potential direct and indirect effects during the nesting season will not be adverse.

Yuma clapper rail: This action will have no effect upon this species based on the planned schedule of activities occurring prior to the breeding season (March 15 to October 1) and minimization of disturbance during collection of sediment and pore-water samples. Indirect effects from habitat loss are not expected due to the small area of disturbance for collection of sediment samples and the avoidance of vegetation removal of emergent habitat.

Desert tortoise: This action will have no direct effect upon this species based on the planned schedule during the winter season and implementation of the measures identified in the PBA. Additionally, USFWS protocol surveys were performed from 2004 through 2009 that resulted in no recent evidence of species presence within the Action Area; therefore, any potential direct effects will be avoided. The habitat within the Action Area is considered marginal, and any loss would be minor and well below the 8-acre upland threshold requested in the PBA re-initiation. Therefore, this action will have no indirect effects upon this species.

Razorback sucker: This action will have no effect upon this species. Although work will occur along the shoreline of the Colorado River, samples will be taken away from gravel/ cobble areas and resuspension of bottom sediments will be minimized. Conservation Measures in the PBA, including seasonal restrictions of work between February 1 and May 31 will be implemented; therefore, any potential direct and indirect effects to these species will be avoided..

Bonytail chub: This action will have no effect upon this species. Although work will occur along the shoreline of the Colorado River, samples will be taken away from gravel/ cobble areas and resuspension of bottom sediments will be minimized. Conservation Measures in the PBA, including seasonal restrictions of work between February 1 and May 31 will be implemented; therefore, any potential direct and indirect effects to these species will be avoided.

5.2.7 Conclusion

The soil investigation activities proposed in the work plan are within the context and boundaries outlined in the PBA; therefore, this action will be compliant with the ESA as long as the measures identified in the PBA are implemented. No additional consultation with the USFWS is required.

5.3 Archeological Surveys and Reviews

The area subject to activities described in this work plan was included in an archaeological survey of the Area of Potential Effects (APE) (Applied Earthworks, 2007, 2010). Over 170 archaeological and historical sites were located within the APE. All archaeological and historical sites will be avoided during the implementation of this work plan, and this work will comply with all applicable cultural resource mitigation measures included in the *Programmatic Agreement (PA) (BLM 2010)* and *Cultural and Historic Properties Management Plan (CHPMP) (BLM 2012)*. Prior to any ground-disturbing activities, soil sampling areas will be reexamined to ensure that no resources are disturbed and will be assessed again prior to drilling activities. Cultural-resource-related documents generated during activities associated with the Soil RFI/RI Work Plan will be made available for review by interested Tribes and the agencies.

The archaeological and historical sites will be protected from work activities and will be monitored during the course of work. The PG&E representative will be responsible for providing cultural sensitivity training to the workers implementing this work plan and for ensuring compliance with all applicable archaeological measures during drilling activities. PG&E will invite participation from the Tribes, archaeological monitors, and agency staff, as appropriate, in this training.

The Topock site and adjacent lands are contained within a larger geographic area that is considered sacred by the Fort Mojave Indian Tribe and by other Native American tribes. Specifically, the United States Bureau of Land Management has determined that a traditional cultural property or property of traditional religious and cultural significance that is eligible for listing on the National Register of Historic Places exists within the APE, as defined in the Programmatic Agreement. In recognition of this, work activities will be conducted in a manner that recognizes and respects these resources and the spiritual values of the surrounding lands.

PG&E understands that the environmental, cultural, and spiritual resources may not be physically perceptible. To this end, site orientation will stress that all site activities must be conducted in a respectful manner that is conscious of this context. Applied Earthworks, a professional cultural resources consulting firm, was retained by PG&E with DTSC approval. Applied Earthworks will observe ground-disturbing activities and will have the authority to temporarily divert or halt such activities in the event that previously unidentified potentially significant cultural resources are discovered during these activities. Specific steps to evaluate and safeguard any previously unidentified potentially significant cultural resources will follow the steps described in the PA and CHPMP and in the forthcoming EIR.

In addition, PG&E will invite the Tribes to arrange for tribal monitors to observe the activities in this work plan. PG&E will work closely with tribal monitors to ensure that monitoring activity is consistent with security and health and safety considerations.

TABLE 5-1
Approvals and Authorizations for Implementation
Soil RCRA Facility Investigation/Remedial Investigation Work Plan,
PG&E Topock Compressor Station, Needles, California

Agency/Organization	Approvals and Authorizations
DOI/Havasu National Wildlife Refuge (HNWR)	Approval letter from DOI anticipated. It is PG&E's understanding that DOI's approval constitutes permission to implement the work plan and authorization to access the HNWR and other federal property. No other application of approval for access to HNWR and federal lands will be required before field implementation. Notification will be provided to land managers prior to field implementation.
DTSC	As state lead agency, approval letter from DTSC is required. Approval from the DTSC is subject to a review pursuant to the California Environmental Quality Act. DTSC is preparing an Environmental Impact Report (EIR) for this work plan.
California Department of Fish and Game	Project activities have been previously authorized by Streambed Alteration Agreement No. 1600-2005-0140-R6. Subsequent to the termination of this SAA in December 2012, work plan activities will be performed in compliance with the substantive requirements of California Fish and Game Code Section 1602.
U.S. Bureau of Land Management	In compliance with Section 106 of the National Historic Preservation Act, BLM shall consult with the Tribes and other signatories and invited signatories to the Programmatic Agreement ("PA") regarding this work plan, pursuant to the requirements of the PA's Consultation Protocol. In addition, project activities will comply with the requirements and mitigation measures contained in the Programmatic Agreement and the Cultural and Historic Properties Management Plan.
California Department of Transportation	Project activities within Interstate 40 right of way (AOC 27, MW-24 Bench) or for Interstate 40 lane closure, if required, will require California DOT approval and compliance with any applicable substantive requirements.
Burlington Northern Santa Fe Railway (BNSF)	Project activities (AOC 14 and AOC 1) require approval to cross BNSF railroad tracks and to pass through a BNSF railroad culvert.
Private Pipeline Companies	As needed, activities located in the right of way of any pipelines will be subject to prior coordination with the owner/manager of the associated facilities.
U.S. Fish and Wildlife Service	Project activities have been previously authorized by the 2007 PBA. The PBA expires in December 2012; the BLM has reinitiated consultation with the United States Fish and Wildlife Service (USFWS) to extend the coverage period of the PBA for an additional 5 years.

6.0 References

Applied Earthworks. 2007. *Archeological Survey PG&E Topock Compressor Station, Needles, California.* May.

———. 2010. *Archaeological and Historical Investigations for the PG&E Topock Compressor Station, Addendum 9: Survey within the Fence Line of the Topock Compressor Station.* April.

ARCADIS. 2008. *Remedial Action Work Plan, PG&E Topock Compressor Station Needles, California.* August 25.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2006. Letter. "Request Letter for Further Investigation in Previously Closed Units." July 13.

———. 2007. Letter. "Conditional Approval of Soil Part A Work Plan." August 10.

———. 2010a. Letter. "Letter Issuing Direction to PG&E on UA-1 and UA-1 Alternate." December 13.

———. 2010b. Letter. "Clarification and Direction to PG&E Regarding Agency Comments on Draft B Work Plan." March 10.

———. 2010c. Letter. "Response to Comments to the Soil Part B Work Plan." July 20.

———. 2010d. Letter. "DTSC Comments on Draft Soil Part B DQO Tech Memo." October 5.

———. 2011a. Letter. "DTSC Direction Letter to Combine Part A and Part B Workplan." January 4.

———. 2011b. *Final Environmental Impact Report Topock Compressor Station Groundwater Remediation Project.* January.

CH2M HILL. 2005. *Topock Program Sampling, Analysis, and Field Procedures Manual, PG&E Topock Compressor Station, Needles, California*. March 31.

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

———. 2007a. *Revised Final RFI/RI Volume 1, PG&E Topock Compressor Station, Needles, California*. August 10.

———. 2007b. *Draft RCRA Facility Investigation Soil Investigation Work Plan Part B, PG&E Topock Compressor Station, Needles, California*. December.

———. 2007c. Email from Christina Hong/CH2M HILL to Jose Marcos DTSC. "Clarification to Responses to PG&E Topock Compressor Station Soil Investigation Part Work Plan August 10, 2007 Conditional Approval Letter." August 10.

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

———————. 2010a. *Data Quality Objectives – Part A Soil Investigation at the Pacific Gas and Electric Company Topock Compressor Station, Needles, California.* Technical Memorandum. March 12.

———————. 2011a. *Draft Soil RCRA Facility Investigation/Remedial Investigation Work Plan, Pacific Gas and Electric Company (PG&E) Topock Compressor Station, Needles, California.* May.

———————. 2011b. *Data Quality Objectives-Part B Soil Investigation at the Pacific Gas and Electric Company Topock Compressor Station, Needles, California*. February 18.

----------.2012a. *PG&E Program Quality Assurance Project Plan, Revision 2, Topock Compressor Station, Needles, California*. December.

_____. 2012b. *Addendum to PG&E Program Quality Assurance Plan for the RCRA Facility Investigation/Remedial Investigation, Topock Compressor Station, Needles, California.* August.

Pacific Gas and Electric Company (PG&E). 2008. Letter. *Soil Investigation Work Plan Part B, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California.* August 14.

United States Department of Interior (DOI). 2008. *Conditional Approval of Soil Part A Work Plan*. June 4.

———————. 2010. *Direction to PG&E on Sampling at the Mouth of Bat Cave Wash*. December 15.

BLM. 2012. Cultural and Historic Properties Management Plan (CHPMP) Topock Remediation Project. U.S. Department of the Interior, Bureau of Land Management. January.

BLM. 2010. Programmatic Agreement among the Bureau of Land Management, Arizona Historic Preservation Officer, California State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the Topock Remediation Project in San Bernardino County, California and Mohave County, Arizona. U.S. Department of the Interior, Bureau of Land Management. October.

United States Environmental Protection Agency (USEPA). 1999. *Contract Laboratory National Functional Guidelines for Organic Data Review*.

———————. 2002. *Contract Laboratory National Functional Guidelines for Inorganic Data Review*.

Tables

TABLE 1-1
SWMUs, AOCs, and Other Undesignated Areas
Soil RCRA Facility Investigation/Remedial Investigation Work Plan, PG&E Topock Compressor Station, Needles, California

SWMU/AOC/Units/ Undesignated Areas	Location Inside or Outside of the Fence Line at Topock Compressor Station	Size of Investigation Area (ft^2)	Additional Information
SWMU 1 – Former Percolation Bed	Outside	19,000	Appendix A; Subappendix C1
SWMU 5 – Sludge Drying Beds	Inside	2,000	Appendix B; Subappendix B2
SWMU 6 – Chromate Reduction Tank	Inside	31	Appendix B; Subappendix B3
SWMU 8 – Process Pump Tank	Inside	110	Appendix B; Subappendix B4
SWMU 9 – Transfer Sump	Inside	24	Appendix B; Subappendix B5
SWMU 11 – Former Sulfuric Acid Tanks	Inside	780	Appendix B; Subappendix B6
AOC 1 – Area Around Former Percolation Bed	Outside	182,000	Appendix; Subappendix C2
AOC 4 – Debris Ravine	Outside	69,000	Appendix A; Subappendix C10
AOC 5 – Cooling Tower A	Inside	15,000	Appendix B; Subappendix B7
AOC 6 – Cooling Tower B	Inside	14,000	Appendix B; Subappendix B8
AOC 7 – Hazardous Materials Storage Area	Inside	740	Appendix B; Subappendix B9
AOC 8 – Paint Locker	Inside	120	Appendix B; Subappendix B10
AOC 9 – Southeast Fence Line (Outside Visitor Parking Area)	Outside	3,400	Appendix A; Subappendix C3
AOC 10 – East Ravine	Outside	20,910	Appendix A; Subappendix C4
AOC 11 – Topographic Low Areas	Outside	56,628	Appendix A; Subappendix C5
AOC 12 – Fill Area	Outside	4,900	Appendix A; Subappendix C6
AOC 13 – Unpaved Areas within the Compressor Station	Inside	NA	Appendix B; Subappendix B11
AOC 14 – Railroad Debris Site	Outside	79,000	Appendix A; subappendix C7
AOC 15 – Auxiliary Jacket Cooling Water Pumps	Inside	810	Appendix B; Subappendix B12
AOC 16 – Sandblast Shelter	Inside	880	Appendix B; Subappendix B13
AOC 17 – Onsite Septic System	Inside	2,500	Appendix B; Subappendix B14
AOC 18 – Combined Hazardous Waste Transference Pipelines	Inside	N/A	Appendix B; Subappendix B15
AOC 19 – Former Cooling Liquid Mixing Area and Former Hotwell	Inside	1,100	Appendix B; Subappendix B16
AOC 20 – Industrial Floor Drains	Inside	N/A	Appendix B; Subappendix B17
AOC 21 – Round Depression near Sludge Drying Bed	Inside	1,800	Appendix B; Subappendix B18

TABLE 1-1
SWMUs, AOCs, and Other Undesignated Areas
Soil RCRA Facility Investigation/Remedial Investigation Work Plan,
PG&E Topock Compressor Station, Needles, California

SWMU/AOC/Units/ Undesignated Areas	Location Inside or Outside of the Fence Line at Topock Compressor Station	Size of Investigation Area (ft^2)	Additional Information
AOC 22 – Unidentified Three Sided-sided Structure	Inside	757	Appendix B; Subappendix B19
AOC 23 – Former Water Conditioning Building	Inside	1,000	Appendix B; Subappendix B20
AOC 24 – Stained Area and Former API Oil/Water Separator	Inside	580	Appendix B; Subappendix B21
AOC 25 – Compressor and Generator Engine Basements	Inside	18,000	Appendix B; Subappendix B22
AOC 26 – Former Scrubber Oil Sump	Inside	1,646	Appendix B; Subappendix B23
AOC 27 – MW-24 Bench	Outside	149,686	Appendix A; Subappendix C11
AOC 28 – Pipeline Drip Legs	Outside	3,222	Appendix A; Subappendix C12
AOC 29 – Interim Measure No. 3 Treatment Plant	Outside	40,276	Not addressed in this Work Plan[a]
AOC 30 – MW-20 Bench	Outside	61,778	Not addressed in this Work Plan[a]
AOC 31 – Former Teapot Dome Oil Pit	Outside	829	Appendix C[b]
AOC 32 – Oil Storage Tanks and Waste Oil Sump	Inside	2,805	Appendix B; Subappendix B24
AOC 33 – Former Potential Former Burn Area near AOC 17	Inside	874	Appendix B; Subappendix B14[b]
Unit 4.3 – Oil/Water Holding Tank	Inside	44	Appendix B; Subappendix B25
Unit 4.4 – Oil/Water Separator	Inside	28	Appendix B; Subappendix B25
Unit 4.5 – Portable Waste Oil Storage Tank	Inside	3	Appendix B; Subappendix B25
UA 1 – Potential Pipe Disposal Area	Outside	8,225	Appendix A; Subappendix C8
UA 2 – Former 300B Pipeline Liquids Tank	Outside	829	Appendix A; Subappendix C9
Perimeter Area	Outside	N/A	Appendix C
Storm Drain System	Outside	N/A	Appendix D

Notes:

[a] As discussed in Section 1.1, these units will be investigated as part of the decommissioning process for the IM-3 Treatment Plant and the groundwater remedy system.

[b] Located within and discussed in association with the Perimeter Area.

[c] Discussed in conjunction with AOC 17.

TABLE 2-1
Approximate X-ray Fluorescence Detection Limits, Topock Compressor Station Background Values in Soil and Residential and Commercial Screening Levels
Soil RCRA Facility Investigation/Remedial Investigation Work Plan,
PG&E Topock Compressor Station, Needles, California

Analyte	Approximate Detection Limit (mg/kg)	Background Value (mg/kg)	Residential Screening Level (mg/kg)	Commercial Screening Level (mg/kg)
Antimony	5	NE	30	380
Arsenic	7	11	0.07	0.24
Barium	47	410	5,200	63,000
Cadmium	12	1.1	39	500
Chromium	30	39.8	NE	1,400
Cobalt	115	12.7	660	300
Copper	25	16.8	3,000	38,000
Lead	8	8.39	80	320
Mercury	10	NE	5.6	180
Molybdenum	6	1.37	380	4,800
Nickel	50	27.3	1,600	16,000
Selenium	4	1.47	380	4,800
Vanadium	40	52.2	5	5,200
Zinc	15	58	23,00	100,000

Notes:

mg/kg = milligrams per kilogram
NE = not established

TABLE 4-1
Summary of Part A Phase 1 Data Gaps
Soil RCRA Facility Investigation/Remedial Investigation Work Plan
Pacific Gas and Electric Company Topock Compressor Station Needles, California

	Summary of Data Gaps[a]			
Unit	**Decision 1 – Determine the nature and extent of residual soil and/or sediment concentrations resulting from historic compressor station practices.**	**Decision 2 – Determine representative EPCs for residual soil and/or sediment contamination resulting from historic compressor station practices.**	**Decision 3 – Determine whether residual soil concentrations resulting from historic compressor station practices may threaten groundwater.**	**Decision 4 – Determine the site-specific soil property and contaminant distribution information necessary to support the CMS/FS decisions and remedial action design.**
SWMU 1	• Data Gap #1 - Vertical extent of contamination within the SWMU 1 boundary. • Data Gap #2 - Lateral extent of white powder upslope from white powder area to the compressor station boundary. • Data Gap #5[b] – Assess potential contamination at the toe of the slope in Bat Cave Wash below a potential historical discharge pipe.	None	• Data Gap #3 - Vertical extent of contamination to support refinement of the vadose leaching zone model	• Data Gap #4 - Soil physical parameters to support the CMS/FS.
AOC 1	• Data Gap #1 - Lateral and vertical extents of contamination in the bottom of Bat Cave Wash (within the portion of AOC 1 between the northern boundary of SWMU 1 and Interstate 40). • Data Gap #3 - Evaluation of tamarisk area near the mouth of Bat Cave Wash. • Data Gap #4 - Characteristics of the potential white powder material on the eastern slope of Bat Cave Wash. • Data Gap #6[b] - Assess nature and extent of contamination within impoundment areas near the railroad bridge and IM-3 road crossing.	None	None	• Data Gap #5 - Soil physical parameters to support the CMS/FS.
AOC 4	• 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 Gap #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 extent of metals and dioxins/furans just inside the compressor station fence line, along the northern boundary of the AOC.	None	None	• Data Gap #5 - Soil physical parameters to support the CMS/FS.
AOC 9	• Data Gap #1 - Vertical extent of contamination in and downslope of the previous stained soil removal area. • Data Gap #2 - Vertical extent of contamination outside of the previous stained soil removal area near the top of the AOC 9 slope. • Data Gap #3 - Lateral and vertical extents of contamination near the eastern (downslope) portion of AOC 9 and along the bottom of the ravine.	None	• Data Gap #4 - Vertical extent of contamination to support refinement of the vadose leaching zone model.	• Data Gap #5 - Soil physical parameters to support the CMS/FS.
AOC 10	• Data Gap #1 - Lateral and vertical extents of contamination in the western portion of AOC 10 (Subarea AOC 10a, downslope from AOC 9, and downslope from the outfall of the former trench drain), and from surface runoff from the compressor station. • Data Gap #2 - Nature and extent of contamination associated with runoff from station access road to the low point north of Subarea 10d. • Data Gap #3 - Nature and extent of contamination in and between drainage depression subareas. • Data Gap #4 - Nature and extent of contamination associated with the newly identified white powder areas (on the slope below the station access road) and the newly identified debris areas (on the slopes of AOC 10).	None	• Data Gap #6 - Vertical extent of contamination to support refinement of the vadose leaching zone model.	• Data Gap #8 - Soil physical parameters to support the CMS/FS.

TABLE 4-1
Summary of Part A Phase 1 Data Gaps
Soil RCRA Facility Investigation/Remedial Investigation Work Plan
Pacific Gas and Electric Company Topock Compressor Station Needles, California

	Summary of Data Gaps[a]			
Unit	**Decision 1 – Determine the nature and extent of residual soil and/or sediment concentrations resulting from historic compressor station practices.**	**Decision 2 – Determine representative EPCs for residual soil and/or sediment contamination resulting from historic compressor station practices.**	**Decision 3 – Determine whether residual soil concentrations resulting from historic compressor station practices may threaten groundwater.**	**Decision 4 – Determine the site-specific soil property and contaminant distribution information necessary to support the CMS/FS decisions and remedial action design.**
AOC 11	• Data Gap #2 - Lateral and vertical extent 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).	None	• 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.	• 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.
AOC 12	None	None	None	None
AOC 14	• 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.	None	None	• Data Gap #5 - Soil physical parameters to support the CMS/FS.
AOC 27	• 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.	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.	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.	• Data Gap #3 - Soil physical parameters to support the CMS/FS. • Data Gap #4 - Volumes and types/characteristics of debris.
AOC 28	• Data Gap #1 – Nature and extent of potential contamination in the immediate vicinity of each drip leg.	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.	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.	• Data Gap #2 - Soil physical parameters to support the CMS/FS.
UA 1	Assess whether or not the suspected pipes are buried in UA 1 or UA 1 alternate.	Not applicable	Not applicable	Not applicable
UA 2	None	None	None	None

Notes:
[a] Data gaps were identified 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.
[b] Data gap was added subsequent to DOI/DTSC February 25, 2011 direction letter.

TABLE 5-1
Approvals and Authorizations for Implementation
Soil RCRA Facility Investigation/Remedial Investigation Work Plan,
PG&E Topock Compressor Station, Needles, California

Agency/Organization	Approvals and Authorizations
DOI/Havasu National Wildlife Refuge (HNWR)	Approval letter from DOI anticipated. It is PG&E's understanding that DOI's approval constitutes permission to implement the work plan and authorization to access the HNWR and other federal property. No other application of approval for access to HNWR and federal lands will be required before field implementation.
DTSC	As state lead agency, approval letter from DTSC is required.
California Department of Fish and Game	Project activities have been previously authorized by Streambed Alteration Agreement No. 1600-2005-0140-R6.
U.S. Bureau of Land Management	In compliance with Section 106 of the National Historic Preservation Act, BLM shall consult with the Tribes and other signatories and invited signatories to the Programmatic Agreement ("PA") regarding this work plan, pursuant to the requirements of the PA's Consultation Protocol.
California Department of Transportation	Project activities within Interstate 40 right of way (AOC 27, MW-24 Bench) will require a permit. A separate permit is needed if Interstate 40 lane closure is required.
Burlington Northern Santa Fe Railway (BNSF)	Project activities (AOC 14 and AOC 1) require a permit to cross BNSF railroad tracks and to pass through a BNSF railroad culvert.
Private Pipeline Companies	As needed, activities located in the right of way of any pipelines will be subject to prior coordination with the owner/manager of the associated facilities.
U.S. Fish and Wildlife Service	Project activities have been previously authorized by the 2007 PBA.

Figures

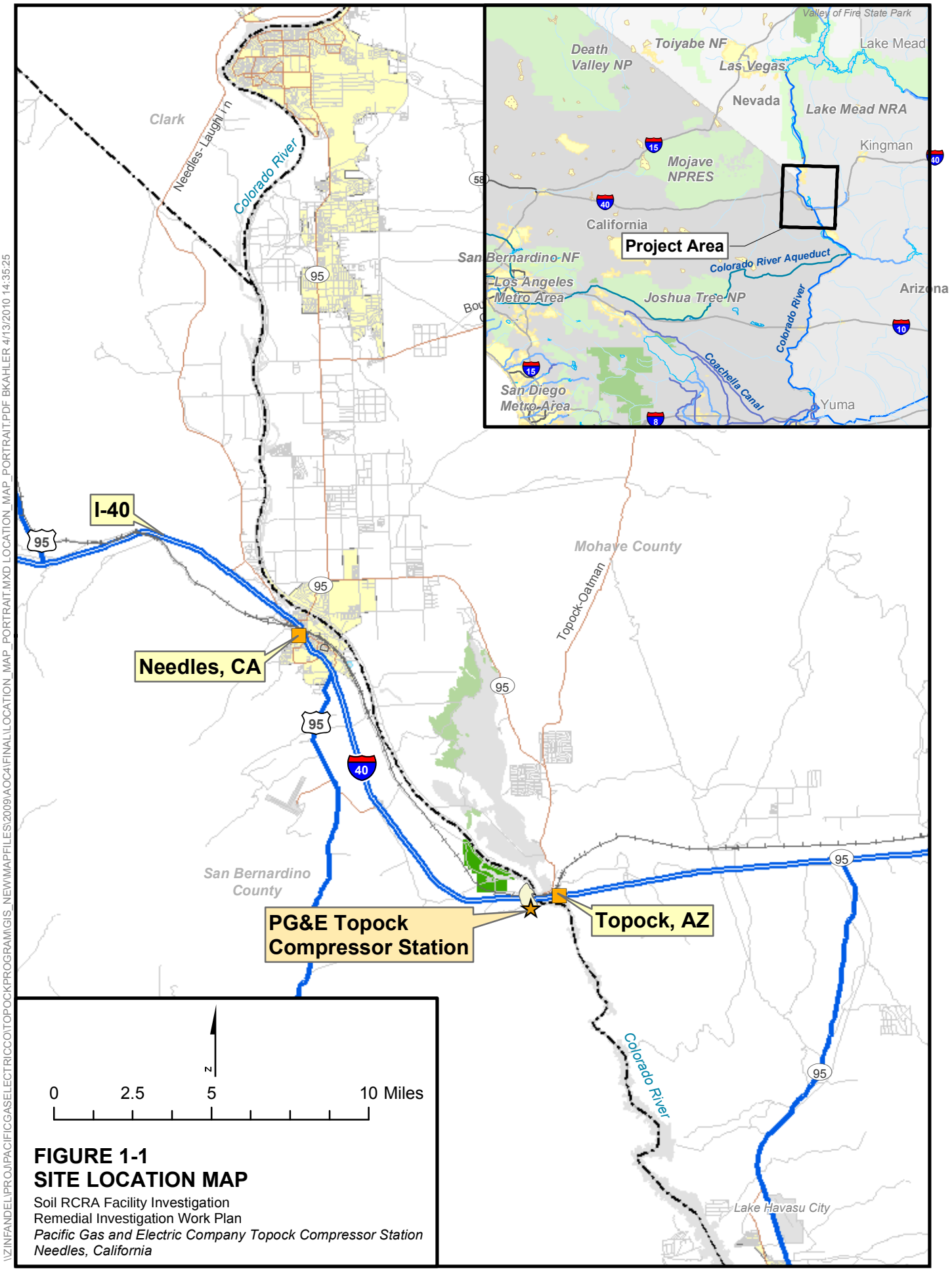


FIGURE 1-1
SITE LOCATION MAP

Soil RCRA Facility Investigation
Remedial Investigation Work Plan
Pacific Gas and Electric Company Topock Compressor Station
Needles, California

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS_NEW\MAPFILES\2009\AOC4\FINAL\LOCATION_MAP_PORTRAIT.MXD LOCATION_MAP_PORTRAIT.PDF BKAHLER 4/13/2010 14:35:25

AOC1
AOC 29
AOC 30
BNSF RAILROAD
INTERSTATE 40
AOC 14
AOC 27
AOC 28d
AOC1
AOC 31
11a
11b
AOC 11
Topographic
Low Area
11c
11d
11d
AOC 12
(F2)
Fill Area
12a
11g
12b
12c
11f
AOC 28c
UA-2
Former
300B Pipeline
Liquids Tank
AOC10d
SWMU1
AOC 28b
AOC 28a
AOC10c
AOC 10b
East Ravine
AOC10a
AOC9
AOC 4
UA-1 A
Potential Pipe
Disposal Area
UA-1 B
Potential Pipe
Disposal Area
UA-1
Potential Pipe
Disposal Area

LEGEND

- Site Fence Boundary
- Area of Concern (AOC)
- Solid Waste Management Unit (SWMU)
- Other Area
- Stormwater Piping Below Ground
- Stormwater Piping Above Ground
- Sensitive Mousetail suncup (Chylismia arenaria) (CRPR 2.2)

N

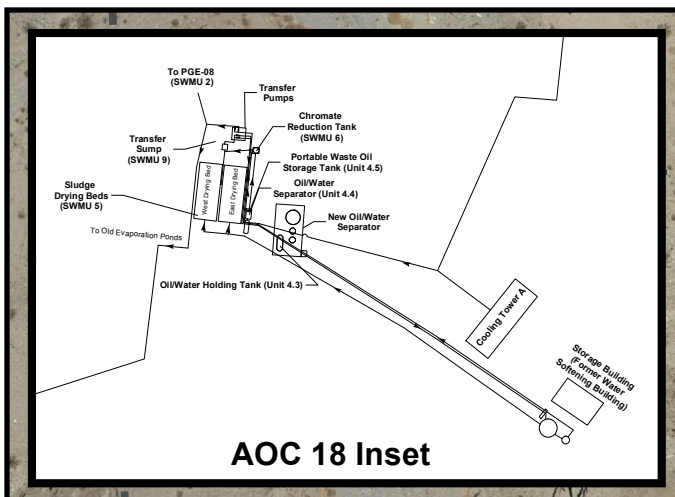
0 400 800 Feet

FIGURE 1-2
SOLID WASTE MANAGEMENT UNITS AREAS OF CONCERN, AND OTHER UNDESIGNATED AREAS TO BE INVESTIGATED UNDER PART A

SOIL RCRA FACILITY INVESTIGATION/REMEDIAL INVESTIGATION WORK PLAN
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\SWP_B\ALL_SWMU_AOC_Locs11X17Outside.mxd



SWMU 11
Sulfuric Acid Tanks

AOC 6
Cooling Tower B

AOC 24
Potential Former
Oil/Water Separator

AOC 25
Compressor Building
Engines and Basements

AOC 19
Former Cooling
Liquid Mixing Area

SWMU 6
Former Chromate
Reduction Tank

AOC 16
Sand Blast Shelter

SWMU 9
Former Transfer Sump

AOC26
Former Scrubber Sump

UNIT 4.5
Former Portable
Waste Oil Storage Tank

AOC 32
Oil Storage Tank and
Waste Oil Sump

AOC 15
Auxiliary Jacket
Water Cooling Pumps

SWMU 5
Former Sludge
Drying Beds

UNIT 4.4
Former Oil/Water Separator

AOC33
Potential Burn Area

UNIT 4.3
Oil Water Holding Tank

AOC 21
Round Area by
Sludge Drying Beds

AOC 18
Transfer Piping
(See Inset Map)

SWMU 11
Sulfuric Acid Tanks

AOC 17
Onsite Septic System

AOC 5
Cooling Tower A

AOC 25
Auxiliary Building

AOC 23
Former Water
Conditioning Building

AOC 22
Unidentified Three-
Sided Structure

SWMU 8
Former Process Pump Tank

AOC 8
Paint Locker

AOC 7
Hazardous Material
Storage Area

LEGEND

- Area of Concern (AOC)
- Solid Waste Management Unit (SWMU)
- Site Fence Boundary
- Stormwater Piping Above Ground (Approximate Location)
- Stormwater Piping Below Ground (Approximate Location)

Notes:
1) AOC 13 is not depicted on this figure. It consists of the unpaved areas within the compressor station.

2) AOC 20 is not depicted on this figure. It consists of industrial floor drains within the compressor station.

3) Boundaries of all SWMUs, AOCs, and Other Areas are approximate.

N

0 100 200 Feet

FIGURE 1-3
PART B INVESTIGATION AREAS

SOIL RCRA FACILITY INVESTIGATION/
REMEDIAL INVESTIGATION WORK PLAN
PG&E NEEDLES TOPOCK COMPRESSOR STATION,
NEEDLES, CA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\SWP_B\ALL_SWMU_AOC_11X17.mxd Date Saved: 8/8/2012 3:47:42 PM

AOC 1 North

AOC 1 North Approximately 0.25 miles

LEGEND

- Proposed Soil Sample Location
- Proposed Contigency Sampling Location
- Proposed Sediment and Pore Water Sample Location
- Proposed Soil and Soil Gas Sampling Location
- Proposed XRF Screening Location
- Manhole
- Storm Drain Catch Basin
- Sump
- Area of Concern (AOC)
- Solid Waste Management Unit (SWMU)
- Other
- Stormwater Piping Below Ground
- Stormwater Piping Above Ground
- Former/Abandoned Stormdrain Line or Trench
- Former/Abandoned Transfer Piping
- Active Transfer Piping
- Former/Abandoned Storm Drain Line or Trench
- Stormwater Collection Trench

0 50 100 200 Feet

N

FIGURE 1-4
ALL PROPOSED SAMPLING LOCATIONS
SOIL RCRA FACILITY INVESTIGATION/REMEDIAL INVESTIGATION WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Path: D:\Projects\Topock\MapFiles\2012\SWP_AUM_Locations\SWPA_102012.mxd

LEGEND

- Proposed Access Routes
- Solid Waste Management Unit (SWMU)
- Area of Concern (AOC)
- Other Area

N

0 250 500 1,000 Feet

FIGURE 2-1
PROPOSED ACCESS ROUTES
SOIL INVESTIGATION PART B
SOIL RCRA FACILITY INVESTIGATION/REMEDIAL INVESTIGATION WORK PLAN
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\SWP_B\AccessRoutes.mxd Date Saved: 12/5/2012 10:38:16 AM

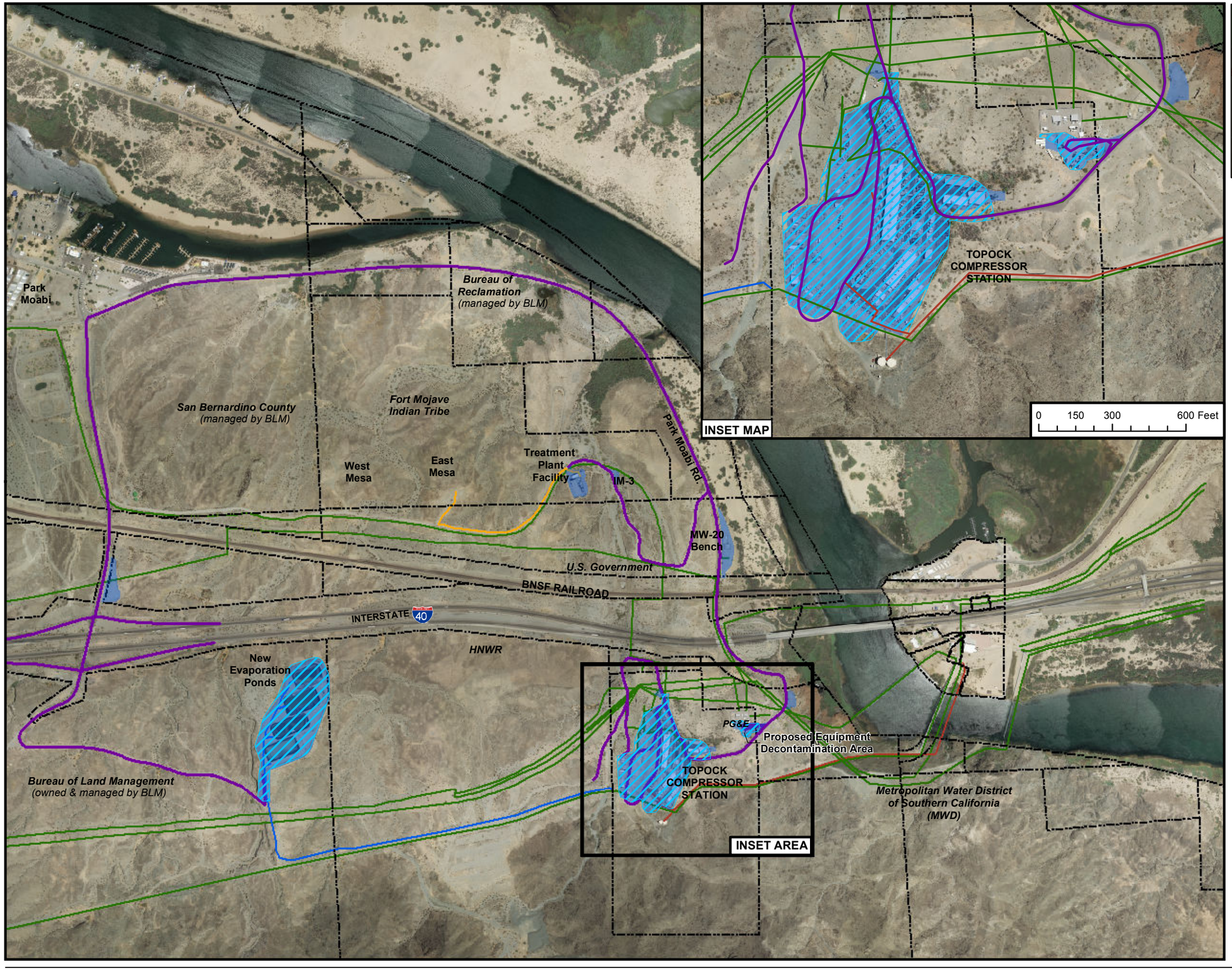
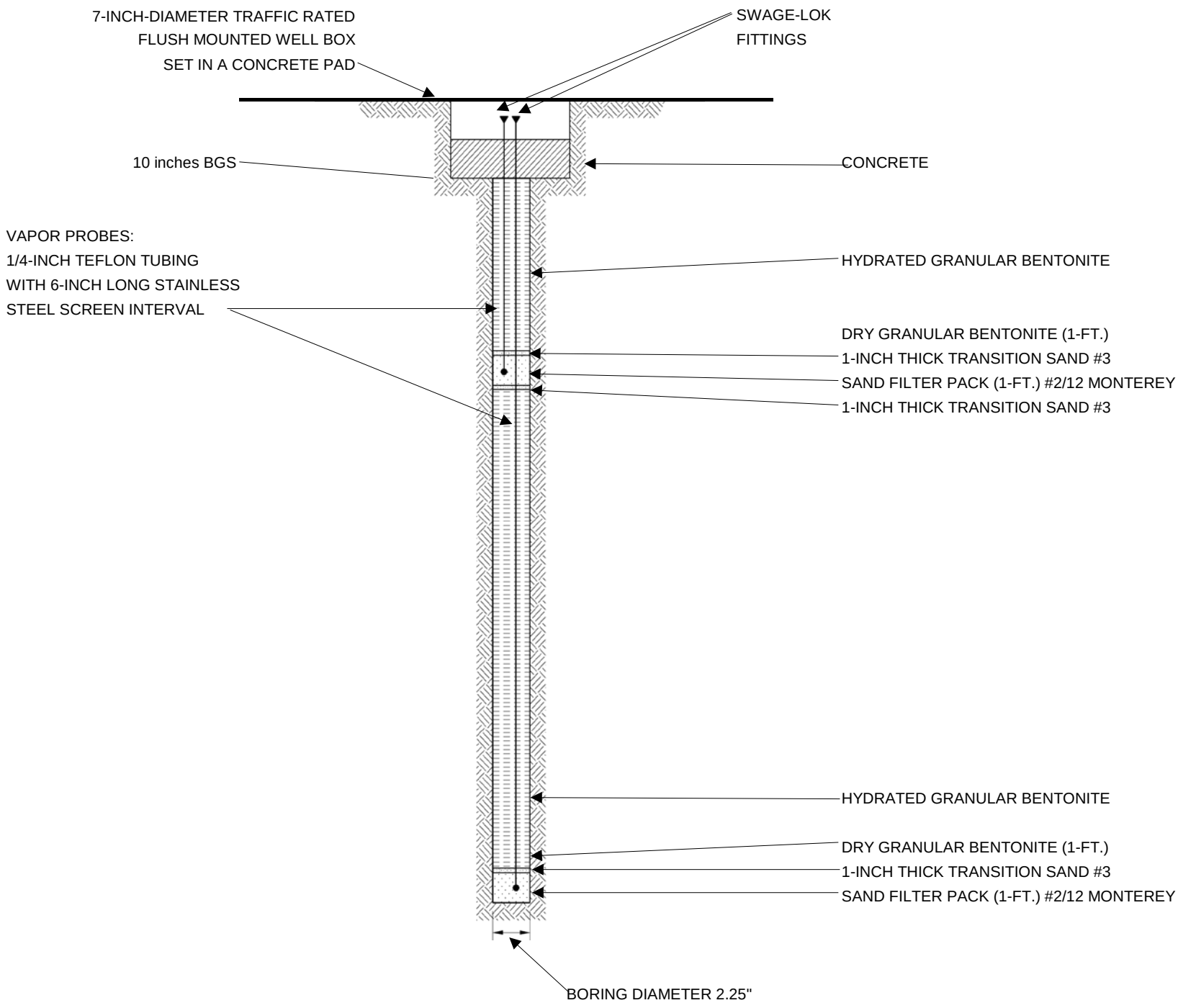


FIGURE 2-2
STAGING AREAS

SOIL RCRA FACILITY INVESTIGATION/REMEDIAL INVESTIGATION WORK PLAN,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



SOIL VAPOR PROBE CONSTRUCTION

SCALE: NTS

FIGURE 2-3
Example Soil Vapor Probe Diagram

Soil RCRA Facility Investigation
Remedial Investigation Work Plan
Pacific Gas and Electric Company Topock Compressor Station
Needles, California