Department of Toxic Substances Control

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July 13, 2006

Ms. Yvonne Meeks
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Pacific Gas and Electric Company
4325 South Higuera Street
San Luis Obispo, CA 93401

RESPONSE TO COMMENTS RELATED TO THE SITE HISTORY PORTION OF THE RCRA FACILITY INVESTIGATION REPORT DATED FEBRUARY 2005, PACIFIC GAS AND ELECTRIC COMPANY, TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA (EPA ID NO. CAT080011729)

Dear Ms. Meeks:

The Department of Toxic Substances Control (DTSC) has completed review of stakeholder comments related to the site history portion of the Resource Conservation Recovery Act (RCRA) Facility Investigation and Remedial Investigation (RFI) Report dated February 2005 for the Pacific Gas and Electric Company (PG&E) Topock Compressor Station. DTSC requests that the RFI Report be revised into three volumes; Volume 1 should present the site history, Volume 2 should present groundwater, surface water, pore water, and river sediment data, and Volume 3 should present soil data.

PG&E should prepare and submit to DTSC a final Volume 1 (Site History) of the RFI Report after review of the enclosed DTSC responses to stakeholder comments. Please submit the final RFI Volume 1 by August 15, 2006.

DTSC has determined that the following Solid Waste Management Units (SWMUs), Regulated Units (Units) and Areas of Concern (AOCs) do not require and additional evaluation:

- SWMU 2
- SWMU 3
- SWMU 4
- SWMU 7
- SWMU 10
- Unit 4.6
- AOC 2
- AOC 3

DTSC has determined that the following SWMUs, Units, AOCs require additional evaluation:

- SWMU 1
- SWMU 5
- SWMU 6
- SWMU 8
- SWMU 9
- Unit 4.3
- Unit 4.4
- Unit 4.5
- AOC 1
- AOC 4
- AOC 5
- AOC 6
- AOC 7
- AOC 8
- AOC 9
- AOC 10
- AOC 11
- AOC 12
- AOC 13
- AOC 14
- AOC 15
- AOC 16 (New)
- AOC 17 (New)
- AOC 18 (New)
- AOC 19 (New)

The above list includes four new Areas of Concern (AOC) that were identified during review of the RFI Report. These AOCs include the sandblast shelter (AOC 16), the septic system for the on-site laboratory (AOC 17), the wastewater transference piping for the facility (AOC 18), and the soil surrounding the stained concrete pad at the Jacket Cooling Water units.

If you have any questions, or need clarification, please contact Mr. Aaron Yue at (714) 484-5439.

Sincerely,

Karen Baker, CHG, CEG, Chief
Geology, Permitting and Corrective Action Branch

KTB/209b

Enclosures: DTSC Responses to Geological Service Unit (GSU) Kate Burger Comments

DTSC Responses to Geological Service Unit (GSU) Greg Neal Comments

DTSC Responses to Metropolitan Water District of Southern California Comments

DTSC Responses to Arizona Department of Environmental Quality (ADEQ) Comments

DTSC Responses to Fort Mojave Indian Tribe Comments

cc: PG&E Topock Consultative Workgroup Members - Via e-mail

COMMENTER: Department of Toxic Substances Control

S4-37 37. Page 3-1, Section 3.1. Include a separate subsection that discusses the mercury pressure switches and mercury-containing gas flow meters that were historically used by the facility. The discussion should address the locations where the devices were used, any historical releases associated with the devices, historical disposal practices for the devices, and the mercury closure process. Currently portions of this discussion are buried in Section 3.1.7.1 (October 1995 Mercury Release).

RESPONSE: The use of mercury-containing devices supported several operations; therefore, a discussion of these devices was provided under "Miscellaneous Operations". PG&E shall revise and expand Section 3.1.5 (Miscellaneous Operations) to provide the requested information on mercury-containing devices.

COMMENTER: Department of Toxic Substances Control

S4-38 38. Page 3-1, Section 3.1. Include a section that discusses lead-containing devices or products that were historically used by the facility.

RESPONSE: Because the use of these devices is not an operation by itself, it should not be listed separately in Section 3.1. Lead-acid batteries were the only lead containing devices identified at the compressor station. PG&E shall revise Section 3.1.5 to provide a more detailed discussion of battery use and disposal.

COMMENTER: Department of Toxic Substances Control

S4-39 39. Page 3-2, Section 3.1.1.1. As appropriate, please cross reference the well numbers cited in this section with the well numbers used in the PG&E Groundwater Background Study. For example, are Topock wells No. 2a and No. 3 the same as wells Topock-2 and Topock-3 from the Groundwater Background Study?

RESPONSE: PG&E shall cross-reference the wells between the RFI/RI Report and the Background Study as requested.

COMMENTER: Department of Toxic Substances Control

S4-40

40. Page 3-3, Section 3.1.1.2. The discussion of the disposal practices for lime sludge generated by the Permutit water conditioning process seems incomplete. The discussion should acknowledge that all disposal practices for this sludge are not known. For example, the white, chromium-containing material that appears in the Interstate 40 road cut above Bat Cave Wash could be lime sludge from the Permutit process. This material is not associated with any other identified solid waste management units (SWMUs) or areas of concern (AOCs).

RESPONSE: PG&E shall revise the discussion in Section 3.1.1.2 to acknowledge that all disposal practices for the lime sludge are not known.

COMMENTER: Department of Toxic Substances Control

S4-41

41. Page 3-7, Section 3.1.3.6. Is there a potential for water loss through the cooling tower foundation (e.g., concrete joints, unsealed concrete)? Please discuss the condition of the concrete foundations when the cooling towers were replaced. Was there evidence of leakage through the concrete?

RESPONSE: PG&E shall evaluate the potential for water loss through the cooling tower foundations and add these findings to Section 3.1.3.6.

COMMENTER: Department of Toxic Substances Control

S4-42

42. Page 3-14, Section 3.1.4.4, second paragraph, first sentence. It seems too definitive to state that all discharges to Bat Cave Wash ceased in 1970 when the injection well came on line. The first paragraph on Page 3-15 states that wastewater may have been discharged to Bat Cave Wash between May 1970 and September 1971 when the injection well was off-line for repairs.

RESPONSE: PG&E shall revise the discussion in Section 3.1.4.4 to clarify that some discharge to Bat Cave Wash may have occurred after 1970.

COMMENTER: Department of Toxic Substances Control

S4-43

43. Page 3-20, Section 3.1.7. This section seems incomplete because the earliest release discussed in the RFI Report occurred in October 1995.

RESPONSE: PG&E shall make reasonable efforts to determine that there are no written records of releases that occurred prior to 1995. PG&E shall add additional clarification in the introduction to Section 3.1.7 that acknowledges that releases may have occurred prior to 1995, but that no available documentation was found for these potential releases.

COMMENTER: Department of Toxic Substances Control

S4-44

44. Page 4-2, Section 4.1.1, first sentence. It seems too definitive to state that all discharges to Bat Cave Wash ceased in 1970 when the injection well came on line. The last paragraph of Section 4.1.1.1 states that wastewater may have been discharged to Bat Cave Wash between May 1970 and September 1971 when the injection well was off-line for repairs.

RESPONSE: PG&E shall revise the discussion in Section 4.1.1 to clarify that some discharge to Bat Cave Wash may have occurred after 1970.

COMMENTER: Department of Toxic Substances Control

S4-45

45. Page 4-5, Section 4.1.2.2. The constituents of concern (COC) list for SWMU 2 (PGE-08, injection well) is incomplete because it does not reflect constituents contained in the wastewater from all facility processes. The list does not reflect waste streams from the oil/water separator or facility maintenance. The list does not include all metals of concern for the facility (e.g., molybdenum).

RESPONSE: PG&E shall determine if the groundwater COC list should include - parameters identified in wastewater streams from the facility oil/water separator and maintenance. PG&E shall determine if the list includes all metals of concern for the facility, including metals that may have been present in known or suspected cooling tower additives. PG&E shall provide additional explanation as to why various metals and wastewater stream constituents were not identified as COCs. In addition, PG&E shall summarize available wastewater effluent data that support the COCs identified for SWMU 2.

COMMENTER: Department of Toxic Substances Control

S4-46

46. Page 4-6, Section 4.1.3.1, second full paragraph. This paragraph describes the results of initial testing of well PGE-06 (in 1964) that indicated the presence of "chromates" at a concentration of 32.5 parts per million. Please provide further discussion of this analytical result.

RESPONSE: PG&E shall provide additional details (if available) on the reported chromate result for PGE-06. At a minimum, PG&E shall clarify why the chromate result is not directly comparable to hexavalent chromium results currently reported for site groundwater.

COMMENTER: Department of Toxic Substances Control

S4-47

47. **Page 4-6, Section 4.1.3.2, last paragraph. Please refer the reader to the section of the RFI Report that describes the responses observed in well PGE-07 during injection in well PGE-08.**

RESPONSE: PG&E shall present the testing of well PGE-08 and any response seen in PGE-07 in Volume 2 of the RFI/RI Report. PG&E shall add a footnote to this section that refers the reader to Volume 2 for additional information on this subject.

COMMENTER: Department of Toxic Substances Control

S4-48

48. **Page 4-20, Section 4.2.7.1. The historical discussion of East Ravine should address the two ditches observed in the 1955 aerial historical photograph that, apparently, could have been used to convey facility wastewater to the ravine. These ditches are discussed in Table 3-12.**

RESPONSE: PG&E shall revise the text in Section 4.2.7.1 to include a discussion of the two drainage channels that run from the compressor station into the East Ravine (as shown in the 1955 aerial photograph and discussed in Table 3-13). PG&E shall provide further clarification if these channels facilitate the drainage of surface water (i.e., stormwater) from the facility or if there is evidence to suggest that these drainages were used to convey facility wastewater to the East Ravine.

COMMENTER: Department of Toxic Substances Control

S4-49

49. **Page 4-21, Section 4.2.7.1. The Revised RFI Report should discuss the potential for water impounded in the ravine to move eastward via shallow subgrade flow, via groundwater flow, and through the culvert downstream of subarea L3. The Phase 2 Soil RFI Workplan should include contingencies for further investigation east of subarea L3. The COC list for the East Ravine seems incomplete if the wastewater from the facility was historically discharged to the ravine.**

RESPONSE: PG&E shall evaluate the potential movement of surface water in the East Ravine and add to the text in Section 4.2.7.1 and other report sections, as appropriate. PG&E shall take this information into consideration during the design of future sampling efforts for this AOC. PG&E shall evaluate if facility wastewater (i.e., cooling water or oily wastewater) was historically discharged to the East Ravine.

RESPONSE TO DTSC GEOLOGICAL SERVICE UNIT COMMENTS FROM GREG NEAL

Draft GSU Comments on Soil Portions of "Draft RCRA Facility Investigation (RFI) Report, PG&E Topock Compressor Station, Needles, California"

	Comment	Response
1	Pursuant to the comments provided below and the attached Table 2, a workplan for additional investigation of SWMUs and AOCs is required. At a minimum, the workplan should include procedures for field investigation (i.e. mapping of existing white powdery residue in Bat Cave Wash, the Railroad Debris Site and Debris Ravine; method(s) of soil sample collection, soil gas or soil matrix sampling for volatile organic compounds (VOCs) and sample preservation techniques), laboratory analytical program, quality assurance project plan, and data quality objectives. To ensure a focused investigation, GSU recommends that PG&E follow the updated data quality objective (DQO) process, such as described in "Guidance for the Data Quality Objective Process, EPA QA/G-4" (dated August 2000). For each of the facility solid waste management units (SWMUs) and areas of concern (AOCs), GSU has summarized its recommendations for further investigation in the enclosed two tables. Table 1 presents the units that do not currently require further evaluation. Units in Table 1 have been identified as areas that have either not handled hazardous materials, have been adequately characterized through previous investigation or by design are not expected to have impacted the site or surrounding soils. Table 2 lists units that require further evaluation. Units on Table 2 have been identified based on incomplete constituent of concern (COC) evaluation, incomplete extent evaluation (or combination of COC and extent evaluation) or lack of investigation. Table 2 also includes a list of COCs for each unit and the list of COCs for further evaluation. These tables provide recommendations for soil aspects of the investigation only.	PG&E shall prepare a RFI/RI Soil Data Gap Work Plan for additional soil investigation at the Topock site. Recommendations provided in this comment shall be incorporated into the RFI/RI Soil Data Gap Work Plan.
2	As identified in a DTSC letter dated August 5, 2005, and reiterated below, additional background sampling is required to provide an appropriate background dataset.	Additional background soil sampling was recommended in the Draft RFI/RI Report (February 2005). The RFI/RI Soil Data Gap Work Plan shall address background soil sampling.

General Comments

	Comment	Response
1	Copies of the original laboratory data sheets should be provided for all samples used in evaluation for further sampling requirements at each SWMU or AOC. The GSU is amenable to receiving this information as part of the appropriate volume of the RFI or a separate data quality assessment report.	Copies of all available laboratory reports shall be provided to DTSC upon request and in a format to be determined.
2	The conceptual site models (CSMs), for most of the SWMUs and AOCs, indicate that the groundwater pathway is incomplete, citing solid or incidental releases, low annual precipitation rates, high evaporation rates and depth to groundwater as factors in the elimination of this pathway. However, no apparent consideration for vertical delineation of impact is discussed. In some cases the deepest samples collected appear to indicate contamination of soils with facility related COCs (i.e. AOC 5, AOC 6, AOC 9 and AOC 10). Further investigation data (i.e. vertical delineation) are necessary in order to eliminate a pathway from consideration.	The CSMs shall be re-evaluated for the inclusion of the groundwater pathway.
3	The background soil investigation is not adequate to further evaluate the results of soil investigations at the facility. DTSC previously provided recommendations for additional background investigation in an August 5, 2005 letter. In addition to the findings presented in the DTSC letter, a limited statistical evaluation of the background data (statistical mean and outlier evaluation) appears to indicate that multiple sample populations are combined into one dataset. The "BGW" series of background samples (collected from the floodplain area and west of the former evaporation ponds) appears to have a statistical mean value higher than that of the remaining dataset for 10 out of 13 metals where data was available. It should be noted that only 19 of the 48 total background samples were analyzed for a complete suite of metals constituents. Further, statistical outlier evaluation (3^{rd} quartile+(1.5*(inter-quartile range))) indicates that many of the data points within the "BGW" dataset are flagged as outside this outlier screening value. While neither of these purely mathematical calculations provides geologic interpretations of the samples collected, they do suggest that the data results may represent multiple sources and may not be suitable for overall background comparison. The potential issues with the current background data preclude the ability to adequately evaluate all of the detections at each unit. Once a more robust background dataset is collected, a re-evaluation of the existing data may eliminate the requirements for additional sampling at locations where marginally elevated concentrations exist. The collection of additional background data is required to determine whether all of the collected samples are appropriate for background determination at the Topock Compressor Station.	Additional background soil sampling was recommended in the Draft RFI/RI Report (February 2005). The RFI/RI Soil Data Gap Work Plan shall address background soil sampling.

	Comment	Response
4	Discussions regarding the generation, content and handling of gas condensate should be included in the background portion of the RFI. Based on a review of available data, it appears that at least one incoming source gas line (Line 300) was impacted with PCBs and a United States Environmental Protection Agency (USEPA) study in the 1980s identified Radon-222 at low levels (less than 10 parts per million by volume) in incoming gas at the Topock Compressor Station. Discussions with the facility indicate that any PCBs and/or radionuclides present in the gas stream are confined within the pipeline and would only have accumulated in pipeline condensate. The longest lived radioactive decay products of Radon-222 are solids and any accumulation would occur within condensate liquids along with PCBs. Sampling of condensate liquids have not identified PCBs at upstream collection points from the compressor station, however, the downstream collection point has had detectable concentrations of PCBs which are attributed to a downstream pipeline pressure equalization connection to a pipeline routed around the Topock facility. Condensate liquids collected from collection points along the pipeline are transported to the facility and added directly to the waste oil storage tank and are not added to the facility wastewater system. Historic PCB sampling associated with potential onsite collection points (former oil bath filters and suction scrubber sump) did not indicate the presence of detectable concentrations. PG&E should provide additional information regarding the potential presence of these compounds at the facility and support for the exclusion of these compounds in the facility investigation.	The requested information on the content and handling of condensate, particularly as it pertains to PCBs and radionuclides, shall be added to Volume 1 of the Final RFI/RI Report.
5	All areas of existing white powdery residue should be identified and mapped even if not specifically associated with an identified SWMU or AOC. This information would be used to provide support of future remedy evaluation. Potential risk to ecological receptors may require the removal of all powdery residue associated with the site and all locations should be defined.	As part of the additional soils investigation, PG&E shall make an attempt to identify areas of water treatment sludge that originated from the compressor station. At a minimum, this endeavor shall consist of the review of aerial photographs and a site reconnaissance.
6	The GSU has added an AOC to the investigation which includes the sandblast shelter in the lower yard. Surface soil samples collected near the shelter as part of the AOC 2 investigation appear to indicate elevated zinc compared to specified background concentrations. No further evaluation of the sandblast shelter has been conducted. Please see Table 2 for a list of COCs for the newly identified AOC 16.	PG&E shall incorporate the sandblast shelter as a new AOC in the RFI/RI Soil Data Gap Work Plan.

	Comment	Response
7	The GSU has added an AOC to the investigation which includes the septic system for the onsite laboratory. Based on descriptions provided by the facility, the laboratory was utilized for monitoring of chemical content in cooling water and not for research and development. Historic and current operations include the disposal of laboratory wastes into the septic system. Please see Table 2 for a list of COCs for the newly identified AOC 17.	PG&E shall incorporate the septic system as a new AOC in the RFI/RI Soil Data Gap Work Plan.
8	The GSU has added an AOC to the investigation which includes all of the wastewater transference piping for the facility. Pressure testing at the time of piping removal indicated that the pipes were tight within the test criteria. However, during removal some sections of pipeline were identified with visual evidence of staining. Reportedly, no as-built drawings of the former pipeline locations are available. Placing sampling locations in an appropriate location to evaluate a specific pipeline will not be possible. Therefore, it is recommended that sampling for the pipelines be handled together by sampling in a grid pattern over the area of former pipes. Please see Table 2 for a list of COCs for the newly identified AOC 18.	PG&E shall incorporate the wastewater transference piping as a new AOC in the RFI/RI Soil Data Gap Work Plan.
9	The DTSC has added an AOC to the investigation which includes soil surrounding the stained concrete pad at the Jacket Cooling Water units. A recent routine facility inspection identified stained concrete near an employee emergency shower adjacent to the compressor building jacket cooling water area. PG&E provided DTSC with the preliminary results of a subsurface investigation of the area which revealed the presence of total chromium above Title 22 total threshold limit concentration (TTLC) and/or soluble threshold limit concentration (STLC) in soil samples collected. The presence of elevated chromium is likely due to historic cooling system liquid mixing conducted in the vicinity. Please see Table 2 for a list of COCs for the newly identified AOC 19.	PG&E shall incorporate the concrete pad at the Jacket Cooling Water Units as a new AOC in the RFI/RI Soil Data Gap Work Plan.
10	Due to the inclusion of VOCs onto the COC list, the indoor air pathway for human health screening should be evaluated at each unit for which VOCs are identified as a COC.	PG&E shall evaluate and consider the indoor air pathway in the development and evaluation of the Conceptual Site Model (CSM) for each SWMU and AOC where VOCs are identified as a COC.
11	The COC list for each SWMU and AOC should include all constituents identified as potentially present through background research or sampling. No COCs should be removed from the evaluation until closure of the specific unit. Sampling data may indicate that further sampling for an individual constituent is not required, however, no constituents should be removed from the COC list until unit closure. Please see the attached Table 2 for COC identification for each unit.	PG&E shall implement the typical process for identifying COCs under CERCLA. This process consists of first identifying contaminants of potential concern (COPCs) based on background research and site history. Through sampling efforts, COPCs are re-evaluated and only those compounds that are detected are normally retained as COCs.

	Comment	Response
12	Further discussion is required as to the method of destruction of the former PG&E Wells 1 and 2. According to the text, they were "destroyed" during the construction of Highway 40, however no further information is provided. PG&E should provide the method of destruction (seal in place, removal, etc.) that was utilized for well destruction.	PG&E shall provide additional information, as available, on the destruction of PG&E wells 1 and 2.

Table 1

SWMU 2	PG&E shall address the comment.
SWMU 3	PG&E shall address the comment.
SWMU 4	PG&E shall address the comment.
SWMU 7	PG&E shall address the comment.
SWMU 10	PG&E shall address the comment.
Unit 4.6	PG&E shall address the comment.
AOC 2	PG&E shall address the comment.
AOC 3	PG&E shall address the comment.

Table 2

SWMU 1	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). SWMU 1 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into this workplan.
SWMU 5	The RFI/RI Soil Data Gap Work Plan shall include additional sampling for SWMU 5. The workplan shall include a grid-based sampling program (to be performed in the lower yard) that shall address DTSC concerns related to this unit.
SWMU 6	The RFI/RI Soil Data Gap Work Plan shall include additional sampling for SWMU 6. The workplan shall include a grid-based sampling program to be performed in the lower yard that shall address DTSC concerns related to this unit.
SWMU 8	The RFI/RI Soil Data Gap Work Plan shall include additional sampling for SWMU 8. The workplan shall include a limited sampling program to be performed at the former location of SWMU 8 that shall address DTSC concerns related to this unit.
SWMU 9	The RFI/RI Soil Data Gap Work Plan shall include additional sampling for SWMU 9. The workplan shall include a grid-based sampling program to be performed in the lower yard that shall address DTSC concerns related to this unit.
Unit 4.3	The RFI/RI Soil Data Gap Work Plan shall include additional sampling for Unit 4.3. The workplan shall include a grid-based sampling program to be performed in the lower yard that shall address DTSC concerns related to this unit.
Unit 4.4	The RFI/RI Soil Data Gap Work Plan shall include additional sampling for Unit 4.4. The workplan shall include a grid-based sampling program to be performed in the lower yard that shall address DTSC concerns related to this unit.
Unit 4.5	The RFI/RI Soil Data Gap Work Plan shall include additional sampling for Unit 4.5. The workplan shall include a grid-based sampling program to be performed in the lower yard that shall address DTSC concerns related to this unit.

AOC 1	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 1 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 4	The RFI/RI Soil Data Gap Work Plan shall include additional investigation at AOC 4. The investigation shall consist primarily of a reconnaissance of the area to document the types of debris present, the extent, and approximate volume. Some limited sampling to verify and better define areas where contamination was previously identified shall be performed if sufficient soil cover is present.
AOC 5	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 5 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 6	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 6 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 7	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 7 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 8	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 8 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 9	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 9 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. However, because this AOC appears to be a cooling water additive release, VOCs, TPH, SVOCs, or PAHs are not considered to be COCs for this AOC.
AOC 10	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 10 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 11	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 11 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 12	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 12 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 13	Additional sampling for AOC 13 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the Work Plan.
AOC 14	The RFI/RI Soil Data Gap Work Plan shall include additional investigation at AOC 14. The investigation shall consist primarily of a reconnaissance of the area to document the types of debris present, the extent, and approximate volume. Some limited sampling to verify and better define areas where contamination was previously identified shall be performed if necessary to support remedy selection. BLM has indicated that this site may have historic significance; therefore, further investigation or sampling of this site may need to be limited.
AOC 15	Additional sampling was recommended for this unit in the Draft RFI/RI Report (February 2005). AOC 15 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 16	Additional sampling for AOC 16 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.
AOC 17	Additional sampling for AOC 17 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment shall be incorporated into the workplan.

AOC 18	The RFI/RI Soil Data Gap Work Plan shall include additional sampling for AOC 18. The workplan shall include a grid-based sampling program to be performed in the lower yard that will address DTSC concerns related to this unit. See also response the General Comment #8.
AOC 19	Additional sampling for AOC 19 shall be incorporated into the RFI/RI Soil Data Gap Work Plan. Recommendations provided in this comment will be incorporated into the workplan.

Table 1
Units Recommended By GSU For No Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	Comments
SWMU 2	Inactive Injection Well PGE-08	562-foot deep injection well located near western property boundary utilized from May 1970 to December 1973 to dispose of facility wastewater. Approximately 29.4 million gallons of wastewater injected, consisting of approximately 95% facility wastewater and 5% oil/water separator and other maintenance liquid. Injection well currently exists.	Soil impact above groundwater level not expected due to operation design of injection well.
SWMU 3	~~Abandoned~~ Inactive Well #6 (PGE-06)	Facility water supply well installed in 1964. Well used during construction of Highway 40 for dust control purposes, however, never utilized for facility source water and remains in standby mode.	According to the RFI Report well PGE-06 was never utilized for waste handling or disposal purposes. Although ongoing groundwater monitoring at this location has identified Cr(total) and Cr(VI), the detections are attributed to releases from SWMU 1. Although identified as "Abandoned Well #6", a more appropriate identification should be "Inactive Well #6" as the well currently exists and is not abandoned in the common use of the term.
SWMU 4	~~Abandoned~~ Inactive Well #7 (PGE-07)	Facility water supply well installed in 1964. Well historically used for facility source water and remains in standby mode.	According to the RFI Report well PGE-07 was never utilized for waste handling or disposal purposes. Identified as "Abandoned Well #7", a more appropriate identification should be "Inactive Well #7" as the well currently exists and is not abandoned in the common use of the term.
SWMU 7	Precipitation Tank	15,000-gallon open top above ground storage tank. Received effluent from chromate reduction tank.	Minor impact above background detected at the time of closure. Approximately 1 foot of soil removed. Further soil sampling does not indicate elevated concentrations of COCs remain. No further evaluation warranted

Table 1 (continued)
Units Recommended By GSU For No Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	Comments
SWMU 10	Old Evaporation Ponds	Located approximately 1000 feet west-southwest of the facility boundary on property not owned by PG&E. Pond 1 initially constructed in 1971 and Ponds 2 through 4 constructed in 1974. Total surface area of approximately 181,000 square feet (~4.15 acres). Constructed of 20 mil PVC liner with 4 inches of sand below the liner and one foot above the liner for protection. Received approximately 30,000 gallons per day of wastewater.	Soil sampling conducted at the time of pond decommissioning. Some of the samples above pond specific background values, primarily Cu, barium (Ba), cobalt (Co), Ni, Cr(total) and selenium (Se). Further evaluation of COC data from other units to be investigated prior to potential sampling at this unit. If investigation at other units does not yield detection of organic COCs, old ponds should remain closed. If significant detections of organic COCs are identified at other units to be investigated, the requirement for additional sampling should be re-evaluated.
Unit 4.6	Waste Oil Tank	Active above ground storage tank, not previously identified by DTSC in CACA.	This is the original AST installed in 1950-1951, secondary containment always present. No record of releases from the tank. Integrity of pad under tank evaluated and determined to be free from defects. Due to above ground nature of the tank visual evaluation of tank integrity was conducted on regular basis. No staining visible on pad under tank.
AOC 2	Area around inactive injection well PGE-08	Surficial area around PGE-08. Also includes pipeline to injection well which transmitted facility wastewater fluid.	Relatively shallow soil near injection wellhead and along transference piping previously sampled. Soil around wellhead does not require further evaluation. Any incidental releases from pipeline connection to wellhead will be identified through pipeline evaluation (AOC 18).
AOC 3	Area Around Abandoned Wells PGE-06 and PGE-07	Surficial area around wells PGE-06 and PGE-07.	According to RFI no hazardous materials handling or disposal occurred in these areas as indicated for SWMUs 3 and 4.

Table 2
Units Recommended By GSU For Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	RFI Constituents of Concern	Comments	Further Sampling Required
SWMU 1	Former Percolation Bed	Upper portions of Bat Cave Wash located just west of the facility fence line. Facility wastewater discharged from 1951 to 1970 for percolation or evaporation.	Title 22 metals, Hexavalent chromium (Cr{VI}), volatile organic compounds (VOCs), Semi-volatile organic compounds (SVOCs), Total petroleum hydrocarbons (TPH), pH	Cr (total) and Cr (VI) concentrations exceed residential preliminary remediation goal (PRG) values. Lateral and vertical definition of identified impact not delineated (see Figure 12-5 of RFI for data). Recommend further investigation for all COCs. VOC evaluation is recommended due to handling of oil/water separator and maintenance liquids. Groundwater in well MW-10 contains elevated levels of molybdenum as compared to other wells sampled by the Groundwater Background Study.	Title 22 metals, Cr(VI), VOCs, SVOCs, TPH, pH
SWMU 5	Sludge Drying Beds	Used from 1951 to 1962 to dehydrate lime sludge as part of the wastewater treatment process. From 1964 to 1969 one bed utilized to treat chromium bearing wastewater with sulfur dioxide. From 1969 to 1985 contained chromate reduction sludge for dehydration. Concrete structure cleaned and hydroblasted to remove "green" discoloration. Broken concrete transported offsite to county landfill. Concrete footings broken and buried onsite.	Title 22 metals, Cr(VI), VOCs, pH, TPH, SVOCs	Soil samples collected at time of closure. Adequate characterization of metals during closure. No evaluation of VOCs, TPH or SVOCs conducted at time of closure. Need to evaluate organic COCs because beds received wastewater from SWMU 6 through 9 processes.	VOCs, TPH, SVOCs

Table 2 (continued)
Units Recommended By GSU For Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	RFI Constituents of Concern	Comments	Further Sampling Required
SWMU 6	Chromate Reduction Tank	Ten foot high by 5 foot diameter concrete vault housed an above ground storage tank. Installed in 1969 and used until 1985 as designed. Used from 1985 to 1989 used as holding tank from oil/water separator	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs	Metals adequately characterized during closure. Closure report identified "oil stained soil on south wall". No apparent VOC, TPH or SVOC analyses. Need to evaluate organic COCs because received wastewater from oil/water separator.	VOCs, TPH, SVOCs
SWMU 8	Process Pump Tank	1,500 gallon steel tank that received wastewater from all sources and discharged to injection well or evaporation ponds.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs	Minor metals impact above background detected at the time of closure. Approximately 1.5 feet of soil removed. Confirmation soil data does not indicate elevated concentrations of metals or Cr(VI). Need to evaluate organic COCs because received wastewater from all facility processes.	VOCs, TPH, SVOCs
SWMU 9	Transfer Sump	Three foot diameter and 20 foot deep concrete sump that received wastewater prior to transferring to evaporation ponds or injection well. From 1969 to 1985 received wastewater from chromate reduction tank. From 1974 to 1989 received wastewater from oil/water separator.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs	Oily sludges and solids accumulated in sump and required periodic removal. During unit removal, visible hydrocarbon staining was observed. Approximately two cubic yards of visually impacted soil was removed. Metals adequately characterized during closure. However, apparently no hydrocarbon or VOC data was collected. Need to evaluate organic COCs because received wastewater from all facility processes.	VOCs, TPH, SVOCs
Unit 4.3	Oil/Water Holding Tank	Fifteen foot long by 5 foot diameter, 3,000 gallon, steel AST, not previously identified by DTSC in Corrective Action Consent Agreement (CACA). Concrete foundation utilized as onsite fill.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs	No previous sampling conducted as no visual indications of impact were observed during removal operations. Sampling recommended to confirm that chemical impact is not present. Pipeline for oil/water system exhibited the highest TPH results of all samples analyzed. Not all samples along pipeline analyzed in the same TPH range.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs

Table 2 (continued)
Units Recommended By GSU For Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	RFI Constituents of Concern	Comments	Further Sampling Required
Unit 4.4	Oil/Water Separator	Fifteen foot long by 6 foot wide concrete structure, not previously identified by DTSC in CACA. Concrete foundation disposed offsite as hazardous waste.	Title 22 metals, Cr(VI), pH, VOCs, SVOCs, TPH	Approximately 19 cubic yards of visually impacted soil excavated and removed. Adequate confirmation sampling for metals. Two samples collected apparently after excavation was complete, exhibited 1,200 and 850 milligrams per kilogram TPH in the "motor oil" range. No VOC analyses were conducted. Recommend evaluation and further definition of identified COC impacts.	VOCs, SVOCs, TPH
Unit 4.5	Portable Waste Oil Storage Tank	Six foot long by 2 foot diameter steel tank mounted on a trailer, not previously identified by DTSC in CACA.	Title 22 metals, Cr(VI), pH, VOCs, TPH	Sampling from oil/water separator (OWS) apparently also represents this unit. Adequate confirmation sampling for metals. Evaluation and further definition of identified impacts should be conducted. Investigation should focus on concrete pad adjacent to OWS.	VOCs, TPH
AOC 1	Downstream extent of former percolation bed	Area extends 700+ feet downstream (northward) toward the Colorado River from SWMU 1.	Title 22 metals, Cr(VI), VOCs, TPH, pH	See SWMU 1 comments. Need further evaluation of the extent of metals and pH. Additional sampling for organic compounds may be conducted only if sampling closer to the facility in Bat Cave Wash indicate their presence. If sampling in SWMU 1 do not indicate the presence of organic compounds, then recommend no additional sampling for these compounds.	Title 22 metals, Cr(VI), pH Organic COC analyses contingent upon findings at SWMU 1

Table 2 (continued)
Units Recommended By GSU For Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	RFI Constituents of Concern	Comments	Further Sampling Required
AOC 4	Debris Ravine	Located outside facility fence line on PG&E property. Natural ravine utilized for historic disposal of construction debris.	Title 22 metals, Cr(VI), VOCs, TPH, PAHs, SVOCs, asbestos	Significant amount of debris remains in place. Very little soil is present for sampling and occurs in thin layer above bedrock. All samples previously analyzed are above background for at least one constituent. Some samples above residential PRG for Cr(total) and some above ecological risk comparison for Ba, Co, Cu, molybdenum (Mo), Se and Zn. Sample analyses identified PAHs and SVOCs as well. However, little soil remains for sampling. During December 2005 site visit, white powdery substance remains in the ravine as well as transite panel(s). Recommend the investigation focus on defining the extent and volume of debris remaining. Definition and inventory of debris would support evaluation of removal/cleanup options.	VOCs, TPH, PAHs, SVOCs, asbestos
AOC 5	Cooling Tower A	Location of the southernmost cooling tower constructed in 1951. Also includes area of former chemical shed, sulfuric acid tank and current cooling water treatment tanks. Cooling Tower A replaced in 2001.	Title 22 metals, Cr(VI), pH	Samples previously collected did not delineate the lateral or vertical extent of impact. Cr(total) identified above industrial PRG in two samples. Cr(VI) detected in surface samples as well. No soil pH analyses conducted on samples previously collected. Further evaluation and definition of limits of impact must be conducted. Potential step-out sampling along prevailing wind direction if sample results warrant.	Title 22 metals, Cr(VI), pH
AOC 6	Cooling Tower B	Location of the northernmost cooling tower constructed in 1954. Also includes area of former chemical shed, sulfuric acid tank and current cooling water treatment tanks. Cooling Tower B replaced in 2002.	Title 22 metals, Cr(VI), pH	Same as AOC 5.	Title 22 metals, Cr(VI), pH

Table 2 (continued)
Units Recommended By GSU For Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	RFI Constituents of Concern	Comments	Further Sampling Required
AOC 7	Hazardous Materials Storage Area	Current and historical chemical product storage area.	Title 22 metals, Cr(VI), VOCs, TPH, SVOCs, PAHs, pH	Area not previously investigated.	Title 22 metals, Cr(VI), VOCs, TPH, SVOCs, PAHs, pH
AOC 8	Paint Locker	Storage locker for flammable paint and paint related materials.	VOCs, TPH	Area not previously investigated.	VOCs, TPH
AOC 9	Southeast Fenceline	Discolored area outside fence line likely to have received facility runoff.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs, PAHs	Cr(total) and Cr(VI) elevated above residential PRGs near fence line and attenuates with distance from facility. Cr(VI), Cu and Zn identified above ecological comparison provided in RFI Report. Excavation and removal of 1.5 cubic yards to impacted soil as a result of sampling. Further evaluation and definition of limits of impact should be conducted. Source must be more clearly defined.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs, PAHs
AOC 10	East Ravine	Offsite area in ravine alongside facility access road. Received facility runoff. 1955 aerial photograph suggests that facility waste streams were discharged to ravine. 1964 and 1967 aerial photographs show impoundments within ravine.	Title 22 metals, Cr(VI), VOCs, TPH, SVOCs, PAHs, pH	Several metals identified above background in at least one sample. Cr(total) and Cr(VI) elevated above residential PRGs. Cr(VI), Cu and Zn above ecological comparison. Potential down gradient extension of AOC 9. Further evaluation and definition of limits of impact must be conducted. Source must be more clearly defined. Due to nature of AOC deeper soil sampling is required. If soil contamination extends to groundwater, a groundwater investigation will be required for this AOC.	Title 22 metals, Cr(VI), VOCs, TPH, SVOCs, PAHs, pH
AOC 11	Topographic Low Area	Topographic low areas offsite of the facility to the northeast, which may have received runoff from the facility.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs, PAHs	Area not previously investigated. Well MW-12 indicates elevated levels of As, Mo, Va and pH relative to wells sampled by the Groundwater Background Study.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs, PAHs

Table 2 (continued)
Units Recommended By GSU For Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	RFI Constituents of Concern	Comments	Further Sampling Required
AOC 12	Fill Area	Fill area offsite north of the facility which may have construction debris or fill from the site.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs, PAHs, asbestos	Area not previously investigated.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs, PAHs, asbestos
AOC 13	Unpaved Areas at Compressor Station	Areas within the facility boundaries that are not paved.	Title 22 metals, Cr(VI), VOCs, TPH, PAHs, SVOCs	Areas previously investigated and identified various detections of metals above background. Multiple samples with detectable hydrocarbons. Nature and extent of impact should be defined.	Title 22 metals, Cr(VI), VOCs, TPH, PAHs, SVOCs
AOC 14	Railroad Debris Site	Area historically utilized as offsite disposal for facility construction and road debris. Adjacent to railroad tracks and Highway 40. Asbestos containing materials previously identified at this site.	Title 22, metals, Cr(VI), VOCs, TPH, PAHs, SVOCs, asbestos	Area previously cleaned of debris and sampled. Multiple constituents above background including Cr(total) and Cr(VI). Materials with elevated SVOCs and PAHs remain at the site. Significant amount of waste material (nuts, bolts, washers, etc) remain at the site. During December 2005 DTSC site visit, white powdery substance was identified surrounding the area, which may be indicative of disposal of chromium containing material. Further sampling to ensure that impacted soil has been identified. Included in the RFI workplan, should be an effort to estimate quantity and types of debris remaining for evaluation of remedy selection.	Title 22, metals, Cr(VI), VOCs, TPH, PAHs, SVOCs, asbestos
AOC 15	Auxiliary Jacket Water Cooling Pumps	Located in the central portion of the facility part of the jacket water cooling system used to cool the compressor engines.	Title 22 metals, Cr(VI), pH	Samples previously collected and identified elevated Cr(total) and Pb concentrations exceeding industrial PRG. Cu, manganese (Mn), and Zn identified above background concentrations. Lateral and vertical definition of impact is needed.	Title 22 metals, Cr(VI), pH

Table 2 (continued)
Units Recommended By GSU For Further Evaluation Under Soil RFI

RFI Identification	Unit Name	Description	RFI Constituents of Concern	Comments	Further Sampling Required
AOC 16	Sandblast Shelter	Located near injection well PGE-08. Apparently utilized to prepare metal at the facility for protective coating.	Title 22 metals	Area not previously identified in facility RFI. Sample AOC 2A from SWMU 2/AOC 2 exhibited elevated Zn concentration compared to background which may not be attributable to SWMU 2/AOC2. No additional samples collected more distant from sandblast shelter, exhibit elevated concentrations. Evaluation of extent of metals is recommended.	Title 22 metals
AOC 17	Onsite Septic System	Septic system connected to facility laboratory and accepted wastes from cooling water monitoring activities.	Title 22, metals, Cr(VI), VOCs, TPH, PAHs, SVOCs	Area not previously identified in facility RFI.	Title 22, metals, Cr(VI), VOCs, TPH, PAHs, SVOCs
AOC 18	Combined Wastewater Transference Pipelines	All pipelines connecting cooling towers to wastewater system including SWMUs 1, 2, 5, 6, 7, 8, 9 and 10 and Units 4.3, 4.4 and 4.5	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs, PAHs	Most pipelines previously pressure tested and passed within the limits of the test. However, during removal visible staining was observed below some sections of piping. Most pipelines have been removed and as-built drawings are not available. Locating pipelines with certainty is not likely. Recommend sampling on a grid within the general areas that contained piping to ensure adequate coverage.	Title 22 metals, Cr(VI), pH, VOCs, TPH, SVOCs, PAHs
AOC 19	Former Cooling Liquid Mixing Area	Concrete pad associated with historic cooling additive mixing area. Located adjacent to the compressor building jacket cooling water area across from the station warehouse building. Currently the location of an employee emergency shower.	Title 22 metals, Cr(VI), pH	Identified by routine facility inspection in January 2006. Preliminary soil samples indicate the presence of total chromium at concentrations exceeding Title 22 TTLC and STLC concentrations.	Title 22 metals, Cr(VI), pH

Site History is Incomplete

The RFI/RI does not adequately identify hazardous materials brought to the site by either chemical class or volume, nor does it provide volumes for wastes generated at the site. In order to evaluate the threats posed to the Colorado River, the RFI/RI needs to include this basic historical information.

What the RFI/RI and supporting documents do describe is the extensive discharge of hazardous wastes on and near the facility from the 1950s through the 1970s, prior to the existence of environmental regulations requiring appropriate management and disposal of such wastes. Much of the waste discharged at or near the facility evidently was either released in ravines and depressions such as Bat Cave Wash, East Ravine, and Debris Ravine, or was injected into an unregulated well. However, the types and volumes of the wastes discharged to most of these areas are not characterized in the RFI/RI. Discharges also occurred at the site in areas that are neither identified nor characterized in either the RCRA Facility Assessment (RFA) completed in 1986, or the series of draft RFI reports to date. Such areas include a septic disposal system that reportedly received potentially hazardous wastes generated in an onsite laboratory (previously unidentified), and from floor drains located near areas where hazardous materials were used at the facility.

S2-1

To develop a basic understanding of past operational practices at the Topock site, a number of additional sources should be incorporated, including PG&E company records, more than a single former-employee interview, and records from other PG&E gas compressor stations.

Environmental Setting Requires Additional Characterization

PG&E has made improvements in understanding the local geology as compared to earlier drafts of the RFI. However, the current RFI/RI relies on outdated geologic information and should be updated to include more current information related to river protection. In particular, recently completed floodplain wells have identified highly transmissive geologic deposits located adjacent to the Colorado River that contain a groundwater plume with high concentrations of Cr6. Recognition of these contaminant pathways is vital to assessing migration of contamination to the river.

S2-2

The bedrock geology that received wastes discharged through injection well PG&E-8 is also inadequately characterized. Geologic reports of the site bedrock have described a rock that is highly fractured and sheared due to tectonic movement along ancient faults. It is widely recognized in the geologic community that faults, fractures and shears can be efficient groundwater conductors that provide a means for contaminant migration. Therefore, additional investigation of the bedrock characteristics is warranted to more fully understand the extent of contamination that occurred from the unregulated discharges into well PG&E-8.

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Page 2

Response to Comment S2-1(RS_101805_4)

Comment noted. PG&E is not required to address this comment at this time. The site history has been extensively researched by PG&E and a significant amount of information relating to facility operations has been compiled and documented in the draft RFI/RI Report. The compiled information provides a detailed account of chemical usage and waste disposal practices from the beginning of facility operation in 1951 through the present time. Sources used for the research include PG&E company records (for Topock and other compressor stations), interviews with current employees, review of interviews with former employees, and regulatory agency (DTSC, RWQCB, County, EPA, etc.) files.

With any project that dates back to 1951 it can be anticipated that some specific details and information may have been lost. However, the historic information collected by PG&E to date represents a reasonable and sufficient effort and understanding related to general chemical category usage and waste disposal practices at the PG&E Topock Compressor Station for the purposes of identifying potentially affected areas and contaminants of concern, and the development of conceptual site models. Continued additional historic research would be repetitive and may introduce unnecessary delays into the RFI/RI process, and it most likely would produce little if any additional significant information. It is also likely that any additional information (e.g., identification of chemical class and volume) would not significantly alter the overall basic understanding of site history or significantly aid in the identification and assessment of potentially contaminated areas. In addition, any uncertainties with

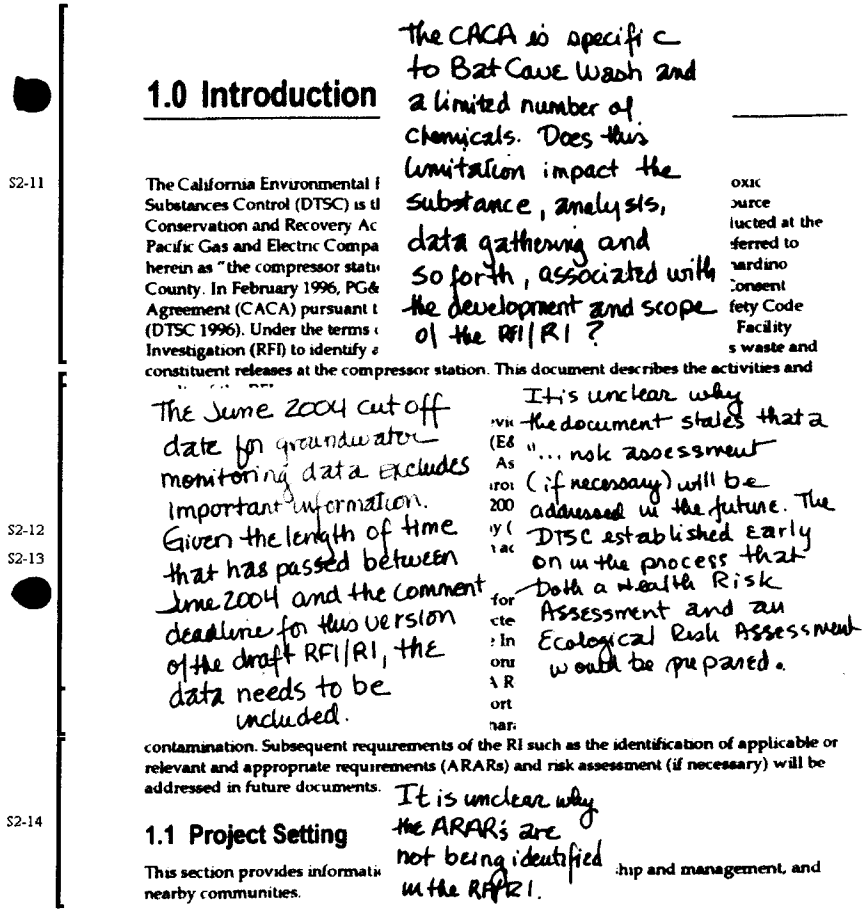
respect to the types of potential contaminants will not significantly alter the overall identification or assessment of Areas Of Concern (AOCs).

PG&E has made a best faith effort to provide a study that meets the standard level of care prescribed for the development of site history and the documentation of chemical usage and waste management practices associated with Resource Conservation Recovery Act (RCRA) Facility Assessment (RFA)/RCRA Facility Investigation (RFI) and CERCLA Preliminary Assessment (PA)/Site Assessment (SI)/Remedial Investigation (RI) programs. Additional historical documentation is not warranted at this time and would not materially assist or improve the Site History section of the draft RFI/RI.

PG&E shall complete the RCRA RFA questionnaire and sign the certification provided in the DTSC letter dated January 6, 2006. A copy of the completed questionnaire and executed certification shall be placed in an Appendix of the Revised Site History Section (Volume 1).

Response to Comment S2-2

Comment noted. PG&E is not required to address this comment at this time. DTSC has deferred response to this comment to a future date since the comment does not relate to the site history section of the RFI. In accordance with DTSC's instructions and direction, PG&E was directed to establish an initial data cut-off-date of June 2004 for the RFI. Otherwise no defined data end point could be established since data continues to be collected on a frequent and regular basis. DTSC has established a new RFI data cut-off date of June 16, 2006 for groundwater, surface water, pore water and river sediment data to be included into Volume 2 and a March 30, 2007 for the soil data to be included into Volume 3. These dates will be identified in future written correspondence from DTSC to PG&E.



1.0 Introduction

The CACA is specific to Bat Cave Wash and a limited number of chemicals. Does this limitation impact the substance, analysis, data gathering and so forth, associated with the development and scope of the RFI/RI?

S2-11

The California Environmental f … oxic
Substances Control (DTSC) is tl … ource
Conservation and Recovery Ac … ducted at the
Pacific Gas and Electric Compa … ferred to
herein as "the compressor stati… ardino
County. In February 1996, PG& … Consent
Agreement (CACA) pursuant t … fety Code
(DTSC 1996). Under the terms … Facility
Investigation (RFI) to identify … s waste and
constituent releases at the compressor station. This document describes the activities and

The June 2004 cut off date for groundwater monitoring data excludes important information. Given the length of time that has passed between June 2004 and the comment deadline for this version of the draft RFI/RI, the data needs to be included.

S2-12

S2-13

It is unclear why the document states that a "... risk assessment (if necessary) will be addressed in the future. The DTSC established early on in the process that both a Health Risk Assessment and an Ecological Risk Assessment would be prepared.

… for … cte … : In … oru … A R … ort … har…

contamination. Subsequent requirements of the RI such as the identification of applicable or relevant and appropriate requirements (ARARs) and risk assessment (if necessary) will be addressed in future documents.

S2-14

It is unclear why the ARARs are not being identified in the RFI/RI.

1.1 Project Setting

This section provides informati… …hip and management, and nearby communities.

[1] The cut-off date of June 30, 2004 was designed to allow for data from the second quarter 2004 quarterly groundwater monitoring event to be incorporated into the RFI Report. However, samples from several wells were inadvertently not collected by field teams during the quarterly event. These wells were revisited and sampled during the July 27 and August 4 weekly events. Although past the cut-off date these data are included in this report to provide a complete set of groundwater data from the monitoring well network.

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Response to Comment S2-11(RS_110105_51)

Comment noted. PG&E is not required to address this comment at this time. The RFI/RI Report provides a reasonable level of information on the entire facility and identified chemicals of concern in addition to those listed in the Corrective Action Consent Agreement (CACA).

Response to Comment S2-12(RS_110105_52)

PG&E is not required to address this comment at this time. Response to comment is deferred to Volume 2. For additional information see response to comment S2-1.

Response to Comment S2-13(RS_110105_54)

PG&E shall revise the text to indicate that a Human and Ecological Risk assessment will be prepared as was previous required by DTSC.

Response to Comment S2-14(RS_110105_55)

Comment noted. PG&E is not required to address this comment at this time. Applicable Relevant and Appropriate Requirements (ARARs) will be identified in a separate document that will be prepared by DTSC and BLM?

1.1.1 Location

The compressor station is located in eastern San Bernardino County, California, about 12 miles southeast of Needles as shown in Figure 1-1. The compressor station began operations in 1951 to compress natural gas supplied from the southwestern United States for transport through pipelines to PG&E's service territory in central and northern California.

1.1.2 Land Ownership and Management

The compressor station occupies approximately
the study area for RCRA corrective action activi
owned and managed by a number of governme
Department of the Interior, United States Bureau
States Bureau of Reclamation (BOR), and San Be

Most of the publicly owned parcels are manage
Wildlife Service (USFWS) manages two parcels
Refuge (HNWR).

Does PG+E own any other property in the vicinity or have any rights of way or entitlements to any other land in immediate vicinity?

1.1.3 Nearby Communities

There are several communities in the general ar
as shown in Figure 1-3. The nearest communitie
and Moabi Regional Park, California, and the to

Topock is located on the Arizona (or eastern) sic
northeast of the compressor station. Topock is a community of about 20 persons in a small mobile home park near the Topock Gorge Marina. Most of the residents in Topock are retired senior citizens who live in the area part of the year, typically from late fall through spring. There are also a couple of permanent homes (i.e., the homes are occupied all year) located on the southern side of Interstate 40 (I-40).

Is the proximity to communities based on the location of the facility, the site, or Study Area?

on the California (or western) side of the Colorado River,
ompressor station. Moabi Regional Park is a part of San
arks system. It is primarily a recreational facility with mobile
oat marina. The park is located on a side channel of the
1 mile west of the main river channel. The mobile homes are
idences. As a regional park, it has no full-time residences.

unity of about 1,300 homes (population 1,800) in Mohave
County, Arizona. It is located approximately 5 miles northeast of the compressor station on the east side of the Colorado River. Its demographics include both permanent and recreational residents. Golden Shores includes several small businesses, a fire station, a post office, and an elementary school.

The proximity of the compressor station to the Colorado River and to the California and Arizona state border has meant that DTSC and PG&E work to keep many additional cities and stakeholders informed (in addition to the most proximate, as required under RCRA). These additional cities and stakeholders include the City of Needles approximately 12 miles northwest and Lake Havasu City, and the city of Parker (18 and 40 miles away, respectively).

S2-15

S2-16

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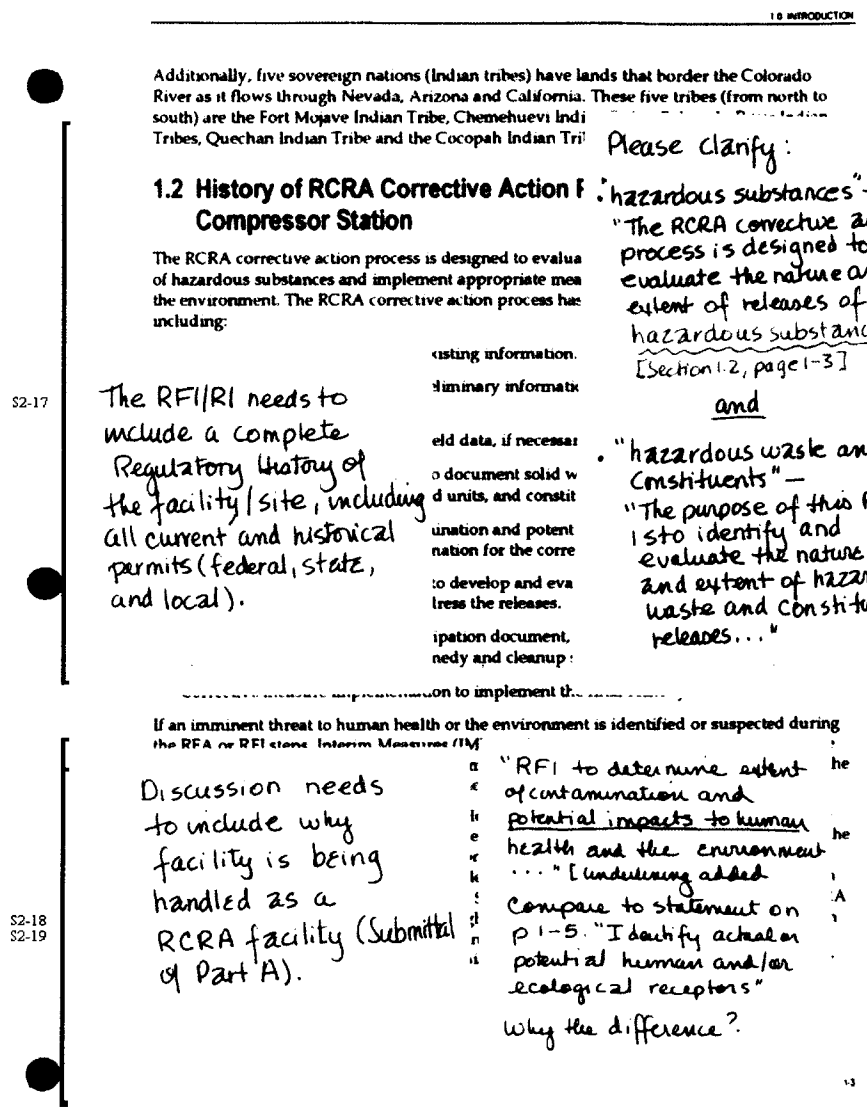
Response to Comment S2-15(RS_110105_56)

PG&E shall include information on other properties in the immediate vicinity that are owned or leased to PG&E (if any exist).

Response to Comment S2-16(RS_110105_57)

PG&E shall clarify in the text that that the values are based on distance from the facility.



1.0 INTRODUCTION

Additionally, five sovereign nations (Indian tribes) have lands that border the Colorado River as it flows through Nevada, Arizona and California. These five tribes (from north to south) are the Fort Mojave Indian Tribe, Chemehuevi Indi… Tribes, Quechan Indian Tribe and the Cocopah Indian Tri…

Please clarify:

"hazardous substances" –
"The RCRA corrective action process is designed to evaluate the nature and extent of releases of hazardous substances..."
[Section 1.2, page 1-3]

and

"hazardous waste and constituents" –
"The purpose of this RFI is to identify and evaluate the nature and extent of hazardous waste and constituent releases..."

1.2 History of RCRA Corrective Action F… Compressor Station

The RCRA corrective action process is designed to evalua… of hazardous substances and implement appropriate mea… the environment. The RCRA corrective action process has… including:

…isting information.

…liminary informatio…

…eld data, if necessar…

…o document solid w… …d units, and constit…

…ination and potent… …nation for the corre…

…o develop and eva… …tress the releases.

…ipation document, …nedy and cleanup…

S2-17 The RFI/RI needs to include a complete Regulatory History of the facility/site, including all current and historical permits (federal, state, and local).

…on to implement th…

If an imminent threat to human health or the environment is identified or suspected during the RFA or RFI stage, Interim Measures (IM)…

"RFI to determine extent of contamination and potential impacts to human health and the environment ..." [underlining added]
Compare to statement on p 1-5. "Identify actual or potential human and/or ecological receptors"
Why the difference?

S2-18 S2-19 Discussion needs to include why facility is being handled as a RCRA facility (Submittal of Part A).

Response to Comment S2-17(RS_110105_58)

Comment noted. PG&E is not required to address this comment at this time. The report does include a complete regulatory history in Section 3. The level of effort and inclusion of all historic and current permits is not warranted as these permits are not likely to provide any substantive information that is not already identified.

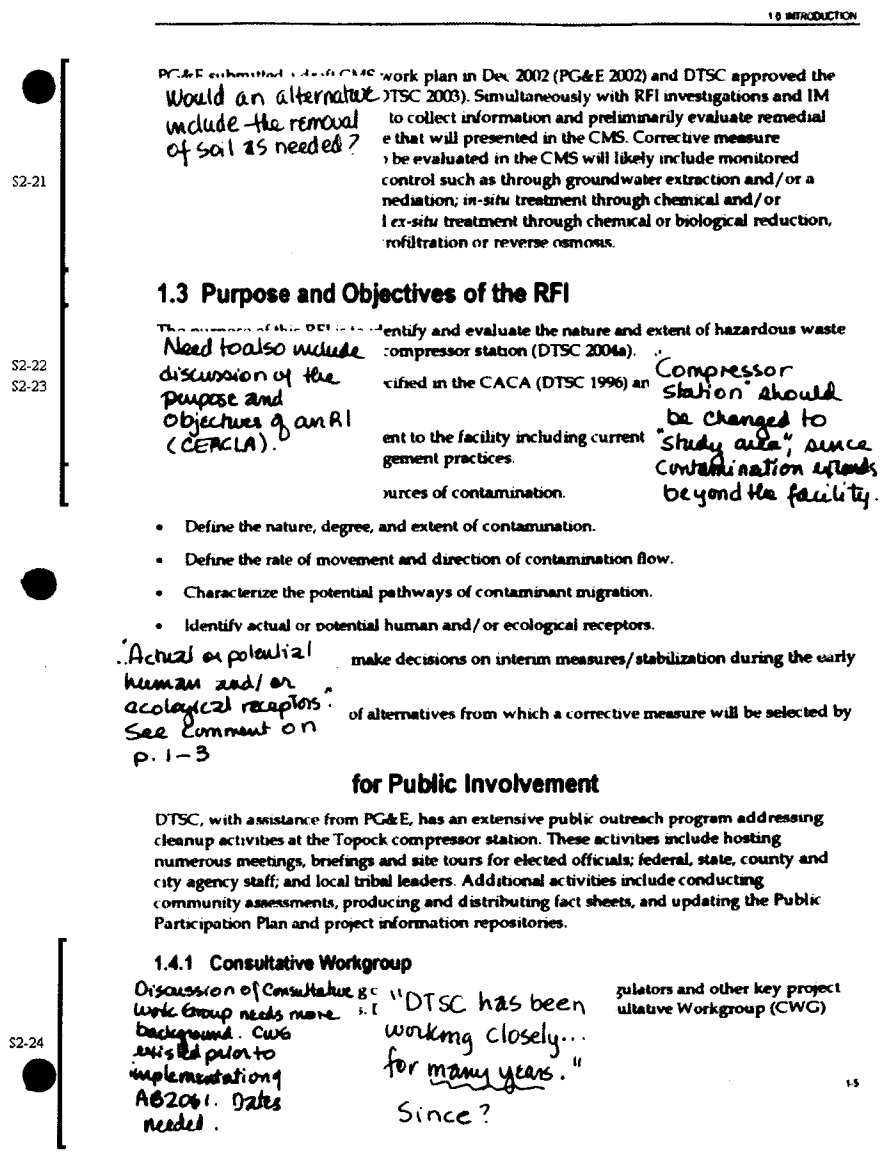
PG&E shall clarify that the statement "hazardous substances" is taken directly from RCRA guidance documents, and that the statement regarding "hazardous waste and constituent releases" is taken directly from the CACA.

Response to Comment S2-18(RS_110105_59)

PG&E shall address this comment by including information on why the facility is being addressed under RCRA.

Response to Comment S2-19(RS_110105_60)

PG&E shall address this comment. The text shall be clarified and revised to be consistent.



1.0 INTRODUCTION

PG&E submitted a draft CMS work plan in Dec 2002 (PG&E 2002) and DTSC approved the

Would an alternative include the removal of soil as needed?

DTSC 2003). Simultaneously with RFI investigations and IM to collect information and preliminarily evaluate remedial e that will presented in the CMS. Corrective measure be evaluated in the CMS will likely include monitored control such as through groundwater extraction and/or a nediation; *in-situ* treatment through chemical and/or *ex-situ* treatment through chemical or biological reduction, rofiltration or reverse osmosis.

S2-21

1.3 Purpose and Objectives of the RFI

entify and evaluate the nature and extent of hazardous waste compressor station (DTSC 2004a).

S2-22 Need to also include discussion of the purpose and objectives of an RI (CERCLA).

S2-23 cified in the CACA (DTSC 1996) an

"Compressor Station" should be changed to "study area", since contamination extends beyond the facility.

ent to the facility including current gement practices.

ources of contamination.

- Define the nature, degree, and extent of contamination.
- Define the rate of movement and direction of contamination flow.
- Characterize the potential pathways of contaminant migration.
- Identify actual or potential human and/or ecological receptors.

Actual or potential human and/or ecological receptors. See Comment on p. 1-3

make decisions on interim measures/stabilization during the early

of alternatives from which a corrective measure will be selected by

for Public Involvement

DTSC, with assistance from PG&E, has an extensive public outreach program addressing cleanup activities at the Topock compressor station. These activities include hosting numerous meetings, briefings and site tours for elected officials; federal, state, county and city agency staff; and local tribal leaders. Additional activities include conducting community assessments, producing and distributing fact sheets, and updating the Public Participation Plan and project information repositories.

1.4.1 Consultative Workgroup

Discussion of Consultative Work Group needs more background. CWG existed prior to implementation AB2061. Dates needed.

S2-24

"DTSC has been working closely... for many years."

Since?

gulators and other key project ultative Workgroup (CWG)

1-5

Response to Comment S2-21(RS_110105_62)

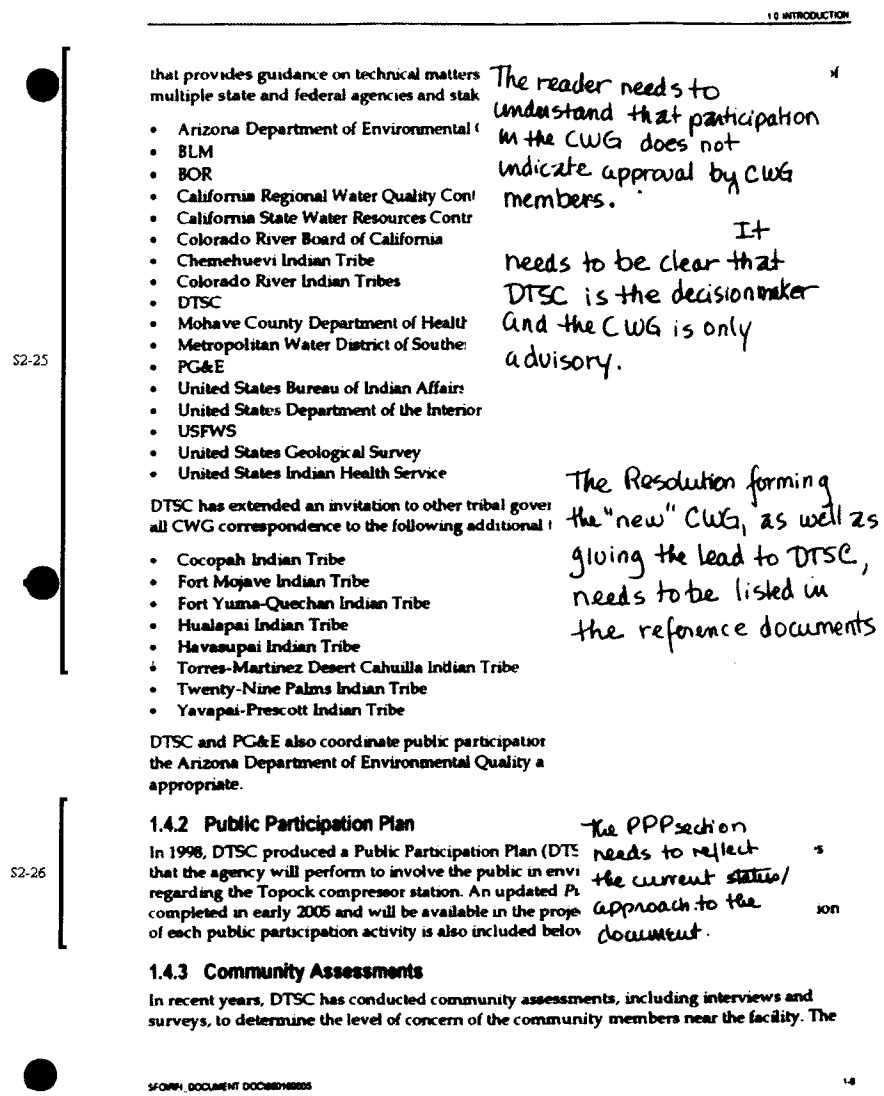
Comment noted. PG&E is not required to address this comment at this time. DTSC assumes that soil removal could and probably will be one likely alternative for evaluation.

Response to Comment S2-23(RS_110105_64)

PG&E shall address this comment. Please note that the objectives are taken directly from the CACA; however, PG&E shall revise the wording to indicate that an area larger than just the compressor station will be addressed. Reference to the Area of Potential Effect (APE) as determined by BLM shall be incorporated with an appropriate reference figure that identifies the APE. Include a discussion of the purpose and definition of the APE.

Response to Comment S2-24(RS_110105_65)

PG&E shall address this comment. Additional information on the CWG shall be provided and the time period shall be better defined.



1.0 INTRODUCTION

that provides guidance on technical matters multiple state and federal agencies and stak

- Arizona Department of Environmental
- BLM
- BOR
- California Regional Water Quality Cont
- California State Water Resources Contr
- Colorado River Board of California
- Chemehuevi Indian Tribe
- Colorado River Indian Tribes
- DTSC
- Mohave County Department of Healt
- Metropolitan Water District of Southe
- PG&E
- United States Bureau of Indian Affair
- United States Department of the Interior
- USFWS
- United States Geological Survey
- United States Indian Health Service

The reader needs to understand that participation in the CWG does not indicate approval by CWG members. It needs to be clear that DTSC is the decisionmaker and the CWG is only advisory.

S2-25

DTSC has extended an invitation to other tribal gover all CWG correspondence to the following additional

- Cocopah Indian Tribe
- Fort Mojave Indian Tribe
- Fort Yuma-Quechan Indian Tribe
- Hualapai Indian Tribe
- Havasupai Indian Tribe
- Torres-Martinez Desert Cahuilla Indian Tribe
- Twenty-Nine Palms Indian Tribe
- Yavapai-Prescott Indian Tribe

The Resolution forming the "new" CWG, as well as giving the lead to DTSC, needs to be listed in the reference documents

DTSC and PG&E also coordinate public participation the Arizona Department of Environmental Quality a appropriate.

1.4.2 Public Participation Plan

In 1998, DTSC produced a Public Participation Plan (DTS that the agency will perform to involve the public in envi regarding the Topock compressor station. An updated *Pu* completed in early 2005 and will be available in the proje of each public participation activity is also included belov

The PPP section needs to reflect the current status/ approach to the document.

S2-26

1.4.3 Community Assessments

In recent years, DTSC has conducted community assessments, including interviews and surveys, to determine the level of concern of the community members near the facility. The

SFO#FH_DOCUMENT DOC080108005

1-8

Response to Comment S2-25(RS_110105_66)

PG&E shall address this comment. The text shall be revised to state that the CWG has a responsibility to participate and provide meaningful input as an advisory resource to DTSC. DTSC is sole and final decision making authority as the lead regulatory administrating agency.

Response to Comment S2-26(RS_110105_67)

PG&E shall address this comment. The section shall be updated as requested.

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S2-27

The community Assessments needs to be updated.

...d in 1997. Concerns expressed during this assessment fell into ...nications and health. Concerns about communications ...terviewees had very little knowledge of the environmental ...or to being contacted for the 1997 assessment. As a result of the ...SC determined the need to keep the public informed regarding ...spond to this need, DTSC began producing fact sheets and ...sitories (a list of information repositories is included in Section 1.4.6).

In June 2002, a second survey was mailed to approximately 74 individuals and organizations. Eight individuals requested to be interviewed after receiving the 2002 survey, and these interviews were conducted in January 2003. Additional interviews were conducted in July and September 2004. DTSC learned that most interviewees were aware of the environmental investigation at the facility, and interviewees expressed a high to moderate level of concern regarding the following categories: environmental impacts, the cleanup process, economics, adequate communication, and health effects.

Public preferences expressed during these community assessments will be summarized in the updated *Public Participation Plan*, to be published by DTSC in early 2005. However, DTSC will respond to public requests at any time and is continuously incorporating feedback from Indian tribes, other stakeholders and the public throughout the course of the corrective action process.

1.4.4 Fact Sheets

Fact sheets are published at project milestones or as the project changes. DTSC published fact sheets in March 1998, September 1999, May 2004 and August 2004 to update the public and stakeholders about project progress. Fact sheets were distributed to elected officials, agency staff, and the residents of local communities including Golden Shores, Topock, and Lake Havasu City, Arizona, as well as to Indian tribes including the Fort Mojave, Chemehuevi, Cocopah, Quechan, Yavapai-Prescott, Hualapai, Havasupai, Torres-Martinez Desert Cahuilla and Colorado River Indian Tribes, and the Twenty-Nine Palms Band of Mission Indians.

1.4.5 Site Tours

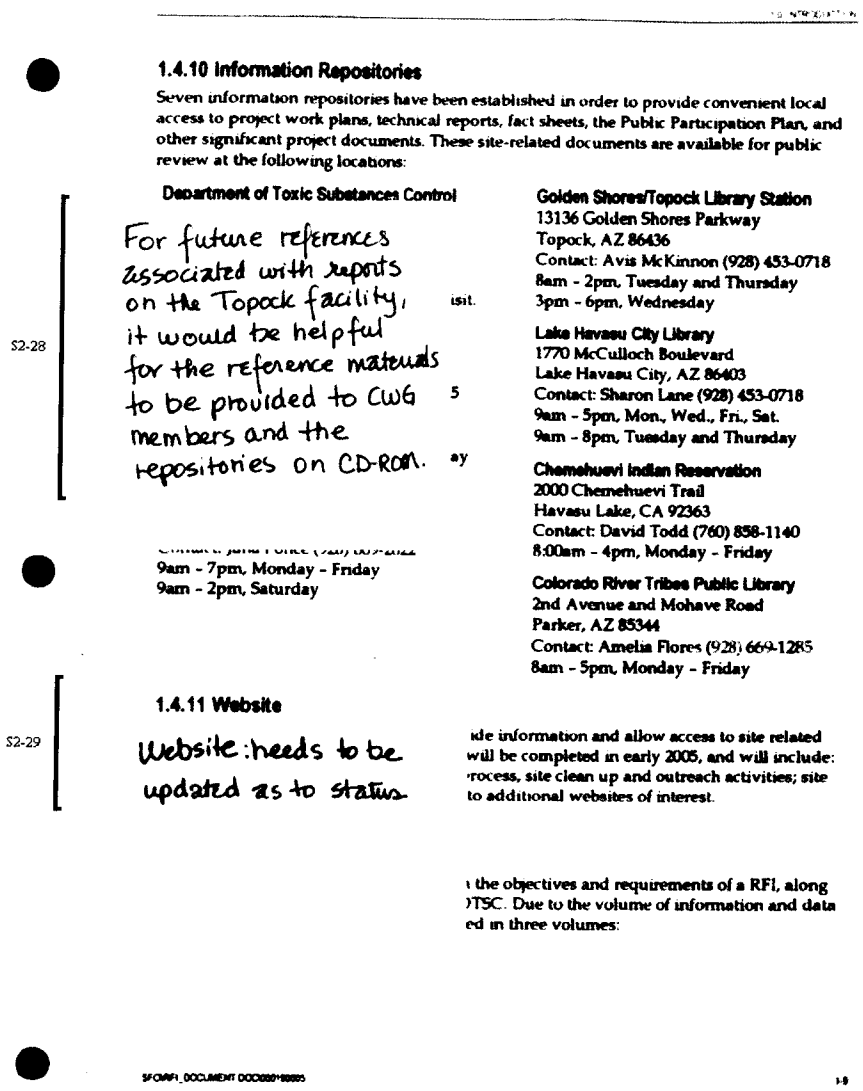
During the January 2003 interviews, local sovereign nation officials requested a tour of the compressor station. DTSC and PG&E responded to this request by hosting members of the Fort Mojave, Chemehuevi, and Colorado River Indian Tribes at a site tour in April 2003. DTSC and PG&E brought tribal representatives up to date on the status of the investigation and the facility superintendent guided them through the compressor and compressor station grounds. Between January 2003 and June 2004, DTSC and PG&E have held an additional four site tours at the facility to brief elected officials, members of the CWG, and tribal representatives on project plans and implementation, including various aspects and stages of the Interim Measures. DTSC and PG&E will continue to host site tours as the project progresses.

1.4.6 Sovereign Nation Briefings

DTSC and PG&E committed to keeping the members and leaders of local Indian tribes informed. DTSC and PG&E have met regularly with staff and members of the Fort Mojave,

Response to Comment S2-27(RS_110105_68)

PG&E shall address this comment and update the text.



1.4.10 Information Repositories

Seven information repositories have been established in order to provide convenient local access to project work plans, technical reports, fact sheets, the Public Participation Plan, and other significant project documents. These site-related documents are available for public review at the following locations:

Department of Toxic Substances Control

For future references associated with reports on the Topock facility, it would be helpful for the reference materials to be provided to CWG members and the repositories on CD-ROM.

S2-28

isit.

5

ay

Golden Shores/Topock Library Station
13136 Golden Shores Parkway
Topock, AZ 86436
Contact: Avis McKinnon (928) 453-0718
8am - 2pm, Tuesday and Thursday
3pm - 6pm, Wednesday

Lake Havasu City Library
1770 McCulloch Boulevard
Lake Havasu City, AZ 86403
Contact: Sharon Lane (928) 453-0718
9am - 5pm, Mon., Wed., Fri., Sat.
9am - 8pm, Tuesday and Thursday

Chemehuevi Indian Reservation
2000 Chemehuevi Trail
Havasu Lake, CA 92363
Contact: David Todd (760) 858-1140
8:00am - 4pm, Monday - Friday

Colorado River Tribes Public Library
2nd Avenue and Mohave Road
Parker, AZ 85344
Contact: Amelia Flores (928) 669-1285
8am - 5pm, Monday - Friday

[illegible] (928) [illegible]
9am - 7pm, Monday - Friday
9am - 2pm, Saturday

1.4.11 Website

Website needs to be updated as to status

S2-29

ide information and allow access to site related
will be completed in early 2005, and will include:
rocess, site clean up and outreach activities; site
to additional websites of interest.

the objectives and requirements of a RFI, along
)TSC. Due to the volume of information and data
ed in three volumes:

SFOMFI_DOCUMENT DOC0001[illegible]

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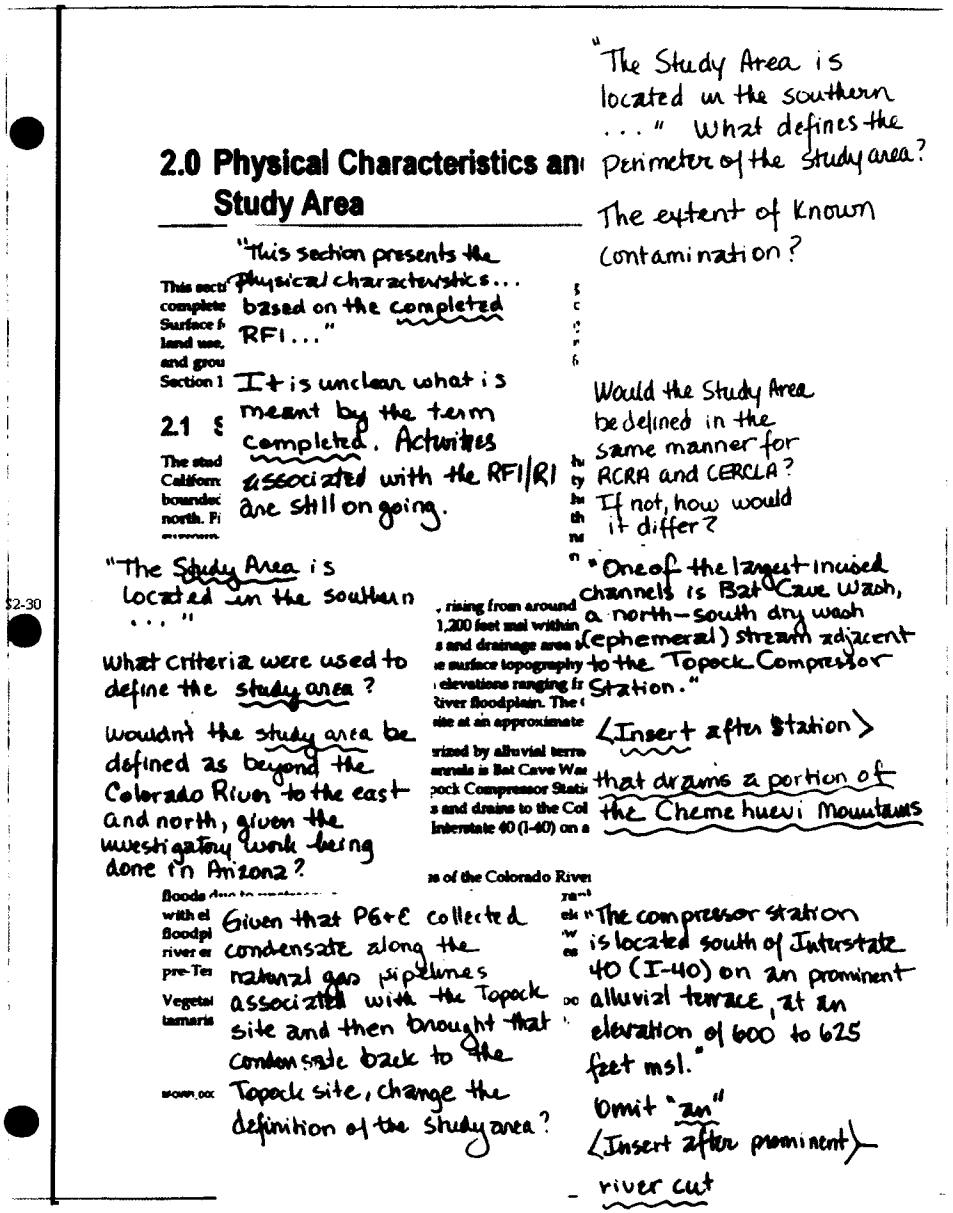
Response to Comment S2-28(RS_110105_69)

Comment noted. PG&E is not required to address this comment at this time. Documents referenced in the RFI/RI have been provided in hardcopy and placed in several central locations. Providing these documents on CD to CWG members may be considered in the future.

Response to Comment S2-29(RS_110105_70)

Comment noted. PG&E is not required to address this comment at this time. The Website will be continually updated. However, this activity is not part of the RFI/RI.



2.0 Physical Characteristics an
Study Area

"This section presents the physical characteristics... based on the completed RFI..."

It is unclear what is meant by the term completed. Activities associated with the RFI/RI are still ongoing.

"The Study Area is located in the southern ..."

What criteria were used to define the study area?

Wouldn't the study area be defined as beyond the Colorado River to the east and north, given the investigatory work being done in Arizona?

Given that PG&E collected condensate along the natural gas pipelines associated with the Topock site and then brought that condensate back to the Topock site, change the definition of the study area?

"The Study Area is located in the southern ..." What defines the perimeter of the study area?

The extent of known contamination?

Would the Study Area be defined in the same manner for RCRA and CERCLA? If not, how would it differ?

"One of the largest incised channels is Bat Cave Wash, a north-south dry wash (ephemeral) stream adjacent to the Topock Compressor Station."

<Insert after Station>

that drains a portion of the Cheme huevi Mountains

"The compressor station is located south of Interstate 40 (I-40) on an prominent alluvial terrace, at an elevation of 600 to 625 feet msl."

Omit "an"

<Insert after prominent>

river cut

S2-30

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Response to Comment S2-30(RS_110105_71)

PG&E shall address this comment and update the text to better define the study area in future documents. The remaining editorial comments may be incorporated as desired.

PG&E shall clarify that the text refers to RFI/RI work "completed to date".

S2-58

3.0 Facility Operations and History

The Topock Compressor Station began operations in December 1951 to compress natural gas supplied from the southwestern United States for transport through pipelines to PG&E's service territory in central and northern California. The com ... still active and is anticipated to remain an active facility into the foreseeabl section provides detailed information on the history of the

Ownership of property where facility is located prior to PG+E needs to be documented with appropriate citations. Identify ownership of property prior to ownership by state. References need to be listed in the Reference section.

3.1 Current and Historic Operations

Prior to construction of the compressor station in 1951, the was mostly undeveloped land, thought the Teapot Dome occupied a small portion of the property at the very north (Figure 3-1). It is unknown when the Teapot Dome was b photography, the Teapot Dome was present at the site in photograph available). It was still present in 1947, but ap prior to, or during construction of, the compressor statior the compressor station was built was owned by the State PG&E leased the property from the State. In 1965, PG&E State.

The main structures at the facility include the compressor building, ... B, and the generator building. Adjacent to the main buildings are various auxiliary structures including an office, a warehouse, a vehicle garage, maintenance buildings, equipment and chemical storage buildings, and a water softening bu aboveground tanks at the facility that are used for storage of water, ... mpressor oil, gasoline and diesel, and wi ajor features of the compressor station.

"The main structures at the facility <insert: currently> include the compressor building..."

"Aboveground tanks" Are there now, or were there historically, any below ground tanks?

..., the facility was equipped with six com ... illion standard cubic feet per day (scfd) ... creased, additional compressors were ac ... l (by turbocharging and supercharging) (... ... ed. Most of the upgrades were completed in the early to ... grades, ... :essing 1.1 billion scfd.

Did the change in increase of gas processed correlate to a change in waste or waste handling practices.

Depending on demand, the facility ... 1.1 billion scfd of natural gas per da ...) million to 24 hours per day, 7 days a week. ... rates and is staffed

Current operations at the compresso ... operations that occurred from the start of facility operations ... mpressor station consist of:

- Water conditioning.
- Compression of natural gas.

SFOWR_DOCUMENT DOC0000000000 3-1

Response to Comment S2-58(RS_101805_36)

PG&E shall address this comment and update the historic ownership of the property with available information.

The word "currently" shall be inserted as requested.

Comment noted. PG&E is not required to address this comment at this time. Underground tanks are discussed in detail in Section 3.1.5.1.

Information on changes in gas processed and associated changes in waste/waste handing shall be provided as available. See also response to Comment S2-1.

- Cooling of the compressed natural gas and compressor lubricating oil.
- Wastewater treatment.
- Facility and equipment maintenance.
- Miscellaneous operations.

Facility operations and associated chemical product usage are summarized in Table 3-1. Waste generation and management associated with facility operations are summarized in Table 3-2. Facility operations, associated chemical use, and waste generation and management activities are described in detail below.

S2-59

3.1.1 Water Conditioning Process

"From 1951 through 1960, PG&E wells 1 and 2 (also known as PGE-01 and PGE-02) were used to supply process water to the facility (bottled water was supplied for drinking)."

Was this water ever used as drinking water at the Topock site? Was this water used in sinks and lavatories, etc. at the Topock site? If so, would those wastewaters have gone into the septic system?

...is that tap local ...urposes. The ... E-02) were ...rinking). PG&E ... is currently ...d from PG&E ...60 or early ...owned by the The AT&SF ...4) were ...and 2 were ...1964 during ... 1974 to

removed from service, and To... Nos. 2a and 3 continue to supp... of Topock, Arizona). ... Curre... ...nking.

Please show PGE-1 and PGE-2 on Facility map and other well maps

"Due to poor quality ..."

The well water is pumped to t... the station. Groundwater fro... minerals, most notably sodiu... excess minerals and improve i... ...locate ...veral d ...er was ...water.

What was the nature of the poor quality? TDS? Cr?

3.1.1.1 Chemical Use in the Water Conditioning Process

In 1951, when the facility was first built, a water conditioning plant designed by Permutit was employed to condition water used at the facility (PG&E 1958a). The plant was located in the southern portion of the facility at what has previously been identified as the "water softening building" (it is currently identified as the "storage building"; see Figure 3-1). The plant consisted of one to two tanks that were used to handle a mixture of soda ash, lime, and sodium aluminate. Water was pumped through the plant to remove excess minerals and thereby soften the water.

SFO/RFI_DOCUMENT DOC 3-2

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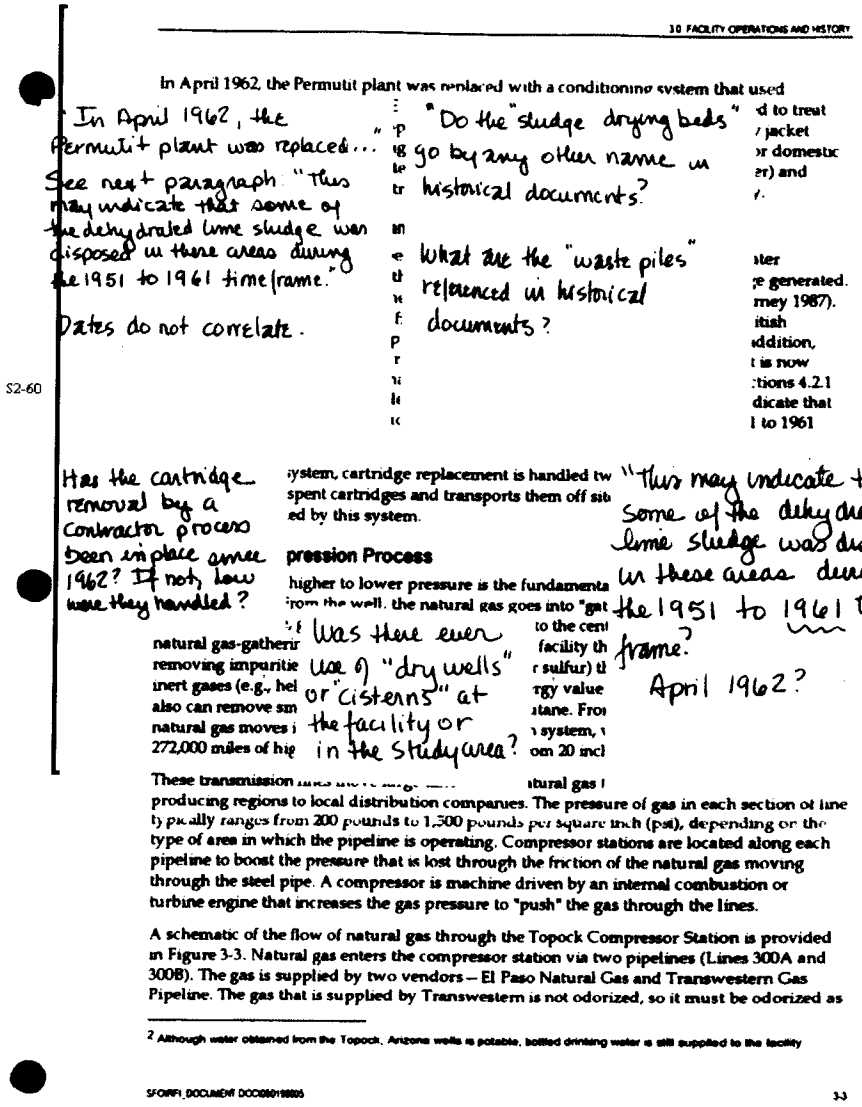
<u>Response to Comment S2-59(RS 101805 38)</u>

PG&E shall address this comment and update the text PG&E shall determine if water derived from wells PGE-01 and PGE-02 was apparently used for all domestic purposes except drinking water and that domestic wastewater presumably was discharged to a septic system.

Comment noted. PG&E is not required to address this comment at this time. The locations of wells PGE-01 and PGE-02 are shown on Figure 3-2.

The predominate water quality issue with wells PGE-01 and PGE-02 was TDS. PG&E shall revise the text as necessary.



3.0 FACILITY OPERATIONS AND HISTORY

In April 1962, the Permutit plant was replaced with a conditioning system that used

In April 1962, the Permutit plant was replaced... See next paragraph "This may indicate that some of the dehydrated lime sludge was disposed in these areas during the 1951 to 1961 timeframe." Dates do not correlate.

"Do the" sludge drying beds" go by any other name in historical documents?

What are the "waste piles" referenced in historical documents?

S2-60

Has the cartridge removal by a contractor process been in place since 1962? If not, how were they handled?

system, cartridge replacement is handled tw
spent cartridges and transports them off sit
ed by this system.

"This may indicate that some of the dehydrated lime sludge was disposed in these areas during the 1951 to 1961 time-frame."

April 1962?

pression Process

higher to lower pressure is the fundamenta
from the well, the natural gas goes into "gat
natural gas-gatherir
removing impuritie
inert gases (e.g., hel
also can remove sm
natural gas moves i
272,000 miles of hig

Was there ever use of "dry wells" or "cisterns" at the facility or in the Study area?

These transmission
producing regions to local distribution companies. The pressure of gas in each section of line typically ranges from 200 pounds to 1,500 pounds per square inch (psi), depending on the type of area in which the pipeline is operating. Compressor stations are located along each pipeline to boost the pressure that is lost through the friction of the natural gas moving through the steel pipe. A compressor is machine driven by an internal combustion or turbine engine that increases the gas pressure to "push" the gas through the lines.

A schematic of the flow of natural gas through the Topock Compressor Station is provided in Figure 3-3. Natural gas enters the compressor station via two pipelines (Lines 300A and 300B). The gas is supplied by two vendors – El Paso Natural Gas and Transwestern Gas Pipeline. The gas that is supplied by Transwestern is not odorized, so it must be odorized as

[2] Although water obtained from the Topock, Arizona wells is potable, bottled drinking water is still supplied to the facility

SFORFI_DOCUMENT DOC050198805

3-3

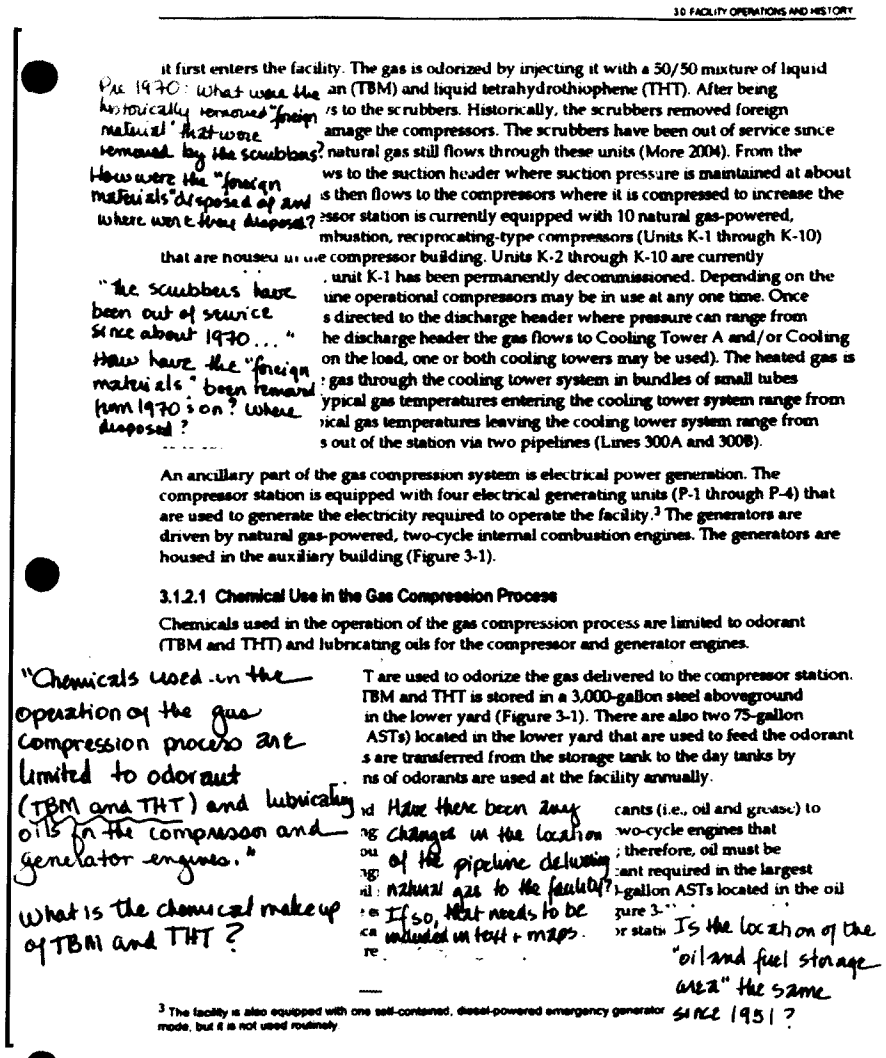
Response to Comment S2-60(RS_101805_6)

PG&E shall address this comment and clarify and update the text. Statement regarding lime sludge disposal should read "1951 to 1962", not "1951 to 1961".

It is possible that other "names" may have been used for the Sludge Dry Beds; PG&E shall identify if possible.

Comment noted. PG&E is not required to address this comment at this time. Because the comment does not provide a citation as to where the term "waste pile" is used, DTSC is not able to make an assessment as to whether the terms refer to the same or separate features.

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to gather additional information on dry wells and cisterns, and on cartridge removal. See also the response to Comment S2-1.



3.0 FACILITY OPERATIONS AND HISTORY

it first enters the facility. The gas is odorized by injecting it with a 50/50 mixture of liquid an (TBM) and liquid tetrahydrothiophene (THT). After being /s to the scrubbers. Historically, the scrubbers removed foreign amage the compressors. The scrubbers have been out of service since natural gas still flows through these units (More 2004). From the ws to the suction header where suction pressure is maintained at about s then flows to the compressors where it is compressed to increase the ssor station is currently equipped with 10 natural gas-powered, mbustion, reciprocating-type compressors (Units K-1 through K-10) that are housed in the compressor building. Units K-2 through K-10 are currently . unit K-1 has been permanently decommissioned. Depending on the ime operational compressors may be in use at any one time. Once s directed to the discharge header where pressure can range from he discharge header the gas flows to Cooling Tower A and/or Cooling on the load, one or both cooling towers may be used). The heated gas is gas through the cooling tower system in bundles of small tubes ypical gas temperatures entering the cooling tower system range from ical gas temperatures leaving the cooling tower system range from s out of the station via two pipelines (Lines 300A and 300B).

An ancillary part of the gas compression system is electrical power generation. The compressor station is equipped with four electrical generating units (P-1 through P-4) that are used to generate the electricity required to operate the facility.[3] The generators are driven by natural gas-powered, two-cycle internal combustion engines. The generators are housed in the auxiliary building (Figure 3-1).

S2-61

3.1.2.1 Chemical Use in the Gas Compression Process

Chemicals used in the operation of the gas compression process are limited to odorant (TBM and THT) and lubricating oils for the compressor and generator engines.

T are used to odorize the gas delivered to the compressor station. TBM and THT is stored in a 3,000-gallon steel aboveground in the lower yard (Figure 3-1). There are also two 75-gallon ASTs) located in the lower yard that are used to feed the odorant s are transferred from the storage tank to the day tanks by ns of odorants are used at the facility annually.

cants (i.e., oil and grease) to wo-cycle engines that ; therefore, oil must be ant required in the largest l-gallon ASTs located in the oil gure 3- or stati

[3] The facility is also equipped with one self-contained, diesel-powered emergency generator mode, but it is not used routinely

SFOMFI_DOCUMENT DOC080100005

Pre 1970: What were the historically removed "foreign material" that were removed by the scrubbers? How were the "foreign materials" disposed of and where were they disposed?

"the scrubbers have been out of service since about 1970..." How have the "foreign materials" been handled from 1970's on? Where disposed?

"Chemicals used in the operation of the gas compression process are limited to odorant (TBM and THT) and lubricating oils for the compressor and generator engines."

What is the chemical make up of TBM and THT?

Have there been any changes in the location of the pipeline delivering natural gas to the facility? If so, that needs to be included in text + maps.

Is the location of the "oil and fuel storage area" the same since 1951?

Response to Comment S2-61(RS_101805_7)

PG&E shall address this comment regarding "foreign material" and clarify and update the text.

Comment noted. PG&E is not required to address this comment at this time. Handling and disposal of scrubber waste (both pre- and post-1970) is discussed in Section 3.1.2.2.

PG&E shall address this comment and clarify that the fuel and oil storage area has been in the same location since the station was constructed in 1951.

PG&E shall address this comment and describe the chemical make up of TBM and THT.

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to gather additional information on the incoming gas pipeline. See also the response to Comment S2-1.

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Chemicals used in the cooling systems are described as part of the cooling water process (Section 3.1.3).

3.1.2.2 Waste Generation and Management in the Gas Compression Process

The primary waste stream generated by the gas compression process is oily water. However, minor amounts of condensate are also produced at pipeline drip points and the scrubbers.

Oily Water. Oily water is produced from drips, minor leaks, and compressed air blowdown. The oily water is collected in floor drains located in buildings and is routed to the oily water treatment system. Section 3.1.4.2 discusses the handling and treatment of oily water.

Scrubber Waste. As previously indicated, from 1951 to about 1970, scrubbers were used to remove foreign matter from the gas prior to compression. The scrubbers used an oil bath system to remove the impurities. The oil bath consisted of metal mesh frames contained within an oil bath. During at least a part of its operations, the oil used in the oil bath was waste oil.

The oil bath system generated an oily waste contaminated with gas condensate, dust, and

Historical documents identify and "1000 gallon pipeline liquids storage tank." Yet, the RFI/RI identifies that the condensate is handled differently. Please clarify.

What testing is done of the oily waste collected in the scrubber sumps?

What is the chemical make up of the "gas condensate"?

S2-62

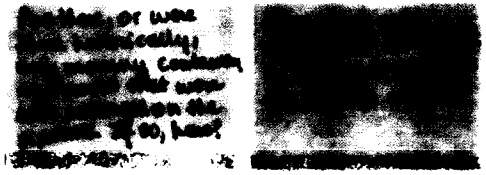
equire less cleaning, the
rubbers in about 1970. Gas still flows through the
bers are not in service and only function as an incidental
e scrubbers are drained annually to remove accumulated
small volume of condensate has been generated. About
ed from the scrubbers roughly once a year (Riddle 2004).
m the scrubbers is combined with the waste oil
ste oil storage tank) and transported off site for disposal

Condensate. Small amounts of condensate are removed from the PG&E pipelines that lie to

What analytical testing was done historically on condensate prior to disposal? Currently?

How is the condensate collected currently? Historically? Was it always collected at the drip points, or was it allow to drip on the soil?

Are there currently, or has there ever been, mercury containing gauges along the pipelines? If so, is it possible that there might be contamination?



3-6

Response to Comment S2-62(RS_101805_39)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to identify the additional requested information. See also the response to Comment S2-1.

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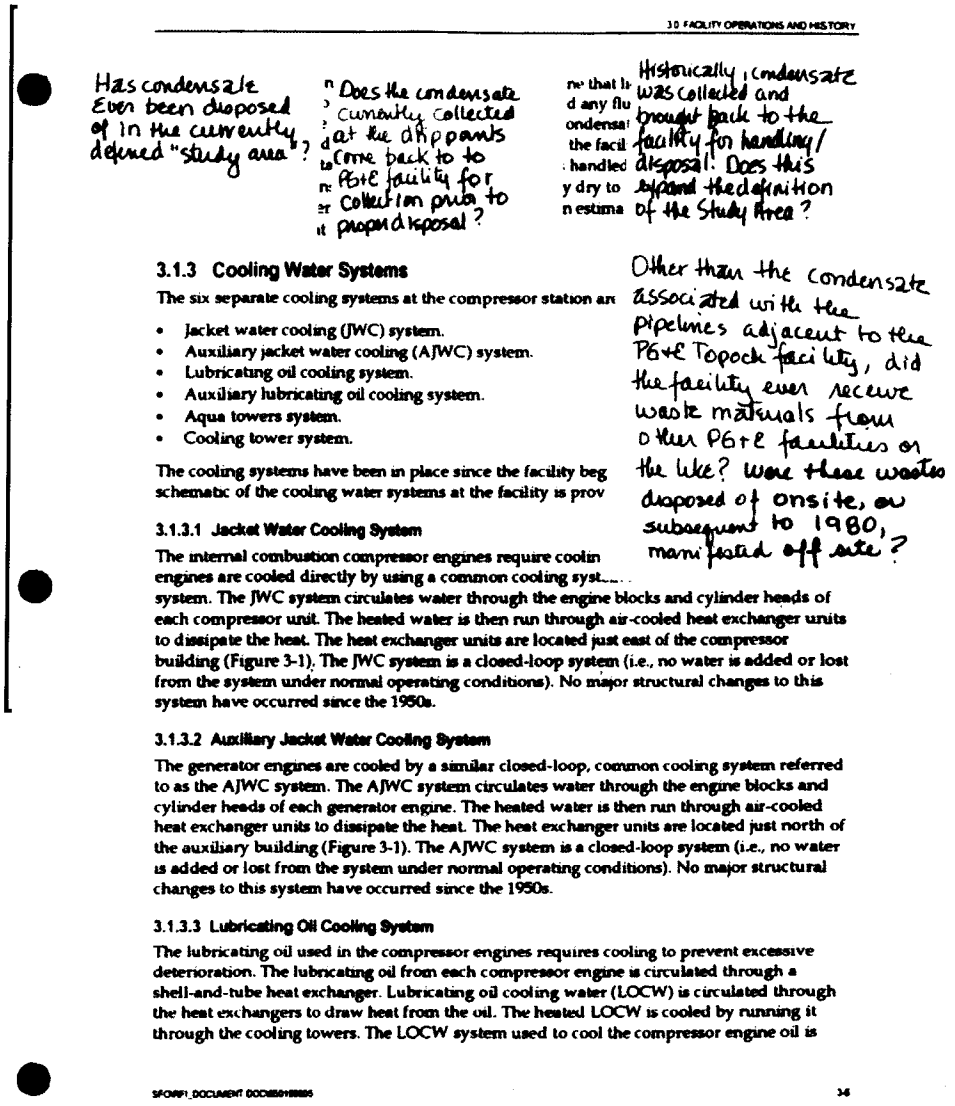

3.0 FACILITY OPERATIONS AND HISTORY

Has condensate Ever been disposed of in the currently defined "study area"?

Does the condensate currently collected at the dehydrants come back to the PG&E facility for collection prior to proper disposal?

Historically, condensate was collected and brought back to the facility for handling/disposal. Does this expand the definition of the Study Area?

3.1.3 Cooling Water Systems

The six separate cooling systems at the compressor station are

- Jacket water cooling (JWC) system.
- Auxiliary jacket water cooling (AJWC) system.
- Lubricating oil cooling system.
- Auxiliary lubricating oil cooling system.
- Aqua towers system.
- Cooling tower system.

S2-63

Other than the condensate associated with the pipelines adjacent to the PG&E Topock facility, did the facility ever receive waste materials from other PG&E facilities or the like? Were these wastes disposed of onsite, or subsequent to 1980, manifested off site?

The cooling systems have been in place since the facility beg
schematic of the cooling water systems at the facility is prov

3.1.3.1 Jacket Water Cooling System

The internal combustion compressor engines require coolin
engines are cooled directly by using a common cooling syst
system. The JWC system circulates water through the engine blocks and cylinder heads of each compressor unit. The heated water is then run through air-cooled heat exchanger units to dissipate the heat. The heat exchanger units are located just east of the compressor building (Figure 3-1). The JWC system is a closed-loop system (i.e., no water is added or lost from the system under normal operating conditions). No major structural changes to this system have occurred since the 1950s.

3.1.3.2 Auxiliary Jacket Water Cooling System

The generator engines are cooled by a similar closed-loop, common cooling system referred to as the AJWC system. The AJWC system circulates water through the engine blocks and cylinder heads of each generator engine. The heated water is then run through air-cooled heat exchanger units to dissipate the heat. The heat exchanger units are located just north of the auxiliary building (Figure 3-1). The AJWC system is a closed-loop system (i.e., no water is added or lost from the system under normal operating conditions). No major structural changes to this system have occurred since the 1950s.

3.1.3.3 Lubricating Oil Cooling System

The lubricating oil used in the compressor engines requires cooling to prevent excessive deterioration. The lubricating oil from each compressor engine is circulated through a shell-and-tube heat exchanger. Lubricating oil cooling water (LOCW) is circulated through the heat exchangers to draw heat from the oil. The heated LOCW is cooled by running it through the cooling towers. The LOCW system used to cool the compressor engine oil is

SFOWP1_DOCUMENT 000080[illegible] 3-6

Response to Comment S2-63(RS_101805_40)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to respond to the additional requested information. See also the response to Comment S2-1.

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causing the cooling effect. The cooled water drops by gravity into the lower cold basin. Cold water from the lower basin is pumped first to the four gas coolers. The four gas coolers are shell and tube heat exchangers. The cold water runs through the tubes and the natural gas flows through the shell. The water exits the gas coolers then flows through the four lube oil cooling water heat exchangers. These are plate-and-frame-type heat exchangers with cooling tower water on one side of the plates and LOCW on the other side of the plates. The cooling tower water exits the LOCW heat exchangers and flows back to the cooling tower hot basins to begin the cycle again. As water is evaporated from the cooling tower, scale begins to form on heat exchange surfaces, corrosion may occur, and biological growth accelerates; therefore, the composition of the cooling water must be carefully maintained at optimal conditions. The cooling tower is equipped with a controller that automatically discharges water from the cooling tower when a certain conductivity is reached. The controller automatically adds acid, a phosphate-based corrosion inhibitor, a scale dispersant, and a biocide. Automatic level controls allow freshwater to flow into the cold basins to maintain a proper water level in the cooling towers.

3.1.3.7 Chemical Use in the Cooling Water System

Cooling water was historically treated with chemicals to prevent corrosion of the metal components, fungus attack on wooden components (the original cooling towers contained some wooden components), algae and bacterial growth, and deposition of minerals (scale). With the exception of the need to control fungus attacks on wooden components (the new towers are constructed of all metal components), cooling water treatment still serves the same purposes today. As described above, six separate cooling water systems are used at the compressor station (i.e., the JWC system, the AJWC system, the LOCW system, the ALOCW system, the aqua towers system, and the cooling tower system). Currently, water treatment chemicals are used in all of the cooling systems except the aqua towers; however, it appears that treatment chemicals were used in the aqua tower system in the past. Cooling water is currently treated using a multi-component additive system, consisting of a phosphate-based corrosion inhibitor, a biocide, and a dispersant. In addition, sulfuric acid is used to control the pH in the cooling towers. The additives used in the different cooling water systems are similar, although the closed-loop (i.e., jacket water, auxiliary jacket water, and lubricating oil cooling water) systems historically contained corrosion control additives at much higher concentrations than the cooling towers. Concentrations of the additives are monitored and adjusted daily.

S2-64

From 1951 to 1985, Cr(VI)-based corrosion inhibitors and biocides were added to the cooling
ferent corrosion inhibitors were used c
ontained Cr(VI). Product specification
Trol X-5, also known as DE-307) indica
(Betz 1985). In the early 1960s, a separ
the control algae, fungi, and/or bacter
osion inhibitor that protects against th
ed copper corrosion inhibitor was add
1980 (Betz 1980a).

Scale control in the towers is achieved by adding a dispe
function of the dispersant is to keep small particles of m
cooling water, to prevent the particles from precipitatin

Betz More information is needed re: specific chemicals used and volumes

"Several different corrosion inhibitors were used during this period; however, all are believed to have contained Cr(VI)."

what volumes were used? We would like more information on all Cr corrosion inhibitors which were used.

Response to Comment S2-64(RS_101805_8)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. According to PG&E all of the available information on the Betz products has been provided. Sources include monitoring and inspection reports prepared by Betz, Betz product information sheets, and correspondence between Betz and PG&E. PG&E shall provide additional clarification in the text. See also the response to Comment S2-1.

S2-65

3.0 FACILITY OPERATIONS AND HISTORY

What was done with the blow down water?

ranges from as low as 10,000 gallons per day (gpd) or less on a ... e maximum of 30,000 gpd on a high-load hot summer day operated at the highest number of cycles (14.3 to 17.6 cycles) (Betz 1952a-b). With increasing hardness of the makeup water, ...ased to approximately 5 cycles in the mid-1960s (Betz 1965, 1967b) three to four in the late 1960s (Betz 1969b). In the late 1970s and were in the range of 7 to 8 cycles (Betz 19... approximately 4.5 cycles (Riddle 2004).

"The actual rate of blowdown ... can not be determined." Can it be estimated?

...n from the towers during the 1950s and ...ailable information, which is from 1968, ...as on the order of 48,500 gpd and range... a maximum of 64,300 gpd in the summe... blowdown ranged from about 4,600 to been as high as 11,000 mg/L (RWQCB ...

"The concentration of TDS in the blowdown ranged from..." How were the TDS ranges determined?

... waste stream associated with the cooling water system was sulfuric acid ...c acid sludge was generated in ...ucted of unlined steel, and the ...e steel. About 2,000 pounds of ...hough it is possible that this ... years. The sludge was ... In 1984, new epoxy-lined ...s been generated since that

"the sludge was removed and transported to an approved Class I disposal site." Prior to approx. 1981, there were no approved Class I disposal sites. Therefore, how and where was sludge disposed of?

How much sulfuric acid was used? Volume?

3.1.4 Wastewater Treatment Process

Since generation of waste water has decreased over time, would it be safe to assume that at least 17 mgy for 1961 through 1968?

...d at the compressor station consists primarily of cooling tower ... percent) and a minor volume of oily water from facility operation and ...s (about 5 percent) (PG&E 1993). As described above, wastewater ...ally decreased through time as the cooling water ...ge has ranged from about 17 million gallons per ...harge) to about to 6 million gallons per year in 2...

"Discharge has ranged from about 17 million..." How does this relate to the Cr mass?

Blowdown Treatment

In late 1963 to early 1964, PG&E began treating the chromium-bearin... (wastewater) from the cooling towers (PG&E 1965a). From 1964 thro... was performed using a single-step treatment system. The original sir... an 800-square-foot treatment pond. Based on PG&E documentation (PG&E 1968a) and aerial photographs, the treatment pond was constructed within one of the sludge drying beds (Figure 3-1). In the treatment pond, chromium-bearing wastewater was injected with sulfur dioxide (ferrous sulfide appears to have been used initially but was subsequently replaced with sulfur dioxide) to reduce Cr(VI) to trivalent chromium (Cr[III]) (PG&E 1965b, 1968a). Samples of the effluent from the single-step treatment system contained total chromium (Cr[T]) at concentrations of 13.81 and 14.41 ppm (PG&E 1968a).

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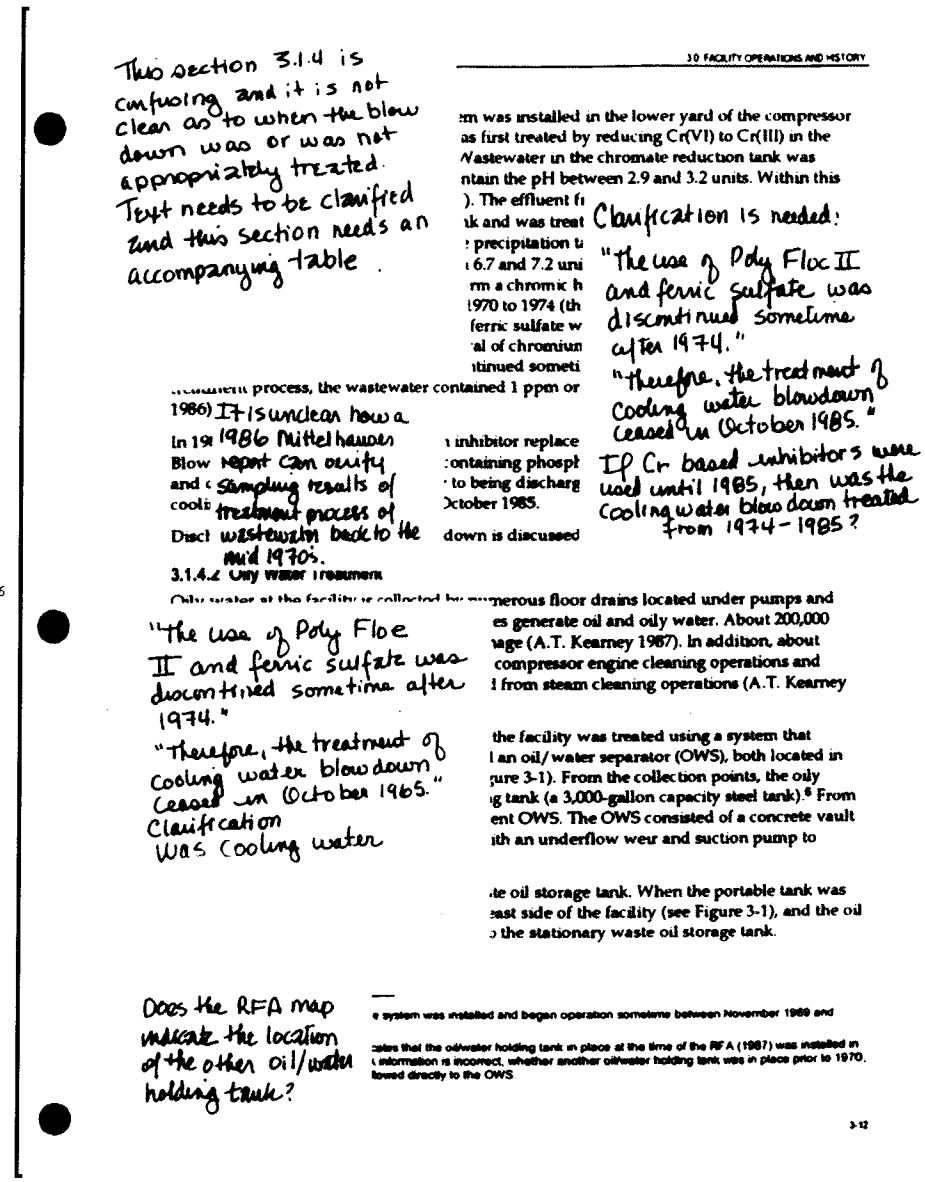
Response to Comment S2-65(RS 101805 41)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt respond to the additional requested information. See also the response to Comment S2-1.



This section 3.1.4 is confusing and it is not clear as to when the blow down was or was not appropriately treated. Text needs to be clarified and this section needs an accompanying table.

3.0 FACILITY OPERATIONS AND HISTORY

...m was installed in the lower yard of the compressor as first treated by reducing Cr(VI) to Cr(III) in the ...Wastewater in the chromate reduction tank was ...ntain the pH between 2.9 and 3.2 units. Within this ...). The effluent fr... ...nk and was treat... ...precipitation t... ...6.7 and 7.2 uni... ...rm a chromic h... ...1970 to 1974 (th... ...ferric sulfate w... ...al of chromium ...ntinued someti...

Clarification is needed:

"The use of Poly Floc II and ferric sulfate was discontinued sometime after 1974."

"Therefore, the treatment of cooling water blowdown ceased in October 1985."

If Cr based inhibitors were used until 1985, then was the cooling water blow down treated from 1974 - 1985?

...treatment process, the wastewater contained 1 ppm or ... 1986) It is unclear how a ... In 19... 1986 Mittelhauser ... inhibitor replace... Blow ... report can verify ... containing phospl... and ... sampling results of ... to being discharg... cooli... treatment process of ... October 1985. Discl... wastewater back to the ... down is discussed... mid 1970s.

3.1.4.2 Oily Water Treatment

S2-66

Oily water at the facility is collected by ...merous floor drains located under pumps and ...es generate oil and oily water. About 200,000 ...age (A.T. Kearney 1987). In addition, about ...compressor engine cleaning operations and ...l from steam cleaning operations (A.T. Kearney ...

"The use of Poly Floc II and ferric sulfate was discontinued sometime after 1974."

"Therefore, the treatment of cooling water blowdown ceased in October 1985."

Clarification Was cooling water

... the facility was treated using a system that ...l an oil/water separator (OWS), both located in ...ure 3-1). From the collection points, the oily ...g tank (a 3,000-gallon capacity steel tank).[6] From ...ent OWS. The OWS consisted of a concrete vault ...ith an underflow weir and suction pump to ...

...te oil storage tank. When the portable tank was ...east side of the facility (see Figure 3-1), and the oil ...o the stationary waste oil storage tank.

Does the RFA map indicate the location of the other oil/water holding tank?

...e system was installed and began operation sometime between November 1989 and ...

...cates that the oil/water holding tank in place at the time of the RFA (1987) was installed in ...information is incorrect, whether another oil/water holding tank was in place prior to 1970, ...lowed directly to the OWS.

3-12

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Response to Comment S2-66(RS_101805_9)

Comment noted. PG&E is not required to address this comment at this time. Section 3.1.4 clearly documents when and how blowdown was treated.

Poly Floc II and ferric sulfate were used to minimize particulate matter in the wastewater which was important while the injection well was being used. Once use of the injection was discontinued, the use of Poly Floc II and ferric sulfate was also discontinued (i.e., after 1974).

The Mittelhauser report (1986) contained copies of laboratory reports of blow down and wastewater samples collected in the mid 1970s. Mittelhauser used these data to identify contaminants of concern for the removal of the wastewater treatment facilities.

The RFI map does include the location of both oil/water holding tanks.

Regional Board Order 69-25 ordered PG&E to cease discharging industrial wastewater by infiltration no later than January 1, 1970 and required any retention of wastewater to be in basins from which no infiltration or surface run-off may occur (RWQCB 1969). In response to this order, PG&E constructed wastewater injection well PGE-08. Injection of wastewater began in May 1970 and continued to August 1973. Records from the time (Dames & Moore 1970) indicate that there were some initial difficulties with the operation of the injection well. From May 1970 to September 1971, some wastewater may have been temporarily discharged to the percolation bed in Bat Cave Wash when injection well PGE-08 was offline for repairs or maintenance.

Pond 1, the first of four single-lined evaporation ponds (i.e., SWMU 10; the Old Evaporation Ponds), was completed September 1971. From September 1971 through August 1973, Pond 1 may have also been used temporarily for the disposal of wastewater when injection well PGE-08 was offline for repairs or maintenance. The 1972 annual report pursuant to Order 70-72 (RWQCB 1970) indicates that a total of 1.6 million gallons of wastewater were discharged to Pond 1 in 1972 (PG&E 1972). This volume constitutes approximately 10 percent of the average annual wastewater volume.[8] Between August a
treated wastewater was discharged alternately on a 3-day cycle betwe
and Pond 1 (PG&E 1973). Beginning in December 1973, wastewater w
to the evaporation ponds. Ponds 2 through 4 were subsequently comp
began receiving wastewater shortly thereafter. Industrial wastewater
compressor station between 1973 and 1989 was discharged to the sing
ponds.

"The volume constitutes approximately 10 percent of the average annual wastewater volume."

Where did the remainder of the wastewater go?

The four single-lined evaporation ponds were replaced by four new, C
evaporation ponds in 1989 (i.e., Ponds #1 through #4). Since 1989, all industrial wastewater from the compressor station has been disposed of at the Class II ponds. The original, single-lined ponds were clean closed in 1993.

S2-67

Discussion of ponds and pond closures need citations.

Sludge
from t
for del
Octob
off site
genera
(PG&E
sludge
May 1985, sludge generated in the precipitation tank
lowdown was transferred
QCB 1970; A.T. Kearney 1
l directly from the precipi
iste. The volume of chrom
stant and averaged about
(PG&E 1984b) indicate the
ams per kilogram (mg/kg).
Soluble threshold limits concentration data for the elutriate der
were reported as 170 mg/L Cr(T) and 0.98 mg/L Cr(VI).

How was the sludge disposed of prior to 1969?

A 1970 letter (PG&E 1970) indicates that PG&E was planning to
sludge on or near the compressor station; however, there is no d
whether this on-site disposal occurred. RWQCB Order 70-73 spe
requirements (location and placement) for the chromium hydro
Landfill was issued on October 29, 1970 (RWQCB 1970). It appe
hydroxide sludge was disposed of at Needles Landfill from that

Does the 1970 letter contain any indication of where they planned on disposing the sludge?

[8] The reported average daily discharge rate at the time was 48,500 gallons, or approxim
(RWQCB 1969)

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Response to Comment S2-67(RS_101805_10)

PG&E shall address this comment by revising the text to indicate that the remainder of the wastewater was injected through PGE-08.

Pond closure citations shall be added.

PG&E shall clarify that little if any sludge was generated prior to 1969 since only a single-step treatment system was used. The single-step system converts Cr(VI) to Cr(III), but does not remove the chromium (i.e., precipitate).

The 1970 letter does not contain any information on where disposal was planned.

1983, although no specific documentation exists for 1971 and 1972.[9] Sludge shipping manifests compiled by PG&E (PG&E 1984c) indicate that a total of 166,500 gallons of sludge were disposed of at the Needles Landfill between 1973 and 1983. Annual volumes shipped varied widely, from 0 to 33,600 gallons, suggesting that there was storage capacity in the sludge drying beds. In response to California Department of Health Services (CDHS) directives (CDHS 1984a), no shipments were sent to the Needles Landfill after 1983 (PG&E 1984b-c). From January 1984 to October 1985, the dried sludge was transported off site to an approved Class I hazardous waste facility (PG&E 1984c; CDHS 1984b).

Although there are non-PG&E references to sludge having been removed from the single-lined ponds (A.T. Kearney 1987; CDHS 1985), it appears unlikely that the facility would have jeopardized the integrity of the pond liner by employing mechanical means of sludge removal. In addition, due to the size and depth of the ponds, it is unlikely that routine removal of sludge would have been required. The "sludge" that would have been present in the ponds would have consisted predominately of mineral salts found in the makeup water and dust blown into the ponds (Riddle 2004). Some solids were found in the ponds and tested as part of an overall sampling program for the wastewater treatment system (Brown and Caldwell 1985a). Based on information obtained from PG&E, it is likely that sludge removal would only have occurred if repairs were required to one of the ponds (Riddle 2004).

Very little sludge, if any, is generated using the phosphate-based cooling water treatment system. The current Class II evaporation ponds were designed for a 20-year life and have accumulated less than 6 inches of residue in the bottom since being placed into service in 1989. Most of the residue currently found in the ponds is dust and sand that has blown into the ponds (Riddle 2004).

Waste Oil. Waste oil removed from the oily wastewater is collected and transported off site for disposal or recycling (additional information on the management of provided in Section 3.1.5.2).

Transported since 1980 by licensed transporter... What happened prior to 1980?

S2-68

3.1.5 Facility and Equipment Maintenance

The fifth major activity at the compressor station is maintenance of the equipment. Typical maintenance tasks include:

- Preventive maintenance of mechanical and electrical systems.
- Mechanical and electrical repairs of operating equipment.
- Minor maintenance of buildings and structures on the property.
- Fueling and servicing of vehicles required for station operations.
- Chemical testing of cooling water.

Equipment maintenance consists of preventive maintenance and repairs for the various mechanical and electrical equipment at the facility. Routine maintenance of small system components occurs on an as-needed basis. Special maintenance tasks consist primarily of compressor engine and generator engine overhauls. Compressor engines are overhauled

[9] Off-site disposal of chromium hydroxide sludge does not appear to have been performed at routine (e.g., quarterly) intervals, but appears to have been performed only sporadically. This suggests that the sludge was stockpiled on site and disposed of only as necessary. This may explain the absence of disposal records for 1971 and 1972.

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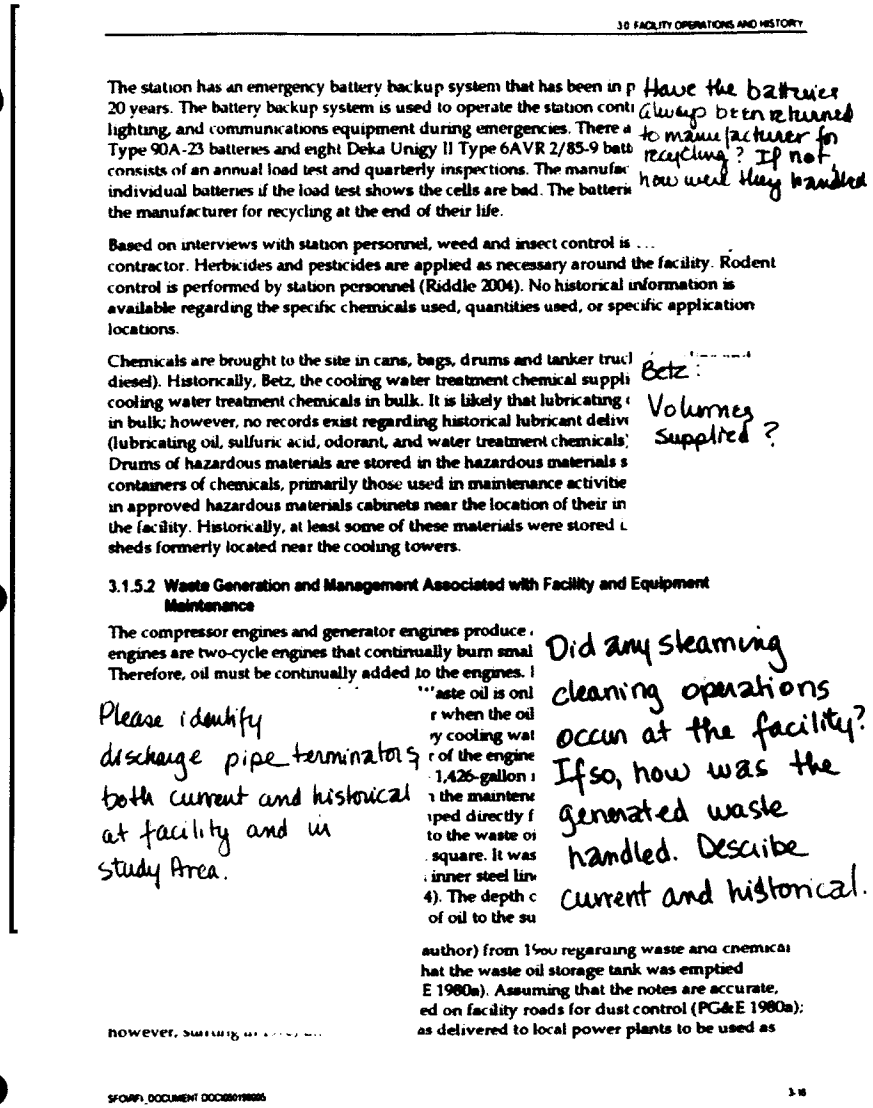
Response to Comment S2-68(RS_101805_29)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to address the additional requested information. See also the response to Comment S2-1.



3.0 FACILITY OPERATIONS AND HISTORY

The station has an emergency battery backup system that has been in p
20 years. The battery backup system is used to operate the station conti
lighting, and communications equipment during emergencies. There a
Type 90A-23 batteries and eight Deka Unigy II Type 6AVR 2/85-9 batt
consists of an annual load test and quarterly inspections. The manufac
individual batteries if the load test shows the cells are bad. The batteri
the manufacturer for recycling at the end of their life.

Have the batteries always been returned to manufacturer for recycling? If not how were they handled

Based on interviews with station personnel, weed and insect control is ...
contractor. Herbicides and pesticides are applied as necessary around the facility. Rodent control is performed by station personnel (Riddle 2004). No historical information is available regarding the specific chemicals used, quantities used, or specific application locations.

Chemicals are brought to the site in cans, bags, drums and tanker truc
diesel). Historically, Betz, the cooling water treatment chemical suppli
cooling water treatment chemicals in bulk. It is likely that lubricating
in bulk; however, no records exist regarding historical lubricant deliv
(lubricating oil, sulfuric acid, odorant, and water treatment chemicals)
Drums of hazardous materials are stored in the hazardous materials s
containers of chemicals, primarily those used in maintenance activitie
in approved hazardous materials cabinets near the location of their in
the facility. Historically, at least some of these materials were stored
sheds formerly located near the cooling towers.

Betz: Volumes supplied?

S2-69

3.1.5.2 **Waste Generation and Management Associated with Facility and Equipment Maintenance**

The compressor engines and generator engines produce
engines are two-cycle engines that continually burn smal
Therefore, oil must be continually added to the engines.
aste oil is onl
r when the oil
y cooling wat
r of the engine
1,426-gallon
the maintena
ped directly f
to the waste oi
square. It was
inner steel lin
4). The depth c
of oil to the su

Please identify discharge pipe terminators both current and historical at facility and in study Area.

Did any steaming cleaning operations occur at the facility? If so, how was the generated waste handled. Describe current and historical.

author) from 1980 regarding waste and chemical
hat the waste oil storage tank was emptied
E 1980a). Assuming that the notes are accurate,
ed on facility roads for dust control (PG&E 1980a);
as delivered to local power plants to be used as

however, starting

SFOAP\ DOCUMENT DOC050199005

3-16

Response to Comment S2-69(RS_101805_11)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to obtain the additional requested information. See also the response to Comment S2-1.

fuel. Since the early 1980s, the waste oil has been removed from the facility by a licensed contractor who transports the oil off site for recycling (PG&E 1983). The facility currently generates a total of about 12,000 gallons of waste oil per year (Riddle 2004).

Other hazardous wastes generated as part of routine maintenance operations such as oily rags, air filters, oil filters, contaminated "dry sweep" (oil absorbent), small quantities of paint, and spent aerosol cans of paint and solvent are accumulated in approved containers in the maintenance work areas. Building and facility maintenance also generates fluorescent lights in addition to the other wastes generated by equipment maintenance. Drums of hazardous waste and spent batteries are stored in the hazardous materials storage area. In the early 1980s, it appears that items such as oily rags, air filters, oil filters, and spent aerosol cans were disposed of with the domestic garbage (PG&E 1980a). Since the early 1980s, all hazardous and controlled wastes have been transported off site to an appropriate disposal facility (McCurdy 2004).

3.1.6 Miscellaneous Operations

Other sources of wastes at the compressor station consist of miscellaneous wastes, standard domestic wastes, chemic

Handwritten notes (PG&
waste, large metal scrap
this document, most em
used at the station or do
300,000-square-foot area
generated each year and
Wrecking.

Domestic waste consist
small metal and wood s
disposed of at the San B
Landfill). Currently, do
disposed of at the Mohz

The compressor station
cooling water is perform
Current testing includes pH, conductivity, concentration of corrosion inhibitors in all four cooling systems, and concentration of scale-control additive in the cooling towers. Test chemicals consist of in

various indicators (PG&E 1974).

Has the facility had a stormwater collection system in place over the years? If not, what happens to the stormwater? Are the stormwater discharge pipes indicated on the site prep map?

Clarify: Has the location of the septic system components changed over the years?

Clarify: What are the components of the septic system? Septic tank? Leachlines? Is there a pump?

Do any facility maintenance buildings have floor drains or the like, that drain into the septic system / leach field?

Clarify: Has the on site laboratory always been in the same location?

Clarify: Does the County permit or inspect the septic system? Historically

S2-70

3-18

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Response to Comment S2-70(RS_101805_24)

PG&E shall clarify in the text that there is no central stormwater collection system for the compressor station. Stormwater is directed off the facility through numerous culverts to surrounding drainages including Bat Cave Wash, the Debris Ravine, and the East Ravine. All of the surrounding drainages either have been, or will be, investigated for potential impacts associated with the compressor station. Including stormwater culverts on the facility map is unnecessary.

PG&E shall provide additional available information on the septic system in the final RFI/RI report.

S2-71

What occurred with the mercury contaminated instruments and associated wastes, prior to the change that occurred in 1996?

...ments (e.g., manometers, thermometers, and flow meters) Compressor Station contained mercury. As part of PG&E's ...ardous materials at the facility, all mercury-containing 996. The work consisted of the draining the elemental mercury e physical removal of all instruments and associated piping ry. The elemental mercury was transported off site for carcasses and other debris was transported off site for disposal f this activity are provided in the *Closure Report for the Removal ents and Piping at PG&E's Topock Compressor Station and Related Facilities* (Trident 1997). An inspection of the facility following the removal confirmed that no other mercury-containing equipment remained at the Topock compressor station (Trident 1997).

3.1.7 Incidental Release History

During the operational history of the compressor station, some incidental releases of chemicals or waste products have occurred. When incidental releases occurred, the proper authorities were notified and the spilt material was cleaned up. Although the investigation and cleanup of incidental releases has not been performed under the RFI, the reporting of releases is required under the terms of the CACA (DTSC 1996). Nine incidental releases have been documented at the facility since 1995, as summarized in Table 3-4. The location of each release is depicted in Figure 3-7. Details of each release are provided below. There is no available documentation regarding releases prior to 1995.

3.1.7.1 October 1995 Mercury Release

During the week of October 16, 1995, a length of gas meter piping adjacent to the east side of the compressor building was being removed to facilitate construction in the area. When the line was cut, metallic mercury (which was unknowingly trapped in the line) was released to an area of exposed soil. The area impacted by the mercury release measured about 18 feet long by 9 feet wide. Initial samples collected from the release area contained mercury ranging from 200 to 12,000 mg/kg.

Between November 20 and December 1, 1995, soil was excavated from the release area. Based on visual observations and interim sampling, the excavation ranged from 2 to 4 feet deep, and it extended laterally over the entire impacted area. When completed, 3,730 pounds of mercury contaminated soil had been removed. The contaminated soil was placed into 55-gallon drums and shipped off site for disposal at the Chemical Waste Management, Inc. facility in Kettleman City, California.

Following excavation, 12 samples were collected from the base of the excavation and one sample was collected from each of the north and south walls. In addition, at the request of the CSBFD, samples were collected on both sides of a wooden form located adjacent to the release area. The results of confirmation samples are summarized in Table 3-5.

The results of the confirmation samples indicate that all mercury exceeding California hazardous waste level, and United States Environmental Protection Agency (USEPA) preliminary remediation goals for both residential and industrial soil had been removed. In addition, a risk assessment performed following the removal action indicated that the

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Response to Comment S2-71(RS_101805_25)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to obtain the additional requested information. See also the response to Comment S2-1.

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S2-72

"In addition, a risk assessment performed following the removal action indicated..."

Citation/Reference needed.

residual concentrations of mercury that remained did not pose an unacceptable treat to human health

i the remediation effort were reported to the CSBFD in 1996
isly indicated, all mercury-containing instrumentation was
in 1996 (Trident 1997). All mercury debris removed from the
ff site for disposal at the Chemical Waste Management, Inc. facility
nia.

Tower Water Release

On Sunday, June 30, 1996, approximately 200 gallons of water from the lower basin of Cooling Tower A overflowed (PG&E 1996b). The overflow entered a facility drain that discharges to Bat Cave Wash. The portion of the wash that was affected by the spill was reportedly on PG&E property.

The overflow was caused by a failure of one of the cooling tower basin level controllers. Scale build-up on the float mechanism of the controller caused it to stick in the "fill" position. As a result, the makeup water line continuously filled the basin until it overflowed. Upon discovering the problem, the facility operator manually closed the makeup water line to stop the overflow. Water from the tower was then pumped to the evaporation ponds to achieve adequate freeboard in the basin.

At the time of the release, cooling water in the tower was non-hazardous and contained phosphate-based corrosion inhibitors. Analysis of cooling samples collected prior to the release indicated an electrical conductivity of 9,000 micromhos and a pH of 7. The conductivity of the released water was thought to be lower due to dilution with the makeup water.

The RWQCB was notified of the release on Monday, July 1, 1996. Surface soil that was contacted by the overflow adjacent to the cooling tower basin and in Bat Cave Wash was removed (PG&E 1996b). Enhanced inspection and maintenance schedules were implemented to avoid recurrence of this incident.

3.1.7.3 August 1998 Cooling Tower Water Release

On August 4, 1998, during a routine daily facility inspection, an operator observed process water being released from Cooling Tower A. The majority of the water flowed onto the soil adjacent to the cooling tower. A small volume of water flowed down the side of the hill into the Bat Cave Wash area. The total release volume was estimated at about 500 gallons. The cooling tower water contained low concentrations of a non-hazardous, phosphate-based corrosion inhibitor. All of the water released evaporated rapidly due to the high summertime temperature. The RWQCB was notified of the incident in a report dated August 11, 1998 (PG&E 1998).

The cause of the release was determined to be a fouled screen associated with a drain return line. The screen was cleaned and the tower was restored to normal operating conditions.

Response to Comment S2-72(RS_101805_27)

PG&E shall provide the citation as requested.

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DTSC was notified on the release by email on March 5, 2004 and in writing in early April 2004. A final report on the release was submitted to DTSC on November 15, 2004 (PG&E 2004).

3.2 Chronology of Major Events

Current operations at the compressor station are very similar to the operations that occurred from the start of facility operations in 1951. However, the compressor station has undergone changes and has been upgraded since it was first constructed in 1951. A chronological summary of the major operational changes at the facility is provided in Table 3-11. Major regulatory agency directives and RCRA corrective action activities performed by PG&E are summarized in Table 3-12.

3.3 Historic Aerial Photographs

Historic aerial photographs were obtained for the area and reviewed to provide information on historic activities at and near the facility, and how activities changed over time. Historic aerial photographs were obtained for the period from 1936 to 1997, which covers the entire period from before the facility was built (i.e., 1951) to recent time. Table 3-13 presents a summary of the information obtained from each of the historic aerial photographs. The aerial photographs are presented in Figures 3-8 through 3-26. Higher-resolution digital copies of the aerial photographs are provided

PG+E began manifesting hazardous wastes/substances offsite in 1980. Please provide a summary table of the materials manifested offsite, including waste code/type and volumes. Of those wastes manifested offsite since 1980, please provide information as to how those wastes streams were handled prior to 1980.

S2-73

Have there been any fires at the Topock facility

Did PG+E burn waste materials at the facility or within the Study Area?

Clarification needed: Do all tanks, sumps, pipelines, and the like, have secondary containment currently? Historically?

Figure 3-1 indicates the location of a "Chromatograph Building" Please describe activity, both past and present.

Figure 3-1 does not appear to indicate the existence of floor drains, either past or present.

Figure 3-1 indicates the location of a "Sand Blast Shelter." Previous RFIs depict a "portable sandblast unit." However, sandblasting is not discussed in this version of the RFI/RI. Please discuss current and historical uses of sandblasting activities, including disposal of waste streams associated with this type of activity.

SFGWP1 DOCUMENT 00085018005

Response to Comment S2-73(RS_101805_26)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E is requested to obtain the additional requested information. See also the response to Comment S2-1.

S2-74

TABLE 3-1
Chemical Products Usage
RCRA Facility Investigation, PG&E Topock Compressor Station, Needles, California

Process/Operation	Approximate Time Period	Products Used	Wastes Generated
Water conditioning	1951 to 1982	Are the Products Used" the same as chemicals brought on site?	Lime sludge
	1982 to present		Spent canisters
Natural gas compression	1951 to present		Oily water, scrubber waste, and condensate
Cooling	1951 to 1985		Wastewater containing metals (primarily chromium) and sulfuric acid sludge[a]
	1985 to present	Phosphate-based corrosion inhibitors, dispersants, and biocides; sulfuric acid	Non-hazardous wastewater containing phosphates
Wastewater treatment	1984 to 1989	Sulfur dioxide	Waste oil
	1989 to 1985	Sulfur dioxide and sodium hydroxide	Waste oil and chromium-bearing sludge
	1985 to present	None	Waste oil
Equipment and facility maintenance	1951 to present	Gasoline and diesel fuel, lubricants, solvents, paint, pesticides, and herbicides	Oily wastewater, waste oil, air filters, oil filters, oily rags, oil absorbent, spent aerosol cans, and spent batteries
Miscellaneous operations	1951 to present	Laboratory test solutions	Scrap metal, domestic garbage, liquid laboratory wastes, and domestic sewage

Notes.
[a] Sulfuric acid sludge generation ended in 1984

Volumes of the wastes generated needs to be included.

Volumes of the hazardous materials used needs to be included.

What about sandblasting waste generated on site?

Mercury wastes are not identified. They were a component of gauges and the like

Fluorescent Tubes?

Fuel waste products?

PAGE 1 OF 1

Response to Comment S2-74(RS_101805_28)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to obtain the additional requested information. See also the response to Comment S2-1.

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S2-75

TABLE 3-2
Waste Generation and Management
RCRA Facility Investigation, PG&E Topock Compressor Station, Needles, California

Process/Operation	Products Used	Wastes Generated	Approximate Time Period	Treated On Site?	Disposition
Water conditioning	Soda ash, lime, and sodium aluminate	Lime sludge	1951 to 1982	No	Exa... dec... Dep...
	Self-contained canisters	Spent canisters	1982 to present	NA	Ren...
Natural gas compression	Odorants (TBM and THT)	Oily water	1951 to 1970	Yes	Bat...
			1970 to 1973	Yes	Injec...
			1973 to 1989	Yes	Single-lined evaporation ponds
			1989 to present	Yes	Double-lined evaporation ponds
	Lubricants	Scrubber waste	1951 to 1970	NA	Collected in Waste Oil Storage tank
		Condensate	1951 to present	No	If PCB concentrations are below 5 ppm, collected in Waste Oil Storage tank. If PCB concentration exceeds 5 ppm, transported offsite as PCB waste.
Cooling	Chromium-based corrosion inhibitors, dispersants, and biocides; sulfuric acid	[illegible]	[illegible]	No	
				Yes	
				Yes	
	...rosion ..., and			Yes	
				No	
				No	
				No	

Please provide volumes for amounts disposed.

Page 3-12 states that "the use of the Poly Floc II and ferric sulfate was discontinued sometime after 1974." Based on this, how can it be stated on this table that cooling water was treated from 1974-1985?

See Sulfuric acid, sulfuric acid sludge, unknown to 1984

Disposition states that the sludge was transported to Class I disposal.

Designation of Class I disposal sites began in? Clarify dates and how waste was handled prior

See Condensate, 1951 to present and disposition

Were PCB regulations in place in 1951? Was condensate tested for PCBs in the 1950s? Please clarify.

Response to Comment S2-75(RS 101805 19)

PG&E shall expand and revise Table 3-2 with available information. PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to obtain the additional requested information. See also the response to Comment S2-1.

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S2-76

TABLE 3-2
Waste Generation and Management
RCRA Facility Investigation, PG&E Topock Compressor Station, Needles, California

Process/Operation	Products Used	Wastes Generated	Approximate Time Period	Treated On Site?	Disposition
Wastewater treatment	None	Waste oil	1951 to present	No	Collected in Waste Oil Storage tank. Possibly used in early years on roads for dust control. Reused (power plant fuel) offsite starting in 1976. Since the early 1980s, waste oil has been transported off site for recycling.
	Sulfur dioxide and sodium hydroxide	Chromium-bearing sludge	1969 to 1983	No	Needles Landfill ᶜ
			1984 to 1985	No	Transported offsite for Class I disposal
Equipment and facility maintenance	Gasoline and diesel fuel, lubricants, solvents, paint pesticides, and herbicides	Oily water	1951 to 1970	Yes	[illegible]
				Yes	[illegible]
				Yes	[illegible]
				Yes	[illegible]
				No	[illegible]
				NA	[illegible]
				NA	[illegible] appropriate regulations
		Spent batteries	1951 to present	NA	Transported off site by contractor/manufacturer

See "oily water," 1951 to 1970. How was oily water "treated" before being disposed of in Bat Cave Wash in 1951? See "condensate", page 1 of 3, Table 3-2. Prior to PCB regulations/requirements, was condensate contaminated with PCBs placed in waste oil storage tank? Was this used on roads for dust control?

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Response to Comment S2-76(RS_101805_20)

PG&E shall expand and revise Table 3-2 with available information. PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to obtain the additional requested information. See also the response to Comment S2-1.

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S2-77

TABLE 3-2
Waste Generation and Management
RCRA Facility Investigation, PG&E Topock Compressor Station, Needles, California

Process/Operation	Products Used	Wastes Generated	Approximate Time Period	Treated On Site?	Disposition
Miscellaneous operations	Laboratory test solutions	Scrap metal	1951 to present	NA	Transported off site for recycling
		Domestic garbage	1951 to present	NA	Needles Landfill
		Laboratory test solutions	1951 to present	Yes[d]	Leach field
		Domestic sewage	1951 to present	Yes[d]	Leach field

Notes:
[a] Some disposal to Bat Cave Wash may have occurred between May 1970 and September 1971 when injection well PGE-08 was offline for maintenance or repairs.
[b] Some disposal to Pond 1 occurred during the September 1971 to August 1973 time period when injection well PGE-08 was offline for maintenance or repairs.
[c] The first batch of chromium-bearing sludge may have been disposed of on site.
[d] Treated via a septic tank.
NA = not applicable.

See "Laboratory test solutions," 1951 to present, "treated" in septic tank?
Clarification needed.

Response to Comment S2-77(RS 101805 21)

PG&E shall expand and revise Table 3-2 with available information. PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to obtain the additional requested information. See also the response to Comment S2-1.

S2-78

TABLE 3-12
Chronology of Major Regulatory Agency Directives and RCRA Corrective Action Activities
RCRA Facility Investigation, PG&E Topock Compressor Station, Needles, California

Date	Event
August 14, 1969	RWQCB adopts Resolution 69-25 requiring PG&E to cease discharging industrial wastewater containing hexavalent chromium by infiltration to Bat Cave Wash.
November 6, 1970	PG&E submits a Report of Waste Discharge to the RWQCB for disposal of industrial wastewater from cooling tower operations into single-lined evaporation pond #1.
December 10, 1970	RWQCB adopts Resolution 70-72 regulating the discharge of treated wastewater into single-lined evaporation pond #1.
December 10, 1970	RWQCB adopts Resolution No. 70-73, regulati Please include Resolution 70-72 in the References sludge at an approved offsite facility (Needles Dump).
September 11, 1975	RWQCB rescinds Resolution No. 70-72 and ad single- lined evaporation ponds (SWMU 10; Old Evapc RWQCB issued a revised Board Order No. 75-! requirement from 2 feet to 1 foot. Also, the Boa wastewater to the Colorado River or to any che In addition, the Board Order specified that chemic culation or evaporation of process wastewater shall be approved to receive these wastes.
August 18, 1980	As required by RCRA, PG&E files a Notification of Hazardous Waste Activity Form with the USEPA for the two-step wastewater treatment system, which included the chromic hydroxide sludge drying beds.
November 17, 1980	PG&E submits a RCRA Part A application to the DTSC covering all hazardous waste management facilities at the compressor station (i.e., the former two-step wastewater treatment system and the four former single-lined evaporation ponds).
April 6, 1981	An Interim Status Document, which outlines the requirements for operation of the Topock Compressor Station as a RCRA hazardous waste facility (USEPA ID No. CAT080011729), is issued by the DTSC to PG&E.
June 9, 1981	PG&E files a Notification of Hazardous Waste Site with USEPA Region 9, pursuant to Section 103 (c) of CERCLA.
March 11, 1983	RWQCB adopts Order 83-29 that rescinds Order 69-25.
December 15, 1982	Pursuant to a request from DTSC, PG&E submits an Operation Plan for the hazardous waste facilities covered by the Interim Status Document.
May 6, 1985	USEPA Region 9 requests that PG&E prepare a Part B Permit Application for the waste treatment units at Topock Compressor Station. After a review of applicable regulations affecting the operation of the hazardous waste management facilities, PG&E submits a notice to the USEPA on September 6 of its intent to decommission and close these facilities (including the four old evaporation ponds).
October 2, 1985	The RWQCB adopts Board Order No. 85-99 for the four for Please include Board Order No. 85-99 in the References ponds, which superseded Board Order No. 75-52. Order No the chromate-based cooling tower water treatment process Phosphate-based inhibitors are in use today.
November 7, 1985	PG&E submits a Closure Plan (dated October 28, 1985) to I and RWQCB. This Closure Plan covered closure of all haza facilities at Topock identified in the Part A RCRA permit app wastewater treatment system (Phase 1 and 2 closure) and t evaporation ponds (Phase 3 Closure)

SF/WP1 DOCUMENT DOC050190005 PAGE 1 OF 4

Response to Comment S2-78(RS_101805_18)

PG&E shall include all RWQCB Resolutions that are cited in Table 3-12 in the references.

TABLE 3-12
Chronology of Major Regulatory Agency Directives and RCRA Corrective Action Activities
RCRA Facility Investigation, PG&E Topock Compressor Station, Needles, California

Date	Event
August 14, 1986	PG&E submits a revised Closure Plan for hazardous waste management facilities at Topock identified in the Part A RCRA permit application.
May 19, 1987	The RWQCB determines that PG&E Topock Compressor Station's old evaporation ponds were not subject to regulation under the California Toxic Pits Control Act.
June 26 and July 10, 1987	The Closure Plan (and subsequent revisions) for closure of the hazardous waste management facilities at Topock identified in the Part A RCRA permit application (the two-step wastewater treatment system and the four single-lined evaporation ponds) is approved by USEPA Region 9 (June 26) and DTSC (July 10).
July 7, 1987	DTSC, RWQCB, and USEPA approve the Closure Plan for the hazardous waste facilities (PG&E receives notification of approval on September 7, 1987).
August 1987	USEPA completes an RFA for the Topock Compressor Station. The RFA identified 13 SWMUs (Units 4.1 through 4.13) through records review, data evaluation, interviews, and a visual site inspection.
January 27, 1988	RWQCB rescinds Board Order No. 85-99 and adopts Board Order No. 88-30, which is revised on March 23, 1988. Revised Order No. 88-30 allows discharge to four Class II surface impoundments.
March 9, 1988	DTSC issued a Stipulation and Order on January 27, 1988 which set forth the agreement reached between DTSC and would trigger upgrading the groundwater monitoring syster evaporation ponds and settling the alleged monitoring defic
November, 1988	PG&E began closure activities of hazardous waste manag identified in the Part A RCRA permit application. Closure a two-step wastewater treatment system consisting of the ch precipitation tank, process pump tank, transfer sump, slud piping were completed in 1990 (Phases 1 and 2). Closure of the four single-lined evaporation ponds could not proceed until new surface impoundments were constructed to replace the old evaporation ponds and the waste had dried sufficiently.
September, 1989	DTSC issues a Report of Violation. This report listed essentially the same groundwater monitoring violations settled by the Stipulation and Order issued March 9, 1988.
July 23, 1990	PG&E submits a Closure Certification Report for clean closure of the facilities in Phases 1 and 2 (the two-step wastewater treatment system) to DTSC, USEPA, and RWQCB.
February 25, 1991	DTSC issues a Corrective Action Order listing the same alleged violations as contained in the previous Report of Violations and the Stipulation and Order.
September to November 1993	PG&E conducts closure construction work at the four former single-lined evaporation ponds.
December 31, 1993	PG&E submits the *Closure Certification Report for the Old Evaporation Ponds* dated December 27, 1993 to DTSC and the RWQCB.
November to December 1994	In response to regulatory agency concerns, additional site excavation work at the four former single-lined evaporation ponds area is conducted.
May 11, 1995	The RWQCB approves the clean closure of the four former single-lined evaporative ponds.
June 26, 1995	The DTSC approves clean closure of the former two-step wastewater treatment system and the four former single-lined evaporation ponds (the former hazardous waste management facilities) and considers these waste management units clean closed.

Please Include Board Order No. 88-30 in the References

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SFONFI, DOCUMENT DOC050190505

S2-78

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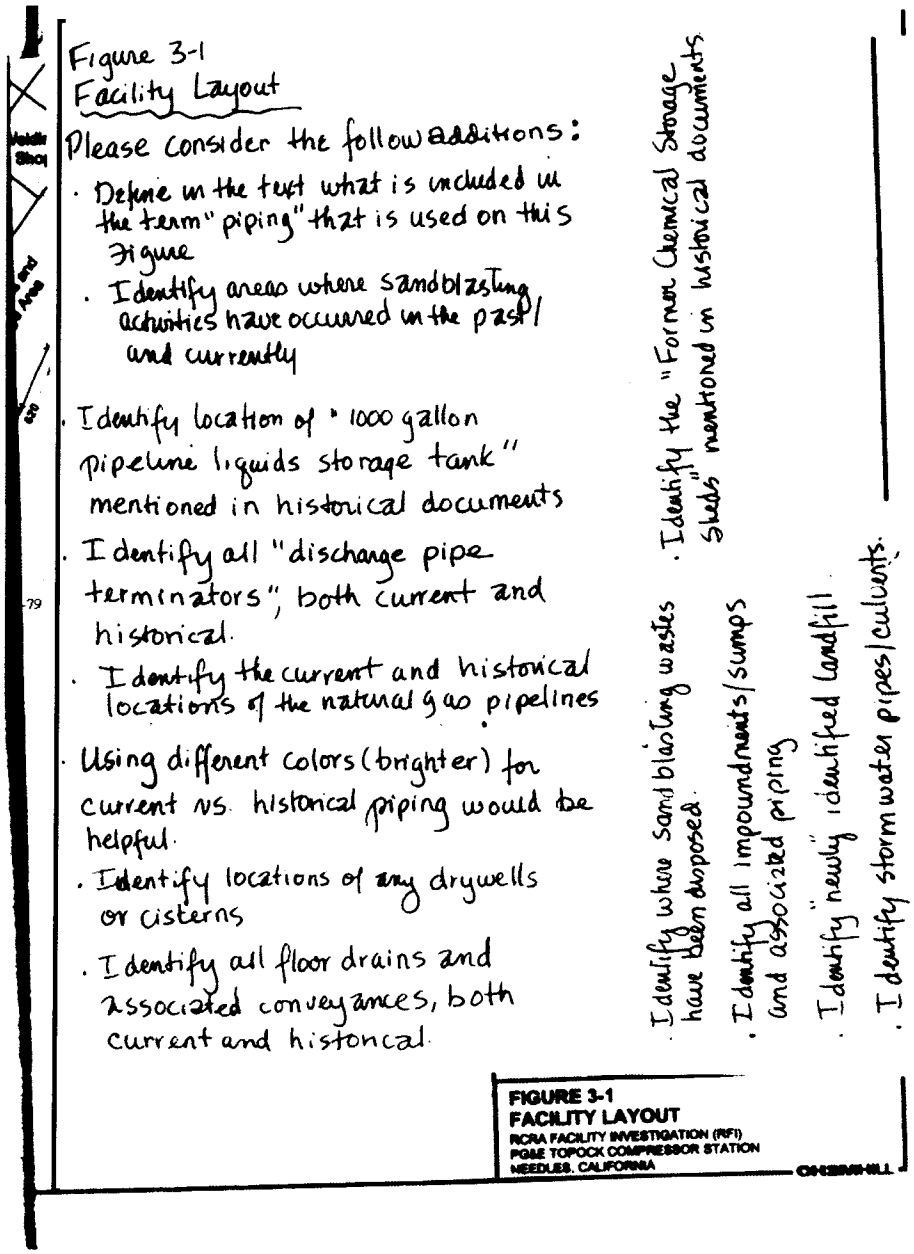
TABLE 3-12
Chronology of Major Regulatory Agency Directives and RCRA Corrective Action Activities
RCRA Facility Investigation, PG&E Topock Compressor Station, Needles, California

Date	Event
August 3, 1995	DTSC submits a letter to PG&E requesting that a Corrective Action Program be conducted at the site.
February 26,1996	PG&E and the DTSC enter into a CACA, whereby PG&E agreed to address past waste discharges at the Bat Cave Wash project site and to conduct an RFI and implement corrective action, if warranted. The CACA identifies 10 SWMUs (SWMU 1 through SWMU 10) and three AOCs (AOC 1 through AOC 3) at the Topock Compressor Station. Eight of the SWMUs identified in the CACA were also identified as SWMUs in the RFA. However, four SWMUs identified in the RFA were not included in the CACA; the CACA combined two of the RFA SWMUs into one SWMU; and the CACA listed two additional SWMUs and three additional AOCs that were not identified in the RFA.
July 2, 1996	DTSC acknowledges the receipt of the Current Conditions Report, RFI work plan, Health and Safety Plan, and Public Involvement Plan.
December 19, 1996	DTSC approves the RFI work plan, Current Conditions Report, and the Health and Safety Plan.
January 12, 1998	PG&E receives, from DTSC, the RFA prepared by A.T. Kearney (August 1987).
February 19, 1998	DTSC approves the RFI work plan amendment per comments given in a February 11, 1998 DTSC memorandum prepared by the Geological Support Unit of DTSC.
May 14, 1998	RWQCB rescinds Order No. 86-30 and adopts Order No. 98-050 regulating the Class II ponds. The Class II ponds are currently regulated u
April 17, 2000	PG&E submits the Draft RFI Report to DTSC.
October 12, 2000	PG&E submits a work plan for additional soils samp 10 potentially-impacted areas associated with the T investigation. The areas were identified through a n interviews with knowledgeable employees, a review reconnaissance within and around the compressor
January 4, 2001	DTSC issues a letter to PG&E indicating that the 1(PG&E's October 12, 2000 work plan are considered AOCs under the RCRA corrective action process.
December 2002	PG&E submits the Draft Corrective Measures Study Work Plan.
June 24, 2003	DTSC approves the Draft Corrective Measure Study Work Plan.
August 11, 2003	DTSC is established as the lead agency for the Topock project at a meeting of the Cal/USEPA Site Designation Committee.
August 2003	DTSC requests that PG&E install a pilot groundwater extraction and treatment system and that the CWG, with representatives from regional, state, and federal agencies, be rechartered.
January 22, 2004	DTSC directs PG&E to prepare immediately an Interim Measures Work Plan to mitigate Cr(VI) detected in monitoring wells near the Colorado River and monitor six monitoring wells along the river floodplain weekly.
February 2004	PG&E submits revised Draft RFI Report to DTSC.
February 9, 2004	DTSC directs PG&E to begin pumping, transport and disposal of groundwater from existing monitoring wells at the MW-20 cluster and monthly surface water sampling at six locations (Interim Measure No. 2).

Please include Order No. 98-050 in the References



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Response to Comment S2-79(RS_101805_22)

PG&E shall add additional available information to Figure 3-1 as available. PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to obtain the additional requested information. See also the response to Comment S2-1.

Response to Comment S2-80(RS_101805_30)

PG&E shall provide additional information on COPCs associated with the oil/water separator as requested

facility maintenance operations (about 5 percent) (PG&E 1993). Based on information from PG&E (1968a), an average of about 48,500 gallons per day of cooling water blowdown were discharged to Bat Cave Wash, with a high of about 64,300 gpd in July and a low of about 25,600 gallons per day in February.

From 1951 until 1964, cooling water blowdown was not treated prior to being released to the wash. The cooling water blowdown contained chromium, including both Cr(III) and Cr(VI). From 1964 to 1969, the cooling water blowdown was treated with a one-step system to reduce Cr(VI) in the wastewater to Cr(III) prior to discharge to the wash. Although the process converted Cr(VI) to Cr(III), the concentration of Cr(T) was apparently not reduced. Concentrations of Cr(T) in the wastewater discharged to Bat Cave Wash, as measured from samples collected in the late 1960s, ranged from 13.81 to 14.41 ppm (PG&E 1968a). Wastewater discharged to Bat Cave Wash also contained high concentrations (4,000 to 11,000 mg/L) of TDS, primarily sodium chloride (RWQCB 1969; PG&E 1993). Beginning in late 1969, cooling water blowdown was treated with a two-step system both to reduce Cr(VI) to Cr(III), as well as to remove Cr(III) from the wastewater prior to discharge to Bat Cave Wash. Following the two-step treatment, Cr(VI) concentrations in the wastewater were generally reduced to below 1 mg/L.

The continuous discharge of wastewater to Bat Cave Wash ceased in May 1970 when injection well PGE-08 was brought online. However, between May 1970 and September 1971, some treated wastewater may have been temporarily discharged to the percolation bed in Bat Cave Wash when injection well PGE-08 was offline for repairs or maintenance.

S2-80

4.1.1.2 Constituents of Potential Concern

The following constituents of potential concern (COPCs) were identified in the CACA (DTSC 1996) for SWMU 1: Cr(T), Cr(IV), copper, nickel, zinc, electrical conductivity (EC), and pH. Although not specified as such, these COPCs appear to be for all media. The following paragraphs present the rationale for the selection of media-specific COPCs for SMWU 1.

During the time frame 1951 to 1970, SWMU 1 received wastewater consisting of cooling tower blowdown and the effluent from the OWS. The wastewater was released to the surface of the wash resulting in impacts to soil. Wastewater also penetrated the soil column and migrated to the water table, resulting in impacts to groundwater.

Cooling tower blowdown during the 1951 to 1970 time period contained Cr(VI)-based products that were added to the cooling water to inhibit corrosion, minimize scale, and control biological growth. In addition, due to evaporation loss in the cooling towers, metals and naturally occurring other inorganics (e.g., sodium chloride) in the cooling water were concentrated. The blowdown may have also been slightly acidic due to the addition of sulfuric acid for pH control in the cooling towers.

The effluent from the OWS is known to have contained entrained heavy hydrocarbons compressor oil and natural gas condensate. Both the compressor oil and condensate are expected to consist of high boiling point straight- and branched-arbons analyzable as TPH. The effluent ma "Volatile compounds" water ever, volatile compounds are not expected released to Bat Cave Wash and are not consi

It is unclear why they are not included as COPCs

Please provide additional info. here. Are we talking about VOCs, SVOCs, total petroleum hydrocarbons?

S2-80

In 1985 and 1986, samples were collected from facility makeup water, cooling water blowdown, treated wastewater (including both cooling water blowdown and oily water), ...e precipitation tank, and water and solids samples from the ...own and Caldwell 1985a-b, 1986). Based on these data, metals of ...), Cr(VI), copper, lead, nickel, and zinc.

Were these samples also tested for VOCs, PCBs and mercury?

..., COPCs for soil with SWMU 1 consist of Cr(T), Cr(VI), copper, lead, ...PH. COPCs for groundwater associated with SWMU 1 consist of ...ead, nickel, zinc, EC, pH, and TPH.

...active Injection Well (PGE-08)

Inactive injection well PGE-08 is located within the facility fenceline in the lower yard on the western side of the compressor station (Figure 4-1).

4.1.2.1 Description and History

Inactive injection well PGE-08 was installed in 1969 to facilitate underground injection of treated wastewater generated during facility operations. The original boring for the well extended to approximately 530 feet bgs (Dames and Moore 1969).[10] Unconsolidated sediments were encountered in the boring to a depth of about 175 feet bgs, and below 175 feet, the boring penetrated hard, fractured crystalline bedrock (Dames and Moore 1969). The original well was cased with 6-inch-diameter solid steel casing to a depth of 405 feet bgs, with the remainder of the borehole in the fractured bedrock being left uncased. Yield tests on the well provided short-term flow rates ranging from 20 to 51 gpm, and a long-term flow rate of about 26 gpm, with a calculated transmissivity of 10,000 gallons per day per foot (gpd/ft) (Dames and Moore 1969). This is equivalent to a hydraulic conductivity of 3.8×10^{-3} centimeters per second (cm/sec) using the open hole length of 125 feet (E&E 2004).

During drilling of the borehole, water level measurements were consistently around 138 feet bgs, indicating that the fractured bedrock network was thorough and that there were no isolated, confined water-bearing zones (Dames and Moore 1969). Water quality data collected following completion of the well indicated that a distinct stratification was present at about 280 feet bgs (Dames and Moore 1969). Above 280 feet bgs, brackish water was present with TDS values ranging from 3,500 to 8,900 ppm. Below 280 feet bgs, water was saline, with TDS values ranging from 11,000 to 14,000 ppm.

Following testing, 2-7/8-inch-diameter tubing was placed inside the well casing and anchored to the bottom of the casing with a packer (Dames and Moore 1969). The annulus between the casing and the tubing was to be filled with a non-corrosive fluid (diesel fuel was suggested, but it is unknown what, if any, fluid was actually used) (Dames and Moore 1969). The design allowed for the injection of wastewater into the lower section of the well through the tubing.

PGE-08 remained unused for approximately one year after it was completed. On or about April 1, 1970, freshwater was injected into the well for testing purposes. Injection of treated wastewater began on May 30, 1970 (Dames and Moore 1970). Several days after wastewater

[10] The Dames and Moore report (1969) lists the total depth of the boring in various places at 530, 540, and 548 feet bgs. The electric log included in the report lists a driller's report of 530 feet, but a logged depth of 525 feet bgs.

was initially injected into the well, the pressure rose dramatically. Hydrochloric acid (HCl) was initially injected into the well (50 gallons of 38 percent HCl) in an attempt to unclog the well. It was subsequently determined that the bottom 15 feet of the well had collapsed.

In June, 1970, the well was cleaned out and deepened to 562 feet bgs. A stainless steel well screen and liner assembly was installed in the well and set at a depth of 405 to 554 feet bgs (Dames and Moore 1970). A high-pressure pump was also installed to increase injection pressure. Well PGE-07 was also deepened at this time and used as a monitoring well during active injection at well PGE-08.

The injection well PGE-08 was used for the injection of tre[a]t[e]d through August 1973. Between August and December 197[3] discharged alternately on a 3-day cycle between the injecti[on] constructed lined evaporation ponds (i.e., SWMU 10, Pon[d] wastewater was permanently routed to the evaporation p[o]nds. PGE-08 has been completely inactive; it has only been use[d] collection.

Historical DTSC documents suggest a greater volume was injected.

S2-81

PG&E estimated that during the injection period (May 19[70] approximately 29.4 million gallons of treated wastewater were injected into this well (PG&E 1987). Approximately 95 percent of the wastewater generated at the facility was from cooling tower blowdown, and the remaining 5 per[cent] oil/water separator and other facility maintenance oper[ations] wastewater sent to PGE-08 for subsurface injection cont[rol] (Mittelhauser 1986).

Were other chemicals other than HCL utilized to keep the injection well functioning? Volumes

4.1.2.2 Constituents of Potential Concern

PGE-08 was used for the subsurface injection of facility [wastewater] injected directly into groundwater at depths exceeding [100 feet] is considered the medium of concern at this SWMU.

There were no significant modifications in the handling and treatment of the cooling tower blowdown and the OWS effluent during the operation of the injection well from 1970 to 1973. Therefore, the COPCs for groundwater associated with SWMU 2 are the same as those for SWMU 1 and consist of Cr(T), Cr(VI), copper, lead, nickel, zinc, EC, pH, and TPH. There are no COPCs for soil.

4.1.3 SWMUs 3 and 4: PG&E Abandoned Well #6 (PGE-06) and Abandoned Well #7 (PGE-07)

PGE-06 and PGE-07 are located on PG&E property to the north of the compressor station (Figure 4-1).

4.1.3.1 Description and History – PGE-06

Well PGE-06 was drilled and completed in June 1964 (Peaker 1964). Due to relatively poor quality of the water extracted from wells on PG&E property, water for the compressor station is derived from wells located on the eastern side of the Colorado River. However, PG&E maintained wells on their property to provide a backup source of water for the facility. PGE-06 was constructed as a replacement for PG&E wells 1 and 2 (also known as

Response to Comment S2-81(RS_101805_31)

PG&E shall clarify the estimated volume of wastewater discharged to PGE-08. Different sources appear to indicate different volumes; therefore, it may be necessary to provide an estimated range.

Comment noted. PG&E is not required to address this comment at this time. A discussion of the chemicals used in association with the injection well is provided in Section 3.1.4.1.

S2-82

4.1.4 SWMU 5 – Sludge Drying Beds

The former sludge drying beds were located within the facility fenceline in the southern part of the lower yard (Figures 4-1 and 4-

Clarification needed:

4.1.4.1 Description and History

The sludge drying beds were constructed station. The two sludge drying beds were bed was approximately 20 feet wide by 50 the upper end at grade level and the lowe floors of both beds were constructed of 8-i to the Transfer Sump (SWMU 9) to facilita

Are the "sludge drying beds" the same as the "waste piles" that are mentioned in historical regulatory documents.

The drying beds were used from 1951 unt by a water conditioning process used at th photographs from the mid-1950s, the dryi also present just south of the sludge dryin; similar are present in those photographs a Section 4.3.1) and what is now called the D that some of the dehydrated lime sludge n the 1951 to 1962 time frame.

From 1964 through 1969, a treatment pond constructed within one of the beds was used to treat chromium-bearing wastewater (PG&E 1968a). Wastewater was allowed to flow through the pond and was injected with sulfur dioxide to reduce Cr(VI) to Cr(III) prior to discharge.

From 1969 through October 1985, the drying beds were used to dehydrate chromic hydroxide sludge generated by the two-step wastewater treatment system (SWMUs 6 through 9) prior to disposal. The chromate hydroxide sludge discharged into the drying beds was found to contain 37,500 mg/kg Cr(T) and 4 mg/kg Cr(VI) (Mittelhauser 1986). The volume of chromic hydroxide sludge disposed of offsite was about 15,000 gallons per year (PG&E 1984b).

A 1970 letter (PG&E 1970) indicates that PG&E was planning on burying the initial batch of sludge on or near the compressor station; however, there is no documentation to confirm whether this occurred. RWQCB Order 70-73 was issued on December 10, 1970 (RWQCB 1970), and it appears that the chromium hydroxide sludge was disposed of at Needles Landfill from that time until 1983. Disposal of the chromium sludge at Needles Landfill was discontinued by 1984. From January 1984 to May 1985, the dried sludge was transported off site to an approved Class I hazardous waste facility (PG&E 1984b).

Use of both sludge drying beds ceased in October 1985. Closure of the drying beds was initiated in December 1988, and most of the beds were removed by February 1989 (Mittelhauser 1990a). In 1995, DTSC issued a closure certification acceptance letter for this unit (DTSC 1995). Additional details on the closure of the sludge drying beds is presented in Section 6.0.

Response to Comment S2-82(RS_101805_32)

Comment noted. PG&E is not required to address this comment at this time. Because the comment does not provide a citation as to where the term "waste pile" is used, DTSC is not able to make an assessment as to whether the terms refer to the same or separate features.

4.3.2 Auxiliary Jacket Water Cooling Pumps

The auxiliary jacket water cooling pumps are part of the auxiliary jacket water cooling system and are located within the facility fenceline north of the auxiliary building (Figure 4-1).

4.3.2.1 Description and History

The auxiliary jacket water cooling system is a closed-loop cooling water system for the generator engines. The pumps are used to circulate the cooling water through the system. Chromium-based cooling water additives were used in this system from 1951 through 1985. In 1985, this system was converted to using non-hazardous, phosphate-based cooling water additives. Incidental leaks and spills have apparently occurred during system maintenance and have resulted in impacts to the soil beneath the pumps.

4.3.2.2 Constituents of Potential Concern

Based on the historic use of chromium-based cooling water additives in this system, COPCs for this site consist of Cr(T), Cr(VI), Cu, Ni, Pb, Zn, and pH. COPCs are anticipated to be limited to soil only.

S2-83

General question: Are pipes used to convey liquids at the site, just in the ground or are they in some sort of encasement or 2ndary containment system? Currently? Historically?

Clarification needed: Were all tanks lined? Were they pressure tested? Did they have tops or covers?

Please describe floor drains in buildings and where they lead to.

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Page 80

Response to Comment S2-83(RS_101805_33)

PG&E has already performed a significant historical information search and has compiled sufficient chemical usage and waste disposal information to support the identification of potentially affected areas and contaminants of concern, and the development of conceptual site models. However, PG&E shall make a reasonable attempt to obtain the additional requested information. See also the response to Comment S2-1.

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S2-84

6.0 SWMUs Closed Prior to the RFI

The closed SWMUs (prior to RFI/RI) need to be re-evaluated based on current guidance and regulatory requirements to ensure that the closed units meet current regular standards for both state and federal requirements.

...e clean closure of six former hazardous waste ...ge Drying Beds (SWMU 5), Chromate Reduction ...7), Process Pump Tank (SWMU 8), Transfer ...onds (SWMU 10). PG&E has also completed ...stem that consisted of the oil/water holding ...ortable waste oil storage tank (Unit 4.5). Details ...ovided below.

Management Facilities

...cilities at the compressor station consisted of ...e old evaporation ponds, and the ...ities was performed in three phases (Phases 1 ...vember 1993 in general accordance with the ...ent *Facilities at the Topock Compressor Station* (Mittelhauser 1986), which was reviewed and approved by DTSC (Mittelhauser 1990a; Trident 1993).

Complete details on the closure of these facilities are presented the documents entitled *Phases 1 and 2 Closure Certification Report, Hazardous Waste Management Facilities* (Mittelhauser 1990a), *Closure Certification Report for the Wastewater Evaporation Ponds* (Trident 1993), and *Closure Certification Report Addendum for the Wastewater Evaporation Ponds* (Trident 1995). These reports include a complete description of all closure activities and contain all data from disposal characterization sampling, disposal manifesting information, and ultimate disposal locations. A closure certification acceptance letter that included all six former hazardous waste management facilities was issued by DTSC on June 26, 1995 (DTSC 1995). The RWQCB also issued a closure acceptance letter for the old evaporation ponds (SWMU 10) on May 11, 1995 (RWQCB 1995).

A summary of the closure activities for these facilities is provided below. This section presents data only for the final confirmatory samples (i.e., representative of final site conditions). Material that was determined to be hazardous waste was transported off site for disposal at the Chemical Waste Management, Inc. Class I Landfill in Kettleman, California. Material that was determined to be non-hazardous was either disposed of off site at a San Bernardino County Class III Landfill (near Barstow), or was used at the facility as fill material.

6.1.1 SWMU 5 (Units 4.12 and 4.13) – Sludge Drying Beds

The two sludge drying beds were formerly located directly adjacent to one another in the southern part of the lower yard (Figure 6-1). Each bed was approximately 20 feet wide by 50 feet long, and the walls and floors of both beds were constructed of 8-inch-thick concrete.

SFO/RFI DOCUMENT DOC[illegible] 6-1

Response to Comment S2-84(RS 110105 72)

Comment noted. PG&E is not required to address this comment at this time. SWMUs that were previously closed were closed in accordance with Work Plans that were reviewed and approved by DTSC and/or the RWQCB. In addition, DTSC and /or the RWQCB reviewed and approved the post-closure reports for these sites and issued letters of approval. As indicated by the cover letter to these comments, DTSC has identified certain closed SWMUs that will be further investigated under the RFI/RI Soil Data Gaps Work Plan.

S2-85

7.0 SWMUs and AOCs Eligible for Closure Without Further Investigation

The SWMUs + AOCs that are suggested for closure without further investigation may require assurances that the past investigations and conclusions met the current federal / state requirements under CERCLA / RCRA.

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without fu ...als
were disp ...sure
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7.1 Sl

SWMU 3 ... s of
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and comp ...or
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groundwater within the wells are related to discharges of wastewater to Bat Cave Wash and do not reflect the disposal of wastes into the wells.

Wells PGE-06 and PGE-07 will continue to be sampled as part of ongoing investigation activities. However, these wells should not continue to be designated as SWMUs and should be closed. Similarly, AOC 3 should also be closed.

7.2 Unit 4.6

Unit 4.6 consists of the waste oil storage tank that is located within the oil and fuel storage area on the eastern side of the facility. The tank is still in active service. The tank is an AST that is routinely visually inspected. In addition, the tank is situated on top of a concrete pad that is bermed on all sides to form secondary containment for the area. The tank and secondary containment were installed in 1951, and no known releases have occurred from this tank.

The waste oil storage tank was modified in 1995 to reduce its capacity from 7,500 gallons to 5,000 gallons. Because the capacity has been reduced to 5,000 gallons, this tank is no longer classified as a RCRA storage facility.

Because there have been no known releases associated with this tank, and the tank is no longer classified as a RCRA storage facility, this SWMU is recommended for closure.

Response to Comment S2-85(RS_110105_74)

Comment noted. PG&E is not required to address this comment at this time. SWMUs that were previously closed were closed in accordance with Work Plans that were reviewed and approved by DTSC and/or the RWQCB. In addition, DTSC and /or the RWQCB reviewed and approved the post-closure reports for these sites and issued letters of approval. As indicated by the cover letter to these comments, DTSC has identified certain closed SWMUs and AOCs that will be further investigated under the RFI/RI Soil Data Gaps Work Plan.

Responses to Arizona Department of Environmental Quality Comments

Draft RFI/RI Report Sections 1 through 8 (excluding geology and hydrogeology)

COMMENTER: ADEQ

S1-5 **ES.5 – page ES-5** In this section for those who are not familiar with the facility layout, history and Solid Waste Management Units (SMWUs) it would be helpful to refer to the Figure 4-1, that shows the SWMUs.

RESPONSE: PG&E shall either add a new figure to the Executive Summary, or add text referring the reader to Figure 4-1 as requested.

COMMENTER: ADEQ

S1-6 **ES.9.2 page ES.9** Please provide a rough estimate of the volumes of treated cooling tower blowdown injected into PGE08.

RESPONSE: PG&E shall provide the estimated volume of wastewater discharged to PGE-08 in Section ES.9.2 as requested.

COMMENTER: ADEQ

S1-26 **Section 3.1 Current and Historic Operations** ADEQ suggests that information regarding ownership of the land by State of California would best be shared earlier in the RFI. It is somewhat lost and buried in the later pages of the RFI.

RESPONSE: PG&E shall add information on historic land ownership to the Executive Summary and Section 1.1.2.

COMMENTER: ADEQ

S1-27 **Section 3.1.1 Water Conditioning Process** – The annual rates of groundwater supplied by the City of Needles Topock wells (in Arizona) should be provided as part of this section. This data is available and has been provided to DTSC and Hill by ADEQ. This information is not only relevant to the water conditioning process, but also to receptors and transport mechanisms.

RESPONSE: PG&E shall add information on rates of groundwater supply as requested.

COMMENTER: ADEQ

S1-28 **Section 3.1.4.1 Cooling Water Blowdown Treatment, Fifth Line** – it should be clarified here that the sludge drying beds were constructed of concrete. Were there joints in the concrete?

RESPONSE: PG&E shall clarify that the Sludge Drying Beds were constructed of concrete, and that the exact design and construction details of the beds are unknown. Therefore, the presence and location of any joints is unknown.

COMMENTER: ADEQ

S1-29 Page 3-12 end of first paragraph – it might be clearer to revise this sentence to read "It is estimated that wastewater treated in the two step process contained 1 ppm or less of chromium." Please provide supporting information such as the frequency of testing, methods for sample collection, analytical methods and analytical results used to determine the resulting chromium concentration.

RESPONSE: PG&E shall provide additional information on chromium concentrations and sampling frequency (if available).

COMMENTER: ADEQ

S1-30 **Section 3.1.4.4 Wastewater Disposal First Paragraph, last sentence** "The light colored flow does not extend beyond the railroad tracks." This sentence, in conjunction with previous sentences, implies that discharge to Bat Cave Wash did not extend beyond the railroad tracks during a 20 year record. Please qualify this statement by providing the number of aerial photographs that were reviewed for this time period. It might be more accurate to say "___aerial photographs for the period 1951 to 1970 were available and reviewed by Hill. In the photographs that were reviewed, the light colored flow in Bat Cave Wash did not extend beyond the railroad tracks. However, only a limited number of aerial photographs were available and it is possible that discharge in Bat Cave Wash could have extended further downstream beyond the railroad tracks during periods in between aerial photograph (Table 3-13)."

RESPONSE: DTSC understands that a total of 11 aerial photographs taken between 1951 and 1970 were reviewed. None of the photographs show discharge extending beyond the railroad track over-crossing. Based on this evidence, it does not appear likely that discharge routinely (or possibly ever) extended beyond this point. . PG&E shall add text detailing the number of photos and time period as requested and shall add text to end of last sentence "... in any of the aerial photographs reviewed."

COMMENTER: ADEQ

S1-31 Page 3-15 – the estimated volumes injected into PGE08 should be clearly stated at the top of the page and in all places in the RFI that mention the volume. What was the volume? The RFI implies different volumes in different places and the estimated volume is never really clearly stated. The RFI should provide the upper end of the estimated volume, assuming wastewater was not diverted to other locations, and the estimated volume, assuming that 10% was redirected to Pond 1. See later comments on this subject. A total of 16 million gallons is implied by the sentence that reads "indicates that a total of 1.6 million gallons of wastewater were discharged to pond 1 in 1972. This volume constitutes approximately 10 percent of the average annual wastewater volume."

RESPONSE: PG&E shall clarify the estimated volume of wastewater discharged to PGE-08. Different sources appear to indicate different volumes; therefore, it may be necessary to provide an estimated range.

COMMENTER: ADEQ

S1-32 Sludge Disposal, page 3-15 – The design of the sludge drying beds should be provided here. Cement lined? Etc.

RESPONSE: To the extent it is available, PG&E shall provide information on the construction of the drying beds (i.e., concrete) as requested.

COMMENTER: ADEQ

Figure 3-2 Location of Water Production Wells. Please add in details regarding the dates that PGE-1 and PGE-2 were abandoned. This figure should be expanded to include the Serrano well, which may be pumping at a fairly great rate. A flow meter will be installed in this well in July 2005 to collect water usage data.

S1-33 It would be helpful to add notes regarding the dates of PG&E usage to the figure for the City of needles Topock Wells and abandonment dates for the former ATSF/Southwest Gas wells.

Also please add notations so that it is clear that these wells are City of Needles Topock 2, 3 and 2A (compared to EPNG Topock 1 and 2). (In general, Hill has developed their own names to wells that were already named by well owners.)

RESPONSE: PG&E shall provide the dates of abandonment for wells PGE-1 and PGE-02.

Comment noted. PG&E is not required to address this comment at this time. This figure supports text in Section 3.1.1 that discusses the use of water at Topock Compressor station and depicts those wells that supplied water to the compressor station; therefore, inclusion of the Serrano well is not appropriate.

PG&E shall change the title of the figure to clarify its narrower focus, (i.e., "Location of Topock Compressor Station Water Supply Wells").

PG&E shall add additional notes to the figure as appropriate to clarify usage dates and well identification.

COMMENTER: ADEQ

S1-34 **SWMU – Former Percolation Bed Section 4.1.1.1 Description and History page 4-3** Second Paragraph – Please provide supporting information such as the frequency of CTBD testing, discharge sampling, and results.

RESPONSE: Comment noted. PG&E is not required to address this comment at this time. Existing results for cooling tower blowdown and wastewater discharge were included in the RFI/RI Report.

COMMENTER: ADEQ

4.1.2 SWMU 2 – Inactive Injection Well PGE08, page 4-4 Aquifer testing was performed on this well by Dames and Moore (1969). This well is screened in bedrock. Results of testing (transmissivity of 10,000 gpd/ft2) should be included in the previous sections discussing aquifer properties in the bedrock aquifer.

Information presented in this section regarding water levels observed during drilling suggests possible communication between the alluvial aquifer and the bedrock aquifer.

S1-35 *Volumes Injected* - Here an estimated total volume of 29.4 million gallons of wastewater were injected to PGE08, which is screened in bedrock. How was this number calculated? Previously in this document, an average rate of 48,500 gpd of CTBD was stated (page 3-11) and an average rate of disposal of 16 million gallons per year (page 3-15) was stated. Using this average rate, an estimated 17.7 million gallons per year would have been injected – assuming no diversion to Pond 1 (a worst case estimate?), over a three year period. If 10 percent was diverted to Pond 1 that would be approximately 15.99 or 16 million gallons per year. Please provide support for the 29.4 million gallons total, which is inconsistent with 16 million gallons per year. It would be beneficial to use the same number throughout text and to clearly state what the number represents and how it was determined.

RESPONSE:
Comment noted. PG&E is not required to address this comment at this time. The first two comments will be addressed in future volumes of the RFI/RI that deal specifically with hydrogeology.

DTSC understands that the total volume of blowdown (which constitutes 95% of the wastewater) discharged for any given day, month, or year is difficult to estimate because the volume discharged varied on a daily basis depending on load (i.e., how much gas was compressed), ambient temperature (hotter temperatures result in increased blowdown), and other operational factors. In addition, it appears that overall annual blowdown rates decreased over the years. The first recorded blowdown rate was for 1968 that indicated an average of 48,500 gallons per day (gpd) or roughly 17.7 million gallons per year (gpy). Currently, the station only produces about 6 million gpy. The 29.4 million gallon total for discharge to PGE-08 over the period from May 1970 to December 1973 comes from an Injection Well Statement provided by PG&E to the RWQCB in 1973. PG&E is requested to clarify discharge volumes (to the extent possible) in all sections.

Document Reviewed: Draft RFI/RI Report

Commenter: Luce Forward and Hargis & Associates for Ft. Mojave Tribe

Date: July 7, 2005

COMMENTER: Luce Forward

LO1-7

Environmental Standards and Requirements of Tribes Are Also Potential ARARs

In addition to the ARARs mentioned above, tribal laws and regulations are also potential ARARs. CERCLA Section 9626 provides that the "governing body of an Indian tribe shall be afforded substantially the same treatment as a State" with respect to many CERCLA provisions including notification (Section 103(a)), consultation on remedial actions (Section 9604(c)(2)) and roles and responsibilities under the National Contingency Plan (Section 9605)).

Further, criteria under the National Contingency Plan include "relative risk or danger to the public health or **welfare** or the environment." (e.g., 42 U.S.C. § 9605(a)(8)(A))(Emphasis added.) Thus, the welfare of the Tribes, including the impact on their cultural, spiritual and religious practices, must be taken into consideration in a CERCLA cleanup.

Finally, as the DTSC is the lead agency for a combination RCRA/CERCLA cleanup, DTSC should also be aware of the responsibilities of federal agencies for the management of cultural resources. A full review of those responsibilities would not be feasible in this comment letter. However, attached hereto is a February 23, 1990 US Department of Energy ("DOE") Memorandum that succinctly summarizes the federal responsibility for management of cultural resources. ("Management of Cultural Resources at US Department of Energy Facilities," February 23, 1990.) You will note that the cited statutes and regulations apply to all federal agencies, not just DOE.

While the State does not have jurisdiction over the involved federal agencies, the State may have similar responsibilities as it is implementing its RCRA program in lieu of federal RCRA. At the very least, DTSC must take the responsibility as the lead agency to affirmatively encourage and monitor federal agencies in exercising their responsibilities properly. Failure of federal agencies to do so runs the risk of creating legal challenges that might delay DTSC's implementation of any chosen remedy. DTSC need look no farther than the implementation of Interim Measure No. 3 to recognize the serious consequences of a failure to consult with Tribes and to accord appropriate legal and moral respect to Tribal cultural and spiritual resources.

Given the overwhelming cultural and spiritual significance of this site location, the individual and cumulative effects of remedial alternatives on tribal welfare and tribal cultural and natural resources has been, and will continue to be, significant. Some potential impacts may also be

unmitigable. Standards and requirements can only be determined through consultation: Only the knowledgeable Tribal authorities, not archaeologists, can provide the information necessary to determine the nature and scope of, and impact to, a sacred place. Such consultation must be conducted before implementing an on-site response action to allow planning to avoid or minimize impacts on cultural resources.

Overall, the RFI fails to show any compliance strategy for these and, perhaps, other ARARs. DTSC must timely and meaningfully consult with the Fort Mojave Indian Tribe and other tribes of the Lower Colorado River (including the Chemehuevi, Colorado River Indian Tribes, Quechan and Cocopah) to establish ARARs consistent with the National Contingency Plan. The RFI also fails to set forth any plan to develop and implement a process to gather data relevant to those ARARs, so that remedial alternatives may be adequately and timely considered.

LO1-7

RESPONSE: Comment noted. No specific changes to the site history sections of the RFI/RI report are required in response to this comment. The identification of ARARs will be included in a future document, and this comment will be considered at that time. Compliance with ARARs will also be considered in remedy selection.

COMMENTER: Luce Forward

LO1-8 **Comments on RFI References to Consultation/Communication with Tribes**

ES.1 Overview

First, nowhere does the RFI reference the Topock Maze as a sacred place to native peoples. This oversight must be corrected and reference must be made in the overview for the benefits of all readers. Elsewhere in the RFI (e.g. Section 2.7 Cultural Resources) the significance of the Maze should be addressed in greater detail without revealing information confidential to the tribes.

Second, the overview notes that there are "three Indian reservations located within 35 miles of the facility: Chemehuevi Indian Reservation, the Fort Mojave Indian Reservation and the Colorado River Indian Reservation."

COMMENT: No rationale is provided for a 35-mile limit relating to the location of Native American reservations. Rather than a seemingly arbitrary distance, DTSC should consider the interests of Native Americans related to the Topock area. Such a definition is needed to comply with the development of ARARs, as discussed above, and to ensure adequate input from Tribes as involved governments and stakeholders.

DTSC needs to ensure that the interests of the all tribes are taken into account, including members of the 5 Tribe Coalition of the Lower Colorado – the Fort Mojave Indian Tribe, the Chemehuevi Indian Tribe, the Colorado River Indian Tribes, the Quechan Indian Nation, and the Cocopah Indian Tribe. All members of the 5 Tribe Coalition have a spiritual connection and interest in the Topock area. While some other tribes may look to the Fort Mojave Indian Tribe, which has the primary stewardship of this area, as the lead in representing the combined interests

of the 5 Tribe Coalition on some issues, DTSC needs to ensure consultation is offered to each of the Tribes.
LO1-8

RESPONSE: PG&E should consider revising the Executive Summary and Section 2.7 to include additional information on the prospective of the Fort Mojave Tribe related to the Topock Maze.

PG&E shall revise Section ES-1 and Section 2.7.2 to identify the nine tribes in the project area.

COMMENTER: Luce Forward

1.4 Opportunities for Public Involvement

This section states that DTSC has "an extensive public outreach program addressing cleanup activities . . . [to] include hosting numerous meetings, briefings and site tours for elected officials; federal, state, county and city agency staff; and local tribal leaders."

LO1-9 COMMENT: This reference is misleading as it lumps together all outreach efforts and may mislead the reader to believe that all entities receive the same level of information at the same time or at each step in the process. For example, a briefing on the compressor station does not mean that details of the Interim Measure No. 3 proposal were discussed or that consultation in fact occurred. As expressed in the implementation of Interim Measure No. 3, agencies admitted mistakes were made; and tribal leaders were not meaningfully and timely consulted prior to decisions being made. See more detailed comments below regarding sections 1.4.1, 1.4.3, 1.4.5, and 1.4.6.

RESPONSE: Extensive documented public outreach activities have occurred. However, PG&E shall revise section 1.4 of the RFI/RI to include a reference to the reader referring them to the Public Participation Plan for the project.

COMMENTER: Luce Forward

LO1-10

1.4.1 Consultative Workgroup ("CWG")

This section also states that "DTSC has extended an invitation to other tribal governments to join the CWG. DTSC sends all CWG correspondence to the following additional tribes: . . ."

COMMENT: The Fort Mojave Indian Tribe appreciates receiving all CWG correspondence. It is also appropriate that all of the tribes of the 5 Tribe Coalition receive that information.

However, as discussed more fully below and in separate comments submitted to DTSC on its Public Participation Plan, the CWG should not be confused with the need for consultation with the Tribes. The CWG process may be effective in providing a forum for discussion and resolution of various technical matters or project activities, but it is not an appropriate process or forum to address certain spiritual and cultural concerns of the Tribes and cannot substitute for ongoing project consultation at the policy level.

Also, DTSC needs to understand that at least two distinct levels of consultation are required. First, as this is a federalized project (i.e., involves federal lands, RCRA and CERCLA), there is a need for government-to-government consultation on the project as a whole. Second, there is a separate need for specific consultation on cultural resources, e.g., consultation under Section 106 of the NHPA (see above comments regarding ARARs and below at Section

1.4.6 Sovereign Nation Briefings). The RFI report should be revised to acknowledge these consultative requirements apart from other public participation and outreach efforts.

LO1-10

RESPONSE: PG&E shall revise Section 1.4 of the RFI/RI to indicate that formal Section 106 consultation is the responsibility of and is conducted by Bureau of Land Management. In addition, the reader shall be referred to the revised Public Participation Plan for the project.

COMMENTER: Luce Forward

LO1-10

1.4.3 Community Assessments

"Public preferences expressed during these community assessments will be summarized in the updated *Public Participation Plan*, to be published by DTSC in early 2005. However, DTSC will respond to public requires at any time and is continuously incorporating feedback from Indian tribes, other stakeholders and the public throughout the course of the corrective action process."

LO1-11

COMMENT: The participation of interested members of the public must not be confused with the requirement to consult with the Indian tribes. As DTSC is aware, the Tribe has submitted, under separate cover, more detailed comments on the *Public Participation Plan* regarding the need for a separate process of consultation with tribes.

RESPONSE: Comment noted. No additional revisions are required by PG&E.

COMMENTER: Luce Forward

1.4.5 Site Tours

"During the January 2003 interviews, local sovereign nation officials requested a tour of the compressor station. DTSC and PG&E responded to this request by hosting members of the Fort Mojave, Chemehuevi, and Colorado River Indian Tribes at a site tour in April 2003. DTSC and PG&E brought tribal representatives up to date on the status of the investigation and the facility superintendent guided them through the compressor and compressor station grounds. Between January 2003 and June 2004, DTSC and PG&E have held an additional four site tours at the facility to brief elected officials, members of the CWG, and tribal representatives on project plans and implementation, including various aspects and stages of the Interim Measures. DTSC and PG&E will continue to host site tours as the project progresses."

LO1-12

COMMENT: This section again misleads the reader by lumping tours with different people and purposes into one paragraph. While site tours may be informative in providing information to the tribes on various aspects of the project, these site tours did not fulfill the requirement for timely and meaningful consultation with the tribes. DTSC should now understand that communicating information to the tribes is different than formal consultation with the tribes in which tribal concerns are communicated to and understood by DTSC or other cognizant government agencies. Tribal concerns regarding design and implementation were not adequate elicited or considered in the Interim Measures process. Recent, confidential communications with DTSC, in the context of discussions to settle pending litigation, suggests to the Tribe that the process will be amended in the future to consider tribal interests through timely and meaningful consultation.

RESPONSE: Comment noted. No additional revisions are required by PG&E.

COMMENTER: Luce Forward

LO1-13

1.4.6 Sovereign Nation Briefings

"DTSC and PG&E are committed to keeping the members and leaders of local Indian tribes informed. DTSC and PG&E have met regularly with staff and members of the Fort Mojave, Chemehuevi and Colorado River Indian Tribes. In July 2004, DTSC and PG&E also briefed the Cocopah and Quechan Indian Tribes. These five tribes comprise the Five River Tribe Coalition; at the request of the coalition, DTSC and PG&E will meet regularly with the full coalition as the project moves forward. Additionally, government-to-government consultations were conducted in August and early September 2004 by the BLM with the above listed tribes, as well as with the Havasupai, Hualapai, Torres-Martinez Desert Cahuilla, and Yavapai-Prescott Indian Tribes and the Twenty-Nine Palms Band of Mission Indians. DTSC and PG&E will continue to keep tribal leaders informed of project progress, and participate in government-to-government consultations as requested."

COMMENT: While briefings to the tribes can be useful, they are not a substitute for formal consultation. Please refer to comments on Section 1.4.5 regarding the need for formal consultation.

Contrary to the statement in the RFI that "government-to-government consultations were conducted . . . with the [Five River Tribes Coalition]," BLM failed to initiate timely government-to-government consultation with the tribes, prior to decisions being made by DTSC and other agencies. Rather than engage the tribes in direct; two-way communication regarding tribal interests, BLM only sent letters and reports to the tribes requesting comment within 30 days or the tribe's concurrence would be assumed. BLM breached, among other obligations, its fiduciary duty to identify and to protect tribal interests, its NHPA Section 106 consultation obligations and its duties to conduct meaningful government-to-government consultation with the tribes. The record is undeniably clear that BLM invested a tremendous amount of time and effort in protecting its own environmental and land management interests and did little or nothing to understand and protect the spiritual and cultural interests of the tribes.

As discussed briefly above, DTSC needs to look no farther than the siting of the Interim Measure No. 3 facilities in a place sacred to the 5 Tribe Coalition to confirm the glaring inadequacy of BLM in fulfilling its fiduciary and consultative obligations. Much like a court can require an agency to meaningfully exercise its discretion without deciding how that discretion is exercised, DTSC, as the lead agency for the Topock cleanup, must ensure that BLM and other federal or state agencies have in fact engaged in timely and meaningful consultation with the Tribes.

In *Pueblo of Sandia v. United States, 50 F. 3d 856 (10th Cir. 1995),* the court held that an agency must make a "reasonable effort" to consult with Tribes in order to take into account the effect of an undertaking on National Register eligible properties. In that case, the Forest Service mailed to the Pueblo a letter asking for the specific locations of sites known to traditional cultural practitioners, to be mapped to a scale of 1:24,000 or better, together with information on the activities practiced, the specific dates, as well as documentation of the of the historic nature of the property. The Forest Service also attended meetings of the All Indian Pueblo Council and informed the Pueblo of the plans for road construction through the canyon. At those meetings the agency was informed that there were sites in the area of potential effect, but this information was not acted upon as it lacked the specificity desired by the agency.

The court found that the information desired by the agency exceeded the level of specifically required in order for the agency to initiate identification of historic properties and exploration of tribal cultural concerns, in consultation with the tribes. Further, the court noted that the occurrence of cultural practices in the area was well known, including the use of certain paths and sites within the canyon. The court held that, where there is a reasonable likelihood that traditional cultural properties are present in an area, the agency is obliged to make a reasonable effort to identify those properties, and found that it had not done so in this case. The court specifically stated that a "good faith" effort to identify such properties would have included consultation with the Pueblos beyond the initial letter and briefing.

It is important to note that the key elements of consultation identified by both the court in *Pueblo of Sandia* and the Secretary of the Interior's Standard and Guidelines are direct interaction and an exchange of views. That an agreement is reached may be the desired result, but the essential attributes of consultation are found in respectful, direct communication. *Pueblo of Sandia* affirms the opinion of many legal experts, that a letter inviting consultation followed by a briefing given to Tribes by the agency does not constitute consultation.

LO1-13

RESPONSE: Comment noted. No additional revisions are required by PG&E.

COMMENTER: Hargis&Associates

T1-1 **RCRA/CERCLA PROCESS**

While we understand that the RFI report is intended to fulfill requirements attendant to a State regulatory process, we find that, under the circumstances of its issuance, the RFI Report does not adequately address certain issues that are most critical to the Tribe. In particular, the RFI Report comprises a presentation of the results of a Facility Investigation pursuant to the Resource Conservation and Recovery Act ("RCRA"). PG&E has further attempted to accommodate the essential contents of a remedial investigation ("RI") report as required under the Federal Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"). Although it is efficient to streamline these documents, to the extent their content is equivalent, this timeline economy is being conducted at the expense of adequate consideration of the Tribe's interests as a stakeholder.

Specifically, the Tribe believes that the rush to implement Interim Measures ("IMs") has subverted full and proper comparison and evaluation of the IMs that would relate to other viable alternative corrective actions. Under a traditional timeline, the RFI/RI reports, once accepted by the agency, would be followed by a RCRA corrective measures study ("CMS") or CERCLA feasibility study ("FS"). This is acknowledged by PG&E on page 1-5 of the RFI Report, which states:

> "Simultaneously with RFI investigations and IM activities, PG&E has continued to collect information and preliminarily evaluate remedial technologies for the Topock site that will be presented in the CMS. Corrective measure alternatives for groundwater to be evaluated in the CMS will likely include monitored natural attenuation; hydraulic control such as through groundwater extraction and/or a bentonite slurry wall; phytoremediation; *in situ* treatment through chemical and/or biological reducing agents; and *ex situ* treatment through chemical or biological reduction, ion exchange, coagulation/microfiltration or reverse osmosis." [Emphasis added.]

With full understanding that our water supply and in-stream resources in the Colorado River must be protected from potential degradation, the Tribe believes that DTSC's and PG&E's haste to implement IMs resulted in their overlooking potentially viable alternatives that would have
T1-1 better protected other Tribal interests.

RESPONSE: Comment noted. No changes to the RFI/RI are required to be made by PG&E in response to this comment. The information in Section 1.2.1 and 1.2.2 on the Interim Measures and the Corrective Measure Study is provided to the reader as general information on the status of the project appropriate for an introduction section of the RFI/RI report. Rationale for selection of Interim Measures and Corrective Measures is outside the purpose of an RFI/RI report.

COMMENTER: Hargis&Associates

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APPLICABILITY OF NATURAL ATTENUATION

Based on H+A's review of the available data, the Tribe believes that there are compelling reasons to believe that the natural attenuation capacity of the aquifer at the Topock Site may be sufficient to at least serve as a component of the site remedy. Field evidence supporting natural attenuation of hexavalent chromium ("Cr(VI)") in the aquifer is strong. This evidence is both reported and discussed throughout the RFI Report. For example:

Reducing Conditions Associated with Fluvial Sediments (p. 2-14) – This section discusses contrasting oxidation-reduction potential ("ORP") within the alluvial and shallow fluvial zones of the Alluvial Aquifer. Whereas oxidizing conditions are typical of groundwater in wells completed in the alluvial zone, conditions in the shallow fluvial groundwater tend to be reducing. The presence of reducing conditions is further corroborated by the ORP of various ion radicals of nitrogen, iron, and manganese. The text further states that:

> "The reducing conditions observed in the floodplain sediments are likely caused by microbial breakdown of the organic carbon present in these shallow fluvial deposits. These reducing conditions in the fluvial deposits play a key role in the attenuation of hexavalent chromium . . . ."

Fate and Transport of Chromium (p. 13-10/11) – This section assembles available information on the behavior of both Cr(VI) and trivalent chromium ("Cr(III)") species in groundwater at the Topock site. It is ultimately concluded that:

> "... though elevated Cr(VI) exists in deep floodplain groundwater, there is no evidence that Cr(VI) is discharging to the river. In fact, available evidence strongly suggests that Cr(VI) is being removed from the groundwater by a blanket of reductive fluvial sediments ..." [Emphasis added.]

These conclusions are supported by independent technical literature for other sites that indicate the reduction of Cr(VI) to Cr(III) in natural systems. For example, Palmer and Puls (1994)[1] discuss the ability of aquifers to naturally attenuate Cr(VI) by reduction in the aquifer. Potential reductants include reduced iron, manganese, sulfur, and nitrogen species, and total organic carbon ("TOC") present in both soil and groundwater. On a mass basis, however, soil has been shown to be more important than groundwater in reducing concentrations of Cr(VI).

Reduced metal species such as divalent iron ("Fe(II)") do not usually exist at high concentrations in soils in aerobic aquifers. TOC concentrations within the aquifer matrix, however, can provide a conservative estimate of an aquifer's capacity for reducing Cr(VI) chromium. Along these lines, Barcelona and Holm (1991)[2] calculated the reduction capacity of aquifer solids ("R_T") in moles per gram using the following equation:

$$R_T = [Fe(II)] + \frac{[TOC]}{3}$$

Because aquifers with aerobic conditions usually have low concentrations of Fe(II), TOC concentration are important in estimating their reductive capacity. Because the estimated aquifer reduction capacity for Cr(VI) calculated from TOC concentrations is larger than, or in the same order of magnitude as, the Cr(VI) reductive capacity measured directly in the laboratory method described below, it is considered to be a conservative estimate.

The reductive capacity of the aquifer relative to the ambient concentration within the groundwater is, of course, dependent on the concentration of Cr(VI) in the groundwater. The available Cr(VI) reductive capacity of the aquifer matrix, expressed as the amount of Cr(VI) that can be reduced per unit mass of aquifer material, can be estimated by a method outlined in

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[1] Palmer, C.D., and R.W. Puls. 1994. *Natural attenuation of hexavalent chromium in ground water and soils*. EPA/540/S-94/505. U.S. Environmental Protection Agency, Office of Research and Development and Office of Solid Waste and Emergency Response, Robert S. Kerr Environmental Research Laboratory, Ada, OK.

[2] Barcelona, M.J., and T.R. Holm. 1991. "Oxidation-reduction capacities of aquifer solids." *Environmental Science & Technology*. v. 25, no. 9, p. 1565-1572.

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Bartlett and James (1988).[3] This method is based on the Walkley and Black Method (Walkley and Black, 1934).[4] This laboratory test provides a more direct measure of the reduction capacity of the aquifer for Cr (VI) because it employs a Cr (VI) solution, potassium dichromate ($K_2Cr_2O_7$), and soil matrix samples collected from the study site.

In Section 13.5 of the RFI Report, PG&E lists further data needs for groundwater characterization. Absent from this list are activities that would further examine parameters that would be used to evaluate natural attenuation capacity of the aquifer. Specifically, in light of the above discussion, it would be appropriate to consider drilling exploratory borings around the periphery of the chromate plume (*e.g.*, perhaps four borings), but only after consultation with the Tribes on the need for and location of specific boring to ensure that all efforts are made to avoid cultural and spiritual impacts.

The purpose of these borings would be to collect soil samples with depth. Such samples would then be analyzed for TOC and potentially other parameters indicative of redox conditions so that the geochemical environment, particularly the reductive capacity of the aquifer, can be conceptualized in three dimensions. If necessary, this information could be further utilized in a geochemical model of a predictive nature that could be used to evaluate potential changes in Cr(VI) in the future.

Before any further IMs are enacted, DTSC should consider other actions that could lessen the impact on the spiritual and cultural values of the Tribe as well as environmental impacts. This above discussion identifies at least one other alternative is potentially viable and could have a significantly less adverse effects.

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RESPONSE: Comment Noted. Discussion of the reducing conditions associated with fluvial sediments and data collected to characterize those conditions at the site should be addressed in future volumes of the RFI/RI that deal specifically with groundwater characterization. No additional revisions are required by PG&E.