Topock Project Executive Abstract

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Priority Status: ☒ HIGH ☐ MED ☐ LOW Is this time critical? ☒ Yes ☐ No	Action Required: ☒ Information Only ☐ Review & Input
Type of Document: ☐ Draft ☐ Report ☐ Letter ☒ Memo ☐ Other / Explain:	☐ Other / Explain:
What does this information pertain to? ☐ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA) ☐ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment) ☐ Corrective Measures Study (CMS)/Feasibility Study (FS) ☐ Corrective Measures Implementation (CMI)/Remedial Action (RA) ☐ California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR) ☐ Interim Measures ☒ Other / Explain: Well Decommissioning	Is this a Regulatory Requirement? ☒ Yes ☐ No If no, why is the document needed?
What is the consequence of NOT doing this item? What is the consequence of DOING this item? This technical memorandum is required to conduct well network maintenance activities associated with the decommissioning of an old well and to comply with California Well Standards.	Other Justification/s: ☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

This technical memorandum defines the decommissioning procedures for an old water supply/waste injection well located west of the Pacific Gas and Electric Company (PG&E) Topock Compressor Station (TCS), referred to as "Well Number 4" in previous PG&E documentation and as "TCS-4" in this Plan. This Plan was prepared in accordance with the *Standard Operating Procedure for Well and Borehole Decommissioning* (SOP), which is being developed as part of the PG&E Topock Remediation Project, Needles, California (Site).

Written by: Pacific Gas and Electric Company

Recommendations:

None.

How is this information related to the Final Remedy or Regulatory Requirements:

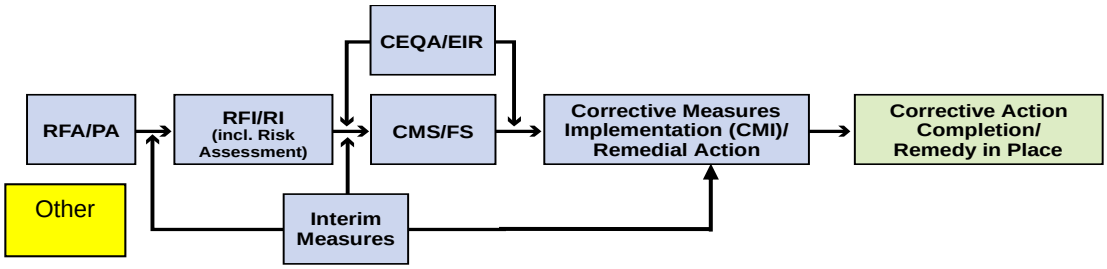
This technical memorandum is submitted for agency concurrence associated with well decommissioning in compliance with the California Well Standards.

Other requirements of this information?

None.

Related Reports and Documents:

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



Legend

RFA/PA – RCRA Facility Assessment/Preliminary Assessment

RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)

CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study

Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4)

DOCUMENT ID:	PGE20151204A
PREPARED FOR:	Pacific Gas and Electric Company
COPY TO:	Project File
PREPARED BY:	CH2M HILL
DATE:	December 4, 2015

This technical memorandum defines the decommissioning procedures for an old water supply/waste injection well located west of the Pacific Gas and Electric Company (PG&E) Topock Compressor Station (TCS), referred to as "Well Number 4" in previous PG&E documentation and as "TCS-4" in this Plan. This Plan was prepared in accordance with the *Standard Operating Procedure for Well and Borehole Decommissioning* (Well-SOP-1), which is being developed as part of the PG&E Topock Remediation Project, Needles, California (Site) and was most recently submitted as part of the Final (100%) Basis of Design Report (CH2M HILL, 2014c). An initial draft of this decommissioning plan was submitted to the agencies for review on July 11, 2014, and the Bureau of Land Management (BLM) provided the plan to the Tribes for consultation in July as well. Comments received from the Agencies and Tribes and PG&E responses to the comments were aggregated in a Response to Comment (RTC) table, which is attached to this plan. This plan has been revised as appropriate per the information in the RTC table and discussion during the September 15, 2015 Technical Work Group (TWG) meeting.

The *RFI/RI Volume 1 Report* (CH2M HILL, 2007a) presented information (in Section 4.1.1.2) regarding a TCS employee who reported that he was personally responsible for welding a cap onto an approximately 12-inch-diameter vertical pipe located in Bat Cave Wash. At some time after the well was capped, it became buried in sediment deposited in the wash bottom and was no longer visible. The well was recently located based on information found in old PG&E site photographs and work order documents, surface geophysical surveys, and potholing in the wash bottom (see Figure 1). The following background information was included in the Addendum to RFI/RI Volume 1 Report (CH2M HILL, 2014a) as part of the AOC 1/SWMU 1 investigation:

> *During recent file reviews of historical Topock documents, a work order was found with hand written notes showing 650 feet of steel pipe extending from a "water treatment chamber" at the former sludge drying bed area to an "abandoned water well" in the bottom of the wash. The date of the work order is March 12, 1964, and the date completed is shown as November 1, 1964 (PG&E, 1964). The work order is included in Appendix B. The discovery of the work order and the previous report from the plant employee of an abandoned well in Bat Cave Wash prompted additional historical file reviews. The description of the Sludge Dying Beds (SWMU-5) in RFI Volume 1 also states that a single-step wastewater treatment pond was constructed in one of the former sludge drying beds in 1964, which is consistent with the date and the scope of work described on this work order. In addition to the work order, two large format blueprints, dated 1956 and 1957, showing topography around the Topock site were located. These blueprints show a well, referred to as "Well #4", in the bottom of Bat Cave Wash. Photographs from 1951 (See Figure 36) indicate a temporary water supply well existed in the vicinity of Well 4 and, therefore, may be the same well. Based on this new information, a surface geophysical survey was performed on April 2, 3, and 4, 2013, in the suspected area of the old well (TCS Well #4). The survey identified a linear arrangement of weak anomalies (identified as a "possible pipeline or buried cable alignment") extending down Bat Cave Wash and terminating at a feature identified as "suspected shallowly buried metal debris". The location of the*

> *northern end of this linear feature is very close to 650 feet from the sludge drying bed, along the estimated route that the pipe was shown to take on the work order. It was inferred that this location corresponds to the location of "Well #4."*
>
> *A pothole was installed July 30, 2013, to positively locate the well. The capped well was found at approximately 4 feet bgs. A steel pipe leading into the well was also confirmed at approximately 7 feet bgs. This horizontal pipe was approximately 3 inches in diameter, was wrapped or covered with a tarlike material, and entered the side of the well via a welded intersection. Once the well location was confirmed, the pothole was backfilled using the same material removed.*
>
> *The well was uncovered again on September 11, 2013, to assess the downhole condition of the well and gather information needed to prepare a well decommissioning plan. Two photos showing the excavation and top of TCS well #4 are presented on Figure 37* [included in this Plan as Figure 2]. *Two soil samples were collected from the excavation around the well and a PVC extension was added to the well casing so it extended to the surface. The excavation area was backfilled to grade with originally excavated material and a downhole video log was performed. This initial video log encountered an obstruction in the well at approximately 59 feet bgs. During the week of March 24, 2014, a rotosonic drill rig was used to clear the obstruction, which was determined to be unconsolidated fill material. The well casing was cleared of the fill material to a depth of approximately 158 feet bgs, where a hard bottom was encountered. On April 1, 2014, a second downhole video log was performed. During the second video log, it was determined that the well had filled back in with unconsolidated material to a depth of approximate 127 feet bgs.*

Given the poor condition of the TCS-4 well, it is not useful as part of the groundwater remedy or groundwater monitoring well network; therefore, the well will be decommissioned. The following sections define the materials and methods that will be used to decommission the well, and are presented consistent with the organization of the SOP:

- Section 1 reviews permitting, approvals, and key fieldwork planning activities.
- Section 2 summarizes technical specifications and procedures for decommissioning the well, including evaluation of the well, materials and placement requirements, and reporting requirements.
- Section 3 presents a summary of documents referenced.

1.0 Permitting, Approvals, and Fieldwork Planning

TCS-4 is located in California and is therefore subject to local State and County regulations (ARAR #98). As detailed in the SOP, California Department of Water Resources has established minimum standards for decommissioning a groundwater well in three cumulative documents, including Bulletin 74 (1968), Bulletin 81 (1981) and Bulletin 74-90 (1991). The County of San Bernardino is the local permitting agency for the California portion of the Site and has adopted these standards. The decommissioning of the TCS-4 well is a well maintenance activity and will be conducted in accordance with the California Well Standards. PG&E will seek concurrence from DTSC and DOI prior to implementing the decommissioning plan. With DOI's direction for well decommissioning, the field activity is exempt from obtaining any federal, state, or local permits or complying with other administrative requirements, pursuant to CERCLA Section 121(e). A review of permitting requirements associated with California Department of Water Resources, San Bernardino County, the Final Groundwater Remedy Programmatic Biological Assessment (PBA) (CH2M HILL, 2014b), and the California Department of Fish and Wildlife Avoidance and Mitigation Measures for the Topock Remediation Project (CDFW, 2013) (pertains to CDFW jurisdictional washes) will be conducted, and substantive permitting requirements will be identified and complied with. The well decommissioning activities will be conducted in a manner consistent with the PBA and is therefore in compliance with Endangered Species Act requirements.

Key planning activities that will be conducted before and during mobilization for TCS-4 well decommissioning fieldwork include:

- **Work Area Demarcation**. The immediate work areas, staging areas, and associated access routes will be marked in the field to facilitate the biological resources survey and utility survey and for discussion during the project initiation meeting with project stakeholders, as discussed below.

- **Archaeological and Historical Resource Survey**. An archaeological and historical resource survey was previously conducted as part of Applied Earthwork's investigation of the expanded APE (Applied Earthworks, 2007) and field verified in 2010. No resources were noted during either investigation. The Area of Potential Effects (APE) for the Topock site is contained within what the FMIT and other Native American Tribes have identified as a larger area of traditional and cultural importance. The Tribes believe that the environmental, cultural, and spiritual resources may not be physically perceptible. DTSC has concluded within the January 2011 certified Environmental Impact Report (EIR; DTSC 2011d) that the 779.2-acre project site "appears to qualify as a historic resource under CEQA [California Environmental Quality Act] as an area that is significant in the social and cultural annals of California," and the BLM also has determined that a traditional cultural property or property of traditional religious and cultural significance that is eligible for listing on the National Register of Historic Places exists in the area of the Topock project, within the current APE, consisting of 1,600 acres of surface area and a section of the Colorado River. Thousands of years of human history are evident in the area surrounding the Compressor Station. Among the larger and better known cultural resources on the site is an expansive desert geoglyph or intaglio known as the Topock Maze. Although the Maze is viewed as one contiguous element of a larger area having unique value to some Tribes, archaeological documents refer to three geographically-distinct parts, two of which overlie the groundwater plume. Prominent historic-era features in the landscape, several of which intrude upon the Maze and also overlie the groundwater plume, include segments of historic U.S. Route 66, the National Trails Highway (NTH; also known as the National Old Trails Highway), and the ROW of the BNSF Railway. A broad spectrum of archaeological resources is also present within the project area and on adjacent lands. Properties on and near the Topock site that are eligible for or listed on the National Register of Historic Places include Native American cultural resources and elements of the historic "built environment." Per standard best practice for the Remediation Project, the immediate work area and all associated access routes will again be field verified prior to well decommissioning activities to ensure no resources will be impacted. All ground disturbing activities will be monitored. Tribal monitors will be invited to the pre-work field verification effort and to monitor the work.

- **Biological Resource Survey**. A biological resource survey will be conducted for the immediate work areas and all associated access routes prior to well decommissioning activities in accordance with the PBA and CDFW Avoidance and Minimization Measures. Once well decommissioning activities are complete, a second survey will be conducted to document changes in site condition. The biological resource surveys will be conducted by a qualified biologist. Per the PBA, a Field Contact Representative (FCR) will be on site during all well decommissioning activities.

- **Utility Survey**. A survey of aboveground and underground utilities will be conducted for the work area prior to beginning intrusive well decommissioning activities. At a minimum, this survey will include site-specific reconnaissance, notification to Underground Service Alert or "Dig Alert," and a geophysical survey to identify underground features. The geophysical methods that may be used, as determined appropriate in the field, include electromagnetic locators, radio frequency locators, magnetic locators, metal detection, and ground-penetrating radar.

- **Project Initiation Meeting with Project Stakeholders**. Consistent with other field projects conducted at the Topock site, PG&E will invite agency representatives, representatives of Native American tribes involved with the Topock project, and other stakeholders to the site for a project initiation meeting. This

meeting will be scheduled to occur immediately prior to the start of intrusive work. During this meeting, all site workers will receive cultural and biological resources sensitivity training. In addition, project health and safety protocols will be presented to all attendees such that site workers, work monitors, and site visitors are familiar with scope of work and associated safety protocols including work area demarcation, work observation areas, personal protection equipment, and site communication protocols.

TCS-4 well decommissioning activities will begin following concurrence from DTSC and DOI. Field activities will begin with the pre-mobilization tasks listed above. Once the well decommissioning field team is mobilized the work is estimated to require one week to complete. Following field work, reporting tasks will be completed as detailed in Section 2.4.

2.0 Technical Specifications and Procedures for Well Decommissioning

Section 2 of the SOP requires a review of the well condition, identification of the appropriate fill materials and associated placement requirements, identification of the well decommissioning procedure, and associated reporting requirements. Each of these topics are detailed in the following subsections.

2.1 Evaluation of Well

Key well information has been assembled and reviewed to evaluate well construction details, the current condition of the well, soil and water quality information, applicable regulatory criteria, and identification of the procedures and materials that should be used. This evaluation process included a search for available well construction information as well as field data collection. This evaluation process is described below:

- Well Documentation Review – A search for available well construction details was performed by reviewing PG&E document archives (the same archives where the blueprints were found) and querying the California DWR well database of well completion reports. Neither of these searches were successful and it was determined that additional field work would need to be conducted to evaluate the construction and current condition of the well.
- Initial Well Location and Measurement – The well was initially located by analyzing anomalies detected during a surface geophysical survey (conducted in April 2013) in conjunction with historical site photos of the well. Excavation of an anomaly at the end of a linear arrangement of weak anomalies that extended down Bat Cave Wash to the south uncovered the TCS-4 well and a 3-inch diameter, steel pipe that is welded into the south side of the well casing. The 10-inch diameter steel well casing appears to be set within a larger diameter (approximately 12-inches) steel conductor casing, and both casings are completed with a concrete pad that only partially remains. The 10-inch diameter well casing was sealed with a welded steel plate. Upon uncapping the well, the total depth was measured at 59 feet bgs, which is shallower than the water table, suggesting that the well was obstructed or in-filled. This measurement was confirmed during an initial video survey of the well. Following the initial well inspection, the excavation around the well was backfilled and the 10-inch steel well casing was extended to ground surface with a temporary PVC extension using a banded rubber coupler to facilitate future access.
- Well Clean-out – Rotosonic drilling and coring techniques were utilized to remove the fill material from within the well. The fill material was removed to a total depth of 158 feet bgs, where the bottom of the well casing was encountered as determined by a marked change in resistance and sound during drilling. Soil samples were collected for waste characterization purposes near the top of the material at 59 to 60 feet bgs and from the approximate mid-point of the material at 104 to 113 feet bgs. Based on the results of these samples and a composite sample from the IDW (see Table 1), the waste material was determined to be non-hazardous, but contains concentrations of analytes above site background

concentrations; therefore, the waste material was disposed off-site in accordance with State and Federal regulations.

- Video Survey – An in-well video camera was used on April 1, 2014 (approximately 4 days after the clean-out was conducted) to evaluate the condition of the well casing and screen, and identify obstructions. The following key observations were made during the video survey (all depths are referenced from the existing ground surface):
  - The 3-inch diameter steel wastewater pipeline is inserted into the side of the well casing at 5.5 feet bgs.
  - The water level was observed at a depth of 69 feet bgs.
  - The well casing is perforated (Mills Knifed) from 76 feet bgs presumably to the total depth of the well casing, though the perforations could only be confirmed to extend down to 127.5 feet bgs.
  - The well was obstructed at or in-filled to a depth of approximately 127.5 feet bgs.
  - The well casing is in very poor condition. A hole in the casing is observed at 49.5 feet bgs, and heavy corrosion is observed throughout the saturated portion of the casing. The casing is damaged, presumably from heavy corrosion, at a depth of 122.6 feet bgs.
- Soil sample results – As partially described in the text cited above from the Addendum to RFI/RI Volume 1 Report, soil samples have been collected from near the TCS-4 well head and within the well casing. While this data will be primarily considered in the RFI/RI soil investigation this information provides context for the planned well decommissioning activities. The following is a comprehensive summary of the soil samples collected since TCS-4 was uncovered (a summary for laboratory analytical results are provided on Tables 2 and 3):
  - Excavation Soil Sample Near TCS-4 Well Head – September 2013. Table 2 present results from two soil samples (*Old Well BCW-1* and *Old Well BCW-2)* collected at DTSC's request, from the excavation around TCS-4, when the well was extended to above ground surface to enable the well to be video-logged and sampled. One sample was collected from a depth of 4-5 feet. The second sample was collected from a depth of 7-8 feet (at the depth of the 3-inch pipe that connects to TCS-4 from the south). The following is a summary of the laboratory analytical results:
    - CrT, CrVI, molybdenum, and zinc were detected in both samples above background concentrations. The samples also had minor exceedances of arsenic, copper, lead, selenium, and vanadium.
    - Dioxin and furans were detected above the toxicity equivalent quotients (TEQs) for Humans, Avians, and Mammals in both samples.
  - Material Inside Well – March 2014. The video log of TCS-4 performed in September 2013 found material blocking the well at 58 feet below grade. At DTSC's request, rotosonic drilling was used to core this material to clean out the well. Table 3 presents results of two samples collected from the material inside TCS-4. One sample was collected near the top of the infilling material (between 1 and 2 feet into the fill, 59-60 feet below ground surface), and the other was collected near the mid-point of the infill (55 feet into the fill, 113 feet below ground surface). The first sample was collected as a split with DTSC. The following is a summary of the laboratory analytical results:
    - CrT, CrVI, copper, lead, selenium, were detected above background in the shallow sample.
    - Arsenic, CrT, cobalt, copper, lead, molybdenum, nickel, selenium, and zinc detected above background concentrations in the deeper sample. Metal concentrations in the deeper sample were considerably higher than in the shallow sample.

    - Dioxin and furans were detected above the TEQs for Humans, Avians, and Mammals in both samples. Dioxin concentrations in the deeper sample were considerably lower than the shallow sample.

- Pipe Wrap Sample – February 2014. To evaluate whether the dioxins detected in the two soil samples around TCS-4 may have originated from the tar-like pipe wrap that covers the lateral pipe connected to TCS Well 4, a sample of the pipe wrap material was collected. The section of pipe that was sampled was exposed at the edge of Bat Cave Wash, about 200 feet south of TCS 4, and appears to have been exposed for a significant length of time, as compared to the pipe encountered at the TCS-4 wellhead, which was buried. This sample was collected with support from asbestos-certified TCS staff and analyzed for dioxins and asbestos. Table 4 presents laboratory analytical results from one sample (SWMU1-PipeWrap-01) collected from a section of exposed pipe. The following is a summary of the laboratory analytical results:
    - The sample was found to be asbestos containing material (ACM) with 12% by area reported as chrysotile asbestos fibers by polarized light microscopy (PLM) bulk analysis.
    - Dioxin and furans were detected above the TEQs for Humans, Avians, and Mammals.
- Water Quality – A review of existing groundwater monitoring data indicate that TCS-4 is within the area of the hexavalent chromium plume at the Site. DTSC directed PG&E to collect a groundwater sample from the well in an April 8, 2014 email, and the sample was collected on May 20, 2014 (as observed and split by DTSC). During a discussion with DTSC on May 16, 2014, it was acknowledged that TCS-4 is an old, damaged production well, not a properly constructed monitoring well, and as such, the quality and representativeness of the data may be compromised. Further, due to the condition of the well, it was determined that the sample would be collected by placing the pump in the upper portion of the water column not more than 10 feet below static water level and that the pumping rate used would be set to minimize drawdown in the well. Water quality parameters were monitored at the surface using a flow-through cell. The sample was collected after approximately 56 gallons were purged, the water level had stabilized at less than half of a foot of drawdown, and water quality parameters also stabilized. The laboratory analytical results are currently pending and will be included as an appendix to the second quarter 2014 groundwater monitoring program report. Water quality measurements during sampling indicate water with a pH of approximately 7.3 and a specific conductance of approximately 3,600 microSiemens per centimeter.

2.2 Identification of Decommissioning Materials and Placement Requirements

The SOP defines the various materials that can be used during the well decommissioning process. This section identifies the specific materials that will be used during the decommissioning of the TCS-4 well. As detailed in the next section, TCS-4 will be decommissioned in place and a portion of the well casing will be perforated prior to sealing.

2.2.1 Sealing Material

The TCS-4 well is located in an area of contaminated soil (AOC 1/SWMU-1) and groundwater (the well is within the hexavalent chromium plume). Further, TCS-4 is located in an active desert wash (Bat Cave Wash), which represents an area of increased surface water infiltration relative to nearby upland areas. For these reasons, and in accordance with the California Well Standards, sealing material will be used to fill the well casing from total depth to a within 5 feet of ground surface. Based on the water quality measurements made during the collection of the groundwater sample, any of the sealing materials identified in the SOP (neat cement, sand-cement grout, concrete, or bentonite) are suitable for use when decommissioning TCS-4; however, because the well casing will be perforated in the vadose zone with the intention of injecting sealing material behind the casing (see Section 2.3), neat cement will be used.

The neat cement will be composed entirely of Type II/V Portland cement grout with up to 6% bentonite powder. Water used to prepare the cement will be obtained from the freshwater supply associated with the TCS. All manufacturers' specifications for mixture volumes and curing times must be strictly followed (typically, ASTM C150, Standard Specification for Portland cement). Further, the use of any additives will comply with the requirements of ASTM C494 (Standard Specification for Chemical Admixtures for Concrete).

The neat cement will be placed in the well casing in one continuous operation using a tremie pipe with positive displacement pumping (pumped under pressure), beginning at the bottom of well with the end of the tremie pipe submerged two feet or more below the surface of the cement during placement. To ensure the sealing material invades the perforations in the well casing, the neat cement that is injected will remain under pressure until the grout has set. This will be achieved by maintaining the level of neat cement in the well casing to within approximately 10-15 feet of the ground surface, which is approximately 55-60 feet above the water level in the well. Utilizing this approach will result in approximately 35-45 pounds per square inch (psi) of pressure at the depth of the water table (approximately 70 feet bgs), and higher at the total depth of the well; therefore, the use of a packer within the well casing to maintain pressure during the placement of sealing material will not be necessary. During this operation, static water is either displaced out of the top of the well by the injected column of material, or is forced into the formation. Water that is displaced out of the top of the well will be contained and disposed in accordance with State and Federal regulations. The cement level in the well will be monitored for settlement during emplacement and approximately 24 hours after, and the volume of neat cement will be measured against the anticipated volume of the well (including estimated borehole area) to verify adequate filling. Additional cement will be added as necessary so the well casing is sealed to a level of approximately 5 feet below the existing ground surface.

2.2.2 Filler Material

In accordance with the California Well Standards, filler material will not be used to decommission TCS-4 because the well is located in an area of contaminated soil and groundwater.

2.2.3 Displaced Site Material

Displaced site material will be used to backfill the portion of the borehole/excavation above the sealed interval. It is assumed that all of the material excavated (i.e., displaced) to access the top of the well casing, which is approximately 4 feet below the existing ground surface, will be temporarily staged in the work area and replaced into the excavation once the decommissioning process is complete. While not anticipated, if additional material is needed to backfill the excavation, it will be sourced from an existing, onsite stockpile of displaced site material reserved for this type of use (currently located east of the IM3 facility along the access road). This material was accumulated and characterized initially as part of each of the respective drilling programs during which it was generated and was determined to be below all interim screening levels (e.g. background concentrations or other screening levels, as appropriate). The existing aggregated stockpile was characterized again once staged in its current location (January 2010) and confirmed to be clean (see Table 5).

2.3 Well Decommissioning Procedure

Based on review of the SOP and the information collected during the well evaluation, the TCS-4 well will be decommissioned using the procedure for "decommission in place, with modification". As identified in the SOP, decommissioning wells in place, when acceptable to the regulatory agencies, is the preferred method as it represents the field procedure which is least intrusive and which creates the least amount of disturbance. In the case of TCS-4, the lead agencies have stated that it is acceptable to decommission the well in place as long as the well casing is perforated at 75, 50, and 25 feet below the existing ground surface. In the absence of as-built information for TCS-4, it is unknown if the casing was adequately sealed at the time of installation. Therefore, adding perforations to the well casing prior to placing the sealing material

will ensure that the outside of the well casing does not provide a conduit for infiltrating fluids from the ground surface to the aquifer.

In accordance with the SOP, TCS-4 will be decommissioned by the following procedure:

1. **Well evaluation and consultation with lead agencies, responsible agencies, affected land owner, and other stakeholders.** The well evaluation is complete as detailed above in Section 2.1. Lead agencies (including the land owner) have been consulted and agree that the well should be decommissioned in place with modification (i.e., casing perforated prior to sealing), and that the well should be sealed from total depth given the well is located within an active wash and in an area of known soil and groundwater contamination.

2. **Implement required well modification.** Prior to decommissioning, the well head must be modified to facilitate clean-out of the well, the perforation of the casing, and the placement of sealing material. Excavation around the TCS-4 well will be conducted initially during this step to modify the well head for decommissioning, and for a second time once grouting within the casing is complete and the "mushroom cap" is installed (see Step 4). The initial excavation will be larger in dimension and up to five opportunistic soil samples will be collected from the extents of the excavation at locations to be determined in the field based on observed staining or agency direction/guidance. These samples will be analyzed for the full AOC-1/SWMU-1 analytical suite, which includes the following chemicals of potential concern (COPCs): hexavalent chromium, Title 22 metals, PAHs, PCBs, pesticides, and dioxins/furans. In addition, due to the potential for the material used to cover the pipe that inserts into the side of the TCS-4 well to contain asbestos, these samples will also be analyzed for asbestos. The results of laboratory analysis of these samples will be incorporated into the Soil RFI/RI project. The sediment around the well casing will be excavated to a depth of approximately 6 feet bgs so that the 3-inch diameter steel pipe that enters the south side of the well casing is exposed. An approximate 5 foot long section of the pipe will be removed from approximately 0.5 foot from the well casing to about 5.5 feet to the south. The stub off of the well casing will be plugged or capped so that sealing material does not exit below the top of casing during the sealing and "mushroom cap" installation (see Step 4). The end of the pipe that extends further south in Bat Cave Wash will be capped and the remainder of the pipe will be left in place as requested by DTSC and DOI (the ultimate disposition of this pipe will be addressed by the ongoing RFI/RI soil investigation). The excavation will then be backfilled using the same material that was excavated so the subsequent steps can be conducted safely (the temporary PVC well casing extension will remain in place for this step). As directed by DTSC (a lead agency), the well casing will be perforated with a Mills Knife at three depths: 75, 50, and 25 feet bgs. Each perforated section is estimated to be between 5 and 10 feet in length. Following perforation, the well casing will be cleaned-out with the same procedures used during the well evaluation. The perforation and clean-out of the casing will be performed using a rotosonic drill rig.

3. **Place sealing material.** Once the perforations and well clean-out is complete, the sealing material will be placed via tremie pipe as detailed in Section 2.2.1. Sealing material placement will begin with the rotosonic drill casing and the tremie pipe near the bottom of the borehole so that the material can be placed without risk of the well collapsing. Once the initial lift of sealing material is sufficiently above the depth of infill (approximately 127.5 feet bgs) the drill casing will begin to be raised along with the tremie pipe. Subsequent lifts of sealing material, if required due to settlement, will be added in the same manner if the material level is below the water table, or the material can be added from the surface if the material level is above the water table. Based on a calculation of the estimated volume of the primary well casing, an estimated minimum volume of neat cement that will be required to seal the well is approximately 2,500 gallons. Variables that might result in a lower required volume include the dimension of the casing at depth (e.g., failures in the casing that result in a smaller diameter) or fill material that was not cleared from inside the well casing; however, because effort will be made to clean out the well prior to sealing, the impact of these variables should be minimal. Alternatively, variables that might result in a higher required volume include seepage of neat cement out of the well casing

through existing holes and perforations that will be installed in the casing. The diameter of the borehole used to install the well and the composition of annular backfill material used, if any, is unknown; therefore, the volume of neat cement required to fill these annular spaces cannot be estimated. The volume of the annular space between the primary well casing and the conductor casing also cannot be estimated because the depth of the conductor casing is unknown (the composition of backfill material, if any, is also unknown).

Decommissioning the well head. The well head will be decommissioned by re-excavating around the well to a depth of approximately 6 feet bgs to expose the 3-inch diameter steel pipe stub. Prior to decommissioning, PG&E will seek a variance to leave the top of the well casing at its current depth of approximately 4 feet bgs. If required, 0.5-1 foot of the 10-inch diameter well casing will be cut off to lower the well head to approximately 5 feet bgs. The remnants of the concrete pad will be removed and all well head features will be encapsulated within a "mushroom cap" composed of neat cement grout that extends beyond the diameter of the conductor casing and 3-inch pipe stub so that fluids drain away from the well. Once the well head cap has cured, the excavation will be backfilled using the same material that was excavated or with additional displaced site material as identified in Section 2.2.3.

Waste Management. Investigation-derived wastes (IDW) will include liquids (groundwater, freshwater potentially used during well clean-out, and decontamination rinsate) and soils generated from within the well casing. All IDW will be containerized in the work area and stored at the existing decontamination pad located at the Transwestern Bench for characterization. All IDW will be characterized for the full list of AOC-1/SWMU-1 COPCs (hexavalent chromium, Title 22 metals, PAHs, PCBs, pesticides, and dioxins/furans) plus total petroleum hydrocarbons (TPH) and asbestos (soil only).

IDW liquids will be processed at the IM-3 treatment plant or transported to a PG&E-contracted offsite disposal facility, as appropriate, based on the results of characterization samples. IDW soils containing contaminants above the site-specific interim screening levels will be transported to a permitted offsite disposal facility; alternatively, if soils are free from contaminants (concentrations below site-specific interim screening levels), soils may be disposed of onsite if acceptable to the property owner and in compliance with applicable laws and regulations.

All equipment decontamination will be conducted on the existing decontamination pad at the Transwestern Bench. Incidental trash will be collected in the work area and disposed in the existing dumpster at the Transwestern Bench for appropriate disposal.

2.4 Well Decommissioning Reporting

Following completion of well decommissioning tasks, a record of well decommissioning will be filed with the California Department of Water Resources, EPA Region 9 Underground Injection Control (UIC) Program, and San Bernardino County. PG&E has discussed the TCS-4 well and this decommissioning plan with the EPA UIC Program. The UIC has confirmed that they do not have record of this well in their database and have requested that PG&E document the decommissioning of the well by filing an "Injection Wells Registration Form" with the EPA Region 9 following the completion of decommissioning activities. This form will document the well operating status as "plugged and approved by regulator". In addition, a project-specific Well Decommissioning Report will be submitted to the lead agencies no later than 90 days after completion of well decommissioning activities and the Topock Well Inventory (located on the DTSC website) will be updated to reflect the results of decommissioning activities. As detailed in the SOP, the Well Decommissioning Report will include, at a minimum:

- A summary of the approval process completed prior to well decommissioning;
- Discussion regarding application of the Well Decommissioning Decision Protocol;
- Details of the work performed including verification of the volume of sealing material used during decommissioning;
- Documentation of compliance with applicable permitting requirements, and;

- Signature and seal of an appropriately licensed professional geologist or engineer.

4.0 References

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Tables

TABLE 1

Soil Sample Results: TCS Well Number 4 (TCS-4)

Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4)

PG&E Topock Compressor Station, Needles, California

					Sample Name:	Old-Well-IDW-Soil	TCS-4-01	TCS-4-02
					Sample Date:	4/9/2014	3/25/2014	3/25/2014
					Depth (feet bgs):	NA	59 - 60	113
Parameter	1 **Site SL**	2 **Title 22 TTLC**	3 **STLC**	4 **RCRA TC**		**Analytical Results**		
Dioxin/Furan (ng/kg)								
1,2,3,4,6,7,8-HpCDD	NE	NE	NE	NE		380	4,200	1,000
1,2,3,4,6,7,8-HpCDF	NE	NE	NE	NE		64	740	200
1,2,3,4,7,8,9-HpCDF	NE	NE	NE	NE		7.8 J	53	20
1,2,3,4,7,8-HxCDD	NE	NE	NE	NE		12.5 U	8.1 J	12.5 U
1,2,3,4,7,8-HxCDF	NE	NE	NE	NE		12.5 U	12.5 U	12.5 U
1,2,3,6,7,8-HxCDD	NE	NE	NE	NE		11 J	79	26
1,2,3,6,7,8-HxCDF	NE	NE	NE	NE		12.5 U	12.5 U	12.5 U
1,2,3,7,8,9-HxCDD	NE	NE	NE	NE		12.5 U	16	10 J
1,2,3,7,8,9-HxCDF	NE	NE	NE	NE		12.5 U	12.5 U	12.5 U
1,2,3,7,8-PeCDD	4.6	NE	NE	NE		12.5 U	2.3 J	12.5 U
1,2,3,7,8-PeCDF	NE	NE	NE	NE		12.5 U	12.5 U	12.5 U
2,3,4,6,7,8-HxCDF	NE	NE	NE	NE		12.5 U	12.5 U	12.5 U
2,3,4,7,8-PeCDF	NE	NE	NE	NE		3.1	12.5 U	18
2,3,7,8-TCDD	4.6	10,000	10,000	NE		5 U	5 U	5 U
2,3,7,8-TCDF	NE	NE	NE	NE		5 U	5 U	5 U
OCDD	NE	NE	NE	NE		3,900	46,000	11,000
OCDF	NE	NE	NE	NE		300	3,800	920
TEQ Avian	16	NE	NE	NE		---	**96**	**50**
TEQ Human	50	NE	NE	NE		---	**150**	**51**
TEQ Mammals	1.6	NE	NE	NE		---	**150**	**51**
Metals (mg/kg)								
Antimony	0.285	500	NE	NE		2 U	2 UJ	2 U
Arsenic	11	500	50	100		9.9	2.1	**20**
Barium	410	10,000	1,000	2,000		66	80	51
Beryllium	0.672	75	7.5	NE		1 U	1 U	1 U
Cadmium	1.1	100	10	20		1 U	1 UJ	1 U
Chromium, Hexavalent	0.83	500	50	NE		0.4 U	**2.2**	0.4 U
Chromium, total	39.8	2,500	50	100		**1,400**	**61 J**	**1,700**
Cobalt	12.7	8,000	800	NE		**16**	6.3	**31**
Copper	16.8	2,500	250	NE		**250**	**18 J**	**580**
Lead	8.39	1,000	50	100		**8.5**	**32 J**	**17**
Mercury	0.0125	20	2	4		0.099 U	0.1 U	0.1 U
Molybdenum	1.37	3,500	3,500	NE		**16**	1 U	**35**
Nickel	27.3	2,000	200	NE		**140**	16 J	**300**
Selenium	1.47	100	10	20		**19**	**1.6**	**42**
Silver	5.15	500	50	100		1 U	1 UJ	1 U
Thallium	2.32	700	70	NE		2 U	2 UJ	2 U
Vanadium	52.2	2,400	240	NE		13	29	5.7
Zinc	58	5,000	2,500	NE		46	30	55
Polycyclic Aromatic Hydrocarbon (µg/kg)								
1-Methyl naphthalene	22,000	NE	NE	NE		---	5 U	5.1 U
2-Methyl naphthalene	310,000	NE	NE	NE		---	5 U	5.1 U

TABLE 1

Soil Sample Results: TCS Well Number 4 (TCS-4)

Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4)

PG&E Topock Compressor Station, Needles, California

					Sample Name:	Old-Well-IDW-Soil	TCS-4-01	TCS-4-02
					Sample Date:	4/9/2014	3/25/2014	3/25/2014
					Depth (feet bgs):	NA	59 - 60	113
	1	2	3	4				
Parameter	**Site SL**	**Title 22 TTLC**	**STLC**	**RCRA TC**		**Analytical Results**		
Polycyclic Aromatic Hydrocarbon (µg/kg)								
Acenaphthene	3,400,000	NE	NE	NE		---	5 U	5.1 U
Acenaphthylene	1,700,000	NE	NE	NE		---	5 U	5.1 U
Anthracene	17,000,000	NE	NE	NE		---	5 U	5.1 U
B(a)P Equivalent	38	NE	NE	NE		---	5 U	16
Benzo (a) anthracene	380	NE	NE	NE		---	5 U	330 UJ
Benzo (a) pyrene	38	NE	NE	NE		---	5 U	330 UJ
Benzo (b) fluoranthene	380	NE	NE	NE		---	5 U	330 UJ
Benzo (ghi) perylene	1,700,000	NE	NE	NE		---	5 U	7.1
Benzo (k) fluoranthene	380	NE	NE	NE		---	5 U	5.1
Chrysene	3,800	NE	NE	NE		---	5 U	330 UJ
Dibenzo (a,h) anthracene	110	NE	NE	NE		---	5 U	5.1 U
Fluoranthene	2,300,000	NE	NE	NE		---	5 U	330 UJ
Fluorene	2,300,000	NE	NE	NE		---	5 U	5.1 U
Indeno (1,2,3-cd) pyrene	380	NE	NE	NE		---	5 U	6.1
Naphthalene	3,600	NE	NE	NE		---	5 UJ	5.1 UJ
PAH High molecular weight	1,160	NE	NE	NE		---	5 U	100
PAH Low molecular weight	10,000	NE	NE	NE		---	5 U	8.4
Phenanthrene	1,700,000	NE	NE	NE		---	5 U	8.4
Pyrene	1,700,000	NE	NE	NE		---	5 U	330 UJ
Polychlorinated Biphenyls (µg/kg)								
Aroclor 1016	3,900	50,000	50,000	NE		---	17 U	17 U
Aroclor 1221	140	50,000	50,000	NE		---	33 U	33 U
Aroclor 1232	140	50,000	50,000	NE		---	17 U	17 U
Aroclor 1242	220	50,000	50,000	NE		---	17 U	17 U
Aroclor 1248	220	50,000	50,000	NE		---	17 U	17 U
Aroclor 1254	220	50,000	50,000	NE		---	17 U	17 U
Aroclor 1260	220	50,000	50,000	NE		---	17 U	17 U
Soluble Threshold Limit Concentration (mg/L)								
Chromium-STLC	NE	NE	NE	NE		70 J	---	---
Copper, STLC	NE	NE	25	NE		0.74	---	---
Selenium, STLC	NE	NE	1	NE		0.072	---	---
Semi-Volatile Organic Compounds (µg/kg)								
1,2,4-Trichlorobenzene	22,000	NE	NE	NE		---	330 UJ	330 UJ
1,2-Dichlorobenzene	1,900,000	NE	NE	NE		---	330 UJ	330 UJ
1,3-Dichlorobenzene	530,000	NE	NE	NE		---	330 UJ	330 UJ
1,4-Dichlorobenzene	2,400	NE	NE	150,000		---	330 UJ	330 UJ
2,4,5-Trichlorophenol	6,100,000	NE	NE	8,000,000		---	330 UJ	330 UJ
2,4,6-Trichlorophenol	6,900	NE	NE	40,000		---	330 UJ	330 UJ
2,4-Dichlorophenol	180,000	NE	NE	NE		---	1,700 UJ	1,700 UJ
2,4-Dimethylphenol	1,200,000	NE	NE	NE		---	330 UJ	330 UJ
2,4-Dinitrophenol	120,000	NE	NE	NE		---	1,700 UJ	R

TABLE 1

Soil Sample Results: TCS Well Number 4 (TCS-4)

Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4)

PG&E Topock Compressor Station, Needles, California

					Sample Name:	Old-Well-IDW-Soil	TCS-4-01	TCS-4-02
					Sample Date:	4/9/2014	3/25/2014	3/25/2014
					Depth (feet bgs):	NA	59 - 60	113
	1	2	3	4				
Parameter	**Site SL**	**Title 22 TTLC**	**STLC**	**RCRA TC**		**Analytical Results**		
Semi-Volatile Organic Compounds (µg/kg)								
2,4-Dinitrotoluene	1,600	NE	NE	2,600		---	330 UJ	330 UJ
2,6-Dinitrotoluene	61,000	NE	NE	NE		---	330 UJ	330 UJ
2-Chloro naphthalene	6,300,000	NE	NE	NE		---	330 UJ	330 UJ
2-Chlorophenol	63,000	NE	NE	NE		---	330 UJ	330 UJ
2-Methylphenol	3,100,000	NE	NE	4,000,000		---	330 UJ	330 UJ
2-Nitroaniline	183,000	NE	NE	NE		---	1,700 UJ	1,700 UJ
2-Nitrophenol	NE	NE	NE	NE		---	330 UJ	330 UJ
3,3-Dichlorobenzidene	1,100	NE	NE	NE		---	660 UJ	670 UJ
3-Nitroaniline	18,000	NE	NE	NE		---	1,700 UJ	1,700 UJ
4,6-Dinitro-2-methylphenol	6,100	NE	NE	NE		---	1,700 UJ	R
4-Bromophenyl phenyl ether	NE	NE	NE	NE		---	330 UJ	330 UJ
4-Chloro-3-methylphenol	6,100,000	NE	NE	NE		---	660 UJ	670 UJ
4-Chloroaniline	2,400	NE	NE	NE		---	660 UJ	670 UJ
4-Chlorophenyl phenyl ether	NE	NE	NE	NE		---	330 UJ	330 UJ
4-Methylphenol	500	NE	NE	4,000,000		---	330 UJ	330 UJ
4-Nitroaniline	24,000	NE	NE	NE		---	1,700 UJ	1,700 UJ
4-Nitrophenol	NE	NE	NE	NE		---	1,700 UJ	R
Benzoic acid	240,000,000	NE	NE	NE		---	1,700 UJ	R
Benzyl alcohol	6,100,000	NE	NE	NE		---	660 UJ	670 UJ
bis (2-chloroethoxy) methane	180,000	NE	NE	NE		---	330 UJ	330 UJ
bis (2-chloroethyl) ether	210	NE	NE	NE		---	330 UJ	330 UJ
bis (2-chloroisopropyl) ether	4,600	NE	NE	NE		---	330 UJ	330 UJ
bis (2-ethylhexyl) phthalate	2,870	NE	NE	NE		---	330 UJ	330 UJ
Butylbenzylphthalate	260,000	NE	NE	NE		---	330 UJ	330 UJ
Dibenzofuran	150,000	NE	NE	NE		---	330 UJ	330 UJ
Diethyl phthalate	49,000,000	NE	NE	NE		---	330 UJ	330 UJ
Dimethyl phthalate	100,000,000	NE	NE	NE		---	330 UJ	330 UJ
Di-n-butyl phthalate	46.9	NE	NE	NE		---	330 UJ	330 UJ
Di-n-octyl phthalate	2,400,000	NE	NE	NE		---	330 UJ	330 UJ
Hexachlorobenzene	300	NE	NE	2,600		---	330 UJ	330 UJ
Hexachlorobutadiene	6,200	NE	NE	10,000		---	660 UJ	670 UJ
Hexachloroethane	35,000	NE	NE	60,000		---	330 UJ	330 UJ
Isophorone	510,000	NE	NE	NE		---	330 UJ	330 UJ
Nitrobenzene	4,800	NE	NE	40,000		---	330 UJ	330 UJ
n-Nitroso-di-n-propylamine	69	NE	NE	NE		---	330 UJ	330 UJ
N-nitrosodiphenylamine	99,000	NE	NE	NE		---	330 UJ	330 UJ
Pentachlorophenol	2,490	17,000	17,000	2,000,000		---	1,700 UJ	R
Phenol	18,000,000	NE	NE	NE		---	330 UJ	330 UJ
Toxicity Characteristic Leaching Procedure (mg/L)								
Chromium, TCLP	NE	NE	NE	NE		0.41	---	---
General Chemistry (%)								
% Moisture	NE	NE	NE	NE		24.3	2	2

TABLE 1

Soil Sample Results: TCS Well Number 4 (TCS-4)

Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4)

PG&E Topock Compressor Station, Needles, California

Notes:

--	not analyzed
%	percent
µg/kg	micrograms per kilogram
bgs	below ground surface
J	estimated result
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NA	sample collected at undocumented depth
NE	not established
ng/kg	nanograms per kilogram
R	result was rejected and is not usable
STLC	soluble threshold limit concentration
TCLP	toxicity characteristic leaching procedure
U	not detected at or above the indicated reporting limit

Detected concentrations exceeding the appropriate screening level are **bold**.

Screening Level Detail:

1 Site Specific screening levels developed from RCRA Facility Investigation/Remedial Investigation

2 Total Threshold Limit Concentrations from the Califonia Code of Regulations (CCR), Title 22, Division 4.5

3 Soluable Threshold Limit Concentractions from the California Code of Regulations (CCR), Title 22, Division 4.5

4 RCRA toxicity characteristic limit from the California Code of Regulations (CCR), Title 22, Division 4.5

TABLE **2**
Soil Sample Results: TCS Well Number 4 (TCS-4) – Adjacent to the Well Head
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name: / Sample Date: / Depth (ft bgs):	Old Well-BCW-1 [a] 9/11/2013 7-8	Old Well-BCW-2 [a] 9/11/2013 4-5
Dioxins and Furans					
1,2,3,4,6,7,8-HpCDD	--	ng/kg		7,000	8,300 J
1,2,3,4,6,7,8-HpCDF	--	ng/kg		ND (1.2)	ND (1.9J)
1,2,3,4,7,8,9-HpCDF	--	ng/kg		170	170 J
1,2,3,4,7,8-HxCDD	--	ng/kg		21	50 J
1,2,3,4,7,8-HxCDF	--	ng/kg		64	110 J
1,2,3,6,7,8-HxCDD	--	ng/kg		200	380 J
1,2,3,6,7,8-HxCDF	--	ng/kg		ND (280)	ND (450J)
1,2,3,7,8,9-HxCDD	--	ng/kg		40	97 J
1,2,3,7,8,9-HxCDF	--	ng/kg		ND (2)	ND (5.6J)
2,3,4,6,7,8-HxCDF	--	ng/kg		ND (4,000)	63 J
OCDD	--	ng/kg		53,000	100,000 J
OCDF	--	ng/kg		8,400	11,000 J
1,2,3,7,8-PeCDD	4.6	ng/kg		8.8 J	18 J
1,2,3,7,8-PeCDF	--	ng/kg		ND (0.42)	ND (2.4J)
2,3,4,7,8-PeCDF	--	ng/kg		ND (4.8)	ND (10J)
2,3,7,8-TCDD	4.6	ng/kg		ND (0.17)	ND (0.23J)
2,3,7,8-TCDF	--	ng/kg		0.46 J	1.6 J
TEQ Human	50	ng/kg		350	230
TEQ Avian	16	ng/kg		250	100
TEQ Mammals	1.6	ng/kg		350	230
General Chemistry					
Moisture	--	%		10.9 J	5.4
pH	--	pH units		8.2	--
Metals					
Antimony	0.285	mg/kg		ND (2.2J)	ND (2.1)
Arsenic	11	mg/kg		4.8	19
Barium	410	mg/kg		130	130
Beryllium	0.672	mg/kg		ND (1.1J)	ND (1)
Cadmium	1.1	mg/kg		ND (1.1J)	ND (1)
Chromium, total	39.8	mg/kg		4,200	4,400
Cobalt	12.7	mg/kg		7	7.2
Copper	16.8	mg/kg		14	23
Chromium, Hexavalent	0.83	mg/kg		80	73
Lead	8.39	mg/kg		12 J	10
Mercury	0.0125	mg/kg		ND (0.11)	ND (0.11)
Molybdenum	1.37	mg/kg		18	6.7

TABLE **2**
Soil Sample Results: TCS Well Number 4 (TCS-4) – Adjacent to the Well Head
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name: / Sample Date: / Depth (ft bgs):	Old Well-BCW-1 [a] 9/11/2013 7-8	Old Well-BCW-2 [a] 9/11/2013 4-5
Metals					
Nickel	27.3	mg/kg		11	12
Selenium	1.47	mg/kg		2.1	ND (1)
Silver	5.15	mg/kg		ND (1.1J)	ND (1)
Thallium	2.32	mg/kg		ND (2.2)	ND (2.1)
Vanadium	52.2	mg/kg		37 J	61
Zinc	58	mg/kg		190	150
Polyaromatic Hydrocarbons					
1-Methyl naphthalene	22,000	µg/kg		ND (5.6)	--
2-Methyl naphthalene	310,000	µg/kg		ND (5.6)	--
Acenaphthene	3,400,000	µg/kg		ND (5.6)	--
Acenaphthylene	1,700,000	µg/kg		ND (5.6)	--
Anthracene	17,000,000	µg/kg		ND (5.6)	--
Benzo (ghi) perylene	1,700,000	µg/kg		ND (5.6)	--
Benzo (a) anthracene	380	µg/kg		ND (5.6)	--
Benzo (a) pyrene	38	µg/kg		ND (5.6)	--
Benzo (b) fluoranthene	380	µg/kg		ND (5.6)	--
Benzo (k) fluoranthene	380	µg/kg		ND (5.6)	--
Chrysene	3,800	µg/kg		ND (5.6)	--
Dibenzo (a,h) anthracene	110	µg/kg		ND (5.6)	--
Fluoranthene	2,300,000	µg/kg		ND (5.6)	--
Fluorene	2,300,000	µg/kg		ND (5.6)	--
Indeno (1,2,3-cd) pyrene	380	µg/kg		ND (5.6)	--
Naphthalene	3,600	µg/kg		ND (5.6)	--
Phenanthrene	1,700,000	µg/kg		ND (5.6)	--
Pyrene	1,700,000	µg/kg		ND (5.6)	--
B(a)P Equivalent	38	µg/kg		ND (4.9)	--
PAH High molecular weight	1,160	µg/kg		ND	--
PAH Low molecular weight	10,000	µg/kg		ND	--
Polychlorinated Biphenyls					
Aroclor 1016	3,900	µg/kg		ND (18)	--
Aroclor 1221	140	µg/kg		ND (37)	--
Aroclor 1232	140	µg/kg		ND (18)	--
Aroclor 1242	220	µg/kg		ND (18)	--
Aroclor 1248	220	µg/kg		ND (18)	--
Aroclor 1254	220	µg/kg		ND (18)	--
Aroclor 1260	220	µg/kg		ND (18)	--

TABLE **2**
Soil Sample Results: TCS Well Number 4 (TCS-4) – Adjacent to the Well Head
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name: / Sample Date: / Depth (ft bgs):	Old Well-BCW-1 [a] 9/11/2013 7-8	Old Well-BCW-2 [a] 9/11/2013 4-5
Semivolatile Organic Compounds					
2,4,5-Trichlorophenol	6,100,000	µg/kg		ND (370)	--
2,4,6-Trichlorophenol	6,900	µg/kg		ND (370)	--
2,4-Dichlorophenol	180,000	µg/kg		ND (1,800)	--
2,4-Dimethylphenol	1,200,000	µg/kg		ND (370)	--
2,4-Dinitrophenol	120,000	µg/kg		ND (1,800)	--
2,4-Dinitrotoluene	1,600	µg/kg		ND (370)	--
2,6-Dinitrotoluene	61,000	µg/kg		ND (370)	--
2-Chloro naphthalene	6,300,000	µg/kg		ND (370)	--
2-Chlorophenol	63,000	µg/kg		ND (370)	--
2-Methylphenol	3,100,000	µg/kg		ND (370)	--
2-Nitroaniline	183,000	µg/kg		ND (1,800)	--
2-Nitrophenol	--	µg/kg		ND (370)	--
3,3-Dichlorobenzidene	1,100	µg/kg		ND (730)	--
3-Nitroaniline	18,000	µg/kg		ND (1,800)	--
4,6-Dinitro-2-methylphenol	6,100	µg/kg		ND (1,800)	--
4-Bromophenyl phenyl ether	--	µg/kg		ND (370)	--
4-Chloro-3-methylphenol	6,100,000	µg/kg		ND (730)	--
4-Chloroaniline	2,400	µg/kg		ND (730)	--
4-Chlorophenyl phenyl ether	--	µg/kg		ND (370)	--
4-Methylphenol	500	µg/kg		ND (370)	--
4-Nitroaniline	24,000	µg/kg		ND (1,800)	--
4-Nitrophenol	--	µg/kg		ND (1,800)	--
Benzoic acid	240,000,000	µg/kg		ND (1,800)	--
Benzyl alcohol	6,100,000	µg/kg		ND (730)	--
bis (2-chloroethoxy) methane	180,000	µg/kg		ND (370)	--
bis (2-chloroethyl) ether	210	µg/kg		ND (370)	--
bis (2-chloroisopropyl) ether	4,600	µg/kg		ND (370)	--
bis (2-ethylhexyl) phthalate	2,870	µg/kg		ND (370)	--
Butylbenzylphthalate	260,000	µg/kg		ND (370)	--
Dibenzofuran	150,000	µg/kg		ND (370)	--
Diethyl phthalate	49,000,000	µg/kg		ND (370)	--
Dimethyl phthalate	100,000,000	µg/kg		ND (370)	--
Di-n-butyl phthalate	46.9	µg/kg		ND (370)	--
Di-n-octyl phthalate	2,400,000	µg/kg		ND (370)	--
Hexachlorobenzene	300	µg/kg		ND (370)	--
Hexachloroethane	35,000	µg/kg		ND (370)	--

TABLE **2**
Soil Sample Results: TCS Well Number 4 (TCS-4) – Adjacent to the Well Head
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name: / Sample Date: / Depth (ft bgs):	Old Well-BCW-1 [a] 9/11/2013 7-8	Old Well-BCW-2 [a] 9/11/2013 4-5
Semivolatile Organic Compounds					
Isophorone	510,000	µg/kg		ND (370)	--
Nitrobenzene	4,800	µg/kg		ND (370)	--
N-nitrosodiphenylamine	99,000	µg/kg		ND (370)	--
n-Nitroso-di-n-propylamine	69	µg/kg		ND (370)	--
Pentachlorophenol	2,490	µg/kg		ND (1,800)	--
Phenol	18,000,000	µg/kg		ND (370)	--
Total Petroleum Hydrocarbons					
TPH as diesel	540	mg/kg		ND (11)	--
TPH as gasoline	540	mg/kg		ND (2.1)	--
TPH as motor oil	1,800	mg/kg		20	--
Volatile Organic Compounds					
1,1,1,2-Tetrachloroethane	1,900	µg/kg		ND (10)	--
1,1,1-Trichloroethane	8,700,000	µg/kg		ND (10)	--
1,1,2,2-Tetrachloroethane	560	µg/kg		ND (10)	--
1,1,2-Trichloroethane	1,100	µg/kg		ND (10)	--
1,1,2-Trichlorotrifluoroethane (Freon 113)	43,000,000	µg/kg		ND (10)	--
1,1-Dichloroethane	3,300	µg/kg		ND (10)	--
1,1-Dichloroethene	240,000	µg/kg		ND (10)	--
1,1-Dichloropropene	1,700	µg/kg		ND (10)	--
1,2,3-Trichlorobenzene	49,000	µg/kg		ND (10)	--
1,2,3-Trichloropropane	5	µg/kg		ND (10)	--
1,2,4-Trichlorobenzene	22,000	µg/kg		ND (10)	--
1,2,4-Trimethylbenzene	62,000	µg/kg		ND (10)	--
1,2-Dibromoethane	34	µg/kg		ND (10)	--
1,2-Dibromo-3-chloropropane	5.4	µg/kg		ND (10)	--
1,2-Dichlorobenzene	1,900,000	µg/kg		ND (10)	--
1,2-Dichloroethane	430	µg/kg		ND (10)	--
1,2-Dichloropropane	890	µg/kg		ND (10)	--
1,3,5-Trimethylbenzene	780,000	µg/kg		ND (10)	--
1,3-Dichlorobenzene	530,000	µg/kg		ND (10)	--
1,3-Dichloropropane	1,600,000	µg/kg		ND (10)	--
1,4-Dichlorobenzene	2,400	µg/kg		ND (10)	--
2,2-Dichloropropane	890	µg/kg		ND (10)	--
2-Chlorotoluene	160,000	µg/kg		ND (10)	--
4-Isopropyltoluene	2,100,000	µg/kg		ND (10)	--
Acetone	61,000,000	µg/kg		ND (100)	--

TABLE **2**
Soil Sample Results: TCS Well Number 4 (TCS-4) – Adjacent to the Well Head
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name: / Sample Date: / Depth (ft bgs):	Old Well-BCW-1 [a] 9/11/2013 7-8	Old Well-BCW-2 [a] 9/11/2013 4-5
Volatile Organic Compounds					
Acrolein	150	µg/kg		ND (200)	--
Acrylonitrile	55	µg/kg		ND (100)	--
Benzene	1,100	µg/kg		ND (10)	--
Bromobenzene	300,000	µg/kg		ND (10)	--
Bromodichloromethane	270	µg/kg		ND (10)	--
Bromomethane	7,300	µg/kg		ND (10)	--
Bromochloromethane	270	µg/kg		ND (10)	--
Bromoform	61,000	µg/kg		ND (10)	--
Carbon disulfide	820,000	µg/kg		ND (10)	--
Carbon tetrachloride	250	µg/kg		ND (10)	--
Chlorobenzene	290,000	µg/kg		ND (10)	--
Chloroethane	15,000,000	µg/kg		ND (10)	--
Chloro methane	120,000	µg/kg		ND (10)	--
Chloroform	290	µg/kg		ND (10)	--
cis-1,2-Dichloroethene	780,000	µg/kg		ND (10)	--
cis-1,3-Dichloropropene	1,700	µg/kg		ND (10)	--
Dibromochloromethane	680	µg/kg		ND (10)	--
Dibromomethane	25,000	µg/kg		ND (10)	--
Dichlorodifluoromethane	180,000	µg/kg		ND (10)	--
Ethyl- benzene	5,400	µg/kg		ND (10)	--
Hexachlorobutadiene	6,200	µg/kg		ND (10)	--
Isopropylbenzene	2,100,000	µg/kg		ND (10)	--
Methyl ethyl ketone	28,000,000	µg/kg		ND (100)	--
Methyl isobutyl ketone	5,300,000	µg/kg		ND (100)	--
Methyl tert-butyl ether (MTBE)	43,000	µg/kg		ND (10)	--
Methylene chloride	11,000	µg/kg		ND (10)	--
N-Butylbenzene	240,000	µg/kg		ND (10)	--
N-Propylbenzene	240,000	µg/kg		ND (10)	--
p-Chlorotoluene	5,500,000	µg/kg		ND (10)	--
sec-Butylbenzene	220,000	µg/kg		ND (10)	--
Styrene	6,300,000	µg/kg		ND (10)	--
tert-Butylbenzene	390,000	µg/kg		ND (10)	--
Tetrachloroethene	550	µg/kg		ND (10)	--
Toluene	5,000,000	µg/kg		ND (10)	--
trans-1,2-Dichloroethene	150,000	µg/kg		ND (10)	--
trans-1,3-Dichloropropene	1,700	µg/kg		ND (10)	--

TABLE **2**
Soil Sample Results: TCS Well Number 4 (TCS-4) – Adjacent to the Well Head
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name:	Old Well-BCW-1 [a]	Old Well-BCW-2 [a]
			Sample Date:	9/11/2013	9/11/2013
			Depth (ft bgs):	7-8	4-5
Volatile Organic Compounds					
Trichloroethene	2,800	µg/kg		ND (10)	--
Trichlorofluoromethane (Freon 11)	790,000	µg/kg		ND (10)	--
Vinyl chloride	60	µg/kg		ND (10)	--
Xylene, m,p-	3,400,000	µg/kg		ND (10)	--
Xylene, o-	3,800,000	µg/kg		ND (10)	--
Xylenes, total	630,000	µg/kg		ND (10)	--

Notes:

[a] – Samples were collected from the excavation around TCS Well #4, from the backhoe bucket.

Calculations:
TEQ Human, TEQ Avian and TEQ Mammals = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is ND.

-- = not analyzed.
ft bgs = feet below ground surface.
J = concentration or reporting limit estimated by laboratory or data validation.
mg/kg = milligrams per kilogram.
ND = not detected at the listed reporting limit.
ng/kg = nanograms per kilogram.
TEF = Toxic Equivalency Factor.
TPH = Total Petroleum Hydrocarbon.
µg/kg = micrograms per kilogram.

TABLE 3
Soil Sample Results: TCS Well Number 4 (TCS-4) – From Within the Well
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name:	TCS-4-01	TCS-4-02
			Sample Date:	3/25/2014	3/25/2014
			Depth within well (ft bgs):	59 - 60	113
			Depth within fill (ft)[1]:	1-2	55
Dioxins and Furans					
1,2,3,4,6,7,8-HpCDD	--	ng/kg		4,200	1,000
1,2,3,4,6,7,8-HpCDF	--	ng/kg		740	200
1,2,3,4,7,8,9-HpCDF	--	ng/kg		53	20
1,2,3,4,7,8-HxCDD	--	ng/kg		8.1 J	ND (4.5)
1,2,3,4,7,8-HxCDF	--	ng/kg		ND (21)	ND (5.7)
1,2,3,6,7,8-HxCDD	--	ng/kg		79	26
1,2,3,6,7,8-HxCDF	--	ng/kg		ND (19)	ND (5.3)
1,2,3,7,8,9-HxCDD	--	ng/kg		16	10 J
1,2,3,7,8,9-HxCDF	--	ng/kg		ND (25)	ND (6.7)
2,3,4,6,7,8-HxCDF	--	ng/kg		ND (1,400)	ND (490)
OCDD	--	ng/kg		46,000	11,000
OCDF	--	ng/kg		3,800	920
1,2,3,7,8-PeCDD	4.6	ng/kg		2.3 J	ND (1.2)
1,2,3,7,8-PeCDF	--	ng/kg		ND (1.5)	ND (0.87)
2,3,4,7,8-PeCDF	--	ng/kg		ND (1.6)	18
2,3,7,8-TCDD	4.6	ng/kg		ND (0.09)	ND (0.45)
2,3,7,8-TCDF	--	ng/kg		ND (0.15)	ND (0.3)
TEQ Human	50	ng/kg		150	51
TEQ Avian	16	ng/kg		96	50
TEQ Mammals	1.6	ng/kg		150	51
Metals					
Antimony	0.285	mg/kg		ND (2J)	ND (2)
Arsenic	11	mg/kg		2.1	20
Barium	410	mg/kg		80	51
Beryllium	0.672	mg/kg		ND (1)	ND (1)
Cadmium	1.1	mg/kg		ND (1J)	ND (1)
Chromium, total	39.8	mg/kg		61 J	1,700
Cobalt	12.7	mg/kg		6.3	31
Copper	16.8	mg/kg		18 J	580
Chromium, Hexavalent	0.83	mg/kg		2.2	ND (0.4)
Lead	8.39	mg/kg		32 J	17
Mercury	0.0125	mg/kg		ND (0.1)	ND (0.1)
Molybdenum	1.37	mg/kg		ND (1)	35
Nickel	27.3	mg/kg		16 J	300
Selenium	1.47	mg/kg		1.6	42

TABLE 3
Soil Sample Results: TCS Well Number 4 (TCS-4) – From Within the Well
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name:	TCS-4-01	TCS-4-02
			Sample Date:	3/25/2014	3/25/2014
			Depth within well (ft bgs):	59 - 60	113
			Depth within fill (ft)[1]:	1-2	55
Metals					
Silver	5.15	mg/kg		ND (1J)	ND (1)
Thallium	2.32	mg/kg		ND (2J)	ND (2)
Vanadium	52.2	mg/kg		29	5.7
Zinc	58	mg/kg		30	55
Polyaromatic Hydrocarbons					
1-Methyl naphthalene	22,000	µg/kg		ND (5J)	ND (5.1J)
2-Methyl naphthalene	310,000	µg/kg		ND (5J)	ND (5.1J)
Acenaphthene	3,400,000	µg/kg		ND (5J)	ND (5.1J)
Acenaphthylene	1,700,000	µg/kg		ND (5J)	ND (5.1J)
Anthracene	17,000,000	µg/kg		ND (5J)	ND (5.1J)
Benzo (ghi) perylene	1,700,000	µg/kg		ND (5J)	7.1 J
Benzo (a) anthracene	380	µg/kg		ND (5J)	11 J
Benzo (a) pyrene	38	µg/kg		ND (5J)	11 J
Benzo (b) fluoranthene	380	µg/kg		ND (5J)	15 J
Benzo (k) fluoranthene	380	µg/kg		ND (5J)	5.1 J
Chrysene	3,800	µg/kg		ND (5J)	12 J
Dibenzo (a,h) anthracene	110	µg/kg		ND (5J)	ND (5.1J)
Fluoranthene	2,300,000	µg/kg		ND (5J)	19 J
Fluorene	2,300,000	µg/kg		ND (5J)	ND (5.1J)
Indeno (1,2,3-cd) pyrene	380	µg/kg		ND (5J)	6.1 J
Naphthalene	3,600	µg/kg		ND (5J)	ND (5.1J)
Phenanthrene	1,700,000	µg/kg		ND (5J)	8.4 J
Pyrene	1,700,000	µg/kg		ND (5J)	14 J
B(a)P Equivalent	38	µg/kg		ND (4.4)	16
PAH High molecular weight	1,160	µg/kg		ND	100
PAH Low molecular weight	10,000	µg/kg		ND	8.4
Polychlorinated Biphenyls					
Aroclor 1016	3,900	µg/kg		ND (17J)	ND (17J)
Aroclor 1221	140	µg/kg		ND (33J)	ND (33J)
Aroclor 1232	140	µg/kg		ND (17J)	ND (17J)
Aroclor 1242	220	µg/kg		ND (17J)	ND (17J)
Aroclor 1248	220	µg/kg		ND (17J)	ND (17J)
Aroclor 1254	220	µg/kg		ND (17J)	ND (17J)
Aroclor 1260	220	µg/kg		ND (17J)	ND (17J)
Semivolatile Organic Compounds					

TABLE 3
Soil Sample Results: TCS Well Number 4 (TCS-4) – From Within the Well
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name:	TCS-4-01	TCS-4-02
			Sample Date:	3/25/2014	3/25/2014
			Depth within well (ft bgs):	59 - 60	113
			Depth within fill (ft)[1]:	1-2	55
Semivolatile Organic Compounds					
1,2,4-Trichlorobenzene	22,000	µg/kg		ND (330J)	ND (330J)
1,2-Dichlorobenzene	1,900,000	µg/kg		ND (330J)	ND (330J)
1,3-Dichlorobenzene	530,000	µg/kg		ND (330J)	ND (330J)
1,4-Dichlorobenzene	2,400	µg/kg		ND (330J)	ND (330J)
2,4,5-Trichlorophenol	6,100,000	µg/kg		ND (330J)	ND (330J)
2,4,6-Trichlorophenol	6,900	µg/kg		ND (330J)	ND (330J)
2,4-Dichlorophenol	180,000	µg/kg		ND (1,700J)	ND (1,700J)
2,4-Dimethylphenol	1,200,000	µg/kg		ND (330J)	ND (330J)
2,4-Dinitrophenol	120,000	µg/kg		ND (1,700J)	--
2,4-Dinitrotoluene	1,600	µg/kg		ND (330J)	ND (330J)
2,6-Dinitrotoluene	61,000	µg/kg		ND (330J)	ND (330J)
2-Chloro naphthalene	6,300,000	µg/kg		ND (330J)	ND (330J)
2-Chlorophenol	63,000	µg/kg		ND (330J)	ND (330J)
2-Methylphenol	3,100,000	µg/kg		ND (330J)	ND (330J)
2-Nitroaniline	183,000	µg/kg		ND (1,700J)	ND (1,700J)
2-Nitrophenol	--	µg/kg		ND (330J)	ND (330J)
3,3-Dichlorobenzidene	1,100	µg/kg		ND (660J)	ND (670J)
3-Nitroaniline	18,000	µg/kg		ND (1,700J)	ND (1,700J)
4,6-Dinitro-2-methylphenol	6,100	µg/kg		ND (1,700J)	--
4-Bromophenyl phenyl ether	--	µg/kg		ND (330J)	ND (330J)
4-Chloro-3-methylphenol	6,100,000	µg/kg		ND (660J)	ND (670J)
4-Chloroaniline	2,400	µg/kg		ND (660J)	ND (670J)
4-Chlorophenyl phenyl ether	--	µg/kg		ND (330J)	ND (330J)
4-Methylphenol	500	µg/kg		ND (330J)	ND (330J)
4-Nitroaniline	24,000	µg/kg		ND (1,700J)	ND (1,700J)
4-Nitrophenol	--	µg/kg		ND (1,700J)	--
Benzoic acid	240,000,000	µg/kg		ND (1,700J)	--
Benzyl alcohol	6,100,000	µg/kg		ND (660J)	ND (670J)
bis (2-chloroethoxy) methane	180,000	µg/kg		ND (330J)	ND (330J)
bis (2-chloroethyl) ether	210	µg/kg		ND (330J)	ND (330J)
bis (2-chloroisopropyl) ether	4,600	µg/kg		ND (330J)	ND (330J)
bis (2-ethylhexyl) phthalate	2,870	µg/kg		ND (330J)	ND (330J)
Butylbenzylphthalate	260,000	µg/kg		ND (330J)	ND (330J)
Dibenzofuran	150,000	µg/kg		ND (330J)	ND (330J)
Diethyl phthalate	49,000,000	µg/kg		ND (330J)	ND (330J)

TABLE 3
Soil Sample Results: TCS Well Number 4 (TCS-4) – From Within the Well
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name:	TCS-4-01	TCS-4-02
			Sample Date:	3/25/2014	3/25/2014
			Depth within well (ft bgs):	59 - 60	113
			Depth within fill (ft)[1]:	1-2	55
Semivolatile Organic Compounds					
Dimethyl phthalate	100,000,000	µg/kg		ND (330J)	ND (330J)
Di-n-butyl phthalate	46.9	µg/kg		ND (330J)	ND (330J)
Di-n-octyl phthalate	2,400,000	µg/kg		ND (330J)	ND (330J)
Hexachlorobenzene	300	µg/kg		ND (330J)	ND (330J)
Hexachlorobutadiene	6,200	µg/kg		ND (660J)	ND (670J)
Hexachloroethane	35,000	µg/kg		ND (330J)	ND (330J)
Isophorone	510,000	µg/kg		ND (330J)	ND (330J)
Nitrobenzene	4,800	µg/kg		ND (330J)	ND (330J)
N-nitrosodiphenylamine	99,000	µg/kg		ND (330J)	ND (330J)
n-Nitroso-di-n-propylamine	69	µg/kg		ND (330J)	ND (330J)
Pentachlorophenol	2,490	µg/kg		ND (1,700J)	--
Phenol	18,000,000	µg/kg		ND (330J)	ND (330J)

Notes:

[1] = Fill within well encountered at 58 ft bgs.

Calculations:
TEQ Human, TEQ Avian and TEQ Mammals = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is ND.

-- = not analyzed.
ft bgs = feet below ground surface.
J = concentration or reporting limit estimated by laboratory or data validation.
mg/kg = milligrams per kilogram.
ND = not detected at the listed reporting limit.
ng/kg = nanograms per kilogram.
TEF = Toxic Equivalency Factor.
TPH = Total Petroleum Hydrocarbon.
µg/kg = micrograms per kilogram.

TABLE **4**
Soil Sample Results: TCS Well Number 4 (TCS-4)– Pipe Wrap Material
Decommissioning Plan for TCS Well Number 4 (TCS-4)
PG&E Topock Compressor Station, Needles, California

Analyte	Interim Screening Level	Units	Sample Name: / Sample Date:	SWMU1-PipeWrap-01 / 2/26/2014
Asbestos				
Asbestos	--	%		12
Dioxins and Furans				
1,2,3,4,6,7,8-HpCDD	--	ng/kg		2,400 J
1,2,3,4,6,7,8-HpCDF	--	ng/kg		ND (620)
1,2,3,4,7,8,9-HpCDF	--	ng/kg		130 J
1,2,3,4,7,8-HxCDD	--	ng/kg		ND (120)
1,2,3,4,7,8-HxCDF	--	ng/kg		ND (160)
1,2,3,6,7,8-HxCDD	--	ng/kg		250 J
1,2,3,6,7,8-HxCDF	--	ng/kg		ND (220)
1,2,3,7,8,9-HxCDD	--	ng/kg		180 J
1,2,3,7,8,9-HxCDF	--	ng/kg		ND (91)
2,3,4,6,7,8-HxCDF	--	ng/kg		ND (1,400)
OCDD	--	ng/kg		18,000
OCDF	--	ng/kg		ND (450)
1,2,3,7,8-PeCDD	4.6	ng/kg		ND (260)
1,2,3,7,8-PeCDF	--	ng/kg		230 J
2,3,4,7,8-PeCDF	--	ng/kg		ND (150)
2,3,7,8-TCDD	4.6	ng/kg		ND (90)
2,3,7,8-TCDF	--	ng/kg		84 J
TEQ Human	50	ng/kg		390
TEQ Avian	16	ng/kg		480
TEQ Mammals	1.6	ng/kg		390

Notes:

Calculations:
TEQ Human, TEQ Avian and TEQ Mammals = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all Dioxins and Furans are nondetect, the final qualifier code is ND.

-- = not analyzed.
J = concentration or reporting limit estimated by laboratory or data validation.
ND = not detected at the listed reporting limit.
ng/kg = nanograms per kilogram.
TEF = Toxic Equivalency Factor.

TABLE 5

Existing Displaced Soil Stockpile - Characterization Data

Decommissioning Plan for Topock Compressor Station Well Number 4

(TCS-4) PG&E Topock Compressor Station, Needles, California

				Sample Name:	**IDW-Pile**
				Sample Date:	**1/20/2010**
				Sample Type:	**Composite**
Parameter	1 **Site SL**	2 **Title 22 TTLC**	3 **STLC**	4 **RCRA TC**	**Analytical Results**
Metals (mg/kg)					
Antimony	0.285	500	NE	NE	2.2 U
Arsenic	11	500	50	100	1.7
Barium	410	10,000	1,000	2,000	94
Beryllium	0.672	75	7.5	NE	1.1 U
Cadmium	1.1	100	10	20	1.1 U
Chromium, Hexavalent	0.83	500	50	NE	0.44 U
Chromium, total	39.8	2,500	50	100	16
Cobalt	12.7	8,000	800	NE	4.9
Copper	16.8	2,500	250	NE	9.9
Lead	8.39	1,000	50	100	6.6
Mercury	0.0125	20	2	4	0.11 U
Molybdenum	1.37	3,500	3,500	NE	1.1 U
Nickel	27.3	2,000	200	NE	9.4
Selenium	1.47	100	10	20	1.1 U
Silver	5.15	500	50	100	1.1 U
Thallium	2.32	700	70	NE	2.2 U
Vanadium	52.2	2,400	240	NE	22
Zinc	58	5,000	2,500	NE	35

Notes:

--	not analyzed
bgs	below ground surface
mg/kg	milligrams per kilogram
NA	sample collected at undocumented depth
NE	not established
U	not detected at or above the indicated reporting limit

Detected concentrations exceeding the appropriate screening level are **bold**.

Screening Level Detail:

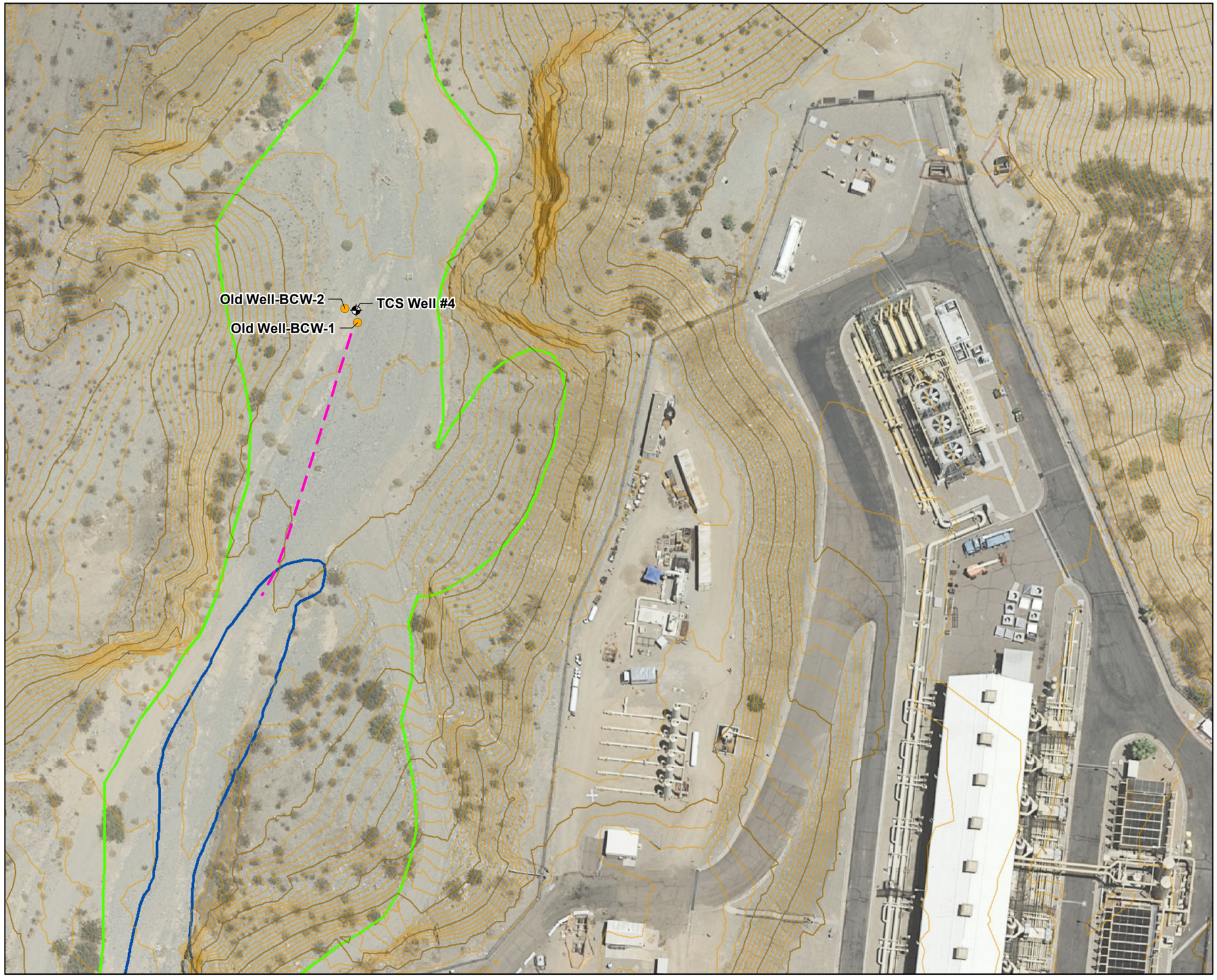
1 Site Specific screening levels developed from RCRA Facility Investigation/Remedial Investigation

2 Total Threshold Limit Concentrations from the Califonia Code of Regulations (CCR), Title 22, Division 4.5

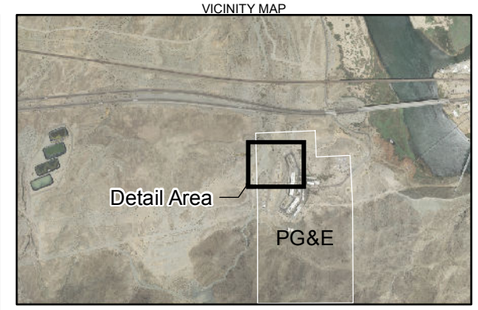
3 Soluable Threshold Limit Concentractions from the California Code of Regulations (CCR), Title 22, Division 4.5

4 RCRA toxicity characteristic limit from the California Code of Regulations (CCR), Title 22, Division 4.5

Figures



VICINITY MAP



LEGEND

- Well Location
- Previous Soil Sample Location
- Estimated Pipeline Location[1]
- Topographic Contour (10-foot interval)
- Topographic Contour (2-foot interval)
- AOC 1 Boundary
- SWMU 1 Boundary

Notes:
1. Estimate location of buried 3-inch diameter steel pipe. Estimated via geophysical survey performed on April 2, 3, and 4, 2013

N

0 60 120
Feet

FIGURE 1
TCS-4 WELL AND SOIL SAMPLE LOCATION MAP

DECOMMISSIONING PLAN FOR
TCS WELL NUMBER 4 (TCS-4)
PG&E NEEDLES TOPOCK COMPRESSOR STATION,
NEEDLES, CA

CH2MHILL

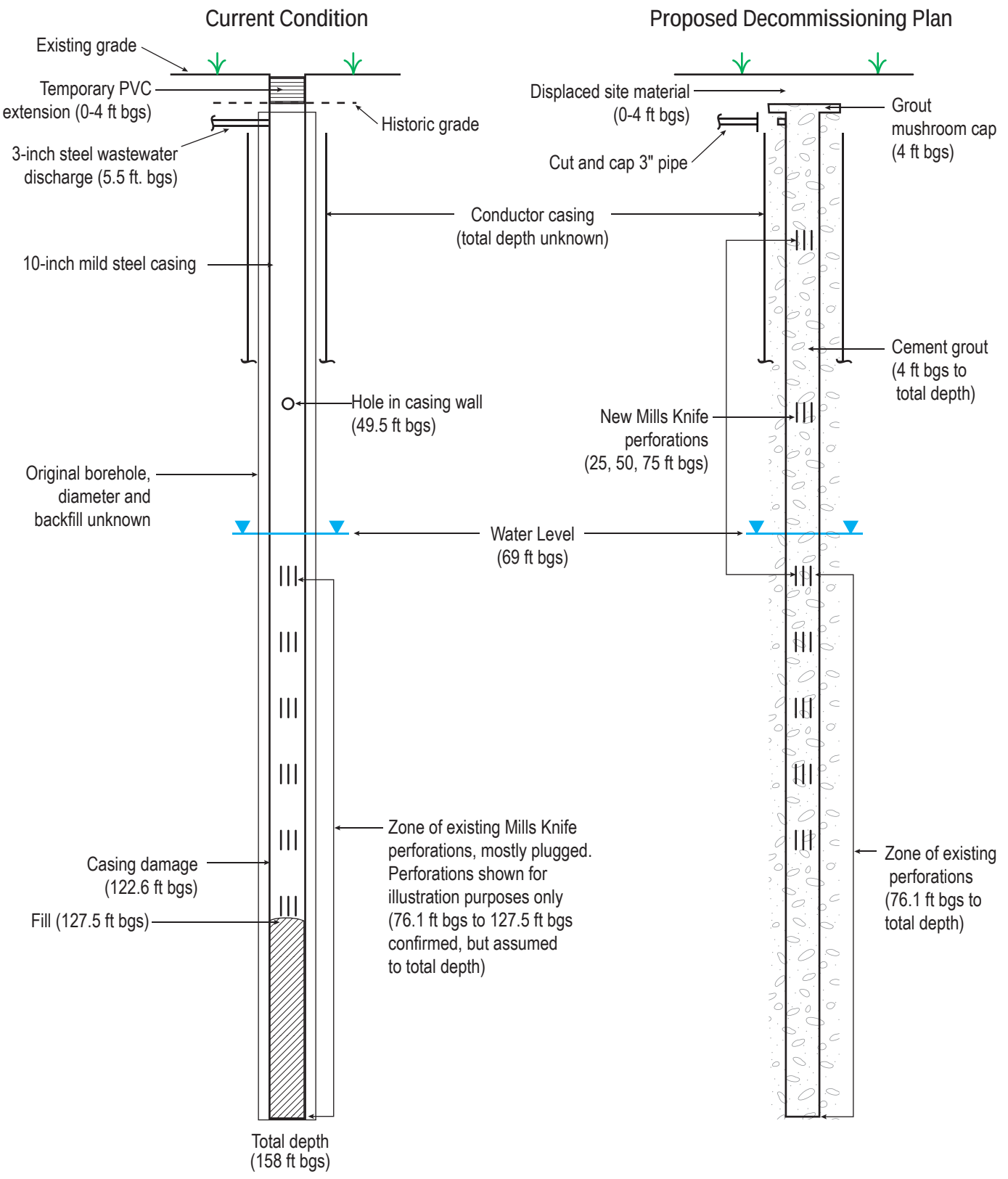
Path: D:\zinfandel\proj\PacificGasElectricCo\TopockProgram\GIS\MapFiles\2014\BCW_OldWell\TCS4Well_LocationMap.mxd

View to South

View to North

FIGURE 2
TCS-4 WELL PHOTOS
DECOMMISSIONING PLAN FOR
TCS WELL NUMBER 4 (TCS-4)
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



Notes
ft bgs = feet below ground surface

All depths relative to existing ground surface.

Drawings are not to scale.

FIGURE 3
TCS-4 WELL SCHEMATIC
DECOMMISSIONING PLAN FOR
TCS WELL NUMBER 4 (TCS-4)
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Attachments

Comments on the Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4) (July 11, 2014)
Pacific Gas and Electric Company, Needles, California

Absolute Comment No.	Comment Source/Number	Section	Reference Text	Comment	Response
1	Department of Toxics Substances Control (DTSC) July 29, 2014 DTSC-1	Topock Project Executive Abstract	This technical memorandum is required to conduct well network maintenance activities associated with the decommissioning of an old well and to comply with California Well Standards.	Add the language shown as underlined.	The specified text will be added.
2	DTSC-2	Topock Project Executive Abstract	This technical memorandum defines the decommissioning procedures for an old water supply/waste injection well located west of the Pacific Gas and Electric Company (PG&E) Topock Compressor Station (TCS), referred to as "Well Number 4" in previous PG&E documentation and as "TCS-4" in this Plan.	Add the language shown as underlined.	The specified text will be added.
3	DTSC-3	Topock Project Executive Abstract	This technical memorandum is ~~required for regulatory approval prior to conducting well decommissioning activities.~~	Replace the language shown as ~~strikethrough~~ with the language underlined below: This technical memorandum is submitted for agency concurrence associated with well decommissioning in compliance with the California Well Standards.	The text will be changed as specified.
4	DTSC-4	Topock Project Executive Abstract	Related Reports and Documents:	"Delete this box or highlight "Other" box to stress where this type of work belongs as compared to the typical cleanup process."	The "other" box will be highlighted in yellow.
5	DTSC-5	Page 1, first paragraph	This technical memorandum defines the decommissioning procedures for an old water supply/waste injection well located west of the Pacific Gas and Electric Company (PG&E) Topock Compressor Station (TCS), referred to as "Well Number 4" in previous PG&E documentation and as "TCS-4" in this Plan.	Add the language shown as underlined.	The specified text will be added.
6	DTSC-6	Page 2, Section 1.0	The decommissioning of the TCS-4 well is a well maintenance activity and ~~implementation of this plan will require prior approval from DTSC and DOI.~~	Replace the language shown as ~~strikethrough~~ with the language underlined below: The decommissioning of the TCS-4 well is a well maintenance activity and will be conducted in accordance with the California Well Standards. PG&E will seek concurrence from DTSC and DOI prior to implementing the decommissioning plan.	The text will be changed as specified.
7	DTSC-7	Page 3, Section 1.0	**Biological Resource Survey**. A biological resource survey will be conducted for the immediate work areas and all associated access routes prior to well ~~repair~~ activities in accordance with the PBA and CDFW Avoidance and Minimization Measures.	Replace the language shown as ~~strikethrough~~ with the language underlined below: **Biological Resource Survey**. A biological resource survey will be conducted for the immediate work areas and all associated access routes prior to well decommissioning activities in accordance with the PBA and CDFW Avoidance and Minimization Measures.	The text will be changed as specified.
8	DTSC-8	Page 3, Section 1.0	TCS-4 well decommissioning activities will begin following ~~approval~~ from DTSC and DOI. Field activities will begin with the pre-mobilization tasks listed above.	Replace the language shown as ~~strikethrough~~ with the language underlined below: TCS-4 well decommissioning activities will begin following concurrence from DTSC and DOI. Field activities will begin with the pre-mobilization tasks listed above.	The text will be changed as specified.
9	DTSC-9	Page 6, Section 2.2.1	The neat cement will be placed in the well casing in one continuous operation using a tremie pipe with positive displacement pumping (pumped under pressure), beginning at the bottom of well with the end of the tremie pipe submerged two feet or more	Add the language shown as underlined. "Want to ensure grout invades perfs. Can cap/packer be placed on the PVC riser/steel casing to hold 25-40lbs pressure while grout sets?"	The following text will be added in the third paragraph of the specified section (where the edit was suggested) to indicate that the neat cement will be kept under pressure while setting: To ensure the sealing material invades the perforations in the well casing, the neat cement that is injected will remain under pressure until the grout has set. This will be achieved by maintaining the level of neat cement in the well casing to within approximately 10-15 feet of the ground surface, which is approximately 55-60 feet above the water level in the well. Utilizing this approach will result in approximately 35-45 pounds per square

Absolute Comment No.	Comment Source/Number	Section	Reference Text	Comment	Response
			below the surface of the cement during placement. The cement grout that is injected will have a pressure maintained (~25 – 40lbs) until the grout has set.		inch (psi) of pressure at the depth of the water table (approximately 70 feet bgs), and higher at the total depth of the well; therefore, the use of a packer within the well casing to maintain pressure during the placement of sealing material will not be necessary.
10	DTSC-10	Page 6, Section 2.2.1	During this operation, *static water is either displaced out of the top of the well by the injected column of material*, or is forced into the formation.	Comment applies to language shown in *italics.* "Include vacuum truck or similar for removing fluids before they come out the top of the well as the fluids could be contaminated or carry contamination. Not an issue if properly pressurized –see other comment.*"	The following text will be added to the last paragraph of the specified section to indicate that water displaced out of the well will be contained: Water that is displaced out of the top of the well will be contained and disposed in accordance with State and Federal regulations.
11	DTSC-11	Page 6, Section 2.2.1	The cement level in the well will be monitored for settlement during emplacement and approximately 24 hours after, and the volume of neat cement will be measured against the anticipated volume of the well (including borehole area) to verify adequate filling.	Add the language shown as underlined.	The following underlined text will be added as specified with the addition of the text in bold: The cement level in the well will be monitored for settlement during emplacement and approximately 24 hours after, and the volume of neat cement will be measured against the anticipated volume of the well (including **estimated** borehole area) to verify adequate filling. See also response to comment DOI-8 regarding the calculation of a minimum volume of neat cement.
12	DTSC-12	Page 7, Section 2.3, List Item Number 2	The end of the pipe that extends further south in Bat Cave Wash will be ~~left open, which is the inferred condition of the other end of the pipe,~~ and the remainder of the pipe will be left in place as requested by DTSC and DOI (the ultimate disposition of this pipe will be addressed by the ongoing RFI/RI soil investigation).	Replace the language shown as ~~strikethrough~~ with the language underlined below: The end of the pipe that extends further south in Bat Cave Wash will be capped and the remainder of the pipe will be left in place as requested by DTSC and DOI (the ultimate disposition of this pipe will be addressed by the ongoing RFI/RI soil investigation). "Cap this end too (as indicated on Figure 3) as the pipe terminates in an area known to be contaminated and would appear to be good general practice."	The text and Figure 3 will be changed as specified.
13	U.S. Department of the Interior (DOI) August 28, 2014 DOI-1	Page 2	Last sentence first full paragraph.	Editorial: The text states ".. *it was determined that he well*…" Please change "he" to "the".	The text will be changed as specified.
14	DOI-2	Page 3	First and second bullets.	Consider rewording "well repair and well maintenance activities" to well decommissioning activities. Since the well is being abandoned rather than repaired or maintained.	Concur. The text will be changed as suggested.
15	DOI-3	Page 4, Second bullet	Well Clean-out – Rotosonic drilling and coring techniques were utilized to remove the fill material from within the well. … Soil samples were collected for waste characterization purposes near the top of the material at 59 to 60 feet bgs and from the approximate mid-point of the material at 104 to 113 feet bgs.	Please provide the waste characterization sampling results and the current status/disposition of the material removed from the well. This may be included within the well decommissioning report.	The waste material removed from within the well casing during clean-out was containerized, and characterized to determine the appropriate disposition option. The material was determined to be non-hazardous, but contains concentrations of analytes above site background concentrations. The waste material will be disposed off-site in accordance with State and Federal regulations. The waste characterization sample results will be added to the revised version of the TCS-4 Decommissioning Plan as Table 1 (existing tables will be renumbered). In addition, the following text will be added to the end of the Well Clean-out bullet: Based on the results of these samples (see Table 1), the waste material was determined to be non-hazardous, but contains concentrations of analytes above site background concentrations; therefore, the waste material will be disposed off-site in accordance with State and Federal regulations.
16	DOI-4		Prior to decommissioning, PG&E will seek a variance to leave the top of the well casing at its current depth of approximately 4 feet bgs. If required, 0.5-1 foot of the 10-inch diameter well casing will be cut off to lower the well head to approximately 5 feet bgs.	DOI requests that the well casing be cut off below the flanges and that the "mushroom cap" encompass both the well casing and conductor casing.	As currently planned, the "mushroom cap" will encompass both the well casing and the conductor casing. See the following text from Section 2.3, Step 4: *The remnants of the concrete pad will be removed and all well head features will be encapsulated within a "mushroom cap" composed of neat cement grout that extends beyond the diameter of the conductor casing and 3-inch pipe stub so that fluids drain away from the well.* Regarding the request to cut the well casing below the flanges, PG&E assumes that this edit is requested to ensure that sealing material is placed between the conductor and primary well casings. If correct, the decommissioning plan will accomplish this without the revision in two ways: 1) sealing material will enter this annular space due to the casing perforation that will be made at approximately 25 feet bgs, and 2) sealing material will enter this annular space through a gap between the conductor casing and the flanges during "mushroom cap" installation. However, if San Bernardino County, as the responsible agency for enforcement of

Absolute Comment No.	Comment Source/Number	Section	Reference Text	Comment	Response
					the California Well Standards, requires the casing to be cut such that the top of the well is lowered to 5 feet below the current ground surface, then this revision will be incorporated. Changes to the document have not been made as a result of this comment.
17	DOI-5	Page 6, Section 2.2.1, third paragraph, first sentence	The text indicates that the grout will be injected under pressure.	Please provide the injection pressure range that is anticipated. At these depths it should be in the 20 to 40 psi.	See response to comment DTSC-9.
18	DOI-6	Page 6, Section 2.2.1, third paragraph, second sentence.	The text indicates that static water may be forced out of the top of the well.	This water may be contaminated and needs to be collected, containerized and disposed of in accordance with State and Federal regulations. Frequently a pump is placed at the top of the well to pump the displaced water into drums before the water is able to leave the well. Please revise text as necessary.	See response to comment DTSC-10.
19	DOI-7	Page 6, Section 2.2.1, third paragraph, third sentence.	The text states "The cement level in the well will be monitored for settlement during emplacement and approximately 24 hours after. Additional cement will be added as necessary so the well casing is sealed to a level of approximately 5 feet below the existing ground surface.	According to California Well Standards Bulletin 74-90. "The pressure required for the placement of cement-based sealing materials shall be maintained long enough for cement-based sealing materials to properly set." In practice, this pressure could be achieved by ensuring that the grout level in the well is maintained at a depth of no more than 5 feet below the existing land surface for a sufficient time for the grout to set. Please revise the text accordingly.	See response to comment DTSC-10.
20	DOI-8	Page 6, Section 2.2.1.	The California Well Standards Bulletin 74-90; with respect verification, state "It shall be verified that the volume of sealing and fill material placed during destruction operations equals or exceeds the volume to be filled and sealed. This is to help determine whether the well or boring has been properly destroyed and that no jamming or bridging of the fill or sealing material has occurred."	Please provide the minimum volume of material that is anticipated to decommission the well. Also please note here, or in Section 2.4 (Well Decommissioning Reporting) that this verification calculation will be provided.	The following text will be added to Section 2.3, Step 3 to indicate the estimated minimum volume of material that will be required to decommission the well: Based on a calculation of the estimated volume of the primary well casing, an estimated minimum volume of neat cement that will be required to seal the well is approximately 650 gallons. Variables that might result in a lower required volume include the dimension of the casing at depth (e.g., failures in the casing that result in a smaller diameter) or fill material that was not cleared from inside the well casing; however, because effort will be made to clean out the well prior to sealing, the volume of any remaining fill material will be known prior to grouting. Alternatively, variables that might result in a higher required volume include seepage of neat cement into voids in the annular space through perforations in the casing. The diameter of the borehole used to install the well and the composition of annular backfill material used, if any, is unknown; therefore, the volume of neat cement required to fill the annular space cannot be accurately estimated. The volume of the annular space between the primary well casing and the conductor casing also cannot be estimated because the depth and the amount and composition of any backfill between the of the conductor and production casings is also unknown. The following underlined text will be added to Section 2.4, third bullet regarding details that will be included in the Well Decommissioning Report: Details of the work performed including verification of the volume of sealing material used during decommissioning;
21	Hualapai Department of Cultural Resources (HDCR) September 15, 2014 HDCR-1	Section 2.1, Page 3		This particular well is outside the normal decommissioning protocol, (September of 2014) due to the age and purpose of the well. In evaluating the well, the plan states that a search for well documentation information was not successful (Section 2.1, page 3), and that additional field work "would need to be conducted to evaluate the construction and current condition of the well." For instance is TCS-4 considered a Class IV Well by CAL EPA standards? If so, is the permitting process different than what is proposed? Hualapai asked a representative of DTSC if TCS-4 was a Class IV well, and they responded, "I don't know as we don't have a lot of real data/information regarding its operation. Also, due to its age in the 60's don't know how the current classification system applies legally to these types of wells" (personal communication September 15, 2014). In view of the lack of sold information, Hualapai feel that it is pre-mature to implement the work plan without having the well documentation review complete.	PG&E disagrees that the well is outside the scope of the Standard Operating Procedure for Well and Borehole Decommissioning (Well-SOP-1), which was developed for the Topock Remediation Project and most recently submitted as part of the Pre-final (90%) Design Submittal for the Final Groundwater Remedy (Operation and Maintenance Manual, Volume 1, Appendix B). The well decommissioning scenario applicable to TCS-4 is detailed in Section 2.3.3 of the SOP (Decommission a Well in Place with Modification). As the comment correctly identifies, the first bullet in Section 2.1 of the TCS-4 Decommissioning Plan indicates that a search of PG&E document archives and the California DWR well database for additional records regarding TCS-4 were not successful and that additional field work would need to be conducted to evaluate the construction and current condition of the well. This field work has been completed and the findings are summarized in the remainder of the bullets included in Section 2.1. The Federal Underground Injection regulations were first established in the 1980s; therefore, since TCS-4 was constructed in the 1950s, it was not permitted as part of the EPA Underground Injection Control Program (especially since it was not designed or constructed for the purpose of waste injection). Typically, when a new injection well is permitted as part of the UIC Program, the approach for future decommissioning is considered as part of the permit application. Regardless, the decommissioning plan for a well in California that is permitted under the UIC Program would still need to meet the California Well Standards (like the TCS-4 Plan). PG&E has

Absolute Comment No.	Comment Source/Number	Section	Reference Text	Comment	Response
					discussed the TCS-4 well and this decommissioning plan with the EPA UIC Program. The UIC has confirmed that they do not have record of this well in their database and have requested that PG&E document the decommissioning of the well by filing an "Injection Wells Registration Form" with the EPA Region 9 following the completion of decommissioning activities. This form will document the well operating status as "plugged and approved by regulator". The reporting requirement will be added to Section 2.4 (Well Decommissioning Reporting) of the plan. The well documentation review for TCS-4 is complete and additional reconnaissance has been conducted within well to obtain the information required to develop a decommissioning plan that will comply with the California Well Standards.
22	HDCR-2	Section 2.1, Page 4		Backfill: (Section 2.1, page 4). Soil from the potholing and initial investigations that took place in April 2013 was used as back-fill. Data within the decommissioning plan states that (page 4) CrT, CrVI, molybdenum and zinc "were detected in both samples above background concentrations." Further, (page 5) dioxins and furans (both not naturally occurring) were "detected above toxicity equivalent quotients for Humans, Avians, and Mammals..." Additionally, samples taken from inside TCS-4 (March 2014) included above background levels for CrT, CrVI, copper, lead, selenium, arsenic, cobalt, nickel and zinc. Why is contaminated soil being used as backfill?	Soils were generated by two different activities as a result of well location and collection of additional information about the construction of TCS-4: 1) soils were generated when potholing around TCS-4, and 2) unconsolidated material was removed from TCS-4 during well clean-out to determine total depth of the well. These materials were handled in different ways in accordance with standard practice for the Topock Remediation Project. 1) Soils generated by potholing around the well were replaced in the same excavation. TCS-4 is within the boundaries of AOC-1/SWMU-1, which are areas actively being investigated as part of the Topock Soil RCRA Facility Investigation/Remediation Investigation (RFI/RI). As is standard practice for potholes installed within these areas for site characterization purposes, and in accordance with previous requests from the Tribes, materials in these areas are not to be removed from the site until the soils investigation and associated risk assessment are complete, and appropriate soil remediation goals are established such that the amount of material that potentially leaves the site is minimized. 2) Unconsolidated material removed from within the well during well clean-out activities was contained and characterized for disposal in accordance with State and Federal regulations (i.e., treated as investigation derived waste generated during drilling). See also response to comment DOI-3 regarding the results of characterization samples and disposal of the material. Based on discussion during September 15, 2015 Technical Work Group (TWG) meeting the material that is generated during the well decommissioning process will be managed using the same procedures. Material excavated from around the well will be returned to the excavation, and material generated from within the well casing will be contained and characterized for disposal in accordance with State and Federal regulations.
23	HDCR-3	Page 5		The pipe wrap sample (page 5), has asbestos containing materials. Does the soil have asbestos fibers?	The two soil samples collected around TCS-4 were not analyzed for asbestos. The analyte list for the two soil samples was the same as the list of analytes for the AOC-1/SWMU-1 soils investigation, which does not include asbestos. The pipe wrap sample was collected and analyzed in response to the analytical results for the two soil samples around TCS-4. The purpose of the pipe wrap sample was to evaluate whether the dioxins detected in the two soil samples around TCS-4 may have originated from the tar-like pipe wrap that covers the lateral pipe connected to TCS Well 4. Asbestos was analyzed for the pipe wrap sample given the potential for this type of pipe covering materials to contain asbestos.
24	HDCR-4	Page 5		Per the plan, (page 5) water quality data indicates that TCS-4 is "within the area of the hexavalent chromium plume," and that "TCS-4 is an old, damaged production well, not a properly constructed monitoring well," indicating that data may be compromised. Again, Hualapai feel that it is pre-mature to implement the work plan without having the well documentation review complete, with supporting data available to the tribes for review.	See response to comment HDCR-1.
25	HDCR-5	Page 6		Filler material: (page 6). This is confusing; is the filler going to be neat cement or? The plan states that "Displaced site material will be used to backfill the portion of the borehole/excavation above sealed interval." Where *is displaced site material* coming from? AOC-4 material was completed removed due to hazardous material. TCS-4 is within the area of the chromium plume. Will *displaced site material* become contaminated from existing contaminated soil conditions at TCS-4? Section 2.3.2, (page 7) states, that "The excavation will then be backfilled using the same material that was excavated..." The soil is contaminated as stated above, so it seems to Hualapai that this is contradictory and does not make any sense. Same applies to Section 2.3.4, *Decommissioning the well head,* why use contaminated soil as backfill?	Response to comment HDCR-2 should be considered with the response to this comment. As defined in the TCS-4 Plan, and in more detail in Well-SOP-1 (see response to comment HDCR-1, first paragraph), neat cement will be used as sealing material, and displaced site material will be used as filler material (as opposed to importing filler material like sand that is foreign to the site). Filler material will not be used within the well casing and will only be used above/around the neat cement sealing material, which will extend to the top of the well casing and a few feet above as part of the "mushroom cap". Filler material will be used to fill the excavation up to ground surface so that neat cement is not visible at ground surface. As stated in the TCS-4 Plan, displaced site material from around the well would be used as filler material.

Absolute Comment No.	Comment Source/Number	Section	Reference Text	Comment	Response
26	HDCR-6	General Comment		As a matter of record, Hualapai prefer that the well casing be left-in-place.	Comment noted, and this is consistent with the TCS-4 Plan.
27	HDCR-7	General Comment		In summary, there appears to be inconsistencies regarding treatment of excavated soils, lack of data, and contaminated soil conditions, not to mention contaminations within the well casings.	See responses to previous HDCR comments.
28	HDCR-8	General Comment		In our opinion, Hualapai feels that the decommissioning plan is inadequate and pre-mature. As this well is the first well to implement the decommissioning standard operating procedure, it is very important that all data be available and not compromise safety protocols. It is our recommendation that further discussions are required prior to decommissioning TCS-4.	See responses to previous HDCR comments.
29	Colorado River Indian Tribes (CRIT) November 20, 2014 CRIT-1	General Comment		The Colorado River Indian Tribes are in receipt of your letter dated July 30, 2014 regarding the Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4) (Plan). After review of the Plan and a site visit by Tribal Staff conducted on June 19, 2014, the Tribes have determined that the decommissioning of the old well is appropriate under the circumstances.	Comment noted.
30	CRIT-2	General Comment		As stated previously, the Tribes have lived in this area since a time long before modern 'recorded' history. Our Ancestors are here with us still. As a matter of respect, and as a method of maintaining the historical record of our existence, it is Mohave custom and practice to leave their belongings, their ceremonial objects, their tolls and their signs of physical, religious, and artistic use and occupation of the area undisturbed, and where our Ancestors left them.	Comment noted.
31	CRIT-3	General Comment		We approve of the Plan's mandate of proceeding with full Tribal Monitoring of all ground-disturbing activities. We also approve of the Plan's general objective of employing minimal ground-disturbance by decommissioning TCS-4 in place, removing only the upper section of old piping, sealing the borehole with neat concrete, trimming and mushroom-copping the well stub, and back-filling the excavation with the original material removed. That methodology appears to pose the least risk of additional adverse impacts to irreplaceable Tribal resources.	Comment noted.
32	CRIT-4	General Comment		However, we take exception to the Plan's apparent reliance on statements made by the contractor *Applied Earthworks*, referring to two archaeological and historical resources site investigations undertaken in 2007, and 2010, asserting that "[n]o resources were noted during either investigation." (Plan, at Section 1.-, Pgs. 2-3). This statement is overbroad, and directly disputed by substantial recent evidence provided to PG&E, DTSC, and BLM by the Tribes involved in oversight and monitoring of the Topock Remediation Project. The area is replete with manifestations of Tribal use, occupancy and culture. The myopic lens of 'archaeological' evidence as the only valid determiner of whether an area contains elements of Tribal historical importance is long discredited. BLM's own Cultural and Historic Properties Management Plan (CHPMP) recognizes that the Topock area has the characteristics of a Traditional Cultural Property, as now commonly understood and recognized by many Federal Agencies. This recognition is appreciated by all the Tribes involved in the Topock Project, and we believe the Plan will be improved by incorporating this broader perspective, rather than the narrow one expressed by the statement identified above.	The text for the second bullet in Section 1 (Archaeological and Historical Resource Survey) will be changed as follows: ~~An archaeological and historical resource survey was previously conducted as part of Applied Earthwork's investigation of the expanded APE (Applied Earthworks, 2007) and field verified in 2010. No resources were noted during either investigation.~~ The Area of Potential Effects (APE) for the Topock site is contained within what the FMIT and other Native American Tribes have identified as a larger area of traditional and cultural importance. The Tribes believe that the environmental, cultural, and spiritual resources may not be physically perceptible. DTSC has concluded within the January 2011 certified Environmental Impact Report (EIR; DTSC 2011d) that the 779.2-acre project site "appears to qualify as a historic resource under CEQA [California Environmental Quality Act] as an area that is significant in the social and cultural annals of California," and the BLM also has determined that a traditional cultural property or property of traditional religious and cultural significance that is eligible for listing on the National Register of Historic Places exists in the area of the Topock project, within the current APE, consisting of 1,600 acres of surface area and a section of the Colorado River. Thousands of years of human history are evident in the area surrounding the Compressor Station. Among the larger and better known cultural resources on the site is an expansive desert geoglyph or intaglio known as the Topock Maze. Although the Maze is viewed as one contiguous element of a larger area having unique value to some Tribes, archaeological documents refer to three geographically-distinct parts, two of which overlie the groundwater plume. Prominent historic-era features in the landscape, several of which intrude upon the Maze and also overlie the groundwater plume, include segments of historic U.S. Route 66, the National Trails Highway (NTH; also known as the National Old Trails Highway), and the ROW of the BNSF Railway. A broad spectrum of archaeological resources is also present within the project area and on adjacent lands. Properties on and near the Topock site that are eligible for or listed on the National Register of Historic Places include Native American cultural resources and elements of the historic "built environment." Per standard best practice for the Remediation Project, the immediate work area and all associated access routes will again be field verified prior to well decommissioning activities to ensure

Absolute Comment No.	Comment Source/Number	Section	Reference Text	Comment	Response
					no resources will be impacted. All ground disturbing activities will be monitored. Tribal monitors will be invited to the pre-work field verification effort and to monitor the work.
33	CRIT-5	General Comment		We look forward to assisting the Bureau of Land Management and all interested parties in achieving the clean-up goals of the Topock Remediation Projects with the least possible impacts to the Tribal cultural resources, both as a matter of our Tribal Nation's interest, and as a matter of our shared National and world heritage interest.	Comment noted.
34	Cocopah Indian Tribe November 24, 2014 Cocopah-1	Section 2.1, Page 3		As we understand, TCS-4 is an older well, constructed in the 1950's and is located at the bottom of Bat Cave Wash. According to the decommissioning plan (July 11, 2014 CH2M Hill), the well was "buried in sediment deposited in the wash bottom," and has been recently re-located and potholed. This particular well is outside the normal decommissioning protocol, (September of 2014) due to the age and purpose of the well. In evaluating the well, the plan states that a search for well documentation information was not successful (Section 2.1, page 3), and that additional field work "would need to be conducted to evaluate the construction and current condition of the well." For instance is TCS-4 considered a Class IV Well by CAL EPA standards? If so, is the permitting process different than what is proposed?	PG&E disagrees that the well is outside the scope of the Standard Operating Procedure for Well and Borehole Decommissioning (Well-SOP-1), which was developed for the Topock Remediation Project and most recently submitted as part of the Pre-final (90%) Design Submittal for the Final Groundwater Remedy (Operation and Maintenance Manual, Volume 1, Appendix B). The well decommissioning scenario applicable to TCS-4 is detailed in Section 2.3.3 of the SOP (Decommission a Well in Place with Modification). As the comment correctly identifies, the first bullet in Section 2.1 of the TCS-4 Decommissioning Plan indicates that a search of PG&E document archives and the California DWR well database for additional records regarding TCS-4 were not successful and that additional field work would need to be conducted to evaluate the construction and current condition of the well. This field work has been completed and the findings are summarized in the remainder of the bullets included in Section 2.1. The Federal Underground Injection regulations were first established in the 1980s; therefore, since TCS-4 was constructed in the 1950s, it was not permitted as part of the EPA Underground Injection Control Program (especially since it was not designed or constructed for the purpose of waste injection). Typically, when a new injection well is permitted as part of the UIC Program, the approach for future decommissioning is considered as part of the permit application. Regardless, the decommissioning plan for a well in California that is permitted under the UIC Program would still need to meet the California Well Standards (like the TCS-4 Plan). PG&E has discussed the TCS-4 well and this decommissioning plan with the EPA UIC Program. The UIC has confirmed that they do not have record of this well in their database and have requested that PG&E document the decommissioning of the well by filing an "Injection Wells Registration Form" with the EPA Region 9 following the completion of decommissioning activities. This form will document the well operating status as "plugged and approved by regulator". The reporting requirement will be added to Section 2.4 (Well Decommissioning Reporting) of the plan. The well documentation review for TCS-4 is complete and additional reconnaissance has been conducted within well to obtain the information required to develop a decommissioning plan that will comply with the California Well Standards.
35	Cocopah-2	Section 2.1, Page 4		Backfill: (Section 2.1, page 4). Soil from the potholing and initial investigations that took place in April 2013 was used as back-fill. Data within the decommissioning plan states that (page 4) CrT, CrVI, molybdenum and zinc "were detected in both samples above background concentrations." Further, (page 5) dioxins and furans (both not naturally occurring) were "detected above toxicity equivalent quotients for Humans, Avians, and Mammals…" Additionally, samples taken from inside TCS-4 (March 2014) included above background levels for CrT, CrVI, copper, lead, selenium, arsenic, cobalt, nickel and zinc. Why is contaminated soil being used as backfill?	Soils were generated by two different activities as a result of well location and collection of additional information about the construction of TCS-4: 1) soils were generated when potholing around TCS-4, and 2) unconsolidated material was removed from TCS-4 during well clean-out to determine total depth of the well. These materials were handled in different ways in accordance with standard practice for the Topock Remediation Project. 1) Soils generated by potholing around the well were replaced in the same excavation. TCS-4 is within the boundaries of AOC-1/SWMU-1, which are areas actively being investigated as part of the Topock Soil RCRA Facility Investigation/Remediation Investigation (RFI/RI). As is standard practice for potholes installed within these areas for site characterization purposes, and in accordance with previous requests from the Tribes, materials in these areas are not to be removed from the site until the soils investigation and associated risk assessment are complete, and appropriate soil remediation goals are established such that the amount of material that potentially leaves the site is minimized. 2) Unconsolidated material removed from within the well during well clean-out activities was contained and characterized for disposal in accordance with State and Federal regulations (i.e., treated as investigation derived waste generated during drilling). See also response to comment DOI-3 regarding the results of characterization samples and disposal of the material. Based on discussion during September 15, 2015 Technical Work Group (TWG) meeting the material that is generated during the well decommissioning process will be managed using the same procedures. Material excavated from around the well will be returned to the excavation, and material generated from within the well casing will be contained and characterized for disposal in accordance with State and Federal regulations.
36	Cocopah-3	Page 5		The pipe wrap sample (page 5), has asbestos containing materials. Does the soil have asbestos fibers?	The two soil samples collected around TCS-4 were not analyzed for asbestos. The analyte list for the two soil samples was the same as the list of analytes for the AOC-1/SWMU-1 soils investigation, which does not include

Absolute Comment No.	Comment Source/Number	Section	Reference Text	Comment	Response
					asbestos. The pipe wrap sample was collected and analyzed in response to the analytical results for the two soil samples around TCS-4. The purpose of the pipe wrap sample was to evaluate whether the dioxins detected in the two soil samples around TCS-4 may have originated from the tar-like pipe wrap that covers the lateral pipe connected to TCS Well 4. Asbestos was analyzed for the pipe wrap sample given the potential for this type of pipe covering materials to contain asbestos.
37	Cocopah-4	Page 5		Per the plan, (page 5) water quality data indicates that TCS-4 is "within the area of the hexavalent chromium plume," and that "TCS-4 is an old, damaged production well, not a properly constructed monitoring well," indicating that data may be compromised. The Cocopah Indian Tribe feels that it is pre-mature to implement the work plan without having the well documentation review complete, with supporting data available to the tribes for review.	See response to comment Cocopah-1.
38	Cocopah-5	Page 6		Filler material: (page 6). This is confusing; is the filler going to be neat cement or? The plan states that "Displaced site material will be used to backfill the portion of the borehole/excavation above sealed interval." Where is displaced site material coming from? AOC-4 material was completely removed due to hazardous material. TCS-4 is within the area of the chromium plume. Will displaced site material become contaminated from existing contaminated soil conditions at TCS-4? Section 2.3.2, (page 7) states, that "The excavation will then be backfilled using the same material that was excavated…" The soil is contaminated as stated above, so it seems to The Cocopah Indian Tribe that this is contradictory and does not make any sense. Same applies to Section 2.3.4, Decommissioning the well head, why use contaminated soil as backfill?	Response to comment Cocopah-2 should be considered with the response to this comment. As defined in the TCS-4 Plan, and in more detail in Well-SOP-1 (see response to comment HDCR-1, first paragraph), neat cement will be used as sealing material, and displaced site material will be used as filler material (as opposed to importing filler material like sand that is foreign to the site). Filler material will not be used within the well casing and will only be used above/around the neat cement sealing material, which will extend to the top of the well casing and a few feet above as part of the "mushroom cap". Filler material will be used to fill the excavation up to ground surface so that neat cement is not visible at ground surface. As stated in the TCS-4 Plan, displaced site material from around the well would be used as filler material.
39	Cocopah-6	General Comment		In summary, there appears to be inconsistencies regarding treatment of excavated soils, lack of data, and contaminated soil conditions, not to mention contaminations within the well casings. It is our opinion that the decommissioning plan is inadequate and pre-mature. As this well is the first well to implement the decommissioning standard operating procedure, it is very important that all data be available and not compromise safety protocols. It is our recommendation that further discussions are required prior to decommissioning TCS-4.	See response to comment Cocopah-1.

Cavaliere, Mike/BAO

From: Innis, Pamela <pamela_innis@ios.doi.gov>
Sent: Wednesday, October 14, 2015 3:20 PM
To: Yvonne Meeks
Cc: Aaron Yue; Amanda Dodson; Amanda Lynn Sansouci; Cathy Wolff-White; Chris Guerre; Hong, Christina/LAC; Christine Medley; Curt Russell; David Back; Dawn Hubbs; Douglas F. Bonamici; Edgar Castillo; Guthrie Dick; Howard Magill; Janice Hinkle; Jason West; Jeff Smith; Jill McCormick; Jose Cortez; Karen Baker; Sheets, Keith/PDX; Leo S. Leohart; Barackman, Martin/RDD; Michael Anderson; Cavaliere, Mike/BAO; Nora McDowell; Renee Kolvet; Steven Escobar; Valisa E. Nez; Wilene Fisher-Holt; Yolanda Garza; Charlie Schlinger; Eric Rosenblum; Margaret R. Eggers; Robert H. Prucha; Win Wright
Subject: TCS-4 Well Decommissioning Plan

Yvonne,

The *Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4)* was submitted to the DTSC and DOI for review in July 2014. BLM provided the TCS-4 Decommissioning Plan to the Tribes for consultation in July as well. Tribal comments on the plan were received between September and November 2014.

The Response to Comment (RTC) table was developed by PG&E in response to DOI, DTSC and Tribe/TRC comments on the draft plan. DOI provided the RTC table to the Tribes on July 14, 2015.

The RTC discussion for TCS-4 was included as an agenda topic at the September 15, 2015 Technical Work Group (TWG) meeting. This meeting gave PG&E, agencies and Tribes an opportunity to discuss the remaining issues regarding the work plan so that it may be implemented this fall to accommodate the ecological window available for field activities. Based on these discussions, PG&E should place excavated material back into the same excavation as shown in the work plan versus containerizing the material for off site disposal and backfilling the excavation with clean displaced site material.

Please revise the *Decommissioning Plan for Topock Compressor Station Well Number 4 (TCS-4)* based on the resolutions provided in the RTC table and reached through discussion in the TWG meeting for implementation this fall.

Thank you.
Pam

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