Department of Toxic Substances Control

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630

Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

Sent Via Email

March 28, 2007

Ms. Yvonne Meeks
Portfolio Manager – Site Remediation
Pacific Gas and Electric Company
4325 South Higuera Street
San Luis Obispo, CA 93401

CONDITIONAL APPROVAL OF WELL PGE-6 REVISED DECOMMISSIONING WORK PLAN, PACIFIC GAS AND ELECTRIC COMPANY (PG&E), TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA (EPA ID NO. CAT080011729)

Dear Ms. Meeks,

The Department of Toxic Substances Control (DTSC) has reviewed the revised PGE-6 Well Decommissioning Work Plan dated November 10, 2006 (Workplan). As a result of our review, DTSC Geological Services Unit (GSU) has compiled a memorandum with specific recommendations. The memorandum with its recommendations is enclosed and incorporated as condition of approval by reference. In addition, DTSC considered comments received from the Fort Mojave Indian Tribe regarding this project, and determined that the following clarification and conditions are necessary as part of this work plan approval:

1. In respect and awareness of the landscape considered sacred to the Fort Mojave Indian Tribe and other tribes with similar views, PG&E shall only use established access routes for transportation of personnel and equipment for the decommissioning activities.

2. PG&E shall work with the interested tribes and make a good faith effort to establish a tribal monitor to be present during all site clearance and disturbance work.

3. DTSC believes that the proper management of all investigation derived material, including soil, to be PG&E's responsibility. DTSC understands that the Fort Mojave Indian Tribe has requested PG&E to explore the possibility to leave non-contaminated soil in place. DTSC does not object to this possibility as long as

the placement of the soil will not create an adverse impact to human health or the environment, and that it complies with all Federal, State and local laws and requirements. DTSC cautions, however, that until action levels and background concentrations are properly established, impacted soils which are left in place may be subject to future investigation and/or remediation.

To clarify DTSC GSU recommendation 6 enclosed, DTSC is requiring PG&E to attempt the removal of the 20-inch conductor casing if a seal does not exist inside or outside the casing. The removal technique may include standard or innovative extraction techniques that minimizes disturbance to the landscape (e.g., hydraulic jacks, vibratory removal, targeted excavation/coring). If the casing cannot be removed after attempts have been made, PG&E shall contact DTSC and other interested stake holders (i.e. Fort Mojave Indian Tribe) to consult on the proper course of action.

If you have any questions or comments regarding this Workplan approval letter or its conditions, please contact me at (714) 484-5439.

Sincerely,

Aaron Yue
Project Manager
Geology, Permitting and Corrective Action Branch

Enclosure

aky:030704B

cc: PG&E Topock Consultative Workgroup Members – Via e-mail
Tribal Representatives in PG&E Contact List – Via e-mail

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Arnold Schwarzenegger
Governor

TO: Aaron Yue
Project Manager
Geology, Permitting & Corrective Action Branch

FROM: Chris Guerre, CHG
Senior Engineering Geologist
Geological Services Unit

DATE: January 26, 2007

SUBJECT: Revised Well Decommissioning Work Plan for Well PGE-6
PG&E Topock Compressor Station, Needles, California
Project No. 22120/540015-48/36-HWMP

DOCUMENT REVIEWED

Well PGE-6 Revised Decommissioning Work Plan, PG&E Topock Compressor Station, Needles, California (Work Plan). The Work Plan is dated November 10, 2006 and was prepared for Pacific Gas and Electric Company (PG&E) by CH2M Hill.

INTRODUCTION

The Geological Services Unit (GSU) of the Department of Toxic Substances Control (DTSC) has reviewed the above-referenced document regarding decommissioning of well PGE-6. The revised Work Plan was prepared in response to a DTSC letter (DTSC, 2006a) requesting that the well be decommissioned to more rigorous standards. PG&E's original work plan for decommissioning well PGE-6 was dated February 28, 2006.

While DTSC guidance (Cal EPA, 1995) recommends that wells built like PGE-6 be decommissioned by complete overdrilling or perforating the entire length of well casing and screen, modified standards were used due to PG&E's concern with the potential risk for well collapse during the decommissioning process.

BACKGROUND

Well PGE-6 is located on the Havasu National Wildlife Refuge approximately 200 feet north of the northern PG&E Topock Compressor Station property line. The Work Plan indicates well PGE-6 was originally installed as a standby industrial water supply well in 1964 with 14-inch diameter steel casing set to a depth of 180 feet below ground surface (bgs). A 20-inch diameter conductor casing is reported to extend from the surface to 19 feet bgs. The well screen is reported to occur from 110 to 180 feet bgs and water occurs in the well at approximately 106 feet bgs. A 1998 video log reveals that the steel well casing is significantly corroded at certain areas above the water table. Corroded holes through the casing illustrate that an annular space exists outside the casing in the unsaturated zone and that an annular seal does not exist. The Work Plan states that the casing above the well screen is in such poor condition that there is significant potential risk of collapse if attempts were made to clean out, rehabilitate, or perforate well PGE-6. The video log's lack of clarity below the water table makes it difficult to view the screened zone, but the screen appears intact. Sediment was identified filling the well to 162 feet bgs.

The Work Plan indicates that well PGE-6 has not been in service as a production well since at least 1971, but has been sampled periodically since 1997. Well PGE-6 used to be sampled on a routine basis as part of the groundwater monitoring program for the Topock Compressor Station, but has recently been dropped from the monitoring program (DTSC, 2006b) due to its scheduled decommissioning. Well PGE-6 is completed within the Alluvial Aquifer in an area impacted with elevated hexavalent chromium concentrations that range up to approximately 3,000 to 5,000 µg/L (CH2M Hill, 2006). Data from neighboring wells MW-24A and MW-24B (Arcadis 2006; CH2M Hill, 2006) indicate that the lower portion of the aquifer intersected by well PGE-6 contains higher Total Dissolved Solids and hexavalent chromium concentrations than the shallow portion of the aquifer. An upward vertical gradient exists in the area based on hydraulic data from shallow well MW-24A and lower well MW-24B. The unsealed PGE-6 borehole disrupts natural bedding and could enhance hydraulic communication vertically within the borehole.

WORK PLAN DECOMMISSIONING PROPOSAL

The Work Plan proposes to decommission well PGE-6 as follows:

1. Remove existing sampling pump assembly.

2. Attempt to remove the sediment at the bottom of the well (162-180 feet bgs) by bailing.

3. Downhole video camera survey after adding potable water to the well to increase visibility.

4. Grout (cement or bentonite) the lower portion of the well from 150 to 180 feet bgs.

5. Perforate a 10-foot interval (130-140 or 140-150 feet bgs) of well screen if numerous corrosion holes/breaches do not already exist.

6. Pressure grout the well screen and blank casing with visible holes with bentonite cement using a packer assembly.

7. Remove the packer and grout the remaining portion of the blank casing.

8. Remove the concrete pad and excavate down approximately 6 feet bgs.

9. The 14-inch well casing and 20-inch conductor casing will be cut off 5 feet bgs using a torch.

10. Continue excavating, as practicable, if a grout seal does not exist outside the 20-inch conductor casing.

11. Place a concrete surface seal over the excavated well head and then backfill with native and clean soil.

RECOMMENDATIONS

The GSU believes that the Work Plan is generally acceptable, but does believe the following list of recommendations should be addressed by PG&E during decommissioning of well PGE-6:

1. PG&E should notify DTSC one to two weeks prior to the implementation of the Work Plan.

2. It is recommended that bentonite be used to seal the bottom portion of the well from approximately 150 to 180 feet bgs. According to the Work Plan (Step 4 on page 2-2), cement grout or bentonite chips may be used to seal the bottom portion of the well. Rather than chips, bentonite pellets would also be acceptable and may be easier to place through the water column than chips. One of the main reasons for this bottom seal is not described in the Work Plan. If the well were to collapse during the perforation step and the perforation tool was lost in the hole, then some pliable sealant would already exist below the collapse/blockage. The perforation tool might be pushed into a bentonite seal and hopefully spun off the rod. Grouting

via a tremie pipe could then continue and seal the rest of the well with minimal interruption of field activities.

3. Revision to Section 2.2.3 of the Work Plan: Type V cement grout should be allowed to set for at least six hours prior to placing any backfill in the surface excavation (California Department of Water Resources, June 1991).

4. The Work Plan proposes the use of a high-capacity suction bailer to remove sediment from the bottom of the well. If necessary, alternative methods may be used to remove sediment and also any debris that might be encountered during this removal. Care should be taken to not overly agitate the well during this process and encourage formation/well collapse.

5. If DTSC cannot determine with certainty that numerous corrosion holes/breaches already exist in the well screen, then the well perforation step will be required in well PGE-6. While not required, the use of a Borehole Televiewer should be considered if the well video survey is inconclusive due to murky water conditions or video clarity.

6. Section 2.2 of the Work Plan (Step 9 on page 2-3): Excavation should also continue, as practical, if a seal does not exist inside or outside the 20-inch conductor casing.

COMMENTS

The following comments are provided to clarify particular portions of the Work Plan.

1. Section 2.2 of the Work Plan (last paragraph on page 2-1) does not indicate that the well screen will be perforated prior to grout placement. The perforation step is a significant component of the decommissioning procedure, but is described elsewhere in the Work Plan (Step 5 on page 2-3). Perforation is required unless numerous holes or breaches already exist in the screened zone of well PGE-6 that will allow placement of an adequate grout seal into the annular space.

2. The Work Plan indicates that well PGE-6 is believed to have been installed without an annular space or bentonite seal. However, the 1998 video log reveals that an annular space exists outside corroded portions of the casing that are located above the water table. The void space created is a potential conduit for contaminant migration from the surface to groundwater. The identified annular space will be filled and sealed with grout during the decommissioning process.

If you have questions regarding the preceding comments, please contact Chris Guerre at (714) 484-5422 or by email at cguerre@dtsc.ca.gov.

Peer Reviewed By: Alfredo Zanoria, CHG, CEG

REFERENCES

Arcadis, September 29, 2006. In Situ Hexavalent Chromium Reduction Pilot Test Work Plan – Upland Plume Treatment.

Cal EPA - The California Environmental Protection Agency, July 1995. Monitoring Well Design and Construction for Hydrogeologic Characterization. Guidance Manual for Groundwater Investigations.

California Department of Water Resources, June 1991. California Well Standards Bulletin 74-90 (Supplement to Bulletin 74-81).

CH2M Hill, February 23, 2006. Technical Memorandum: Well Disposition Evaluation for Inactive Supply Well PGE-7, PG&E Topock Compressor Station.

DTSC, 2006a. October 23, 2006. Review of Workplan for Decommissioning Well PGE-6 at Pacific Gas and Electric Company, Topock Compressor Station, Needles, California (EPA ID NO. CAT080011729).

DTSC, 2006b. October 26, 2006. Modification of Groundwater and Shoreline Surface Water Sampling Frequencies at Pacific Gas and Electric Company, Topock Compressor Station, Needles, California (EPA ID NO. CAT080011729).