



Pacific Gas and  
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February 7, 2006

Norman Shopay  
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California Department of Toxic Substances Control  
Geology and Corrective Action Branch  
700 Heinz Avenue  
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Subject: Work Plan for Collecting Additional Anaerobic Core Samples,  
PG&E Topock Compressor Station, Needles, California

Dear Mr. Shopay:

This letter transmits a *Work Plan for Collecting Additional Anaerobic Core Samples* at the PG&E Topock Compressor Station. PG&E proposes to collect additional anaerobic core samples during the upcoming installation of wells at Locations A and B.

Please contact me at (805) 546-5243 if you have any questions on the work plan.

Sincerely,

cc. Kate Burger/ DTSC

Enclosure

# Work Plan for Collecting Additional Anaerobic Core Samples, PG&E Topock Compressor Station, Needles, California

DATE: February 7, 2006

## 1.0 Background

In January and February 2005, anaerobic core samples were collected from several borings during the drilling of wells in the floodplain near Pacific Gas and Electric Company's (PG&E's) Topock Compressor Station. These cores were sealed into airtight sleeves in a glove box under nitrogen atmosphere to minimize contact with atmospheric oxygen. The sealed samples were frozen and have been stored in a freezer at the Topock facility since their dates of collection. A work plan for analytical testing of the core samples is pending.

Microbial populations become dormant under freezing conditions but will usually become active again when the temperature is raised. However, after being frozen for over a year, the cultures in these core samples may not be as vigorous as when first collected.

Beginning February 6, 2006, there will be additional drilling in the floodplain to install new monitoring well clusters as described in *Technical Addendum No. 1: Well Installation Work Plan for Interim Measures Performance Monitoring, PG&E Topock Compressor Station, Needles, California*, dated January 27, 2006 (work plan). PG&E would like to take the opportunity to collect additional anaerobic core samples during this drilling phase. The objective of this sampling is to obtain additional samples, for use in the upcoming anaerobic core testing. The initial laboratory core tests will be set up to use both the fresh samples collected in 2006 and frozen samples from 2005. Using a combination of 2005 and 2006 samples will allow evaluation of the geochemical conditions from a larger number of wells across a larger area of the floodplain. During the initial phase of the laboratory testing we will compare the degree of reducing conditions present in the two sets of samples. If the 2005 samples show significantly less reducing capacity than the 2006 samples, the 2005 samples will be removed from the test and replaced with additional 2006 samples. This would mean that all the samples in the test would be from the two wells sampled in 2006 (Sites A and B). If the two sample sets show similar degrees of reducing capacity, both will be used in the laboratory testing, allowing us to select samples from a group of seven wells.

## 2.0 Core Collection

Cores will be collected during drilling at Sites A and B, as shown on Figure 3-2 of the work plan. Previous data near these sites indicate that anaerobic conditions are prevalent throughout the top 70 feet of fluvial sediments. Oxidation-reduction potential (ORP) measurements will be monitored during drilling to verify redox conditions with depth. Chromium reducing conditions have been observed for ORP readings less than (i.e., more

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negative than) -70 millivolts (mV), so areas with this characteristic will be targeted for core collection.

Core samples will be collected at 10-foot intervals, with the first sample collected just below where the water table is encountered. Collection procedures will be the same as those followed for the 2005 samples. These procedures are discussed in Section 3.0. It is anticipated that a total of 10 to 16 samples will be collected from Sites A and B and will be stored in the onsite freezer. Should testing of these cores be deemed necessary, the samples will be transported under frozen conditions to the CH2M HILL lab in Corvallis, Oregon for laboratory analysis.

At Site A, core samples will be collected until depths are reached where ORP measurements show more oxidizing conditions (i.e., readings greater than -70 mV).

Site B is adjacent to PE-1 and will not have ORP measurements available during drilling. ORP measurements were made during drilling of PE-1, and the results indicated that reducing conditions exist to 66 feet below ground surface (bgs). Samples will therefore be collected at Site B to no greater than 66 feet bgs.

## 3.0 Sample Collection Procedure

### 3.1 Collection Preparation

1. Cut ten to twelve 16-inch-long lengths of ProtecCore™ flat tubing (plastic/aluminum laminate). Place a piece of ProtecCore™ on a plain piece of cardboard, and use a heating iron to seal approximately 2 inches of one end (creating a tube with one end sealed). Seal one end of all 10 to 12 pieces.
2. Place a plastic trash bag in the glove box with the open end gathered around the nitrogen tube. Turn the nitrogen gas to the glove box on at a low flow (note/mark amount the regulator is opened), and record the amount of time it takes the trash bag to fill the entire interior of the glove box. This will be “glove box purge time.” Remove the trash bag and place two 1-gallon zip-lock storage bags in the glove box.

### 3.2 Sample Collection

The core samples for preservation are to be collected every 10 feet and should be collected from areas of the core that have the least possibility of being exposed to the atmosphere (2 to 3 feet from the end of a core run).

1. When the drill core barrel is brought to the surface, immediately transfer the core into the plastic sleeve. **For anaerobic samples** (core material gray in color), transfer the plastic-sleeve-covered sample to the nitrogen glove box as soon as possible (the interior of the glove box should be a nitrogen atmosphere). Turn the nitrogen on at that predetermined flow and allow the nitrogen to flow for the “glove box purge time.”
2. After the glove box has been purged of oxygen, it is safe to work on the collection of the sample.

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- Determine the area within the core that you plan to collect. Scrape the external part of the sample off to reveal the inner (non-compromised) core.
  - Place the sample in a zip-lock bag. Place the tube/ nozzle of the nitrogen hose inside the glove box into the zip-lock, and discharge sufficient nitrogen to displace any air contained in the bag. Seal the zip-lock after squeezing out as much gas as possible.
  - Place the first zip-lock with sample into the second zip-lock, again purging with nitrogen and removing as much excess gas as possible.
3. Remove the double-bagged oxygen free sample from the glove box, label the zip-lock, and place into one of the ProtecCore™ sleeves. Insert a nitrogen tube and continue to purge the ProtecCore™ sleeve from the back of the sleeve while sealing the open end with the iron. (Make sure the iron is not going to melt the zip-lock bags or sample collection materials, etc.)
  4. Label the ProtecCore™ sleeve. Place in ice chest, on ice, in the field and transfer to the freezer at the compressor station at the end of the day or sooner. Example of sample label: **MW-34-60N** (Well name = MW-34, depth of sample = 60 feet, and 'N' for nitrogen-box-collected sample).
  5. Record in the field notes any observations about the texture, color, and moisture content of the material in the sample. On the core/boring log, note depths where anaerobic core samples were collected.

## 4.0 Certification

This work plan was prepared by CH2M HILL under the supervision of the professional whose seal and signature appears hereon, in accordance with currently accepted professional practices; no warranty, expressed or implied, is made.

 R.G. # 7423

Professional Geologist