



**Matthew Rodriguez**  
Secretary for  
Environmental Protection



## Department of Toxic Substances Control

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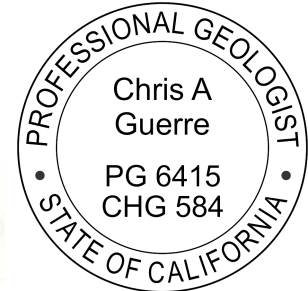


**Edmund G. Brown Jr.**  
Governor

### MEMORANDUM

**TO:** Aaron Yue  
Senior Hazardous Substances Engineer  
Project Manager  
Geological Services Branch

**FROM:** Chris Guerre, PG, CHG  
Senior Engineering Geologist  
Geological Services Unit (GSU)



**DATE:** October 20, 2017

**SUBJECT:** RESPONSE TO COMMENTS ON PROPOSAL FOR ALTERNATIVE  
GROUNDWATER SAMPLING TRIAL  
PACIFIC GAS AND ELECTRIC COMPANY (PG&E)  
TOPOCK COMPRESSOR STATION SITE  
NEEDLES, CALIFORNIA (EPA ID NO. CAT080011729)

PCA 22120 SITE CODE 540015 WP 48

### INTRODUCTION

The GSU has reviewed PG&E's July 31, 2017 document "*Response to DTSC's Geological Services Unit April 6, 2017 Memorandum titled Proposal for Alternative Groundwater Sampling Trial, Pacific Gas and Electric, Topock Compressor Station*" and September 11, 2017 submittal regarding supplemental information pertaining to wells OW-5S and OW-5M. The April 6, 2017 GSU memorandum provided specific comments on PG&E's August 21, 2015 proposal (2015 Proposal) to use alternative groundwater sampling approaches at select monitoring wells in the Topock Groundwater Monitoring Program and Compliance Monitoring Program.

In 2014, the Department of Toxic Substances Control (DTSC) approved micropurge/minimal drawdown (MD) groundwater sampling in place of traditional three volume (3V) purge methods at many Topock alluvial wells with screen lengths of 20-feet or less as the MD results were generally comparable with the 3V data. Based upon that acceptance, the 2015 Proposal expanded the approach to include bedrock wells and

wells with screens longer than 20-feet that were omitted from the initial sampling study. The 2015 Proposal includes collecting samples using MD or HydraSleeve (HS) groundwater grab samples followed by collection of 3V purge samples for comparison. Additionally, a change to MD at some wells is proposed with the resulting MD data being compared to historic 3V data.

The GSU's April 6, 2017 memorandum concurred with most of PG&E's 2015 alternative sampling proposals, but did call out several well specific modifications/exceptions. Additionally, the GSU memorandum requested that all wells should have conductivity profiles run prior to sampling trials.

## **GSU RECOMMENDATIONS**

The GSU has responded to the specific alternative sampling proposal issues identified in PG&E's response to comment letter dated July 31, 2017. The GSU has utilized the April 6, 2017 GSU memorandum format in responding to issues.

### **Proposal for GMP Monitoring Wells**

#### **Table 2 - Select Long Screen Bedrock GMP Wells**

**MW-24BR:** This well has an approximately 60-foot well screen interval. Flow testing was requested by the GSU to determine if there were any discrete zones exhibiting flow that one would want to target for MD sampling that was originally proposed by PG&E. PG&E's July 31, 2017 letter now indicates that MD sampling is no longer being pursued and 3V sampling will continue. The GSU acknowledges PG&E's removal of this well from the sampling trial.

**PGE-07BR:** This well has approximately 50 feet of open borehole. Flow testing was requested by the GSU to determine if there were any discrete zones exhibiting flow that one would want to target for MD sampling that was originally proposed by PG&E. PG&E's July 31, 2017 letter now indicates that MD sampling is no longer being pursued and 3V sampling will continue. The GSU acknowledges PG&E's removal of this well from the sampling trial. However, PG&E should continue and conduct conductivity profiling on this well as requested in the GSU's April 6, 2017 comment. This could assess if significant conductivity stratification exists with the newer well configuration that was completed in October 2007.

**PGE-08:** Response to the GSU's original April 6, 2017 comment below is still requested.

*“Continue sampling this well on the established annual frequency. Conduct a downhole video at this long screen well (~150 foot well screen length) to assess current conditions. Copies of all older downhole videos of the well should be provided to DTSC. PG&E should evaluate different ways to retrofit the well, including removal of the packer (Baker No. 47A4), in hopes of having this well provide more meaningful data for the groundwater remedy. PG&E should conduct borehole flow testing if access to the screen zone is accomplished.”*

Additionally, based on the November 2006 wellbore video report contained in the 2008 CH2M Hill 2008 bedrock document, the GSU recommends that attempts be made to install a pipe over the top of the former injection pipe that was observed at approximately 362 feet below the top of casing (btoc). This assumes the packer system cannot be removed. This could allow instrument access, including downhole video, to investigate the screened section of the well beyond the packer system.

### **Table 2 - GMP Bedrock Wells with Short Screen Lengths**

**MW-61-110:** The GSU's April 6, 2017 memo approved alternative sampling for this well, but did not call it out specifically. However, PG&E's July 31, 2017 reply table indicates that the pump will be kept at 100 feet within this well. The GSU thought the pump would be placed at mid-screen as noted in Table 2 of PG&E's original August 21, 2015 alternative trial proposal. In looking back at the 2015 proposal, it is now apparent that Table 1 and Table 2 are not consistent with pump placement. The basis for pump placement within this well needs to be specified.

**MW-66BR-270:** This well has approximately 23 feet of open borehole. The GSU noted concern that grab sampling (HS) might lead to stagnant water build up in the tight bedrock formation over time. PG&E's July 31, 2017 letter now indicates that HS sampling is no longer being pursued and purging to dryness will continue. The GSU acknowledges PG&E's removal of this well from the sampling trial.

### **Table 2 - GMP Bedrock Wells with Very Long Open Boreholes**

**MW-58BR:** Responses to the GSU's original April 6, 2017 comment below are still requested.

*"Before disturbing the water column with other procedures, run a conductivity profile in this 140-foot long open borehole to see if anomalous saline zones exist. Assuming no significant data are provided from the profile, reconstruct this well with screened zones similar to when it was separated into upper and lower zones in 2010/2011 when 200 ug/L hexavalent chromium concentrations were detected in the lower zone. Then develop the new configuration before sampling the shallow and lower zones again. The history of the retrofitting of this well is also requested including the reason for removal of the Flute system. Finally, PG&E should discuss how past flooding of this well could have affected well chemistry if surface water entered the well (see photograph at end of this memorandum)."*

The GSU is directing PG&E to reconfigure and retrofit this well. PG&E needs to submit a short, succinct work plan detailing this work.

**MW-64BR:** Responses to the GSU's original April 6, 2017 comment below are still requested.

*“Before disturbing the water column with other procedures, run a conductivity profile in this 140-foot long open borehole to see if anomalous saline zones exist. Assuming no significant data are provided from the profile, reconstruct this well with screened zones similar to the MW-64-BR-LOWER/UPPER-150 configuration since hexavalent chromium was routinely detected at those horizons in 2011. The GSU is envisioning a semi-permanent dual screen PVC well inserted into the 3.8-inch diameter borehole. A couple weeks after development, conduct MD and 3V (modified?) sampling with pumps hung at the horizons used in 2011 (unless a more appropriate horizon is identified based on conductivity profiling).”*

The GSU is directing PG&E to reconfigure and retrofit this well. PG&E needs to submit a short, succinct work plan detailing this work.

**MW-70BR-225:** PG&E's July 31, 2017 reply doesn't confirm that the MD pump will be moved to a depth between 220 and 229 feet btoc based on 2011 flow testing which identified a flow zone from the bottom of the borehole (229'). Confirmation is requested.

## **Table 2 - GMP Alluvial Monitoring Wells with Long Screens**

**TW-01:** PG&E should still consider performing a detailed borehole flow test at this well (100 foot well screen length) to assess current flow characteristics as 14 years have elapsed since the last test and one may want to utilize a specialized flow meter best suited to non-pumping conditions. As with all wells, conduct a conductivity profile in this borehole prior to sampling.

The GSU is not opposed to moving forward with the proposed three depth (170, 205, and 230-foot depths) MD/HS trial proposed in PG&E's July 31, 2017 letter based on the older 2003 flow test data. However, clarification is needed regarding what a “MD/HS trial” will entail for this well.

Based on any new flow test data and on the trial, sampling strategies should be explored to have this well provide more meaningful data for the groundwater remedy. Further plans to sample and retrofit this well should be made after the sampling trial is conducted. Retrofitting this well might include installation of inflatable packers or flexible baffles to provide better data to distinguish between shallow and deep aquifer conditions. Again, the end goal for this well is to enhance the monitoring capabilities of this long-screened well for use in the groundwater remedy.

**TW-04 and TW-05:** The GSU's April 6, 2017 memorandum concurred with the August 21, 2015 PG&E proposal to sample these two wells with MD at the mid-point of the well screen. Only exceptions were called out in the GSU memorandum. However, PG&E's July 31, 2017 letter/table now indicates that MD sampling is no longer proposed at the mid-point. It is recommended that the mid-point be utilized in both wells since geophysical logs don't seem to suggest an obvious horizon to place the pump intake.

Additionally, please run a conductivity profile in all wells including TW-05. Finally, like the GSU comment on long screen CMP wells, the GSU may direct PG&E to conduct borehole flowmeter testing to guide pump placement if MD analytical results are not comparable with the three volume purge data.

### **Table 3 - Proposal for IM3 CMP Monitoring Wells**

**Proposal Item 1:** The GSU concurred with the PG&E 2015 proposal for the seven OW wells with 30-foot or 20-foot screen lengths (i.e., OW-1S/M/D, OW-2S/M/D and OW-5D) that included a change to MD sampling with results evaluated against historical trends in each Annual CMP Report. PG&E's July 31, 2017 reply table indicates that conductivity profiles will only be conducted on deep "D" wells.

The GSU requests that all wells, including CMP wells, have conductivity profiles to assess if severe conductivity contrasts exist within wells.

**Proposal Item 2:** For the two OW (i.e., OW-5S and OW-5M) and eight CW wells (CW-1M/1D, CW-2M/2D, CW-3M/3D and CW-4M/4D) with 40-foot or 50-foot screen lengths, a trial of MD sampling versus 3V sampling was approved by the GSU in its April 6, 2017 memorandum. The GSU also directed PG&E to conduct borehole flowmeter testing to guide pump placement should MD analytical results differ significantly from the three volume purge data. PG&E's July 31, 2017 reply table indicates that sampling pump depths are proposed to be changed for these wells based on geophysical and lithologic log interpretations. For well CM-2M, it is suggested to move the pump depth to 170' based on the lithologic log (less silt and clay than the 177' proposed). For well CM-4D, it is suggested to move the pump depth to 267' based on the lithologic log (more gravel and less silt than the 280' proposed). For OW-5S/OW-5M, it is recommended that the well screen mid-point (90'/230' respectively) be utilized in these wells to locate MD pump placement as lithologic log data doesn't seem to provide overwhelming evidence to suggest with great confidence an ideal pump location. Finally, if borehole flow meter testing is needed as described above, it should also include wells that are 2-inches in diameter. PG&E's July 31, 2017 reply table indicates that "flow testing not practical in 2-inch wells", but the GSU believes that certain test methods can accommodate 2-inch wells.

### **New Issues**

- The following wells were included in PG&E's July 31, 2017 reply table even though the GSU had already approved MD sampling in the original proposal: MW-57-70, MW-61-110, MW-62-065, MW-63-065, MW-69-195, MW-70-105, MW-72-080, and MW-73-080. It is not certain why these wells were called out in PG&E's July 31, 2017 reply table. Perhaps it is to acknowledge that conductivity profiles are being added. Clarification for listing these wells is requested.
- PG&E's July 31, 2017 reply table includes bedrock wells MW-60-125 and MW-74-240 with 20-foot screens. These wells were not included in PG&E's original

2015 proposal. PG&E should clarify if these wells should be on the table and included in the MD trial. Any other wells that might have been overlooked should also be included on the table.

- PG&E's July 31, 2017 reply table indicates that alluvial well MW-65-160 (10-foot screen length) was added at DTSC's direction and it was accepted. The GSU does not recall this request and is confused since this well has been sampled using low flow since 2014. PG&E should clarify if this well should be on the table and why it is included.

PG&E should address the requests noted in this memorandum.

The GSU notes that the comments and recommendations presented in this memorandum are facility specific and should not be applied to other projects without consultation with the Project Geologist. If you have any questions or comments please telephone me at (714) 484-5422, or e-mail me at [christopher.querre@dtsc.ca.gov](mailto:christopher.querre@dtsc.ca.gov).

Peer reviewed by: Wendy Arano, PG

cc: Alfredo Zanoria, CEG, CHG