



Pacific Gas and  
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November 30, 2017

Mr. Aaron Yue  
Project Manager  
Department of Toxic Substances Control  
5795 Corporate Avenue  
Cypress, CA 90630

**Subject: Response to DTSC's Geological Services Unit October 20, 2017 Memorandum titled  
*Comments on Proposal for Alternative Groundwater Sampling Trial, Pacific Gas and  
Electric, Topock Compressor Station***

Dear Mr. Yue:

Pacific Gas and Electric (PG&E) has reviewed the approval conditions and requests in the technical memorandum from the California Department of Toxic Substances Control's (DTSC) Geological Services Unit (GSU) dated October 20, 2017 and April 6, 2017. The April 2017 GSU technical memorandum responded to PG&E's August 2015 letter with alternative sampling approach recommendations for longer screen or bedrock monitoring wells that were not included with the DTSC 2014 approval of minimal drawdown (MD) sampling at many Topock monitoring wells. The October GSU memorandum responded to additional information and comments presented in a July 31, 2017 PG&E letter. Thank you for your review and detailed response to PG&E recommendations.

The attached Table 1 provides a list of wells approved for a change in sampling method or a sampling method trial. Table 2 summarizes PG&E's understanding, and acceptance or clarification to the GSU technical memoranda. Table 3 lists specific sampling depths at wells where MD sampling is not from mid-screen.

With four exceptions listed in Tables 1 and 2, PG&E will implement DTSC's approved actions in the Q4 2017 sampling event. For the wells with approved trials of MD vs. three-volume purge sampling, a semiannual frequency will be followed for collection of purge method trial samples. That will yield results from three sampling events at each well in the sampling trials, for review in the 4Q 2018 and Annual Groundwater Monitoring Report for GMP and PMP wells, or in the 4Q 2018 and annual Compliance Monitoring Report for CMP wells.

PG&E will also collect specific conductivity (SC) profile data from these wells as indicated on Tables 1 and 2. PG&E will further endeavor to collect SC profile data from all other monitoring well locations that are included in the 4Q 2017 GMP groundwater sampling event and from the CMP monitoring wells. SC profile data will be collected before monitoring wells are purged for sample collection.

For the four exceptions listed in Table 1 and Table 2 (wells TW-01, MW-58BR, MW-64BR, and PGE-08), PG&E is preparing a detailed response for submittal to you by January 12, 2018.

Please contact me at (760) 791-5884 if you have any questions or comments regarding this response.

Sincerely,

A handwritten signature in blue ink, appearing to read "Curt Russell".

Curt Russell  
Topock Site Manager

cc: Chris Guerre/DTSC, Pam Innis/DOI

**Table 1****Monitoring Wells Approved for Change to MD Sampling, or for MD vs. 3V sampling Trails***PG&E Topock Groundwater Monitoring*

<b>Monitoring Wells Approved for Change to MD Sampling</b>		
MW-61-110	OW-1D	OW-2D
OW-1S	OW-2S	OW-3S
OW-1M	OW-2M	OW-5D
<b>Monitoring Wells Approved for MD vs. 3V Sampling Trial</b>		
MW-57-185*	OW-5S	CW-2D
MW-60BR-245*	OW-5M	CW-3M
MW-70BR-225	CW-1M	CW-3D
MW-72BR-200*	CW-1D	CW-4M
TW-04	CW-2M	CW-4D
TW-05		
<b>Monitoring Wells to Continue Current Sampling Approach</b>		
MW-24BR	MW-66BR-270	PGE-07BR
MW-48	MW-68BR-280	
<b>Monitoring Wells Pending Review and Detailed Response by PG&amp;E to DTSC (current sampling approach will be used for Q4 2017)</b>		
MW-58BR	PGE-08	TW-01
MW-64BR		

Only changes from Sampling Methods approved by DTSC in June 2014 (DTSC 2014) and detailed in Table 7-1, 2014 Annual Groundwater Monitoring Report (CH2M 2015), are presented in this table. See Table 2 for details.

Notes:

SC profile data will be collected from all wells listed here, or included with the Q4 2017 GMP event, before sampling.

MW-23-60 and MW-23-80 will have both pH and SC profile data collected

\* The MD vs. 3V Sampling Trial will use 2 depths for MD sampling. Tables 2 and 3 provide specific depths.

MD minimal drawdown sampling method  
 3V three volume purge sampling method  
 SC specific conductivity

Table 2

Summary of Sampling Method Recommendations, and October 2017 Outcomes

PG&E Topock Groundwater Monitoring

Well ID	Recommendation in PG&E's August 2015 Letter; and any July 31, 2017 Deviation Request	Approval Conditions or Requests in DTSC's April 6, 2017 and October 20, 2017 GSU Technical Memoranda	PG&E's Reply – Acceptance and any Clarification; or <b>Exception</b>
MW-24BR	MD Trial, with dedicated bladder pump, at 408 feet July 2017 Deviation: PG&E requested to continue current 3V sampling approach.	Deviation from initial recommendation for MD trial was approved in the October 20 GSU Tech Memo.	Accept - collect SC profile, continue 3V sampling  This is a low-yield deep well with a 60-foot screen in bedrock with very low hydraulic conductivity (CH2M 2008). A dedicated electric submersible pump is used beginning 2014 due to biofouling concern at this well.
MW-48	MD approved by DTSC 2014 in low yield well, difficult to achieve MD so purge dry method used. Amended 2017 to continue purge dry then sample	Purge dry and sample acceptable	Accept - collect SC profile, continue purge dry then sample method
MW-57-185	MD Trial with pump at 171 feet  July 2017 Deviation: Trial of MD sampling at 2 depths (171 and 150 feet) vs. 3V purge	October 20 GSU Tech Memo approves trial of MD at 2 depths vs. 3V purge, SC profile	Accept - Collect SC profile and begin sampling trial in Q4 2017.
<b>MW-58BR</b>	Continue current MD sampling purge approach, with pump at 190 feet	Reconstruct well with screens corresponding to former packer placement in open bore, and add flood protection	<b>Exception: a detailed response regarding well reconstruction will follow no later than January 12, 2018</b>  PG&E accepts the need to evaluate and improve flood protection at this above-ground well head completion.  Current MD sampling will continue for 4Q 2017 pending detailed response to DTSC's multi-screen reconstruction request.
MW-60BR-245	MD Trial, with pump at 180 feet  July 2017 Deviation: Trial of MD sampling at 2 depths (171 and 150 feet) vs. 3V purge	Trial of MD at 2 depths vs. 3V purge, SC profile	Accept - Collect SC profile and begin sampling trial in Q4 2017.
MW-61-110	MD, keep pump at 100 feet	MD approved with SC profile; use exact mid-depth of screen (102 feet)	Accept - Collect SC profile; begin MD sampling in Q4 2017.  MD pump set at mid-screen = 102 feet.

Table 2

Summary of Sampling Method Recommendations, and October 2017 Outcomes

PG&E Topock Groundwater Monitoring

Well ID	Recommendation in PG&E's August 2015 Letter; and any July 31, 2017 Deviation Request	Approval Conditions or Requests in DTSC's April 6, 2017 and October 20, 2017 GSU Technical Memoranda	PG&E's Reply – Acceptance and any Clarification; or <b>Exception</b>
<b>MW-64BR</b>	HydraSleeve and MD Trial; continue MD sample collection from middle of saturated borehole and test HS sampling.	Reconstruct well with screens corresponding to former packer placement in open bore.	<b>Exception: a detailed response regarding well reconstruction will follow no later than January 12, 2018</b> Current MD sampling will continue for 4Q 2017 pending detailed response to DTSC's multi-screen reconstruction request.
<b>MW-66BR-270</b> <b>MW-68BR-280</b>	HydraSleeve (HS), mid screen MD from mid screen	April 6 GSU tech memo recommends to periodically purge the wells if sampling trials are conducted.	Collect SC profile. 3V successful since 2015. 3V purges from near top of water column, so this approach will continue.
<b>MW-70BR-225</b>	MD Trial, with pump between 220 and 229 feet	MD vs. 3V sampling trial approved, with SC profile	Accept - Collect SC profile and begin sampling trial in Q4 2017.
<b>MW-72BR-200</b>	MD Trial, with dedicated bladder pump, at 151 feet July 2017 deviation: propose trial of MD at 2 depths (152 and 195 feet) vs. 3V purge.	Trial of MD at 2 depths vs. 3V purge, SC profile	Accept - Collect SC profile and begin sampling trial in Q4 2017.
<b>TW-01</b>	MD Trial, mid-screen July 2017 deviation: propose three depths for MD vs. HS sampling trial based on 2003 spinner log flow test data. Depths proposed based on 2003 flow testing and lithology were 170, 205 and 230 foot depths.	April 6 GSU request: MD specific depths need justification. Pending details from flow testing, GSU proposes 170, 215 and 260 foot depths based on 2003 groundwater samples. October 20 GSU requests: Explain what an HS/MD sampling trial would entail. PG&E Should still consider performing new flow tests under non-pumping conditions.	<b>Exception: a detailed response regarding new flow testing will follow no later than January 12, 2018</b> Continue present 3V sampling for 4Q 2017, pending detailed response.
<b>TW-04</b>	MD Trial, mid-screen	MD Trial at mid-screen and SC profile approved with October 20 GSU Tech Memo	Accept - Collect SC profile and begin sampling trial in Q4 2017.
<b>TW-05</b>	MD Trial, mid-screen	MD Trial at mid-screen and SC profile approved with October 20 GSU Tech Memo	Accept - Collect SC profile and begin sampling trial in Q4 2017.
<b>OW-3S; OW-1S, OW-1M, OW-1D, OW-2S, OW-2M, OW-2D, OW-5D</b>	Change to MD with pump at mid-screen Wells in alluvium with 20-30 foot screens	MD approved with SC profile	Accept – collect SC profile and begin MD sampling or MD vs. 3V trial in Q4 2017

Table 2

Summary of Sampling Method Recommendations, and October 2017 Outcomes

PG&E Topock Groundwater Monitoring

Well ID	Recommendation in PG&E's August 2015 Letter; and any July 31, 2017 Deviation Request	Approval Conditions or Requests in DTSC's April 6, 2017 and October 20, 2017 GSU Technical Memoranda	PG&E's Reply – Acceptance and any Clarification; or <b>Exception</b>
<b>OW-5S, OW-5M, CW-1M, CW-1D, CD-2M, CW-2D, CW-3M, CW-3D, CW-4M, CW-4D</b>	MD Trial, MD sampling from mid-screen, or specific depths Wells in alluvium with 40-50 foot screens	MD Trial approved with SC profile See Table 3 for specific MD pump depths	Accept – collect SC profile and begin MD sampling or MD vs. 3V trial in Q4 2017 If MD results differ substantially from 3V results at a well, perform flow testing at that well to re-evaluate MD sampling depth.
<b>PGE-07BR</b>	MD Trial, with dedicated bladder pump, at 275 feet July 2017 Deviation: PG&E requested to continue current 3V sampling approach.	Deviation from initial recommendation for MD trial was approved in the October 20 GSU Tech Memo.	Accept - collect SC profile, continue 3V sampling This is a deep well with an approximate 50-foot packed-off screen in bedrock, with very low hydraulic conductivity (CH2M 2008). Bedrock Cr results are ND.
<b>PGE-08</b>	3V	Explore feasibility of packer removal or access to well screen below packer; then video logging, flow testing.	<b>Exception: a detailed response will follow no later than January 12, 2018</b> This is a former supply well with an approximate 150-foot screen in bedrock. Existing packer blocks access to screen. Packer is damaged and lodged in place (CH2M 2008). Cr results are ND. Continue 3V sampling for 4Q 2017, pending detailed response.

Only changes from Sampling Methods approved by DTSC in June 2014 (DTSC 2014) and detailed in Table 7-1 of the 2014 Annual Groundwater Monitoring Report (CH2M 2015), are presented in this table.

References:

California Department of Toxic Substances Control (DTSC) 2014. *PG&E Topock: DTSC Response to Section 7 2013 Annual Report Recommendations*. Email to PG&E dated June 27.

CH2M HILL 2008. *Summary Report for Hydraulic Testing in Bedrock Wells, PG&E Topock Compressor Station, Needles, California*. January.

CH2M HILL 2015. *Fourth Quarter 2014 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California*. March.

Notes:

- MD minimal drawdown sampling method
- HS HydraSleeve sampling method
- 3V three volume purge sampling method
- ND non-detect
- SC specific conductivity

**Table 3****Specific MD Pump Depths for Newly Approved MD Sampling, Where Pump is Not Mid-Screen***PG&E Topock Groundwater Monitoring*

<b>Well ID</b>	<b>MD Sampling Pump Depth</b>
<b>MW-57-185</b>	MD vs. 3V Trial with 2 MD pump depths: 171 feet and 150 feet
<b>MW-60BR-245</b>	MD vs. 3V Trial with 2 MD pump depths: 175 and 238 feet
<b>MW-70BR-225</b>	MD vs. 3V Trial, one sampling depth with MD pump set between 220 and 229 feet*
<b>MW-72BR-200</b>	MD vs. 3V Trial with 2 MD pump depths: 152 and 195 feet
<b>CW-1M</b> <b>CW-1D</b>	MD vs. 3V Trial with one MD pump depth per well: CW-1M at 175 feet and CW-1D at 267 feet
<b>CW-2M</b> <b>CW-2D</b>	MD vs. 3V Trial with one MD pump depth per well: CW-2M at 170 feet* and CW-2D at 317 feet
<b>CW-3M</b> <b>CW-3D</b>	MD vs. 3V Trial with one MD pump depth per well: CW-3M at 197 feet and CW-3D at 297 feet
<b>CW-4M</b> <b>CW-4D</b>	MD vs. 3V Trial with one MD pump depth per well: CW-4M at 150 feet and CW-4D at 267 feet*

Notes:

MD     minimal drawdown sampling method  
3V     three volume purge sampling method

\*       Depth modified or clarified per October 2017 DTSC GSU recommendation