

Date Started: 07/31/2019	Surface Elevation: 465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed: 09/23/2019	Shallow Well Elevation: 465.4 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 465.3 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103798.1	Project: Final GW Remedy Phase 1
Driller Name: E. Ramos / S. Vasquez	Easting (NAD83): 7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst: O. Flores / L. Amaya	Borehole Diameter: 6-12 inches	
Logger: GJ / SM / CS / DC / AM	Water Level Start: 10.5 ft bgs	Project Number: RC000753.0051
Editor: Grant Willford	Development End Date: 11/23/2019	
Total Depth: 417 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
0					(0.0 - 150.8') 2" PVC Sch 80 Casing		(+0.5 - 1.0') 22 bags Note: 30-inch Diameter Concrete Pad with 18-inch Diameter Lockable Vault, Quickcrete Concrete Mix with Buff dye
1					(+0.5 - 1.0') Concrete Pad		
2							
3					(2.2 - 5.0') Bentonite seal chips	(2.2 - 5.0') 2.92	(2.2 - 5.0') 7 (140%) Note: Puregold Medium Chips, installed due to void and heat of hydration concerns, installed >20% of calculated volume to fill void
4							
5							
6		Topock - Fill	SP				
7							
8							
9							
10					(0.0 - 42.0') 12.0" Borehole		
11					(5.0 - 16.9') Portland Cement 6% Bentonite	(5.0 - 16.9') 66 gallons	(5.0 - 16.9') 100 gallons (52%) Note: Type I, II and V and Benseal, used >20% of the calculated volume due to potential voids forming during flushing of the 10-inch casing
12							
13							
14	MW-X-VAS-12-17 (<0.033 U ppb) 6/25/2019 15:10						
15			NR				
16							
17							
18					(16.9 - 118.2') Bentonite seal chips	(16.9 - 118.2') 78.93 bags	(16.9 - 118.2') 77 bags (-2%) Note: Puregold Medium Chips
19		Topock - Fill	SW				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

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Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
20					(19.5 - 20.5') Centralizer		
21					(0.0 - 150.8') 2" PVC Sch 80 Casing		
22							
23							
24							
25							
26							
27							
28		Topock - Fill	SW				
29							
30					(16.9 - 118.2') Bentonite seal chips	(0.0 - 42.0') 12.0" Borehole	(16.9 - 118.2') 78.93 bags
31							(16.9 - 118.2') 77 bags (-2%) Note: Puregold Medium Chips
32							
33							
34	MW-X-VAS-32-37 (<0.033 U ppb) 6/26/2019 11:45						
35							
36							
37		Topock - Fluvial Deposits	SW				
38							
39							

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Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
40			SW		(0.0 - 150.8') 2" PVC Sch 80 Casing	(0.1 - 300.8') 2" PVC Sch 80 Casing	
41						(0.0 - 42.0') 12.0" Borehole	
42							
43							
44			NR				
45							
46							
47							
48		Topock - Fluvial Deposits	SW				
49		Topock - Fluvial Deposits	GW		(16.9 - 118.2') Bentonite seal chips	(16.9 - 118.2') 78.93 bags	(16.9 - 118.2') 77 bags (-2%) Note: Puregold Medium Chips
50							
51		Topock - Fluvial Deposits	SW			(42.0 - 324.0') 10.0" Borehole	
52							
53							
54							
55		Topock - Fluvial Deposits	SP				
56							
57							
58		Topock - Fluvial Deposits	SW				
59							

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Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
60					(0.0 - 150.8') 2" PVC Sch 80 Casing		
61		Topock - Fluvial Deposits	SW				
62							
63		Topock - Fluvial Deposits	SP				
64							
65							
66							
67							
68							
69		Topock - Fluvial Deposits	SW		(16.9 - 118.2') Bentonite seal chips		
70					(69.5 - 70.5') Centralizer	(42.0 - 324.0') 10.0" Borehole	(16.9 - 118.2') 78.93 bags
71							
72							
73	MW-X-VAS-71-76 (<0.033 U ppb) 6/27/2019 08:52						
74							
75							
76		Topock - Fluvial Deposits	SP				
77							
78		Topock - Fluvial Deposits	SW				
79							

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Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
80					(0.0 - 150.8') 2" PVC Sch 80 Casing		
81		Topock - Fluvial Deposits	SW				
82							
83							
84		Topock - Fluvial Deposits	SW				
85							
86							
87							
88		Topock - Fluvial Deposits	SW-SM				
89							
90					(16.9 - 118.2') Bentonite seal chips	(42.0 - 324.0') 10.0" Borehole	(16.9 - 118.2') 78.93 bags
91							
92							
93		Topock - Fluvial Deposits	GW-GM				
94		Topock - Fluvial Deposits	SP				
95		Topock - Fluvial Deposits	SW				
96							
97			NR				
98		Topock - Fluvial Deposits	SW				
99							

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Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
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Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
100					(0.0 - 150.8') 2" PVC Sch 80 Casing		
101							
102		Topock - Fluvial Deposits	SW				
103							
104		Topock - Fluvial Deposits	SW				
105							
106		Topock - Fluvial Deposits	SW				
107							
108		Topock - Fluvial Deposits	GW				
109	MW-X-VAS-107-112 (<0.033 U ppb) 6/27/2019 15:04	Topock - Fluvial Deposits	SM		(16.9 - 118.2') Bentonite seal chips	(16.9 - 118.2') 78.93 bags	(16.9 - 118.2') 77 bags (-2%) Note: Puregold Medium Chips
110							
111							
112							
113		Topock - Fluvial Deposits	GW				
114	MW-X-VAS-112-117 (<0.033 U ppb) 6/28/2019 09:56	Topock - Fluvial Deposits	SM		(42.0 - 324.0') 10.0" Borehole		
115							
116							
117							
118		Topock - Alluvium Deposits	SM				
119					(118.2 - 146.8') Bentonite seal pellets	(118.2 - 146.8') 22.9 buckets	(118.2 - 146.8') 25 buckets (9%) Note: Pel-Plug (TR30) 3/8"

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Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
120					(119.5 - 120.5') Centralizer		
121					(0.0 - 150.8') 2" PVC Sch 80 Casing		
122							
123							
124							
125							
126							
127							
128							
129		Topock - Alluvium Deposits	SM		(118.2 - 146.8') Bentonite seal pellets	(42.0 - 324.0') 10.0" Borehole	(118.2 - 146.8') 22.9 buckets
130							(118.2 - 146.8') 25 buckets (9%) Note: Pel-Plug (TR30) 3/8"
131							
132							
133							
134							
135							
136							
137							
138							
139							

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Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
140					(0.0 - 150.8') 2" PVC Sch 80 Casing		
141							
142							
143					(118.2 - 146.8') Bentonite seal pellets	(118.2 - 146.8') 22.9 buckets	(118.2 - 146.8') 25 buckets (9%) Note: Pel-Plug (TR30) 3/8"
144							
145							
146							
147							
148		Topock - Alluvium Deposits	SM				
149							
150							
151					(150.8 - 170.8') 2" Sch 80 PVC (20-slot) Screen		
152							
153					(146.8 - 174.0') Cemex #3 MESH (8x10)	(146.8 - 174.0') 26.6 bags	(146.8 - 174.0') 34 bags (28%) Note: Lapis Lustre Sand
154	MW-X-VAS-152-157 (<0.17 U ppb) 6/29/2019 09:19						
155							
156							
157							
158			NR				
159							


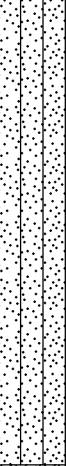





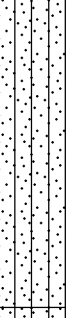


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160			NR		(150.8 - 170.8') 2" Sch 80 PVC (20-slot) Screen		
161							
162							
163							
164		Topock - Alluvium Deposits	CL				
165							
166							
167					(146.8 - 174.0') Cemex #3 MESH (8x10)	(146.8 - 174.0') 26.6 bags	(146.8 - 174.0') 34 bags (28%) Note: Lapis Lustre Sand
168							
169							
170		Topock - Alluvium Deposits	CL				
171							
172					(170.5 - 172.0') Centralizer		
173					(170.8 - 173.2') Sump and End Cap		
174							
175		Topock - Alluvium Deposits	SM				
176							
177		Topock - Alluvium Deposits	GP		(174.0 - 297.4') Bentonite seal pellets	(174.0 - 297.4') 103.3 buckets	(174.0 - 297.4') 119 buckets (15%) Note: Pel-Plug (TR30) 3/8"
178			NR				
179							



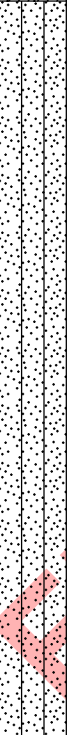

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180			NR		(0.1 - 300.8') 2" PVC Sch 80 Casing		
181							
182							
183							
184	MW-X-VAS-182-187 (<0.17 U ppb) 6/29/2019 15:28	Topock - Alluvium Deposits	SM				
185							
186							
187		Topock - Alluvium Deposits	SC				
188		Topock - Alluvium Deposits	ML				
189		Topock - Alluvium Deposits	SM				
190		Topock - Alluvium Deposits	CL				
191		Topock - Alluvium Deposits	MH				
192							
193							
194		Topock - Alluvium Deposits	ML				
195							
196							
197							
198		Topock - Alluvium Deposits	ML				
199			CL				

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201										
202		Topock - Alluvium Deposits	SM				(174.0 - 297.4') Bentonite seal pellets	(42.0 - 324.0') 10.0" Borehole	(174.0 - 297.4') 103.3 buckets	(174.0 - 297.4') 119 buckets (15%) Note: Pel-Plug (TR30) 3/8"
203										
204										
205										
206										
207										
208										
209	MW-X-VAS-207-212 (<0.17 U ppb) 6/30/2019 13:28									
210										
211										
212										
213										
214										
215										
216										
217										
218										
219										

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Date Started: 07/31/2019	Surface Elevation: 465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed: 09/23/2019	Shallow Well Elevation: 465.4 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 465.3 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103798.1	Project: Final GW Remedy Phase 1
Driller Name: E. Ramos / S. Vasquez	Easting (NAD83): 7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst: O. Flores / L. Amaya	Borehole Diameter: 6-12 inches	
Logger: GJ / SM / CS / DC / AM	Water Level Start: 10.5 ft bgs	Project Number: RC000753.0051
Editor: Grant Willford	Development End Date: 11/23/2019	
Total Depth: 417 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
220					(0.1 - 300.8') 2" PVC Sch 80 Casing		
221							
222							
223		Topock - Alluvium Deposits	SM				
224							
225							
226							
227							
228					(174.0 - 297.4') Bentonite seal pellets		
229							
230					(229.5 - 230.5') Centralizer		
231							
232							
233		Topock - Alluvium Deposits	SM				
234							
235							
236							
237							
238							
239							
					(42.0 - 324.0') 10.0" Borehole	(174.0 - 297.4') 103.3 buckets	(174.0 - 297.4') 119 buckets (15%) Note: Pel-Plug (TR30) 3/8"

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
240			SM		(0.1 - 300.8') 2" PVC Sch 80 Casing		
241							
242							
243		Topock - Alluvium Deposits	SM				
244							
245							
246							
247	MW-X-VAS-245-255 (<0.033 U ppb) 7/1/2019 13:35						
248							
249							
250		Topock - Alluvium Deposits	SM		(174.0 - 297.4') Bentonite seal pellets	(42.0 - 324.0') 10.0" Borehole	(174.0 - 297.4') 103.3 buckets
251							(174.0 - 297.4') 119 buckets (15%) Note: Pel-Plug (TR30) 3/8"
252							
253							
254							
255							
256		Topock - Alluvium Deposits	SM				
257							
258							
259							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
260					(0.1 - 300.8') 2" PVC Sch 80 Casing		
261							
262							
263							
264		Topock - Alluvium Deposits	SM				
265							
266							
267							
268					(174.0 - 297.4') Bentonite seal pellets		
269							
270					(269.5 - 270.5') Centralizer		
271							
272							
273							
274		Topock - Alluvium Deposits	SM				
275							
276							
277							
278							
279							
					(42.0 - 324.0') 10.0" Borehole	(174.0 - 297.4') 103.3 buckets	(174.0 - 297.4') 119 buckets (15%) Note: Pel-Plug (TR30) 3/8"

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
280					(0.1 - 300.8') 2" PVC Sch 80 Casing		
281							
282							
283							
284							
285							
286							
287							
288							
289					(174.0 - 297.4') Bentonite seal pellets	(174.0 - 297.4') 103.3 buckets	(174.0 - 297.4') 119 buckets (15%) Note: Pel-Plug (TR30) 3/8"
290		Topock - Alluvium Deposits	SM		(42.0 - 324.0') 10.0" Borehole		
291							
292							
293							
294	MW-X-VAS-292-297 (<0.17 U ppb) 7/2/2019 14:45						
295							
296							
297							
298					(297.4 - 324.0') Cemex #3 MESH (8x10)	(297.4 - 324.0') 28 bags	(297.4 - 324.0') 33 bags (18%) Note: Lapis Lustre Sand
299							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
300					(0.1 - 300.8') 2" PVC Sch 80 Casing		
301					(300.8 - 320.8') 2" Sch 80 PVC (20-slot) Screen		
302							
303							
304							
305							
306							
307							
308							
309		Topock - Alluvium Deposits	SM		(297.4 - 324.0') Cemex #3 MESH (8x10)	(42.0 - 324.0') 10.0" Borehole	(297.4 - 324.0') 28 bags
310							(297.4 - 324.0') 33 bags (18%) Note: Lapis Lustre Sand
311							
312							
313							
314							
315							
316							
317							
318							
319							

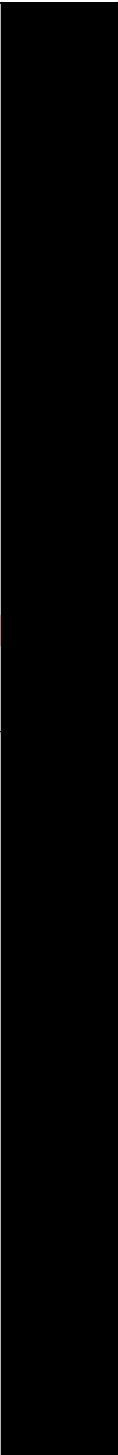
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
320							
321							
322							
323		Topock - Alluvium Deposits	SM		(300.8 - 320.8') 2" Sch 80 PVC (20-slot) Screen (320.5 - 321.5') Centralizer (297.4 - 324.0') Cemex #3 MESH (8x10) (42.0 - 324.0') 10.0" Borehole (320.8 - 323.2') Sump and End Cap	(297.4 - 324.0') 28 bags	(297.4 - 324.0') 33 bags (18%) Note: Lapis Lustre Sand
324							
325							
326							
327							
328		Topock - Alluvium Deposits	MH				
329		Topock - Alluvium Deposits	SM				
330							
331							
332		Topock - Alluvium Deposits	MH		(324.0 - 417.0') Bentonite seal chips	(324.0 - 417.0') 24.9 bags	(324.0 - 417.0') 34 bags (37%) Note: Puregold Medium Chips, used >20% of the calculated volume due to potential voids that formed during drilling
333							
334							
335							
336		Topock - Alluvium Deposits	MH				
337							
338	MW-X-VAS-337-342 (<0.17 U ppb) 7/11/2019 11:30	Topock - Alluvium Deposits	ML				
339		Topock - Alluvium Deposits	ML				

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Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
340	MW-X-VAS-337-342 (<0.17 U ppb) 7/11/2019 11:30	Topock - Alluvium Deposits	ML				(324.0 - 417.0') 34 bags (37%) Note: Puregold Medium Chips, used >20% of the calculated volume due to potential voids that formed during drilling
341		Topock - Alluvium Deposits	GM				
342		Topock - Alluvium Deposits	SM				
343		Topock - Alluvium Deposits	ML				
344		Topock - Alluvium Deposits	ML				
345		Topock - Alluvium Deposits	MH				
346		Topock - Alluvium Deposits	ML				
347		Topock - Alluvium Deposits	SW-SM				
348		Topock - Weathered Bedrock - conglomerate	MH				
349		Topock - Weathered Bedrock - conglomerate	ML				
350			ML				
351							
352							
353							
354							
355							
356							
357							
358							
359							

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Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
360							
361							
362							
363							
364							
365							
366							
367		Topock - Weathered Bedrock - conglomerate	ML				
368							
369							
370					(324.0 - 417.0') Bentonite seal chips	(324.0 - 414.0') 6.0" Borehole	(324.0 - 417.0') 24.9 bags
371							(324.0 - 417.0') 34 bags (37%) Note: Puregold Medium Chips, used >20% of the calculated volume due to potential voids that formed during drilling
372							
373							
374							
375		Topock - Weathered Bedrock - conglomerate	SM				
376							
377		Topock - Weathered Bedrock - conglomerate	GW-GM				
378		Topock - Weathered Bedrock - conglomerate					
379		Topock - Weathered Bedrock - conglomerate	GM				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
380		Topock - Weathered Bedrock - conglomerate	GM				
381							
382							
383							
384	MW-X-VAS-382-387 (<0.17 U ppb) 7/13/2019 14:43	Topock - Weathered Bedrock - conglomerate	CL				
385							
386							
387							
388							
389							
390					(324.0 - 417.0') Bentonite seal chips	(324.0 - 417.0') 24.9 bags	(324.0 - 417.0') 34 bags (37%) Note: Puregold Medium Chips, used >20% of the calculated volume due to potential voids that formed during drilling
391							
392							
393							
394		Topock - Weathered Bedrock - conglomerate	CL				
395							
396							
397							
398							
399							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

Date Started:	07/31/2019	Surface Elevation:	465.4 ft amsl	Well ID: MW-91-170, MW-91-320
Date Completed:	09/23/2019	Shallow Well Elevation:	465.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	465.3 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2103798.1	Project: Final GW Remedy Phase 1
Driller Name:	E. Ramos / S. Vasquez	Easting (NAD83):	7616739.7	Location: PG&E Topock, Needles, California
Drilling Asst:	O. Flores / L. Amaya	Borehole Diameter:	6-12 inches	
Logger:	GJ / SM / CS / DC / AM	Water Level Start:	10.5 ft bgs	Project Number: RC000753.0051
Editor:	Grant Willford	Development End Date:	11/23/2019	
Total Depth:	417 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
400		Topock - Weathered Bedrock - conglomerate	CL				
401		Topock - Weathered Bedrock - conglomerate	GC				
402		Topock - Weathered Bedrock - conglomerate	ML				
403		Topock - Weathered Bedrock - conglomerate	GC				
404		Topock - Weathered Bedrock - conglomerate	SM				
405		Topock - Weathered Bedrock - conglomerate	CL				
406		Topock - Weathered Bedrock - conglomerate	SM				
407		Topock - Weathered Bedrock - conglomerate	CL		(324.0 - 414.0') 6.0" Borehole		
408		Topock - Weathered Bedrock - conglomerate	SM		(324.0 - 417.0') Bentonite seal chips	(324.0 - 417.0') 24.9 bags	(324.0 - 417.0') 34 bags (37%) Note: Puregold Medium Chips, used >20% of the calculated volume due to potential voids that formed during drilling
409		Topock - Weathered Bedrock - conglomerate	GC				
410		Topock - Weathered Bedrock - conglomerate	SM				
411		Topock - Weathered Bedrock - conglomerate	SM				
412		Topock - Weathered Bedrock - conglomerate	SM				
413		Topock - Weathered Bedrock - conglomerate	SM				
414	MW-X-VAS-412-417 (<0.17 U ppb) 7/15/2019 12:43	Topock - Weathered Bedrock - conglomerate	GM		(414.0 - 417.0') 4.0" Borehole		
415		Topock - Weathered Bedrock - conglomerate	GM				
416		Topock - Weathered Bedrock - conglomerate	GM				
417		Topock - Weathered Bedrock - conglomerate	GM				
418					End of Boring at 417.0' bgs.		
419							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery

Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: MW-91d	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1							(0.0 - 12.0') Topock - Fill; Poorly graded sand (SP); brown (10YR 5/3); fine grained to medium grained, angular to subround; trace mica; trace wood; dry; no odor	(0.0 - 7.0') Formation was collapsing at the surface during the installation of the 12-inch conductor casing. Used bentonite to stop the collapse at the surface. Bentonite was mixed into the core during installation of the 12-inch casing to 7 ft bgs.	(0.0 - 177.0') 5100 gallons of water used; 1600 gallons of water recovered; 3500 gallons of water lost
2									
3									
4	96								
5									
6				Topock - Fill	SP				
7									
8							(8'); trace clay; trace organics; no wood particles. 3.0" lense of fat clay @ 8.0' bgs (5Y 4/1)	(8.0 - 17.0') Soft drilling, low recovery due to soft dredge sands	
9								compacting or falling out of core barrel.	
10		No Sieve Samples Collected					(10'); moist; no clay		
11							(11'); wet	(11.0') Approximate Depth to Water.	
12							(12.0 - 19.0') No recovery (NR)		
13	48								
14									
15		MW-X-VAS-12-17 (<0.033 U ppb) 6/25/2019 15:10							
16						NR			
17									
18	24								
19									
20	96			Topock - Fill	SW		(19.0 - 36.5') Topock - Fill; Well graded sand (SW); yellowish brown / moderate yellowish brown (10YR 5/4); fine grained to coarse grained, subangular to subround; little mica; trace	(17.0 - 19.0') No recovery, due to casing and core barrel dropping 2 ft. during clean out to 17 ft. bgs. Heaving sands formation collapse observed on	

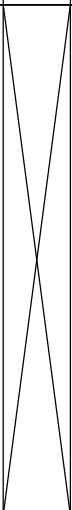



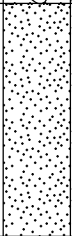

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery, blue water table symbol represents depth to water measured during the first VAS interval

Date Started:	<u>06/20/2019</u>	Surface Elevation:	<u>465.4 ft amsl</u>	Boring No.: <u>MW-91d</u>
Date Completed:	<u>07/31/2019</u>	Northing (NAD83):	<u>2103798.1</u>	
Drilling Co.:	<u>Cascade</u>	Easting (NAD83):	<u>7616739.7</u>	Client: <u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Total Depth:	<u>417 ft bgs</u>	Project: <u>Final GW Remedy Phase 1</u>
Drill Rig Type:	<u>Prosonic Truck Mount</u>	Borehole Diameter:	<u>6-12 inches</u>	Location: <u>PG&E Topock, Needles, California</u>
Driller Name:	<u>E. Ramos / S. Vasquez</u>	Depth to First Water:	<u>9.6 ft bgs</u>	
Drilling Asst:	<u>O. Flores / L. Amaya</u>	Sampling Method:	<u>4 Inch X 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger:	<u>GJ / SM / CS / DC / AM</u>	Sampling Interval:	<u>Continuous</u>	
Editor:	<u>Grant Willford</u>	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

SOIL BORING LOG PG&E TOPOCK BORING LOGS\GINT FILES\12.31.19\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/31/19 11:57

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41	36	No Sieve Samples Collected			NR		(40.0 - 47.0') No recovery (NR)	slip below ground surface. The 12-inch was advanced to 38 ft bgs to stabilize the borehole.	
42									
43									
44									
45									
46									
47	120			Topock - Fluvial Deposits	SW		(47.0 - 48.2') Topock - Fluvial Deposits; Well graded sand (SW); grayish brown (10YR 5/2); fine grained to very coarse grained, subangular to round; trace granules to large pebbles, round; trace mica; coarser clast composed of quartz; wet	(42.0') Final depth of conductor casing after installing deeper to fix mud tub seal.	
48				Topock - Fluvial Deposits	GW		(48.2 - 50.5') Topock - Fluvial Deposits; Well graded gravel with sand (GW); grayish brown (10YR 5/2); granules to small cobbles, subangular to round; some fine to coarse grained sand, subangular to round; trace mica; coarser clast composed of granite and basalt; wet		
49				Topock - Fluvial Deposits	SW		(50.5 - 53.8') Topock - Fluvial Deposits; Well graded sand with gravel (SW); grayish brown (10YR 5/2); fine grained to very coarse grained, subangular to subround; little granules to very large pebbles, subangular to subround; trace round; trace mica; coarser clasts composed of granite and basalt; wet		
50									
51									
52	120			Topock - Fluvial Deposits	SP		(53.8 - 57.0') Topock - Fluvial Deposits; Poorly graded sand (SP); brown (10YR 5/3); very fine grained to fine grained, subround to round; trace granules to very large pebbles, subround to round; wet		
53									
54									
55									
56									
57	120	Topock - Fluvial Deposits	SW		(57.0 - 62.2') Topock - Fluvial Deposits; Well graded sand (SW); brown (10YR 5/3); very fine grained to coarse grained, round; trace mica; wet				
58									
59									
60									

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: MW-91d	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61	120			Topock - Fluvial Deposits	SW				
62				Topock - Fluvial Deposits	SP		(62.2 - 63.5') Topock - Fluvial Deposits; Poorly graded sand (SP); brown (10YR 5/3); very fine grained to fine grained, round; trace mica; wet		
63							(63.5 - 75.5') Topock - Fluvial Deposits; Well graded sand with gravel (SW); brown (10YR 5/3); very fine grained to very coarse grained, subangular to round; little granules to very large pebbles, subangular to round; trace subangular to subround; trace mica; coarser clast composed of basalt, granite, and metadiorite; wet		
64	120	No Sieve Samples Collected							
65									
66									
67									
68									
69									
70				Topock - Fluvial Deposits	SW				
71									
72	120		MW-X-VAS-71-76 (<0.033 U ppb) 6/27/2019 08:52					(71.0 - 77.0') A foot of heaving sands in the casing resulted in the groundwater sample interval to be adjusted from 72 to 77 ft. bgs to 71 to 76 ft. bgs.	
73									
74									
75									
76	120			Topock - Fluvial Deposits	SP		(75.5 - 77.0') Topock - Fluvial Deposits; Poorly graded sand (SP); brown (7.5YR 5/3); very fine grained to fine grained, subangular to round; trace mica; wet		
77									
78				Topock - Fluvial Deposits	SW		(77.0 - 83.5') Topock - Fluvial Deposits; Well graded sand (SW); brown (10YR 5/3); very fine grained to very coarse grained, subangular to subround; trace mica; wet		
79									
80									

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81	120			Topock - Fluvial Deposits	SW				
82									
83									
84				Topock - Fluvial Deposits	SW		(83.5 - 87.0') Topock - Fluvial Deposits; Well graded sand with gravel (SW); brown (10YR 5/3); very fine grained to very coarse grained; little granules to very large pebbles, subangular to round; trace subround to round; trace mica; coarse clasts composed of granite, basalt, and quartz; wet; granules and pebbles increase with depth		
85									
86									
87				Topock - Fluvial Deposits	SW-SM		(87.0 - 93.0') Topock - Fluvial Deposits; Well graded sand with silt (SW-SM); brown (10YR 5/3); very fine grained to very coarse grained, subangular to round; little granules to large pebbles, subround to round; little silt; trace mica; coarser clasts composed of metadiorite; wet		
88									
89									
90	108	No Sieve Samples Collected		Topock - Fluvial Deposits	GW-GM		(93.0 - 94.0') Topock - Fluvial Deposits; Well graded gravel with silt and sand (GW-GM); brown (10YR 5/3); granules to small cobbles, subangular to round; and very fine to very coarse grained sand, subangular to subround; little silt; trace mica; coarser clasts composed of metadiorite; wet		
91									
92									
93				Topock - Fluvial Deposits	SP		(94.0 - 95.0') Topock - Fluvial Deposits; Poorly graded sand (SP); strong brown (7.5YR 4/6); very fine grained to fine grained, subround to round; trace silt; trace mica; wet		
94									
95									
96	96			Topock - Fluvial Deposits	SW		(95.0 - 96.0') Topock - Fluvial Deposits; Well graded sand with gravel (SW); brown (10YR 5/3); very fine grained to medium grained, subangular to round; some granules to very large pebbles, subround to round; trace subround to round; trace silt; trace mica; coarser clasts composed of metadiorite; wet; fractured cobble/boulder fragments within formation		
97					NR		(96.0 - 97.0') No recovery (NR)		
98				Topock - Fluvial Deposits	SW		(97.0 - 104.0') Topock - Fluvial Deposits; Well graded sand (SW); brown (10YR 5/3); very fine grained to very coarse grained, subangular to subround; trace granules to small pebbles, subround to round; trace mica; wet		
99									
100									

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid					
101	96			Topock - Fluvial Deposits	SW			(102.0 - 105.0') Tight formation.						
102														
103														
104														
105	84	No Sieve Samples Collected	MW-X-VAS-107-112 (<0.033 U ppb) 6/27/2019 15:04	Topock - Fluvial Deposits	SW		(104.0 - 105.0') Topock - Fluvial Deposits; Well graded sand with gravel (SW); dark grayish brown / dark yellowish brown (10YR 4/2); very fine grained to very coarse grained, subround to round; and granules to very large pebbles, subangular to round; trace subround to round; trace silt; trace mica; coarser clasts composed of metadiorite; wet; fractured cobbles/ boulder fragments within formation							
106				Topock - Fluvial Deposits	SW		(105.0 - 107.0') Topock - Fluvial Deposits; Well graded sand (SW); brown (10YR 5/3); very fine grained to very coarse grained, subangular to subround; little granules to small pebbles, subround to round; trace silt; trace mica; wet							
107				Topock - Fluvial Deposits	GW		(107.0 - 108.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); brown (10YR 4/3); granules to very large pebbles, subround to round; some very fine to very coarse grained sand, subangular to round; trace silt; trace mica; coarse clasts composed of metadiorite, granite, basalt, quartz; wet							
108							Topock - Fluvial Deposits			SM		(108.0 - 112.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); dark grayish brown / dark yellowish brown (10YR 4/2); very fine grained to coarse grained, subangular to round; some granules to very large pebbles, subround to round; some silt; little subround to round; trace mica; trace organics; wet; organic odor; coarser clasts composed of metadiorite and granite, pulverized cobble/boulder fragments observed		
109												(109') brown (10YR 5/3); little silt; no organics; increase sand		
110				60		MW-X-VAS-112-117 (<0.033 U ppb) 6/28/2019 09:56	Topock - Fluvial Deposits			GW		(112.0 - 114.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); dark gray (10YR 4/1); very fine grained to small cobbles, subangular to round; little very fine to very coarse grained sand, subangular to round; trace silt; trace clay; trace organics; coarser clasts composed of metadiorite; wet; organic odor	(112.0 - 117.0') Rough drilling, collect groundwater sample across fluvial / alluvium contact.	
111												Topock - Fluvial Deposits		
112							Topock - Alluvium Deposits			SM				
113	(117') reddish brown / moderate brown (5YR 4/4) little red / moderate reddish brown (10R 4/6); some silt; decrease in granules and pebbles, no cobbles													
114							(118') little silt; increase in sand, weathered granules and pebbles							
115														
116														
117														
118	120			Topock - Alluvium Deposits	SM									
119														
120														

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: MW-91d	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
121									
122									
123									
124	120								
125									
126									
127									
128							(128'); some silt; little granules to very large pebbles, angular to subangular; decrease in sand		
129									
130		No Sieve Samples Collected		Topock - Alluvium Deposits	SM				
131									
132	120								
133									
134							(134'); little silt; increase sand, increase in granules and pebbles		
135									
136									
137									
138							(138'); some granules to very large pebbles, angular to subangular; slight decrease in silt	(137.0') During reaming with the 10-inch casing, drilling became difficult due to increased friction. Reinstalled 6-casing and started flushing.	
139	120								
140									

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
141								10-inch over the 6-inch.	
142									
143									
144	120								
145									
146									
147									
148				Topock - Alluvium Deposits	SM		(148'); and silt; moist to wet; decrease in sand		
149									
150		No Sieve Samples Collected							
151									
152	120							(151.0 - 157.0') Heaving sands came into casing during clean out to set the sample screen from 152 to 157 ft. bgs. Sampler screen was clogged with sand and had to be reinstalled.	
153									
154		MW-X-VAS-152-157 (<0.17 U ppb) 6/29/2019 09:19							
155							(155'); some granules to very large pebbles, angular to subangular; little silt; wet; increase in sand		
156									
157							(157.0 - 161.0') No recovery (NR)		
158	72				NR			(157.0 - 167.0') Loose sands fell out of core barrel into hopper when bagging core, 165 to 167 drilling got hard.	
159									
160									

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: MW-91d	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
161	72				NR				
162							(161.0 - 167.0') Topock - Alluvium Deposits; Sandy lean clay with gravel (CL); brown (7.5YR 4/4); medium plasticity; some very fine to very coarse grained sand, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; coarser clasts composed of metadiorite; moist; hard; blocky; some meta-diorite clasts are weathered		
163									
164				Topock - Alluvium Deposits	CL				
165	120	No Sieve Samples Collected							
166									
167									
168							(167.0 - 174.5') Topock - Alluvium Deposits; Sandy lean clay with gravel (CL); reddish brown / moderate brown (5YR 4/4); medium plasticity; some very fine to very coarse grained sand, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; coarser clasts composed of metadiorite; moist; some meta-diorite clasts are weathered	(167.0 - 177.0') Smooth drilling.	
169									
170				Topock - Alluvium Deposits	CL				
171									
172									
173	84								
174							(173.5'); moist to wet		
175				Topock - Alluvium Deposits	SM		(174.5 - 177.0') Topock - Alluvium Deposits; Silty sand (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to medium pebbles, angular to subangular; little clay; trace large to very large pebbles, angular to subangular; wet		
176									
177				Topock - Alluvium Deposits	GP		(177.0 - 177.5') Topock - Alluvium Deposits; Poorly graded gravel (GP); boulders; wet	(177.0 - 187.0') Normal drilling.	(177.0 - 327.0') 5395 gallons of water used; 4465 gallons of water recovered; 930 gallons of water lost
178							(177.5 - 180.5') No recovery (NR)		
179									
180					NR				

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
181	84		MW-X-VAS-182-187 (<0.17 U ppb) 6/29/2019 15:28	Topock - Alluvium Deposits	NR		(180.5 - 187.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subround; little granules to medium pebbles, subangular to subround; little silt; trace subangular; trace clay; trace large to very large pebbles subangular; wet		
182									
183									
184					SM		(183.5'); little granules to very large pebbles, angular to subangular; little clay		
185							(184.5'); little granules to large pebbles, angular to subangular; trace clay		
186	120	No Sieve Samples Collected		Topock - Alluvium Deposits				(187.0 - 197.0') Normal drilling.	
187									
188					SC		(187.0 - 188.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subround; some clay; little granules to large pebbles, angular to subangular; little silt; coarser clasts composed of metadiorite; iron oxide staining on metadiorite pebbles; wet		
189					ML		(188.0 - 189.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); red (2.5YR 4/6); medium plasticity; some very fine to very coarse grained sand, angular to subround; little granules to large pebbles, angular to subangular; little clay; coarser clasts composed of metadiorite; moist to wet; very stiff		
190					SM		(189.5 - 190.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (2.5YR 4/4) to dark reddish brown (2.5YR 3/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to very large pebbles, angular to subround; little clay; coarser clasts composed of metadiorite; moist to wet		
191					CL		(190.0 - 191.5') Topock - Alluvium Deposits; Sandy lean clay with gravel (CL); reddish brown (2.5YR 4/4); medium plasticity; some very fine to very coarse grained sand, angular to subround; little granules to small pebbles, angular to subround; little silt; moist; very stiff		
192					MH		(191.5 - 192.5') Topock - Alluvium Deposits; Sandy elastic silt with gravel (MH); reddish brown (2.5YR 4/4); high plasticity; some very fine to very coarse grained sand, angular to subround; little granules to medium pebbles, angular to subround; little clay; coarser clasts composed of metadiorite; moist; very stiff		
193							(192.5 - 197.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); light red (2.5YR 7/6); medium plasticity; some very fine to very coarse grained sand, angular to subround; little granules to medium pebbles, angular to subangular; little clay; coarser clasts composed of metadiorite; moist; green staining		
194									
195									
196									
197									
198									
199									
200									
				Topock - Alluvium Deposits	ML		(197.0 - 199.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (2.5YR 4/4); low plasticity; some very fine to medium grained sand, angular to subround; little granules to medium pebbles, angular to subangular; little clay; trace coarse to very coarse grained sand angular to subangular; moist; very stiff		
				Topock - Alluvium Deposits	CL		(199.0 - 202.0') Topock - Alluvium Deposits; Sandy lean clay with gravel (CL); reddish brown (2.5YR 4/4); medium plasticity; some very fine to very coarse grained sand, angular to subround; little		

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery, blue water table symbol represents depth to water measured during the first VAS interval

Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
201				Topock - Alluvium Deposits	CL		granules to large pebbles, angular to subround; little silt; coarser clasts composed of metadiorite; moist; very stiff		
202							(202.0 - 227.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); red (2.5YR 4/6); very fine grained to very coarse grained, angular to subround; some silt; little granules to large pebbles, angular to subround; little clay; coarser clasts composed of metadiorite; moist		
203	120						(204'); little silt; trace clay; moist to wet		
204							(204.5'); some silt; trace very large pebbles, subangular; trace subangular; moist to wet		
205							(206.3'); little silt; no cobbles, increase in sand		
206							(207'); wet		
207								(207.0 - 217.0') Normal drilling, approximately 6 inches of sample fell out of core barrel at ~208.5 during bagging, material was the same as in the core. Groundwater sample interval 207 to 212 ft. bgs screened across sandy zone 207 to 209 ft bgs.	
208							(209'); some silt; moist to wet; no clay, weathered granules and pebbles		
209			MW-X-VAS-207-212 (<0.17 U ppb) 6/30/2019 13:28	Topock - Alluvium Deposits	SM		(210.5'); little clay; moist to wet; decrease in silt, decrease in sand		
210		No Sieve Samples Collected							
211									
212	108								
213									
214									
215									
216									
217									
218									
219	114								
220									

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: MW-91d	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
221	114			Topock - Alluvium Deposits	SM				
222									
223									
224									
225									
226	111.6	No Sieve Samples Collected		Topock - Alluvium Deposits	SM		(227.0 - 240.0') Topock - Alluvium Deposits; Silty sand (SM); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to large pebbles, angular to subangular; trace clay; coarser clasts composed of metadiorite; moist; iron oxide staining; weathered granules and pebbles	(227.0 - 232.0') Normal drilling.	
227									
228									
229									
230									
231									
232									
233									
234									
235									
236	114			Topock - Alluvium Deposits	SM		(230'); increase in silt, decrease in sand	(232.0 - 237.0') Hard drilling.	
237									
238									
239									
240							(235'); moist to wet		
							(237'); and silt; little clay; decrease in sand	(237.0 - 245.0') Normal drilling.	

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SOIL BORING LOG PG&E TOPOCK C:\USERS\SMC\GRAND\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\1231.19\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GPJ 12/31/19 11:57

Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: MW-91d
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1	
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location: PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs	
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number: RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous	
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
241	114	No Sieve Samples Collected		Topock - Alluvium Deposits	SM		(240.0 - 247.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to very large pebbles, angular to subangular; trace clay; coarser clasts composed of metadiorite; moist; weathered granules and pebbles		
242									
243									
244									
245									
246	MW-X-VAS- 245-255 (<0.033 U ppb) 7/1/2019 13:35			Topock - Alluvium Deposits	SM		(243.5 - 244.0'); dry	(245.0 - 247.0') Hard drilling.	
247									
248									
249									
250									
251			Topock - Alluvium Deposits	SM		(247.0 - 254.0') Topock - Alluvium Deposits; Silty sand (SM); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to very large pebbles, angular to subangular; little clay; trace mica; coarser clasts composed of metadiorite; moist; weathered granules and pebbles	(247.0 - 257.0') Normal drilling.		
252									
253									
254									
255									
256			Topock - Alluvium Deposits	SM		(254.0 - 259.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (2.5YR 4/4) little (7.5R 4/6); very fine grained to very coarse grained, angular to subround; some silt; little granules to very large pebbles, angular to subangular; trace clay; moist; mottled; iron oxide staining; weathered granules and pebbles			
257									
258									
259									
260									
					SM		(259.5 - 269.0') Topock - Alluvium Deposits; Silty sand (SM);	(257.0 - 267.0') Normal drilling, water was observed to contain more bubbles during drilling. Possibly due to increased specific conductivity or	





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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
261	120			Topock - Alluvium Deposits	SM		reddish brown (2.5YR 4/4) little (7.5R 4/6); very fine grained to very coarse grained, angular to subround; medium plasticity, no dilatency; some silt; little granules to very large pebbles, angular to subangular; little clay; coarser clasts composed of metadiorite; moist; mottled; weathered granules and pebbles	salinity.	
262									
263									
264									
265									
266	120	No Sieve Samples Collected		Topock - Alluvium Deposits	SM		(269.0 - 327.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (2.5YR 4/4) some (7.5R 4/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; some silt; little clay; trace angular; coarser clasts composed of metadiorite; moist; mottled; weathered granules to small cobbles	(267.0 - 277.0') Normal drilling, during reaming with 10-inch removed 6-inch casing and attempted to dry drill due to reduce water use.	
267									
268									
269									
270									
271	120			Topock - Alluvium Deposits	SM		(275'); little granules to very large pebbles, angular to subround; trace angular to subangular; increase in silt, increase in sand		
272									
273									
274									
275									
276	120								
277									
278									
279									
280									





Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery, blue water table symbol represents depth to water measured during the first VAS interval

Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: MW-91d	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
281	120	No Sieve Samples Collected		Topock - Alluvium Deposits	SM			(281.0 - 287.0') Rough drilling.	
282									
283							(283.0 - 285.0'); dry		
284									
285									
286									
287							(287') red / moderate reddish brown (10R 4/6) and reddish brown (2.5YR 4/4); trace clay; dry to moist; decrease in silt, increase in sand	(287.0 - 297.0') Rough drilling.	
288									
289									
290									
291		(291'); decrease in silt, increase in sand							
292	120	MW-X-VAS-292-297 (<0.17 U ppb) 7/2/2019 14:45					(293'); moist to wet		
293									
294									
295									
296									
297									
298	120							(297.0 - 307.0') Rough drilling.	
299									
300							(299.5') reddish brown (2.5YR 4/4) some red / moderate reddish		

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: MW-91d	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
301	120	No Sieve Samples Collected		Topock - Alluvium Deposits	SM		brown (10R 4/6); some granules to very large pebbles, angular to subangular; decrease sand		
302									
303							(303'); little granules to very large pebbles, angular to subangular; little silt; increase sand		
304									
305									
306	120	No Sieve Samples Collected		Topock - Alluvium Deposits	SM		(307'); some granules to very large pebbles, angular to subangular; trace angular to subangular; dry to moist; decrease sand	(307.0 - 317.0') Rough drilling.	
307									
308									
309									
310									
311	120	No Sieve Samples Collected		Topock - Alluvium Deposits	SM		(312') dark reddish brown (2.5YR 3/4) trace red / moderate reddish brown (10R 4/6); some silt; moist to wet; increase sand	(317.0 - 323.0') Normal drilling.	
312									
313									
314									
315									
316	120	No Sieve Samples Collected		Topock - Alluvium Deposits	SM		(317.0 - 323.0') Normal drilling.		
317									
318									
319									
320									











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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
321	120			Topock - Alluvium Deposits	SM		(321'); little silt; dry to moist; iron oxide staining; increase sand		
322									
323									
324								(323.0 - 326.0') Rough drilling.	
325									
326	1200	No Sieve Samples Collected		Topock - Alluvium Deposits	MH		(327.0 - 328.2') Topock - Alluvium Deposits; Gravelly elastic silt with sand (MH); reddish brown (2.5YR 4/4); medium plasticity; some granules to very large pebbles, angular to subround; little very fine to very coarse grained sand, subangular to subround; little clay; some coarser clasts composed of metadiorite; moist; medium stiff; moderate cementation	(326.0 - 327.0') Normal drilling.	
327									
328				Topock - Alluvium Deposits	SM		(328.2 - 329.9') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); very fine grained to small cobbles, subangular to subround; low plasticity; some silt; little granules to large pebbles, angular to subround; little clay; moist; weak cementation	(327.0 - 337.0') Normal Drilling.	(327.0 - 412.0') No water used
329				Topock - Alluvium Deposits	SM				
330				Topock - Alluvium Deposits	MH		(329.9 - 334.0') Topock - Alluvium Deposits; Gravelly elastic silt with sand (MH); reddish brown (2.5YR 4/4); medium plasticity; some granules to large pebbles, angular to subangular; little very fine to very coarse grained sand, subangular to subround; little clay; moist; medium stiff; weak cementation		
331							(331'); trace clay; increase in granules and pebbles, decrease in silt and clay		
332									
333				Topock - Alluvium Deposits	MH		(334.0 - 337.5') Topock - Alluvium Deposits; Sandy elastic silt with gravel (MH); reddish brown (2.5YR 4/4); medium plasticity; some fine to very coarse grained sand, subangular to subround; little granules to very large pebbles, angular to subangular; trace clay; moist; medium stiff; weak cementation		
334									
335									
336				Topock - Alluvium Deposits	ML		(337.5 - 338.0') Topock - Alluvium Deposits; Gravelly silt with sand (ML); reddish brown (2.5YR 4/4); low plasticity; some granules to very large pebbles, angular to subangular; little very fine to very coarse grained sand, subangular to subround; trace clay; moist; medium stiff; weak cementation	(337.0 - 345.0') Normal drilling, drilled 8 ft due to slough.	
337									
338	96	MW-X-VAS-337-342 (<0.17 U ppb) 7/11/2019 11:30		Topock - Alluvium Deposits	ML		(338.0 - 341.0') Topock - Alluvium Deposits; Gravelly silt with sand (ML); reddish brown (2.5YR 4/4); medium plasticity; some granules to very large pebbles, angular to subangular; little very		
339				Topock - Alluvium Deposits	ML				
340									

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
341	96		MW-X-VAS-337-342 (<0.17 U ppb) 7/11/2019 11:30	Topock - Alluvium Deposits	ML		fine to very coarse grained sand, subangular to subround; little clay; moist; stiff; moderate cementation (339'); wet to moist; weak cementation; decrease in granules and pebbles, increase in silt		
342				Topock - Alluvium Deposits	GM		(341.0 - 342.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); reddish brown (2.5YR 4/4); granules to very large pebbles, angular to subround; some fine to very coarse grained sand, subangular to subround; little silt; trace clay; moist		
343				Topock - Alluvium Deposits	SM		(342.5 - 345.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); medium grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subround; little silt; trace clay; moist; weak cementation		
344									
345	144	No Sieve Samples Collected		Topock - Alluvium Deposits	ML		(345.0 - 348.0') Topock - Alluvium Deposits; Gravelly silt with sand (ML); reddish brown (2.5YR 4/4); low plasticity; some small to large pebbles, angular to subround; little fine to coarse grained sand, subangular to subround; moist to dry; soft; weak cementation	(345.0 - 352.0') Normal drilling.	
346							(347'); moist to dry; soft; weak cementation; increase in granules and pebbles, increase in sand, decrease in silt		
347				Topock - Alluvium Deposits	MH		(348.0 - 348.3') Topock - Alluvium Deposits; Gravelly elastic silt with sand (MH); light brown (7.5YR 6/4); medium plasticity; some clay; little granules to medium pebbles, angular to subround; trace very fine to fine grained sand, subangular to round; dry; soft; weak cementation		
348				Topock - Alluvium Deposits	ML		(348.3 - 352.0') Topock - Alluvium Deposits; Gravelly silt with sand (ML); reddish brown (2.5YR 4/4); low plasticity; some small to large pebbles, angular to subround; little fine to coarse grained sand, subangular to subround; moist to dry; soft; weak cementation		
349									
350				Topock - Alluvium Deposits	SW-SM		(352.0 - 355.0') Topock - Alluvium Deposits; Well graded sand with silt and gravel (SW-SM); reddish brown (2.5YR 4/4); very fine grained to medium grained, subangular to subround; little granules to very large pebbles, angular to subround; little silt; little clay; trace small cobbles, subangular; moist; weak cementation	(352.0 - 357.0') Rough drilling.	
351									
352	60			Topock - Weathered Bedrock - conglomerate	MH		(355.0 - 357.0') Topock - Weathered Bedrock - conglomerate; Gravelly elastic silt with sand (MH); reddish brown (2.5YR 4/4); medium plasticity; some granules to very large pebbles, angular to subround; little very fine to fine grained sand, subangular to subround; little clay; little coarser clasts composed of metadiorite; dry to moist; stiff; moderate cementation		
353				Topock - Weathered Bedrock - conglomerate	ML		(357.0 - 359.0') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); reddish brown (2.5YR 4/4); low plasticity; some very fine to medium grained sand, subangular to subround; little granules to very large pebbles, angular to subround; little clay; moist; medium stiff; weak cementation	(357.0 - 362.0') Rough drilling, slough in 4-inch rathole advance 6-inch for clean out.	
354									
355				Topock - Weathered Bedrock -	ML		(359.0 - 374.0') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); reddish brown (2.5YR 4/4); low plasticity; some very fine to very coarse grained sand, subangular		
356									
357									
358									
359									
360									

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
361	60			conglomerate			to subround; little granules to very large pebbles, angular to subround; little clay; trace coarser clasts composed of metadiorite; dry to moist; soft		
362							(361'); moist to wet		
363							(361.5'); moist to wet; soft; weak cementation; increase in sand, decrease in silt	(362.0 - 367.0') Soft drilling, slough in 4-inch rathole advance 6-inch for clean out.	
364							(363'); dry to moist		
365									
366									
367	120			Topock - Weathered Bedrock - conglomerate	ML				(367.0 - 372.0') Soft Drilling.
368							(369'); dry to moist; soft; weak cementation; increase in sand, decrease in silt		
369									
370		No Sieve Samples Collected							
371									
372									
373									
374									
375	60			Topock - Weathered Bedrock - conglomerate	SM		(374.0 - 377.0') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); fine grained to very coarse grained, subangular to subround; some granules to very large pebbles, angular to subround; trace clay; moist; medium dense; moderate cementation	(372.0 - 377.0') Normal drilling.	
376									
377				Topock - Weathered Bedrock - conglomerate	GW-GM		(377.0 - 377.5') Topock - Weathered Bedrock - conglomerate; Well graded gravel with silt and sand (GW-GM); reddish brown (2.5YR 4/4); granules to boulders, subangular to subround; little very fine to very coarse grained sand, subangular to subround; little silt; dry to moist; weak cementation	(377.0 - 382.0') Normal drilling.	
378				Topock - Weathered Bedrock - conglomerate					
379	60			Topock - Weathered Bedrock - conglomerate	GM		(377.5 - 382.0') Topock - Weathered Bedrock - conglomerate; Silty gravel with sand (GM); reddish brown (2.5YR 4/4); granules to very large pebbles, angular to subround; little very fine to very coarse grained sand, subangular to subround; little silt; trace clay; trace coarser clasts composed of metadiorite; dry to moist;		
380									


















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Date Started:	<u>06/20/2019</u>	Surface Elevation:	<u>465.4 ft amsl</u>	Boring No.: <u>MW-91d</u>
Date Completed:	<u>07/31/2019</u>	Northing (NAD83):	<u>2103798.1</u>	
Drilling Co.:	<u>Cascade</u>	Easting (NAD83):	<u>7616739.7</u>	Client: <u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Total Depth:	<u>417 ft bgs</u>	Project: <u>Final GW Remedy Phase 1</u>
Drill Rig Type:	<u>Prosonic Truck Mount</u>	Borehole Diameter:	<u>6-12 inches</u>	Location: <u>PG&E Topock, Needles, California</u>
Driller Name:	<u>E. Ramos / S. Vasquez</u>	Depth to First Water:	<u>9.6 ft bgs</u>	
Drilling Asst:	<u>O. Flores / L. Amaya</u>	Sampling Method:	<u>4 Inch X 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger:	<u>GJ / SM / CS / DC / AM</u>	Sampling Interval:	<u>Continuous</u>	
Editor:	<u>Grant Willford</u>	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

SOIL BORING LOG PG&E TOPOCK DATABASE FOR PI OG GP1 TOPOCK DATA TEMPLATE FOR PI OG GDT 12/31/19 11:57

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Date Started:	06/20/2019	Surface Elevation:	465.4 ft amsl	Boring No.: <u>MW-91d</u>	
Date Completed:	07/31/2019	Northing (NAD83):	2103798.1		
Drilling Co.:	Cascade	Easting (NAD83):	7616739.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	417 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	E. Ramos / S. Vasquez	Depth to First Water:	9.6 ft bgs		
Drilling Asst:	O. Flores / L. Amaya	Sampling Method:	4 Inch X 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	GJ / SM / CS / DC / AM	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
401	162			Topock - Weathered Bedrock - conglomerate	CL		(400.0 - 401.0') Topock - Weathered Bedrock - conglomerate; Gravelly lean clay with sand (CL); reddish brown (2.5YR 4/4); medium plasticity; some silt; little granules to large pebbles, angular to subround; little fine to very coarse grained sand, subangular to subround; trace small cobbles, subangular; moist; soft to medium stiff; weak cementation	(403.0 - 407.0') Soft drilling.	
402				Topock - Weathered Bedrock - conglomerate	GC		(401.0 - 402.2') Topock - Weathered Bedrock - conglomerate; Clayey gravel with sand (GC); reddish brown (2.5YR 4/4); granules to very large pebbles, angular to subround; little fine to very coarse grained sand, subangular to subround; little silt; little clay; little coarser clasts composed of metadiorite; moist; weak cementation		
403				Topock - Weathered Bedrock - conglomerate	ML		(402.2 - 403.6') Topock - Weathered Bedrock - conglomerate; Gravelly silt with sand (ML); reddish brown (2.5YR 4/4); low plasticity; some granules to very large pebbles, angular to subround; little medium to very coarse grained sand, subangular to subround; little clay; moist; soft; weak cementation		
404				Topock - Weathered Bedrock - conglomerate	GC		(403.6 - 404.0') Topock - Weathered Bedrock - conglomerate; Clayey gravel with sand (GC); reddish brown (2.5YR 4/4); granules to small cobbles, angular to subround; little medium to very coarse grained sand, subangular to subround; little silt; little clay; little coarser clasts composed of metadiorite; moist; weak cementation		
405				Topock - Weathered Bedrock - conglomerate	SM		(404.0 - 406.1') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); fine grained to very coarse grained, subangular to subround; some granules to very large pebbles, angular to subround; little silt; little clay; little coarser clasts composed of metadiorite; moist; weak cementation		
406				Topock - Weathered Bedrock - conglomerate	SM		(406.1 - 407.0') Topock - Weathered Bedrock - conglomerate; Sandy lean clay with gravel (CL); reddish brown (2.5YR 4/4); medium plasticity; some silt; little granules to large pebbles, subangular to subround; little fine to very coarse grained sand, subangular to subround; moist; soft; weak cementation		
407	120	No Sieve Samples Collected		Topock - Weathered Bedrock - conglomerate	CL		(407.0 - 408.0') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); fine grained to very coarse grained, subangular to subround; low plasticity; some granules to very large pebbles, angular to subround; little silt; little clay; moist; weak cementation	(412.0 - 417.0') Groundwater sample turbidity could not get below 10 NTU with the use of three filters. Well screen fell to 413.9' - 418.9' prior to collecting sample. Used water to flush the casing of fines prior to the installation of the bentonite seal.	(412.0 - 417.0') 375 gallons of water used; 0 gallons of water recovered; 375 gallons of water lost
408				Topock - Weathered Bedrock - conglomerate	SM		(408.0 - 411.0') Topock - Weathered Bedrock - conglomerate; Clayey gravel with sand (GC); reddish brown (2.5YR 4/4); granules to small cobbles, angular to subround; some fine to very coarse grained sand, subangular to subround; little silt; little clay; moist; weak cementation		
409				Topock - Weathered Bedrock - conglomerate	GC		(411.0 - 414.8') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); fine grained to very coarse grained, subangular to subround; low plasticity; some granules to very large pebbles, angular to subround; some silt; little clay; moist; weak cementation		
410				Topock - Weathered Bedrock - conglomerate	GC		(414.8 - 417.0') Topock - Weathered Bedrock - conglomerate; Silty gravel with sand (GM); reddish brown (2.5YR 4/4); granules to very large pebbles, angular to subround; some fine to very coarse grained sand, subangular to subround; little silt; little clay; some coarser clasts composed of metadiorite; moist; moderate cementation		
411				Topock - Weathered Bedrock - conglomerate	SM				
412				Topock - Weathered Bedrock - conglomerate	SM				
413		MW-X-VAS-412-417 (<0.17 U ppb)		Topock - Weathered Bedrock - conglomerate	SM				
414		7/15/2019 12:43		Topock - Weathered Bedrock - conglomerate	GM				
415				Topock - Weathered Bedrock - conglomerate	GM				
416				Topock - Weathered Bedrock - conglomerate	GM				
417				Topock - Weathered Bedrock - conglomerate	GM				
End of Boring at 417.0' bgs.									
418									
419									
420									

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