

Date Started: 08/07/2019	Surface Elevation: 481.64 ft amsl	Well ID: MW-76-39, MW-76-156
Date Completed: 09/26/2019	Shallow Well Elevation: 481.24 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 481.35 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103227.14	Project: Final GW Remedy Phase 1
Driller Name: Dan O' Mara	Easting (NAD83): 7615744.97	Location: PG&E Topock, Needles, California
Drilling Asst: John DeMay	Borehole Diameter: 10-12 inches	
Logger: Daniel Luneau	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 9/18/2019	
Total Depth: 161 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
1					(+0.2 - 2.0') Surface completion		(+0.2 - 2.0') 16.5 bags Note: 30 Inch diameter concrete pad with 18 inch diameter lockable vault, King Kon-Crete 4000 PSI dyed Buff.
2					(0.4 - 24.0') 2" PVC Sch 40 Casing		
3							
4							
5							
6							
7							
8					(0.9 - 16.0') Portland Cement 5% Bentonite Type I, II and V with Hydrogel	(0.9 - 16.0') 69.4 gallons	(0.9 - 16.0') 75 gallons (108%) Note: Grout seal
9					(9.5 - 10.5') Centralizer		
10							
11							
12							
13							
14							
15							
16							
17		Topock - Fluvial Deposits	GM				
18		Topock - Fluvial Deposits	ML		(16.0 - 22.0') Bentonite seal chips Puregold medium chips	(16.0 - 22.0') 4.2 bags	(16.0 - 22.0') 5 bags (119%) Note: Seal between filter pack and grout seal.
19		Topock - Fluvial Deposits	ML		(0.3 - 136.0') 2" PVC Sch 80 Casing		
					(0.0 - 16.0') 12.0" Borehole		
					(16.0 - 161.0') 10.0" Borehole		

WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\12.28.20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/30/20 16:30

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, J = estimated value, NR = no recovery; Notes: solid blue and hollow blue water table marks represent depth to water (ft. bgs.) measured post development for the shallow well and deep well respectively; groundwater samples collected during drilling of MW-76d; installed in MW-76s

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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
21		Topock - Alluvium Deposits	ML		(16.0 - 22.0') Bentonite seal chips Puregold medium chips (0.4 - 24.0') 2" PVC Sch 40 Casing	(16.0 - 22.0') 4.2 bags	(16.0 - 22.0') 5 bags (119%) Note: Seal between filter pack and grout seal.
22		Topock - Alluvium Deposits	ML				
23		Topock - Alluvium Deposits	ML				
24							
25					(24.0 - 39.0') 2" 20-Slot Sch 40 PVC Screen		
26							
27							
28	MW-C-VAS-26-31 (380 ppb) 6/19/2019 10:35						
29							
30		Topock - Alluvium Deposits	ML		(16.0 - 161.0') 10.0" Borehole		
31					(22.0 - 43.3') Cemex #3 Mesh (8x20) Lapis Lustre Sand	(22.0 - 43.3') 20.5 bags	(22.0 - 43.3') 26 bags (127%) Note: Filter pack, used >20% of the calculated volume due to potential voids that formed during drilling.
32							
33							
34							
35							
36							
37		Topock - Alluvium Deposits	SM				
38							
39		Topock - Alluvium Deposits	SM		(39.0 - 41.3') Sump and PVC End Cap (39.2 - 39.5') PVC plug		Note: PVC plug installed to isolate filter pack sand in sump.

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WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\12.28.20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/30/20 16:30

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Drilling Asst: John DeMay	Borehole Diameter: 10-12 inches	
Logger: Daniel Luneau	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 9/18/2019	
Total Depth: 161 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
41		Topock - Alluvium Deposits	SM		(39.5 - 40.5') Centralizer (39.5 - 41.3') Sump filled with filter pack		
42		Topock - Alluvium Deposits	SM		(22.0 - 43.3') Cemex #3 Mesh (8x20) Lapis Lustre Sand	(22.0 - 43.3')	(22.0 - 43.3') 26 bags (127%) Note: Filter pack, used >20% of the calculated volume due to potential voids that formed during drilling. Note: Sump compromised and filled with filter pack sand.
43	--No Sample-- (Interval did not produce) 6/19/2019 14:15					20.5 bags	
44							
45							
46							
47							
48	--No Sample-- (Interval did not produce) 6/20/2019 09:55						
49							
50					(16.0 - 161.0') 10.0" Borehole		
51							
52					(43.3 - 134.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(43.3 - 134.0')	(43.3 - 134.0') 91 buckets (120%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids that formed during drilling.
53	MW-C-VAS-51-56 (0.146 J ppb) 6/25/2019 12:00		NR				
54							
55							
56							
57							
58							
59							

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Driller Name: Dan O' Mara	Easting (NAD83): 7615744.97	Location: PG&E Topock, Needles, California
Drilling Asst: John DeMay	Borehole Diameter: 10-12 inches	
Logger: Daniel Luneau	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 9/18/2019	
Total Depth: 161 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
61					(0.3 - 136.0') 2" PVC Sch 80 Casing		
62							
63	--No Sample-- (Interval did not produce)						
64	6/25/2019 13:15						
65							
66							
67							
68	MW-C-VAS-66-71 (<0.033 U ppb)						
69	6/26/2019 10:44						
70			NR		(43.3 - 134.0') Bentonite seal pellets Pel-Plug (TR30) 3/8" (69.5 - 70.5') Centralizer	(16.0 - 161.0') 10.0" Borehole	(43.3 - 134.0') 75.9 buckets
71							(43.3 - 134.0') 91 buckets (120%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids that formed during drilling.
72							
73							
74							
75							
76							
77							
78							
79							

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WELL CONSTRUCTION DETAILS_PG&E_TOPOCK_TOPOCK DRAFT BORING LOGS\GINT FILES\12.28.20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/29/20 16:30

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Driller Name: Dan O' Mara	Easting (NAD83): 7615744.97	Location: PG&E Topock, Needles, California
Drilling Asst: John DeMay	Borehole Diameter: 10-12 inches	
Logger: Daniel Luneau	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 9/18/2019	
Total Depth: 161 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume	
81					(0.3 - 136.0') 2" PVC Sch 80 Casing			
82								
83	MW-C-VAS-81-86 (<0.17 U ppb) 6/27/2019 10:58							
84								
85								
86								
87								
88								
89								
90			NR		(43.3 - 134.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(16.0 - 161.0') 10.0" Borehole	(43.3 - 134.0') 75.9 buckets	(43.3 - 134.0') 91 buckets (120%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids that formed during drilling.
91								
92								
93								
94								
95								
96								
97								
98								
99								

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Drilling Asst: John DeMay	Borehole Diameter: 10-12 inches	
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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
101					(0.3 - 136.0') 2" PVC Sch 80 Casing		
102							
103							
104							
105							
106							
107							
108							
109							
110			NR		(43.3 - 134.0') Bentonite seal pellets Pel-Plug (TR30) 3/8" Centralizer (16.0 - 161.0') 10.0" Borehole	(43.3 - 134.0') 75.9 buckets	(43.3 - 134.0') 91 buckets (120%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids that formed during drilling.
111							
112							
113							
114							
115							
116							
117							
118	MW-C-VAS-117-122 (<0.17 U ppb) 6/28/2019 14:59						
119							

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Date Completed: 09/26/2019	Shallow Well Elevation: 481.24 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 481.35 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103227.14	Project: Final GW Remedy Phase 1
Driller Name: Dan O' Mara	Easting (NAD83): 7615744.97	Location: PG&E Topock, Needles, California
Drilling Asst: John DeMay	Borehole Diameter: 10-12 inches	
Logger: Daniel Luneau	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 9/18/2019	
Total Depth: 161 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
121	MW-C-VAS-117-122 (<0.17 U ppb) 6/28/2019 14:59				(0.3 - 136.0') 2" PVC Sch 80 Casing		
122							
123							
124							
125							
126							
127					(43.3 - 134.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(43.3 - 134.0') 75.9 buckets	(43.3 - 134.0') 91 buckets (120%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids that formed during drilling.
128			NR				
129							
130					(16.0 - 161.0') 10.0" Borehole		
131							
132							
133							
134							
135							
136							
137		Topock - Alluvium Deposits	ML		(134.0 - 161.0') Cemex #3 Mesh (8x20) Lapis Lustre Sand	(134.0 - 161.0') 28.8 bags	(134.0 - 161.0') 36 bags (125%) Note: Filter pack, used >20% of the calculated volume due to potential voids that formed during drilling.
138							
139		Topock - Alluvium Deposits	SM		(136.0 - 156.0') 2" 20-Slot Sch 80 PVC Screen		

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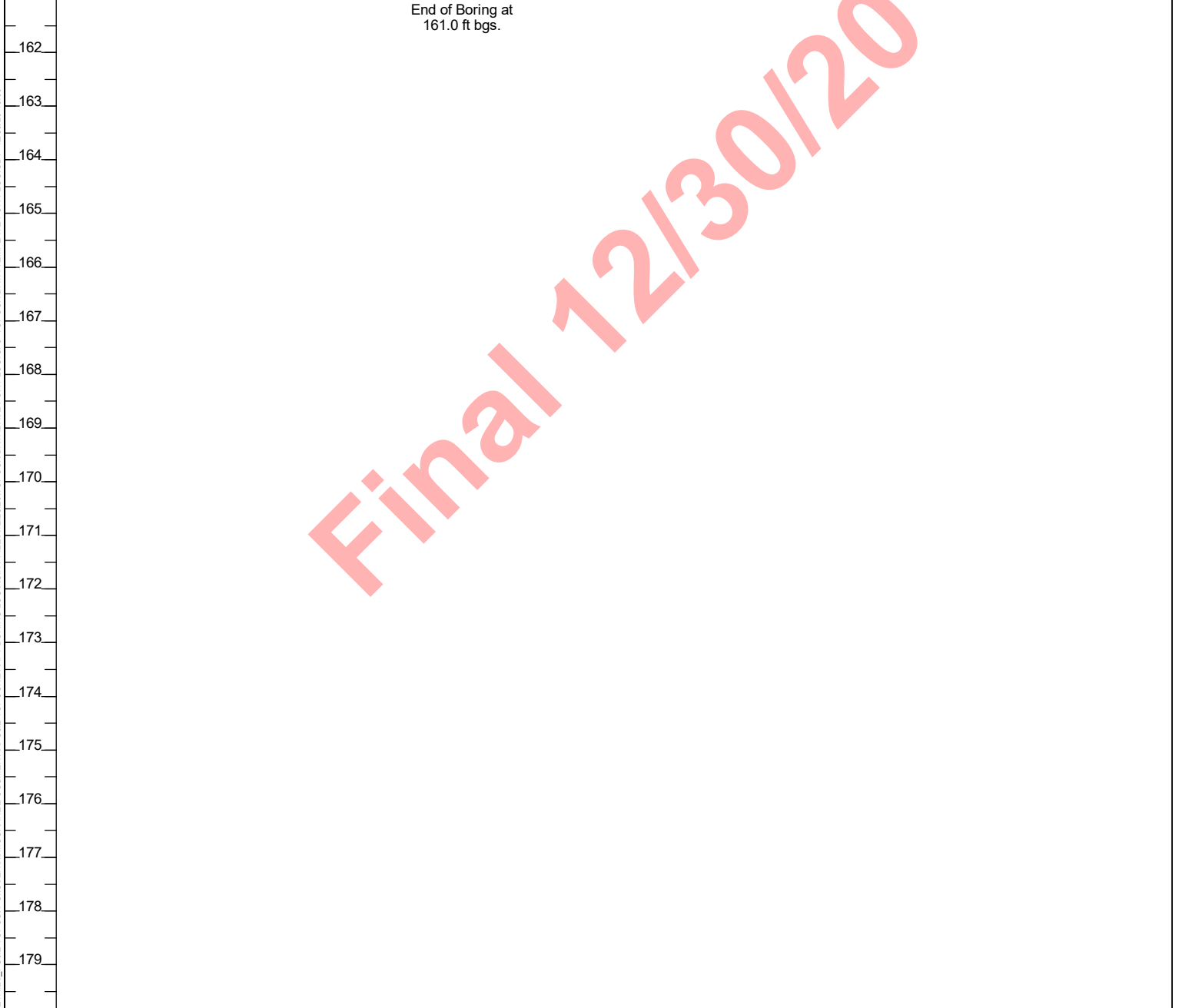
Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume	
141		Topock - Alluvium Deposits	SM		(136.0 - 156.0') 2" 20-Slot Sch 80 PVC Screen			
142								
143		Topock - Alluvium Deposits	ML					
144								
145		Topock - Alluvium Deposits	ML					
146								
147		Topock - Alluvium Deposits	ML					
148								
149	MW-C-VAS-147-152 (<0.17 U ppb) 6/29/2019 13:58	Topock - Alluvium Deposits	SP-SM		(134.0 - 161.0') Cemex #3 Mesh (8x20) Lapis Lustre Sand	(16.0 - 161.0') 10.0" Borehole	(134.0 - 161.0') 28.8 bags	(134.0 - 161.0') 36 bags (125%) Note: Filter pack, used >20% of the calculated volume due to potential voids that formed during drilling.
150								
151		Topock - Alluvium Deposits	SP-SM					
152								
153		Topock - Alluvium Deposits	SP-SM					
154								
155		Topock - Alluvium Deposits	SP-SM					
156								
157		Topock - Alluvium Deposits	SP-SM		(156.3 - 156.6') PVC plug (156.5 - 157.5') Centralizer	(156.0 - 158.3') Sump and PVC End Cap (156.6 - 158.3') Sump filled with filter pack		Note: PVC plug installed to isolate filter pack sand in sump. Note: Sump compromised and filled with filter pack sand.
158								
159		Topock - Alluvium Deposits	SP-SM					

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Drilling Asst: John DeMay	Borehole Diameter: 10-12 inches	
Logger: Daniel Luneau	Static Water Level: See Log for Depths	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 Note: percentages are the actual volume vs the calculated volume
161		Topock - Alluvium Deposits	SP-SM		(16.0 - 161.0') 10.0" Borehole	(134.0 - 161.0') 28.8 bags	



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Date Started:	07/25/2019	Surface Elevation:	481.64 ft amsl	Boring No.: MW-76s	
Date Completed:	08/07/2019	Northing (NAD83):	2103227.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615744.97	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	161 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic Track Mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O' Mara	Depth to First Water:	25.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	John DeMay	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Daniel Luneau	Sampling Interval:	Screen Intervals		
Editor:	Sean McGrane	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 - 16.0') No recovery; core not collected or logged see MW-76d for lithology		(0.0 - 146.0') No water used
2									
3									
4									
5									
6									
7									
8	0								
9									
10		No Sieve Samples Collected							
11									
12									
13									
14									
15									
16									
17				Topock - Fluvial Deposits	GM		(16.0 - 17.6') Topock - Fluvial Deposits; Silty gravel with sand (GM); light gray (7.5YR 7/1); medium grained to very large pebbles, angular to subangular; low plasticity; some angular to subangular; little silt; trace angular to subround; dry	(16.0 - 17.0') Rough drilling	
18	128.4			Topock - Fluvial Deposits	ML		(17.6 - 19.0') Topock - Fluvial Deposits; Sandy silt (ML); reddish brown / moderate brown (5YR 4/4); and fine to coarse grained sand, angular to subround; little medium to large pebbles, subangular to subround; trace clay; moist	(17.0 - 26.0') Drilled normally, sediments expanded in bags.	
19				Topock - Fluvial Deposits	ML		(19.0 - 20.1') Topock - Fluvial Deposits; Sandy silt (ML); dark yellowish brown (10YR 3/6); low plasticity; some fine to medium grained sand, subangular to subround; little clay; trace granules to		
20									

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SOIL BORING LOG: PG&E-TOPOCK-C:\USERS\MCGRANE\DOCUMENTS\PG&E-TOPOCK\DRIFT BORING LOGS\GINT FILES\12.28.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/30/20 16:01

Date Started:	07/25/2019	Surface Elevation:	481.64 ft amsl	Boring No.: MW-76s	
Date Completed:	08/07/2019	Northing (NAD83):	2103227.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615744.97	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	161 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic Track Mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O' Mara	Depth to First Water:	25.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	John DeMay	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Daniel Luneau	Sampling Interval:	Screen Intervals		
Editor:	Sean McGrane	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		
21	128.4			Topock - Alluvium Deposits	ML		small pebbles, subangular to subround; moist (20.1 - 21.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown (5YR 4/4); no plasticity; some fine to coarse grained sand, subangular to subround; little clay; trace granules to small pebbles, subangular to subround; moist				
22				Topock - Alluvium Deposits	ML		(21.5 - 24.4') Topock - Alluvium Deposits; Silt with sand (ML); reddish brown / moderate brown (5YR 4/4); medium plasticity; little very fine to fine grained sand, subangular to subround; little clay; moist				
23				Topock - Alluvium Deposits	ML		(24.4 - 36.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown (5YR 4/4); some granules to large pebbles, subangular to subround; some medium to coarse grained sand, angular to subround; little clay; moist to wet				
24	132	No Sieve Samples Collected	MW-C-VAS-26-31 (380 ppb) 6/19/2019 10:35	Topock - Alluvium Deposits	ML		(28.5'); moist				
25										(31.0 - 36.0') Core bag melted 31 to 33.5 feet, core disturbed, 32 to 36 ft formation got tight.	
26											(33.5'); dry to moist
27											
28	Topock - Alluvium Deposits	SM		(36.0 - 37.7') Topock - Alluvium Deposits; Silty sand (SM); dark brown (10YR 3/3); medium grained to coarse grained, subangular to subround; and silt; little small pebbles, angular to subround; moist to wet							
29	106.8			Topock - Alluvium Deposits	SM		(37.7 - 41.0') Topock - Alluvium Deposits; Silty sand (SM); very dark grayish brown (10YR 3/2); coarse grained to very coarse grained, subangular to subround; some silt; little small to medium pebbles, angular to subround; trace large cobbles, subround; trace clay; moist to wet				
30				Topock - Alluvium Deposits	SM						
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											

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, J = estimated value, NR = no recovery; Notes: depth to water and groundwater samples collected during drilling of MW-76d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-76-39, MW-76-156 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\12.28.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/30/20 16:01

Date Started:	07/25/2019	Surface Elevation:	481.64 ft amsl	Boring No.: MW-76s	
Date Completed:	08/07/2019	Northing (NAD83):	2103227.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615744.97	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	161 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic Track Mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O' Mara	Depth to First Water:	25.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	John DeMay	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Daniel Luneau	Sampling Interval:	Screen Intervals		
Editor:	Sean McGrane	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				Topock - Alluvium Deposits	SM				
42							(41.0 - 46.0') Topock - Alluvium Deposits; Silty sand (SM); reddish brown (5YR 4/3); medium grained to coarse grained, subangular to subround; some silt; trace small to medium pebbles, subangular to subround; trace clay; wet		
43	106.8		--No Sample-- (Interval did not produce) 6/19/2019 14:15	Topock - Alluvium Deposits	SM		(43.5'); moist		
44									
45									
46									
47							(46.0 - 136.0') No recovery (NR); core not collected or logged see MW-76d for lithology		
48			--No Sample-- (Interval did not produce) 6/20/2019 09:55						
49									
50		No Sieve Samples Collected							
51									
52									
53	0		MW-C-VAS-51-56 (0.146 J ppb) 6/25/2019 12:00		NR				
54									
55									
56									
57									
58									
59									
60									

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SOIL BORING LOG: PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\12.28.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/30/20 16:01

Date Started: 07/25/2019	Surface Elevation: 481.64 ft amsl	Boring No.: MW-76s
Date Completed: 08/07/2019	Northing (NAD83): 2103227.14	
Drilling Co.: Cascade	Easting (NAD83): 7615744.97	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 161 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Terrasonic Track Mount	Borehole Diameter: 10-12 inches	Location: PG&E Topock, Needles, California
Driller Name: Dan O' Mara	Depth to First Water: 25.7 ft bgs	Project Number: RC000753.0051
Drilling Asst: John DeMay	Sampling Method: 8 inch x 10 ft. Core Barrel	
Logger: Daniel Luneau	Sampling Interval: Screen Intervals	
Editor: Sean McGrane	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									
62									
63			--No Sample-- (Interval did not produce) 6/25/2019 13:15						
64									
65									
66								(66.0 - 126.0') Normal Drilling	
67									
68			MW-C-VAS-66-71 (<0.033 U ppb) 6/26/2019 10:44						
69									
70	0	No Sieve Samples Collected			NR				
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									

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Date Started: 07/25/2019	Surface Elevation: 481.64 ft amsl	Boring No.: MW-76s
Date Completed: 08/07/2019	Northing (NAD83): 2103227.14	
Drilling Co.: Cascade	Easting (NAD83): 7615744.97	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 161 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Terrasonic Track Mount	Borehole Diameter: 10-12 inches	Location: PG&E Topock, Needles, California
Driller Name: Dan O' Mara	Depth to First Water: 25.7 ft bgs	Project Number: RC000753.0051
Drilling Asst: John DeMay	Sampling Method: 8 inch x 10 ft. Core Barrel	
Logger: Daniel Luneau	Sampling Interval: Screen Intervals	
Editor: Sean McGrane	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									
82									
83			MW-C-VAS-81-86 (<0.17 U ppb) 6/27/2019 10:58						
84									
85									
86									
87									
88									
89									
90	0	No Sieve Samples Collected			NR				
91									
92									
93									
94									
95									
96									
97									
98									
99									
100									

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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, J = estimated value, NR = no recovery; Notes: depth to water and groundwater samples collected during drilling of MW-76d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-76-39, MW-76-156 installed in borehole

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Date Started:	07/25/2019	Surface Elevation:	481.64 ft amsl	Boring No.: MW-76s	
Date Completed:	08/07/2019	Northing (NAD83):	2103227.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615744.97	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	161 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic Track Mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O' Mara	Depth to First Water:	25.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	John DeMay	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Daniel Luneau	Sampling Interval:	Screen Intervals		
Editor:	Sean McGrane	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									
102									
103									
104									
105									
106									
107									
108									
109									
110	0	No Sieve Samples Collected			NR				
111									
112									
113									
114									
115									
116									
117									
118			MW-C-VAS-117-122 (<0.17 U ppb) 6/28/2019 14:59						
119									
120									

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Date Started: 07/25/2019	Surface Elevation: 481.64 ft amsl	Boring No.: MW-76s
Date Completed: 08/07/2019	Northing (NAD83): 2103227.14	
Drilling Co.: Cascade	Easting (NAD83): 7615744.97	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 161 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Terrasonic Track Mount	Borehole Diameter: 10-12 inches	Location: PG&E Topock, Needles, California
Driller Name: Dan O' Mara	Depth to First Water: 25.7 ft bgs	Project Number: RC000753.0051
Drilling Asst: John DeMay	Sampling Method: 8 inch x 10 ft. Core Barrel	
Logger: Daniel Luneau	Sampling Interval: Screen Intervals	
Editor: Sean McGrane	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			MW-C-VAS-117-122 (<0.17 U ppb) 6/28/2019 14:59						
122									
123									
124									
125									
126									
127								(126.0 - 136.0') Normal drilling	
128	0				NR				
129									
130		No Sieve Samples Collected							
131									
132									
133									
134									
135									
136									
137				Topock - Alluvium Deposits	ML		(136.0 - 138.0') Topock - Alluvium Deposits; Sandy silt (ML); reddish brown / moderate brown (5YR 4/4); low plasticity; some medium grained sand, subangular to subround; little medium to large pebbles, subangular; little clay; moist	(136.0 - 146.0') Rough Drilling	
138	117.6			Topock - Alluvium Deposits	SM		(138.0 - 144.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4); fine grained to medium grained, subangular to subround; some silt; little medium to large pebbles, subangular to subround; little clay; moist		
139									
140									

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Date Started:	07/25/2019	Surface Elevation:	481.64 ft amsl	Boring No.: MW-76s	
Date Completed:	08/07/2019	Northing (NAD83):	2103227.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615744.97	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	161 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic Track Mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O' Mara	Depth to First Water:	25.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	John DeMay	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Daniel Luneau	Sampling Interval:	Screen Intervals		
Editor:	Sean McGrane	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	117.6			Topock - Alluvium Deposits	SM					
142				Topock - Alluvium Deposits	ML	(144.0 - 146.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); dark yellowish brown (10YR 4/4); some fine to medium grained sand, subangular to subround; little medium to large pebbles, subangular; little clay; dry				
143				Topock - Alluvium Deposits	ML	(146.0 - 150.0') Topock - Alluvium Deposits; Sandy silt (ML); reddish brown / moderate brown (5YR 4/4); some medium to coarse grained sand, subangular to subround; little clay; trace small to medium pebbles; wet				
144	No Sieve Samples Collected		MW-C-VAS-147-152 (<0.17 U ppb) 6/29/2019 13:58	Topock - Alluvium Deposits	ML		(148.5'); moist to wet	(146.0 - 161.0') Rough drilling, used water to flush casing prior to well installation.	(146.0 - 161.0') 1430 gallons of water used; 75 gallons of water recovered; 1355 gallons of water lost	
145				Topock - Alluvium Deposits	SP-SM	(150.0 - 161.0') Topock - Alluvium Deposits; Poorly graded sand with silt and gravel (SP-SM); reddish brown / moderate brown (5YR 4/4); coarse grained, subangular to subround; and granules to large pebbles, angular to subangular; little silt; trace clay; moist to wet				
146										
147										
148										
149	189.6			Topock - Alluvium Deposits	SP-SM					
150										
151										
152										
153										
154										
155										
156										

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Date Started:	07/25/2019	Surface Elevation:	481.64 ft amsl	Boring No.: MW-76s	
Date Completed:	08/07/2019	Northing (NAD83):	2103227.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615744.97	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	161 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic Track Mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O' Mara	Depth to First Water:	25.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	John DeMay	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Daniel Luneau	Sampling Interval:	Screen Intervals		
Editor:	Sean McGrane	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	189.6	No Sieve Samples Collected		Topock - Alluvium Deposits	SP-SM				

End of Boring at 161.0 ft bgs.

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