

Date Started: 12/16/2018	Surface Elevation: 529.65 ft amsl	<b>Well ID: MW-83-090, MW-83-180</b>
Date Completed: 04/09/2019	Shallow Well Elevation: 529.24 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.13 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.21	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.42	Location: PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	
Logger: Michael Andrews	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 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					(+0.1 - 2.0') Surface completion		(+0.1 - 2.0') 20 bags Note: 3.5 x 3.5 ft concrete pad with 18" diameter lockable vault, King Kon-Crete 4000 PSI
2					(0.4 - 70.0') 2" PVC Sch 40 Casing		
3					(2.0 - 3.0') Portland Cement 5% Bentonite Type I, II and V with Hydrogel	(2.0 - 3.0') 5.5 gallons	(2.0 - 3.0') 8 gallons (145%) Note: Grout seal topped off on 4/1/19. Used >20% of the calculated volume due potential voids forming during drilling and grout migration into the formation.
4							
5					(3.0 - 8.0') Portland Cement 5% Bentonite Type I, II and V with Hydrogel	(3.0 - 8.0') 26.6 gallons	(3.0 - 8.0') 30 gallons (113%) Note: Grout seal
6							
7							
8							
9							
10				NR			
11							
12							
13					(8.0 - 18.0') Bentonite seal chips puregold medium chips	(8.0 - 18.0') 8.14 bags	(8.0 - 18.0') 25 bags (307%) Note: Chips used to fill large void. Used >20% of the calculated volume to backfill the void
14							
15							
16							
17							
18							
19					(18.0 - 65.0') Portland Cement 5% Bentonite Type I, II and V with Hydrogel	(18.0 - 65.0') 279.6 gallons	(18.0 - 65.0') 700 gallons (250%) Note: Grout seal. Used >20% of the calculated volume due potential voids forming during drilling and grout migration

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; 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-83d; installed in MW-83s

WELL CONSTRUCTION DETAILS\_PG&E TOPOCK C:\USERS\SMC\GRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\11.18.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 11/18/20 22:06

Date Started: 12/16/2018	Surface Elevation: 529.65 ft amsl	<b>Well ID: MW-83-090, MW-83-180</b>
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Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.21	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.42	Location: PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	
Logger: Michael Andrews	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 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
21					(0.4 - 70.0') 2" PVC Sch 40 Casing		
22							
23							
24							
25							
26							
27							
28							
29							
30			NR		(18.0 - 65.0') Portland Cement 5% Bentonite Type I, II and V with Hydrogel	(18.0 - 65.0') 279.6 gallons	(18.0 - 65.0') 700 gallons (250%) Note: Grout seal. Used >20% of the calculated volume due potential voids forming during drilling and grout migration
31							
32					(31.5 - 32.5') Centralizer		
33							
34							
35							
36							
37							
38							
39							

Final - Revised 1/20

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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
41					(0.4 - 70.0') 2" PVC Sch 40 Casing		
42							
43							
44							
45							
46							
47							
48							
49							
50			NR		(18.0 - 65.0') Portland Cement 5% Bentonite Type I, II and V with Hydrogel	(18.0 - 65.0') 279.6 gallons	(18.0 - 65.0') 700 gallons (250%) Note: Grout seal. Used >20% of the calculated volume due potential voids forming during drilling and grout migration
51							
52							
53							
54							
55							
56							
57							
58							
59							

Final - Revised 1/20

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Total Depth: 184 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					(0.4 - 70.0') 2" PVC Sch 40 Casing		
62					(18.0 - 65.0') Portland Cement 5% Bentonite Type I, II and V with Hydrogel	(18.0 - 65.0') 279.6 gallons	(18.0 - 65.0') 700 gallons (250%) Note: Grout seal. Used >20% of the calculated volume due to potential voids forming during drilling and grout migration
63			NR				
64							
65							
66		Topock - Fluvial Deposits	SM		(65.0 - 67.0') Bentonite seal chips Puregold medium chips	(65.0 - 67.0') 1.63 bags	(65.0 - 67.0') 3 bags (184%) Note: Seal between filter pack and grout seal. Used >20% of the calculated volume due to potential voids forming during drilling.
67							
68							
69							
70		Topock - Fluvial Deposits	SW-SM		(70.0 - 90.0') 2" Sch 40 PVC (20-slot) Screen		
71							
72							
73							
74					(67.0 - 94.0') Cemex #3 MESH (8x20) Lapis Lustre Sand	(67.0 - 94.0') 31.7 bags	(67.0 - 94.0') 41 bags (129%) Note: Filter pack. Used >20% of the calculated volume due to potential voids forming during drilling.
75		Topock - Fluvial Deposits	SM				
76							
77							
78	MW-L-VAS-76-81 (31 ppb) 10/6/2018 16:34						
79		Topock - Fluvial Deposits	GW-GM				

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Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	
Logger: Michael Andrews	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
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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
81		Topock - Fluvial Deposits	GW-GM		(70.0 - 90.0') 2" Sch 40 PVC (20-slot) Screen		
82							
83			NR				
84							
85							
86							
87					(67.0 - 94.0') Cemex #3 MESH (8x20) Lapis Lustre Sand	(67.0 - 94.0') 31.7 bags	(67.0 - 94.0') 41 bags (129%) Note: Filter pack. Used >20% of the calculated volume due to potential voids forming during drilling.
88							
89							
90		Topock - Alluvium Deposits	SM		(7.0 - 184.0') 10" Borehole		
91					(90.5 - 91.5') Centralizer		
92					(90.0 - 92.3') Sump and PVC End Cap		
93							
94							
95		Topock - Alluvium Deposits	SM				
96							
97					(94.0 - 158.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(94.0 - 158.0') 62.3 buckets	(94.0 - 158.0') 61 buckets (98%) Note: Intermediate bentonite seal
98			NR				
99							

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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					(0.5 - 160.0') 2" PVC Sch 80 Casing			
102								
103								
104								
105								
106								
107								
108	MW-L-VAS-106-111 (0.84 ppb) 10/9/2018 11:46							
109								
110			NR		(94.0 - 158.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(7.0 - 184.0') 10" Borehole	(94.0 - 158.0') 62.3 buckets	(94.0 - 158.0') 61 buckets (98%) Note: Intermediate bentonite seal
111								
112								
113								
114								
115								
116								
117								
118								
119								

Final - Revised 1/20

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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
121					(0.5 - 160.0') 2" PVC Sch 80 Casing		
122							
123							
124							
125							
126							
127							
128							
129							
130			NR		(94.0 - 158.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(94.0 - 158.0') 62.3 buckets	(94.0 - 158.0') 61 buckets (98%) Note: Intermediate bentonite seal
131							
132					(131.5 - 132.5') Centralizer		
133							
134							
135							
136							
137							
138							
139							

Final - Revised 1/20

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141					(0.5 - 160.0') 2" PVC Sch 80 Casing		
142							
143	MW-L-VAS-141-146 (<0.033 U ppb) 10/10/2018 14:58						
144							
145							
146							
147							
148			NR				
149					(94.0 - 158.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(94.0 - 158.0') 62.3 buckets	(94.0 - 158.0') 61 buckets (98%) Note: Intermediate bentonite seal
150					(7.0 - 184.0') 10" Borehole		
151							
152							
153							
154							
155							
156							
157							
158		Topock - Alluvium Deposits	GM				
159					(158.0 - 182.0') Cemex #3 MESH (8x20) Lapis Lustre Sand	(158.0 - 182.0') 29.2 bags	(158.0 - 182.0') 31 bags (106%) Note: Filter pack

Final - Revised 12/20

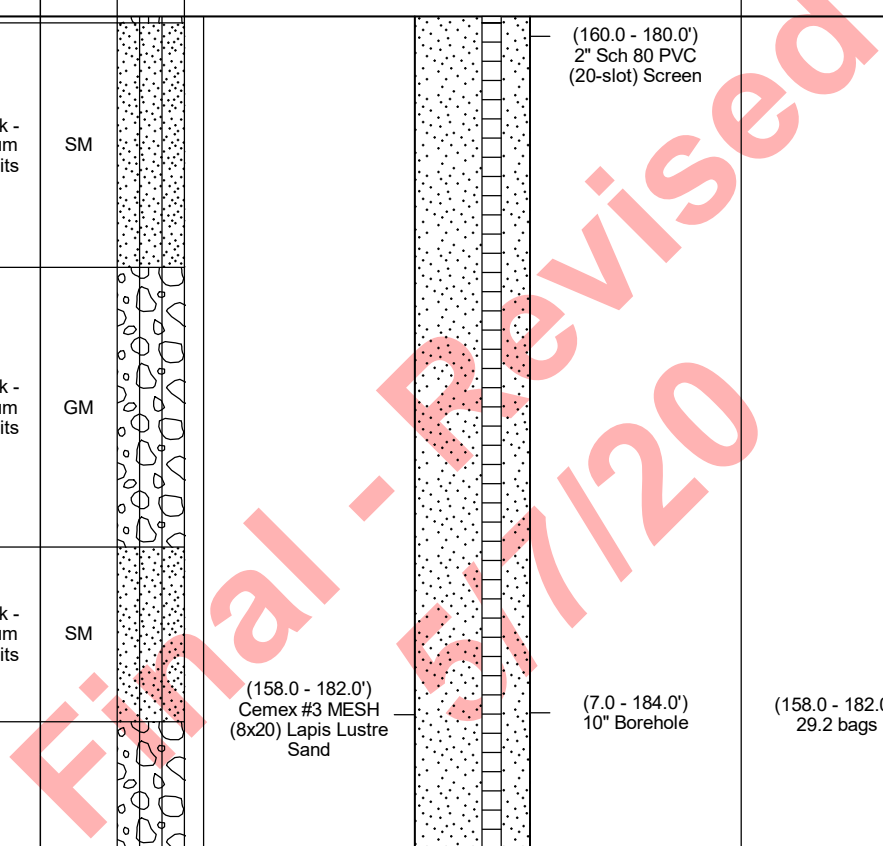
WELL CONSTRUCTION DETAILS: PG&E TOPOCK C:\USERS\SMC\GRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\11.18.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 11/18/20 22:06

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161		Topock - Alluvium Deposits	SM		(160.0 - 180.0') 2" Sch 80 PVC (20-slot) Screen			
162								
163		Topock - Alluvium Deposits	GM					
164								
165								
166		Topock - Alluvium Deposits	SM		(158.0 - 182.0') Cemex #3 MESH (8x20) Lapis Lustre Sand	(7.0 - 184.0') 10" Borehole	(158.0 - 182.0') 29.2 bags	(158.0 - 182.0') 31 bags (106%) Note: Filter pack
167								
168		Topock - Alluvium Deposits	GM					
169								
170								
171								
172		Topock - Alluvium Deposits	SM					
173								
174		Topock - Alluvium Deposits	SM					
175								
176		Topock - Alluvium Deposits	SM					
177								
178		Topock - Alluvium Deposits	SM					
179								



WELL CONSTRUCTION DETAILS: PG&E TOPOCK TOPOCK DRAFT BORING LOGS\GINT FILES\11.18.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 11/18/20 22:06

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181	MW-L-VAS-181-186 (3.3 ppb) 10/20/2018 11:06	Topock - Alluvium Deposits	SM			(158.0 - 182.0') 29.2 bags	(158.0 - 182.0') 31 bags (106%) Note: Filter pack		
182		Topock - Alluvium Deposits	SM				(180.0 - 182.0') Sump and PVC End Cap		
183			NR						Note: Fines that settled out of the water column inside the casing.
184					End of Boring at 184.0 ft bgs.				

Final - Revised 5/7/20

WELL CONSTRUCTION DETAILS\_PG&E\_TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E\_TOPOCK\DRIFT BORING LOGS\GINT FILES\11.18.20\TOPOCK DATABASE FOR PLOG.GPJ\_TOPOCK DATA TEMPLATE FOR PLOG.GDT 11/18/20 22:06

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Date Started:	12/03/2018	Surface Elevation:	529.65 ft amsl	<b>Boring No.: MW-83s</b>
Date Completed:	12/15/2018	Northing (NAD83):	2102862.21	
Drilling Co.:	Cascade	Easting (NAD83):	7615260.42	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 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:	74.7 ft bgs	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number: RC000753.0051
Logger:	Michael Andrews	Sampling Interval:	Screen Interval	
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 - 66.0') No recovery (NR); Cores not collected or logged, see MW-83d log for lithology	(0.0 - 18.0') Drilling rate 51.34 minutes	(0.0 - 184.0') 600 gallons of water used; 200 gallons of water recovered; 400 gallons of water lost
2						(1.0 - 12.0') Drill rods chattering			
3								(6.0') Rough drilling due to 20-inch boulder	
4								(8.0') Drilled slow due to 20-inch boulder	
5								(12.0 - 18.0') Rough drilling	
6								(18.0 - 26.0') Drill time 21.11 minutes, potential voids forming, rough drilling, 6-inch to 20-inch	
7									
8									
9									
10		No sieve samples collected			NR				
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Final - Revised 5/7/20

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; Notes: depth to water and groundwater samples collected during during drilling of the MW-83d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-83-090, MW-83-180 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\SMC\GRAND\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\05.07.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 05/07/20 12:54

Date Started:	12/03/2018	Surface Elevation:	529.65 ft amsl	<b>Boring No.: MW-83s</b>	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.21		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.42	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 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:	74.7 ft bgs		
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	RC000753.0051
Logger:	Michael Andrews	Sampling Interval:	Screen Interval		
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								boulder recovered (19.0') Formation collapsing	
22								(24.0') Heavy rig chatter	
23								(26.0 - 36.0') Drill time 10.35 minutes	
24								(28.0') Voids forming	
25									
26									
27									
28									
29									
30		No sieve samples collected			NR				
31									
32								(31.0 - 36.0') Rough drilling	
33									
34									
35									
36								(36.0 - 56.0') Drill time 73.45 minutes	
37								(37.0') Rough drilling	
38									
39								(38.0 - 40.0') Rough drilling, potential voids forming	
40									

Final - Revised 5/7/20

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Date Started: 12/03/2018	Surface Elevation: 529.65 ft amsl	<b>Boring No.: MW-83s</b>
Date Completed: 12/15/2018	Northing (NAD83): 2102862.21	
Drilling Co.: Cascade	Easting (NAD83): 7615260.42	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 184 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: 74.7 ft bgs	
Drilling Asst: E. Huellmantel / T. Wolfe	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: RC000753.0051
Logger: Michael Andrews	Sampling Interval: Screen Interval	
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									
42									
43									
44								(43.0') Rough drilling	
45									
46									
47									
48									
49									
50		No sieve samples collected			NR				
51									
52									
53									
54									
55									
56									
57								(56.0 - 66.0') Drill time 17.05 minutes	
58									
59									
60									

Final - Revised 5/7/20

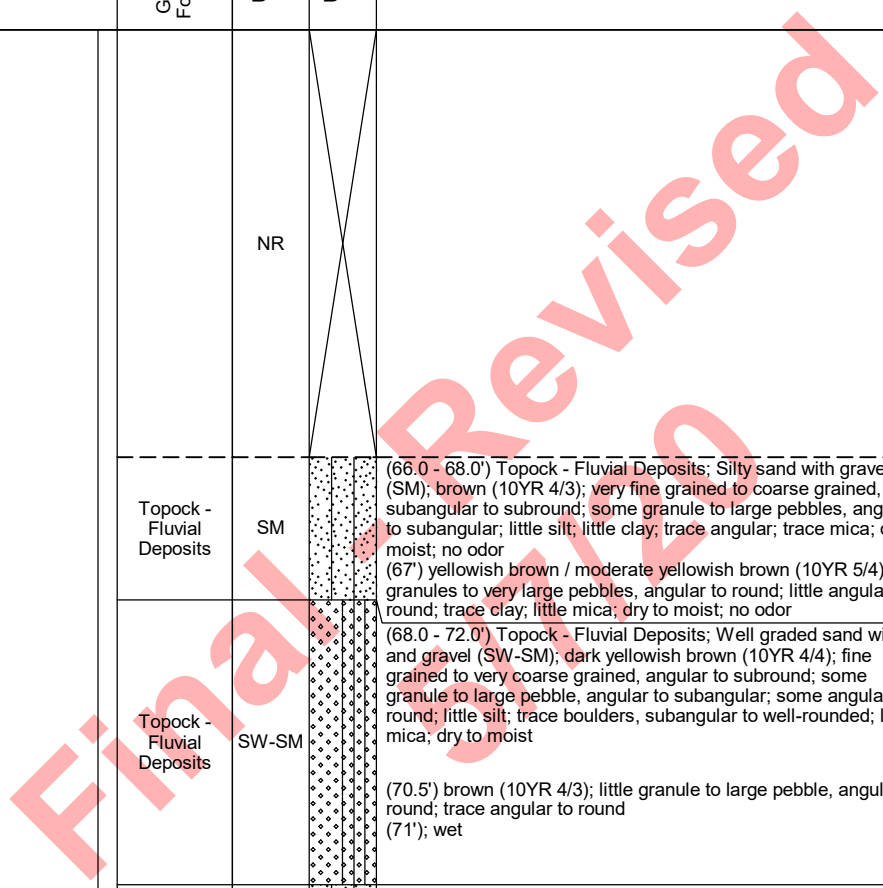
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: depth to water and groundwater samples collected during drilling of the MW-83d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-83-090, MW-83-180 installed in borehole

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Date Started:	12/03/2018	Surface Elevation:	529.65 ft amsl	<b>Boring No.: MW-83s</b>	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.21		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.42	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 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:	74.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft. Core Barrel		
Logger:	Michael Andrews	Sampling Interval:	Screen Interval		
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								(60.0') Heavy rig chatter	
62								(61.0 - 65.0') Rough drilling, potential voids forming	
63					NR				
64									
65									
66									
67				Topock - Fluvial Deposits	SM		(66.0 - 68.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to coarse grained, subangular to subround; some granule to large pebbles, angular to subangular; little silt; little clay; trace angular; trace mica; dry to moist; no odor	(66.0 - 70.0') Voids forming	
68							(67') yellowish brown / moderate yellowish brown (10YR 5/4); little granules to very large pebbles, angular to round; little angular to round; trace clay; little mica; dry to moist; no odor		
69	72	No sieve samples collected		Topock - Fluvial Deposits	SW-SM		(68.0 - 72.0') Topock - Fluvial Deposits; Well graded sand with silt and gravel (SW-SM); dark yellowish brown (10YR 4/4); fine grained to very coarse grained, angular to subround; some granule to large pebble, angular to subangular; some angular to round; little silt; trace boulders, subangular to well-rounded; little mica; dry to moist		
70									
71							(70.5') brown (10YR 4/3); little granule to large pebble, angular to round; trace angular to round		
72							(71'); wet		
73									
74	48			Topock - Fluvial Deposits	SM		(72.0 - 78.5') Topock - Fluvial Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, subangular to round; some granule to very large pebble, angular to round; some silt; little angular to subangular; little clay; little mica; dry to wet; dry to moist to wet with depth	(72.0 - 76.0') Rough drilling, drill rods chattering, drill time 24.30 minutes	
75							(74') angular to round; trace clay		
76									
77							(76') dark grayish brown / dark yellowish brown (10YR 4/2); some granule to very large pebble, angular to round; some silt; trace subangular to subround; trace clay; trace mica; wet; no odor; increase in granules and very large pebbles	(76.0') Approximate depth to water table	
78	63	MW-L-VAS-76-81 (31 ppb) 10/6/2018 16:34					(77'); 6" lens with increase in fines	(76.1 - 86.0') Drill time 24.45	
79							(78'); 6" lens with increase in fines	(76.5 - 81.0') Drill rods chattering	
80				Topock - Fluvial Deposits	GW-GM		(78.5 - 81.3') Topock - Fluvial Deposits; Well graded gravel with silt and sand (GW-GM); dark grayish brown / dark yellowish brown (10YR 4/2); granules to very large pebbles, angular to round; little angular to round; little very fine to medium grained sand, subangular to round; trace boulders, boulder; trace silt; trace clay;	(78.0 - 84.0') Hard/rough drilling	

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SOIL BORING LOG: PG&E TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\05.07.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 05/07/20 12:54

Date Started:	12/03/2018	Surface Elevation:	529.65 ft amsl	<b>Boring No.: MW-83s</b>	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.21		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.42	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 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:	74.7 ft bgs		
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	RC000753.0051
Logger:	Michael Andrews	Sampling Interval:	Screen Interval		
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				Topock - Fluvial Deposits	GW-GM		wet; no odor		
82							(81.3 - 86.0') No recovery (NR); See drilling notes	(81.3') Boulder at jammed up core barrel resulting in no recovery.	
83	63				NR				
84									
85									
86							(86.0 - 94.5') Topock - Alluvium Deposits; Sandy silt with gravel (SM); (7.5R 4/3); very fine grained to very coarse grained, subangular to round; some silt; little granule to very large pebble, angular to subangular; trace clay; wet	(86.0 - 96.0') Soft drilling, drill time 21.30 minutes, and core very wet.	
87									
88									
89									
90		No sieve samples collected		Topock - Alluvium Deposits	SM				
91	108								
92									
93									
94									
95				Topock - Alluvium Deposits	SM		(94.5 - 96.0') Topock - Alluvium Deposits; Silty sand (SM); brown (7.5YR 4/3); very fine grained to coarse grained, angular to subround; and silt; little clay; trace granules to large pebbles, subangular to round; trace angular to subangular; little mica; wet; no odor		
96									
97							(96.0 - 156.0') (NR); Cores not collected or logged, see MW-83d log for lithology	(96.0 - 106.0') Drill time 15.01 minutes and drill rods chattering 96 to 101 ft. bgs.	
98					NR				
99									
100									

Final Revised 5/7/20

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Date Started: 12/03/2018	Surface Elevation: 529.65 ft amsl	<b>Boring No.: MW-83s</b>
Date Completed: 12/15/2018	Northing (NAD83): 2102862.21	
Drilling Co.: Cascade	Easting (NAD83): 7615260.42	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 184 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: 74.7 ft bgs	
Drilling Asst: E. Huellmantel / T. Wolfe	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: RC000753.0051
Logger: Michael Andrews	Sampling Interval: Screen Interval	
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								(102.0 - 106.0') Soft Drilling	
103									
104									
105									
106									
107								(106.0 - 126.0') Soft drilling and drill time 20.15 minutes.	
108			MW-L-VAS-106-111 (0.84 ppb) 10/9/2018 11:46						
109									
110		No sieve samples collected			NR				
111									
112									
113									
114									
115									
116									
117									
118									
119									
120									

Final - Revised 5/7/20

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Date Started:	12/03/2018	Surface Elevation:	529.65 ft amsl	<b>Boring No.: MW-83s</b>	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.21		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.42	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 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:	74.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft. Core Barrel		
Logger:	Michael Andrews	Sampling Interval:	Screen Interval		
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									
122									
123									
124									
125									
126								(126.0 - 146.0') Soft drilling and drill time 26.30 minutes.	
127									
128									
129									
130		No sieve samples collected			NR				
131									
132									
133									
134									
135									
136									
137									
138									
139									
140									

Final - Revised 5/7/20

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Date Started:	12/03/2018	Surface Elevation:	529.65 ft amsl	<b>Boring No.: MW-83s</b>	
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Drilling Co.:	Cascade	Easting (NAD83):	7615260.42	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 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:	74.7 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft. Core Barrel		
Logger:	Michael Andrews	Sampling Interval:	Screen Interval		
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									
142									
143			MW-L-VAS-141-146 (<0.033 U ppb) 10/10/2018 14:58						
144									
145									
146								(146.0 - 156.0') Drill rods chattering and drill time 15.05 minutes with core barrel. Drill time with 10-casing 30.20 minutes.	
147									
148					NR				
149									
150		No sieve samples collected							
151									
152									
153									
154									
155									
156							(156.0 - 160.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (10YR 4/3); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; some silt; trace angular to subangular; trace clay; wet; iron oxide staining	(156.0 - 166.0') Soft drilling and drill time 25.31 minutes. Core barrel lost down hole.	
157				Topock - Alluvium Deposits	GM				
158	117								
159							(159'); little very fine to very coarse grained sand, subangular to subround; wet; weak cementation; increase granules to very large pebbles		
160									

Final - Revised 5/7/20

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Date Started:	12/03/2018	Surface Elevation:	529.65 ft amsl	<b>Boring No.: MW-83s</b>
Date Completed:	12/15/2018	Northing (NAD83):	2102862.21	
Drilling Co.:	Cascade	Easting (NAD83):	7615260.42	Client: PG&E
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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:	74.7 ft bgs	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number: RC000753.0051
Logger:	Michael Andrews	Sampling Interval:	Screen Interval	
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	117			Topock - Alluvium Deposits	SM		(160.0 - 163.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3); very fine grained to very coarse grained, angular to round; little granule to large pebble, angular to subround; little silt; little clay; little mica; wet; no odor; weak cementation		
162							(163.5 - 167.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); dark grayish brown / dark yellowish brown (10YR 4/2); granules to large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little silt; little clay; wet		
163				No sieve samples collected			Topock - Alluvium Deposits		
164	Topock - Alluvium Deposits	SM						(167.5 - 170.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, angular to subrounded; some granules to very large pebbles, angular to subangular; some silt; little clay; trace mica; wet; no odor	
165							Topock - Alluvium Deposits	GM	
166	Topock - Alluvium Deposits	GM							
167				Topock - Alluvium Deposits	GM		(176') brown (7.5YR 5/3); trace clay; little mica; wet; increase in silt		
168	Topock - Alluvium Deposits	SM					(175.0 - 179.0') Rough drilling		
169				Topock - Alluvium Deposits	SM		(177.5 - 182.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3); very fine grained to very coarse grained, angular; some small to very large pebbles, angular to subangular; some silt; little clay; little mica; wet; moderate cementation		
170	198						Topock - Alluvium Deposits	GM	
171				Topock - Alluvium Deposits	SM				
172	Topock - Alluvium Deposits	GM							
173				Topock - Alluvium Deposits	SM				
174	Topock - Alluvium Deposits	GM							
175				Topock - Alluvium Deposits	SM				
176	Topock - Alluvium Deposits	GM							
177				Topock - Alluvium Deposits	SM				
178	Topock - Alluvium Deposits	GM							
179				Topock - Alluvium Deposits	SM				
180	Topock - Alluvium Deposits	GM							

Final Revised 5/1/20

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; Notes: depth to water and groundwater samples collected during drilling of the MW-83d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-83-090, MW-83-180 installed in borehole

SOIL BORING LOG: PG&E-TOPOCK-C:\USERS\SMCGRANE\DOCUMENTS\PG&E-TOPOCK\DRIFT BORING LOGS\GINT FILES\05.07.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 05/07/20 12:54

Date Started:	12/03/2018	Surface Elevation:	529.65 ft amsl	<b>Boring No.: MW-83s</b>	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.21		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.42	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 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:	74.7 ft bgs		
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	RC000753.0051
Logger:	Michael Andrews	Sampling Interval:	Screen Interval		
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
181	198	No sieve samples collected	MW-L-VAS-181-186 (3.3 ppb) 10/20/2018 11:06	Topock - Alluvium Deposits	SM		(182.0 - 182.5') Topock - Alluvium Deposits; Silty sand (SM); (7.5R 4/3); very fine grained to very coarse grained, subangular to subround; and silt; trace granules to medium pebbles, angular to subangular; little mica; wet; no odor (182.5 - 184.0') No recovery (NR); Cores not collected or logged, see MW-83d log for lithology	(181.0 - 182.5') Rough drilling	
182				Topock - Alluvium Deposits	SM			(182.4') Large boulder	
183				NR		(182.5 - 184.0') Rough drilling			
184									

End of Boring at 184.0 ft bgs.

Final - Reviewed 5/17/20

SOIL BORING LOG: PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\05.07.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 05/07/20 12:54

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