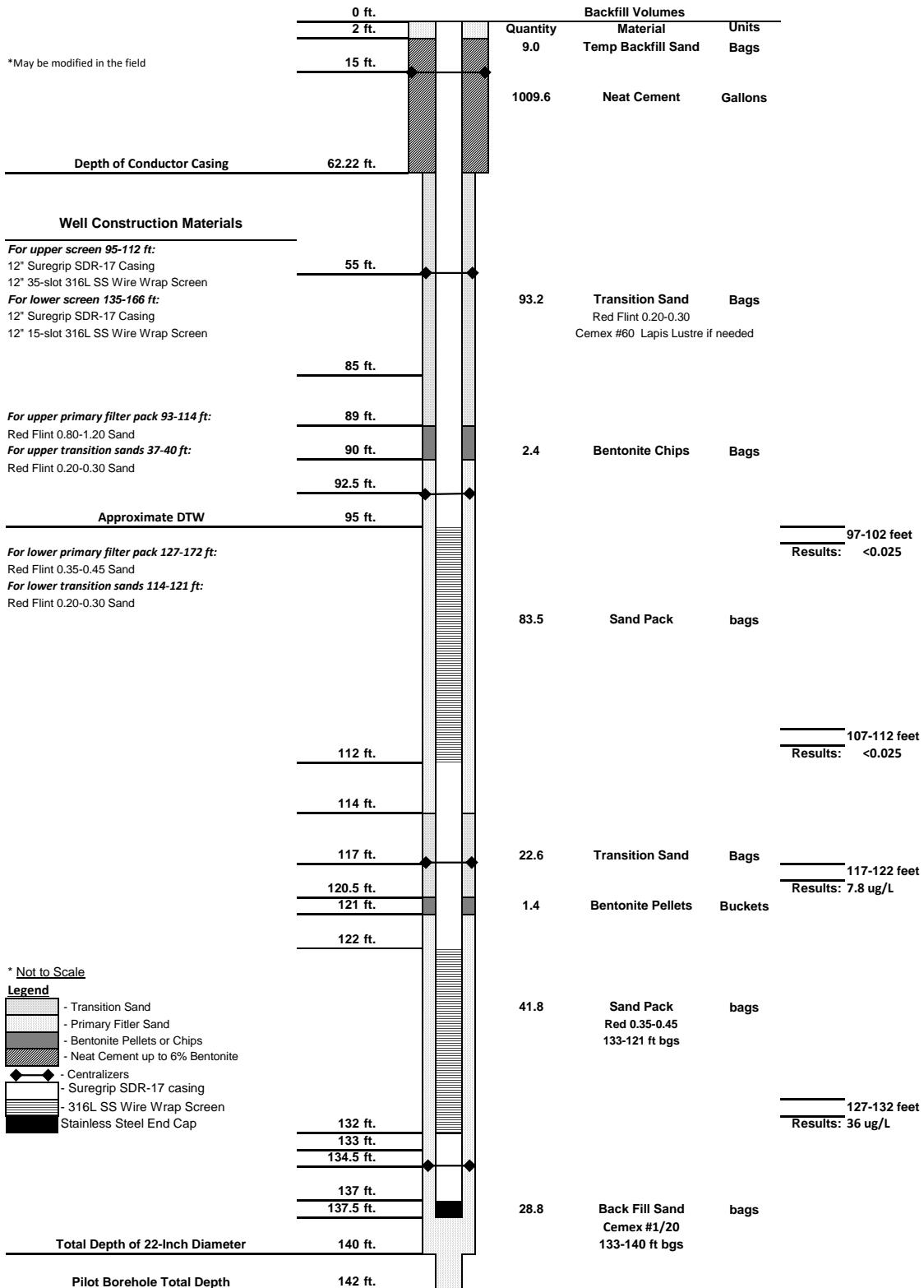


**Final Well Design
FW-02B (10/25/22)**



Well ID: FW-02B Well Purpose: Remediation Well Type: Dual Screened
 Borehole Dia.: 22 - 24 in. Well Diameters: 12 in.



Date Started: 10/23/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B
Date Completed: 11/05/2022	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Dual Rotary	Northing (NAD83): 2100637.96	Project: Final GW Remedy Phase 2A
Driller Name: Josh Saldana	Easting (NAD83): 7614544.74	Location: PG&E Topock, Needles California
Drilling Asst: L.G. / A.A. / D.A.	Borehole Diameter: 22-24 inches	
Logger: Ellen Redner	Static Water Level: See Log for Depths	Project Number: 30126255
Editor: Sean McGrane	Development End Date: 11/19/2022	
Total Depth: 142.06 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
1	No Groundwater Samples Collected	Fluvial Deposits	SW	[Pattern]	(0.0 - 95.0') 12" SHUR-GRIP SDR17 PVC Casing (0.0 - 2.0') Red Flint Sand 0.80-1.20 MM	(0.0 - 2.0') 9 bags	(0.0 - 2.0') 14 bags (156%) Note: Temporary backfill sand, used >20% of the calculated volume due to potential voids that formed during drilling.
2					(0.0 - 60.7') 24" Diameter Borehole		
3		NR	[Pattern]	(2.0 - 6.9') Portland Cement Type I, II and IV with up to 6% Quik-Gel.	(2.0 - 6.9') 82.1 gallons	(2.0 - 6.9') 86 gallons (105%) Note: Grout seal third lift	
4				[Pattern]			(6.9 - 20.7') Portland Cement Type I, II and IV with up to 6% Quik-Gel. (13.5 - 14.5') Kwik-Zip Centralizer
5							
6		Fluvial Deposits	SW	[Pattern]	[Pattern]	(6.9 - 20.7') 231.4 gallons	(6.9 - 20.7') 570 gallons (246%) Note: Grout seal second lift, used >20% of the calculated volume due to potential voids that formed during drilling and grout migration into the formation.
7							
8							
9							
10		NR	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
11							
12		Fluvial Deposits	SW	[Pattern]	[Pattern]	[Pattern]	[Pattern]
13							
14		NR	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
15							
16		Fluvial Deposits	SW	[Pattern]	[Pattern]	[Pattern]	[Pattern]
17							
18		NR	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
19							
20		Fluvial Deposits	SW	[Pattern]	[Pattern]	[Pattern]	[Pattern]
21							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, SS = Stainless Steel, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue water table marks represent depth to water (ft. bgs.) measured post development.

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Date Started: 10/23/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B
Date Completed: 11/05/2022	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Dual Rotary	Northing (NAD83): 2100637.96	Project: Final GW Remedy Phase 2A
Driller Name: Josh Saldana	Easting (NAD83): 7614544.74	Location: PG&E Topock, Needles California
Drilling Asst: L.G. / A.A. / D.A.	Borehole Diameter: 22-24 inches	
Logger: Ellen Redner	Static Water Level: See Log for Depths	Project Number: 30126255
Editor: Sean McGrane	Development End Date: 11/19/2022	
Total Depth: 142.06 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details		Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume	
21	No Groundwater Samples Collected	Fluvial Deposits	SW	[Pattern]	(0.0 - 95.0') 12" SHUR-GRIP SDR17 PVC Casing	[Pattern]			
22									
23									
24									
25									
26									
27									
28									
29			Fluvial Deposits	SW	[Pattern]				
30						(20.7 - 61.7') Portland Cement Type I, II and IV with up to 6% Quik-Gel.		(20.7 - 61.7') 687.3 gallons	(20.7 - 61.7') 660 gallons (96%) Note: Grout seal first lift
31									
32									
33		Alluvium Deposits	SW	[Pattern]					
34									
35									
36									
37									
38		Alluvium Deposits	SW-SM	[Pattern]					
39									
40		Alluvium	SW	[Pattern]					

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, SS = Stainless Steel, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue water table marks represent depth to water (ft. bgs.) measured post development.

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Date Started: 10/23/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B
Date Completed: 11/05/2022	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Dual Rotary	Northing (NAD83): 2100637.96	Project: Final GW Remedy Phase 2A
Driller Name: Josh Saldana	Easting (NAD83): 7614544.74	Location: PG&E Topock, Needles California
Drilling Asst: L.G. / A.A. / D.A.	Borehole Diameter: 22-24 inches	
Logger: Ellen Redner	Static Water Level: See Log for Depths	Project Number: 30126255
Editor: Sean McGrane	Development End Date: 11/19/2022	
Total Depth: 142.06 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details		Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
41		Deposits			(0.0 - 95.0') 12" SHUR-GRIP SDR17 PVC Casing			
42		Alluvium Deposits	SW	[Pattern]				
43								
44								
45								
46								
47		Alluvium Deposits	SW-SM	[Pattern]				
48		Alluvium Deposits	SW-SM	[Pattern]				
49		Alluvium Deposits	SW-SM	[Pattern]				
50	No Groundwater Samples Collected							
51								
52					(20.7 - 61.7') Portland Cement Type I, II and IV with up to 6% Quik-Gel.		(20.7 - 61.7') 687.3 gallons	(20.7 - 61.7') 660 gallons (96%) Note: Grout seal first lift
53		Alluvium Deposits	SW	[Pattern]				
54					(53.5 - 54.5') Kwik-Zip Centralizer			
55								
56								
57		Alluvium Deposits	SW	[Pattern]				
58								
59		Alluvium Deposits	SW-SM	[Pattern]				
60								

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Date Started: 10/23/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B
Date Completed: 11/05/2022	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Dual Rotary	Northing (NAD83): 2100637.96	Project: Final GW Remedy Phase 2A
Driller Name: Josh Saldana	Easting (NAD83): 7614544.74	Location: PG&E Topock, Needles California
Drilling Asst: L.G. / A.A. / D.A.	Borehole Diameter: 22-24 inches	
Logger: Ellen Redner	Static Water Level: See Log for Depths	Project Number: 30126255
Editor: Sean McGrane	Development End Date: 11/19/2022	
Total Depth: 142.06 ft bgs	Well Completion:	<input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
61		Alluvium Deposits	SW-SM		(0.0 - 95.0') 12" SHUR-GRIP SDR17 PVC Casing	(20.7 - 61.7') 687.3 gallons	(20.7 - 61.7') 660 gallons (96%) Note: Grout seal first lift
62					(20.7 - 61.7') Portland Cement Type I, II and IV with up to 6% Quik-Gel.		
63		Alluvium Deposits	SW		(61.7 - 64.6') Cemex #60 (40x70) Lapis Lustre Sand	(61.7 - 64.6') 10.1 bags	(61.7 - 64.6') 10 bags (99%) Note: Transition sand
64							
65							
66			NR				
67		Alluvium Deposits	SW				
68							
69		Alluvium Deposits	SW				
70	No Groundwater Samples Collected						
71							
72		Alluvium Deposits	SM		(64.6 - 89.0') Red Flint Sand 0.20-0.30 MM	(64.6 - 89.0') 84.9 bags	(64.6 - 89.0') 88 bags (104%) Note: Transition sand
73							
74							
75		Alluvium Deposits	SW				
76							
77							
78							
79		Alluvium Deposits	SW-SM				
80							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, SS = Stainless Steel, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue water table marks represent depth to water (ft. bgs.) measured post development.

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Date Started: 10/23/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B
Date Completed: 11/05/2022	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Dual Rotary	Northing (NAD83): 2100637.96	Project: Final GW Remedy Phase 2A
Driller Name: Josh Saldana	Easting (NAD83): 7614544.74	Location: PG&E Topock, Needles California
Drilling Asst: L.G. / A.A. / D.A.	Borehole Diameter: 22-24 inches	
Logger: Ellen Redner	Static Water Level: See Log for Depths	Project Number: 30126255
Editor: Sean McGrane	Development End Date: 11/19/2022	
Total Depth: 142.06 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume			
81	No Groundwater Samples Collected	Alluvium Deposits	SW-SM	SW-SM	(0.0 - 95.0') 12" SHUR-GRIP SDR17 PVC Casing					
82										
83	No Groundwater Samples Collected	Alluvium Deposits	SW	SW	(64.6 - 89.0') Red Flint Sand 0.20-0.30 MM	(64.6 - 89.0') 84.9 bags	(64.6 - 89.0') 88 bags (104%) Note: Transition sand			
84										
85										
86										
87	No Groundwater Samples Collected	Alluvium Deposits	SW	SW	(89.0 - 90.0') Puregold Medium Bentonite Chips	(89.0 - 90.0') 2.42 bags	(89.0 - 90.0') 3 bags (124%) Note: Bentonite seal			
88										
89										
90	No Groundwater Samples Collected	Alluvium Deposits	SW-SM	SW-SM	(92.0 - 93.0') Kwik-Zip Centralizer					
91										
92										
93										
94										
95	No Groundwater Samples Collected	Alluvium Deposits	SW-SM	SW-SM	(90.0 - 113.4') Red Flint Sand 0.80-1.20 MM	(90.0 - 113.4') 81.4 bags	(90.0 - 113.4') 97 bags (119%) Note: Filter pack, swabbed the filter pack for approximately 100 minutes prior to installation of the bentonite seal.			
96										
97	No Groundwater Samples Collected	Alluvium Deposits	SW	SW	(95.0 - 112.0') 12" 35-Slot 316L SS Wire Wrap Screen					
98										
99										
100	FW-02B-VAS-97-102 (<0.025 ppb) 8/24/2022 11:12	Alluvium Deposits	SW	SW						

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Date Started: 10/23/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B
Date Completed: 11/05/2022	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Dual Rotary	Northing (NAD83): 2100637.96	Project: Final GW Remedy Phase 2A
Driller Name: Josh Saldana	Easting (NAD83): 7614544.74	Location: PG&E Topock, Needles California
Drilling Asst: L.G. / A.A. / D.A.	Borehole Diameter: 22-24 inches	
Logger: Ellen Redner	Static Water Level: See Log for Depths	Project Number: 30126255
Editor: Sean McGrane	Development End Date: 11/19/2022	
Total Depth: 142.06 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
101		Alluvium Deposits	SW	[Pattern]	(95.0 - 112.0') 12" 35-Slot 316L SS Wire Wrap Screen		
102							
103		Alluvium Deposits	SW	[Pattern]	(90.0 - 113.4') Red Flint Sand 0.80-1.20 MM	(90.0 - 113.4') 81.4 bags	(90.0 - 113.4') 97 bags (119%) Note: Filter pack, swabbed the filter pack for approximately 100 minutes prior to installation of the bentonite seal.
104							
105		Alluvium Deposits	SW-SM	[Pattern]	(112.0 - 122.0') 12" SHUR-GRIP SDR17 PVC Casing		
106							
107		Alluvium Deposits	SW	[Pattern]	(115.5 - 116.5') Kwik-Zip Centralizer (113.4 - 120.3') Red Flint Sand 0.20-0.30 MM	(113.4 - 120.3') 24 bags	(113.4 - 120.3') 36 bags (150%) Note: Transition sand, used >20% of the calculated volume due to potential voids that formed during drilling or the finer grained transition entering the well through the upper screen during installation.
108							
109	FW-02B-VAS-107-112 (<0.025 ppb) 8/24/2022 09:15	Alluvium Deposits	SW-SM	[Pattern]			
110							
111		Alluvium Deposits	SM	[Pattern]			
112							
113		Alluvium Deposits	SW	[Pattern]			
114							
115		Alluvium Deposits	SW-SM	[Pattern]			
116							
117	FW-02B-VAS-117-122 (7.8 ppb) 8/30/2022 11:14	Alluvium Deposits	SW-SM	[Pattern]			
118							
119		Alluvium Deposits	SW-SM	[Pattern]			
120							

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Date Started: 10/23/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B
Date Completed: 11/05/2022	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Dual Rotary	Northing (NAD83): 2100637.96	Project: Final GW Remedy Phase 2A
Driller Name: Josh Saldana	Easting (NAD83): 7614544.74	Location: PG&E Topock, Needles California
Drilling Asst: L.G. / A.A. / D.A.	Borehole Diameter: 22-24 inches	
Logger: Ellen Redner	Static Water Level: See Log for Depths	Project Number: 30126255
Editor: Sean McGrane	Development End Date: 11/19/2022	
Total Depth: 142.06 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
121		Alluvium Deposits	SW-SM		(120.3 - 120.9') Pel-Plug Bentonite Pellets 3/8" (TR30)	(120.3 - 120.9') 1.5 buckets	(120.3 - 120.9') 2 buckets (133%) Note: Bentonite seal, used >20% of the calculated volume due to potential voids that formed during drilling.
122		Alluvium Deposits	SM		(112.0 - 122.0') 12" SHUR-GRIP SDR17 PVC Casing		
123		Alluvium Deposits	SM		(122.0 - 132.0') 12" 15-Slot 316L SS Wire Wrap Screen		
124		Alluvium Deposits	SW-SM				
125		Alluvium Deposits	SW-SM				
126		Alluvium Deposits	SM		(120.9 - 133.2') Red Flint Sand 0.35-0.45 MM	(120.9 - 133.2') 43 bags	(120.9 - 133.2') 55 bags (128%) Note: Filter pack, used >20% of the calculated volume due to potential voids forming during drilling or the finer grained lower filter pack entering the well through the upper screen during installation. Swabbed the filter pack for approximately 30 minutes prior to installation of the bentonite seal.
127		Alluvium Deposits	SM				
128		Alluvium Deposits	SW				
129	FW-02B-VAS-127-132 (36 ppb) 8/31/2022 11:00	Alluvium Deposits	SW				
130		Alluvium Deposits	SM				
131		Alluvium Deposits	SM				
132		Alluvium Deposits	SM				Note: Conducted "Dummy Tool" Pre-alignment test to approximately 132.5 ft bgs to confirm there were no obstructions in the well post construction.
133		Weathered Bedrock - Conglomerate	N/A		(132.0 - 137.0') 12" SHUR-GRIP SDR-17 PVC Sump		
134		Weathered Bedrock - Conglomerate	N/A				
135		Weathered Bedrock - Conglomerate	N/A		(134.0 - 135.0') Kwik-Zip Centralizer		
136	FW-02B-VAS-135-137 (Sample results disregarded as water not likely representative of aquifer and is considered not water bearing interval) 9/1/2022 09:22	Competent Bedrock - Conglomerate	N/A		(133.2 - 140.0') Cemex #1/20 (20x40) Lapis Lustre Sand	(133.2 - 140.0') 27.3 bags	(133.2 - 140.0') 29 bags (106%) Note: Backfill sand
137		Competent Bedrock - Conglomerate	N/A				
138		Competent Bedrock - Conglomerate	N/A		(137.0 - 137.95') 12" 316 SS End Cap		
139		Competent Bedrock - Conglomerate	N/A				
140		Competent Bedrock - Conglomerate	N/A				

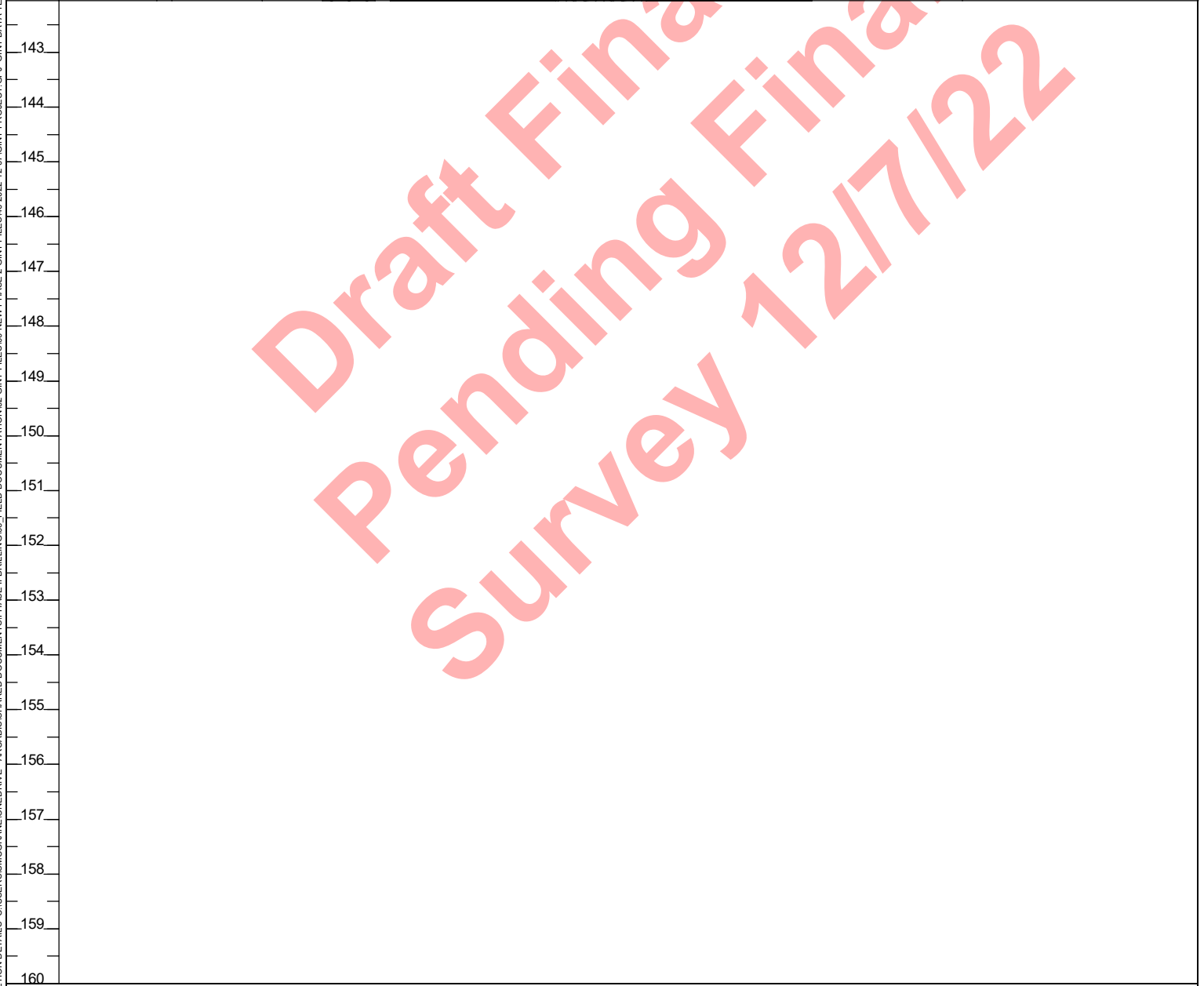
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, SS = Stainless Steel, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue water table marks represent depth to water (ft. bgs.) measured post development.

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Date Started:	10/23/2022	Surface Elevation:	551.67 ft amsl	Well ID: FW-02B		
Date Completed:	11/05/2022	Shallow Well Elevation:	N/A			
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client:	PG&E	
Drilling Method:	Dual Rotary	Northing (NAD83):	2100637.96	Project:		Final GW Remedy Phase 2A
Driller Name:	Josh Saldana	Easting (NAD83):	7614544.74	Location:		PG&E Topock, Needles California
Drilling Asst:	L.G. / A.A. / D.A.	Borehole Diameter:	22-24 inches			
Logger:	Ellen Redner	Static Water Level:	See Log for Depths	Project Number:		30126255
Editor:	Sean McGrane	Development End Date:	11/19/2022			
Total Depth:	142.06 ft bgs	Well Completion:	<input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault			

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume

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 Pending Final -
 Survey 12/7/22



Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, SS = Stainless Steel, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue water table marks represent depth to water (ft. bgs.) measured post development.

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Date Started: 08/20/2022	Surface Elevation: 551.67 ft amsl	Boring No.: FW-02B Pilot
Date Completed: 09/01/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Drill Rig Type: Boart Longyear drill head	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Driller Name: Matt Arnold	Depth to First Water: 102.0 ft bgs	
Drilling Asst: LA / IS / DH	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: 30126255
Logger: J. Anderson / L. Milando	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1				Fluvial Deposits	SW		(0-2 ft) Well graded sand with gravel (SW); light gray (10YR 7/2); very fine to very coarse grained, subangular to subround; trace granules, subangular; trace small to very large pebbles, subangular; poorly sorted; dry; NOTE: sample disturbed from air-knifing activities.	(0.0 - 5.0') Air-knifed for utility clearance sediments not logged.	(0.0 - 5.0') No drilling fluid used
2			(2-8 ft) No Recovery						
3				NR	NR				
4	2								
5				Fluvial Deposits	SW		(8-10.5 ft) Well graded sand with gravel (SW); brown (10YR 5/3); very fine to very coarse grained, subangular to subround; little small to very large pebbles, subangular; trace silt; trace granules, subangular; trace clay; poorly sorted; dry.	(8.0 - 17.0') Soft drilling, core sample lost down hole, core barrel is pushing loose sand into the formation instead of the core barrel.	(8.0 - 17.0') No drilling fluid used
6									
7				NR	NR				
8									
9		No Sieve Samples Collected	No Groundwater Samples Collected	NR	NR		(10.5-17 ft) No Recovery		
10									
11				NR	NR				
12	2.5								
13				Fluvial Deposits	SW		(17-28.5 ft) Well graded sand with gravel (SW); brown (10YR 5/3); very fine to very coarse grained, subangular to subround; little small to very large pebbles, subangular; trace silt; trace granules, subangular; trace clay; poorly sorted; dry. (17.5-19.5 ft) Increase in the percentage of coarser grained sediments.	(17.0 - 22.0') Core barrel snagged on the drill casing and the drill casing advanced approximately 0.5-1 ft. Potential void	(17.0 - 22.0') No drilling fluid used
14									
15				NR	NR				
16									
17				NR	NR				
18	4.5								
19				NR	NR				
20									

Final 10/12/22

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

TOPOCK SOIL BORING LOG \ARCADIS\0365\SHAREPOINT.COM\SSL\DA\WWW\ROOT\TEAMS\PG&E\TOPOCK\CONSTRUCTION\SHARED DOCUMENTS\PHASE II DRILLING\06_FIELD DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\18 2022-10-12\GINT PROJECT\GPJ_GINT DATA TEMPLATE.GDT_10/12/22

Date Started:	08/20/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B Pilot	
Date Completed:	09/01/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	142 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-8 inches	Location:	PG&E Topock, Needles California
Driller Name:	Matt Arnold	Depth to First Water:	102.0 ft bgs		
Drilling Asst:	LA / IS / DH	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	J. Anderson / L. Milando	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21	4.5			Fluvial Deposits	SW		(17-28.5 ft) Well graded sand with gravel (SW); brown (10YR 5/3); very fine to very coarse grained, subangular to subround; little small to very large pebbles, subangular; trace silt; trace granules, subangular; trace clay; poorly sorted; dry.	forming or extremely soft sand.	
22							(24 ft) Increase in the percentage of coarser grained sediment and granules with depth. Lower percentage of silt percentage with depth.		
23	7	No Sieve Samples Collected	No Groundwater Samples Collected	Fluvial Deposits	SW		(28.5-31 ft) Well graded sand with gravel (SW); light gray (10YR 7/2); very fine to very coarse grained, subangular to subround; little small to very large pebbles, subangular to subround; trace granules, subangular; trace silt; dry; pebbles composed of metadorite; granule and pebble size decreases with depth; percentage of sand decreases with depth; friable caliche cementation.		
24									
25	4.5			Alluvium Deposits	SW			(32.0 - 107.0') Rough drilling, potential boulder at approximately 32 ft bgs.	(32.0 - 107.0') No drilling fluid used
26									
27	7.5			Alluvium Deposits	SW-SM		(37-39.5 ft) Well graded sand with silt (SW-SM); light gray (10YR 7/2); very fine to coarse grained, subangular to subround; trace silt; trace small pebbles, subround; trace granules, subangular; dry; strong HCl reaction; friable caliche cementation.		
28									
29									
30									
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38									
39									
40									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

TOPOCK SOIL BORING LOG \ARCADIS\0365\SHAREPOINT.COM\SS\DA\WWW\ROOT\TEAMS\PG&E\TOPOCK\CONSTRUCTION\SHARED_DOCUMENTATION\PHASE II DRILLING\06_FIELD_DOCUMENTATION\02_GINT_FILES\00_NEW_PHASE_2_GINT_FILES\08_2022-10-12\GINT_PROJECT\GPIJ_GINT_DATA_TEMPLATE.GDT_10/1/2022

Date Started: 08/20/2022	Surface Elevation: 551.67 ft amsl	Boring No.: FW-02B Pilot
Date Completed: 09/01/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Drill Rig Type: Boart Longyear drill head	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Driller Name: Matt Arnold	Depth to First Water: 102.0 ft bgs	
Drilling Asst: LA / IS / DH	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: 30126255
Logger: J. Anderson / L. Milando	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41	7.5			Alluvium Deposits	SW		(39.5-46.5 ft) Well graded sand with gravel (SW); light brownish gray (10YR 6/2), and light gray (10YR 7/1); very fine to very coarse grained, subangular to subround; little granules, subangular; trace small pebbles, subangular; trace silt; poorly sorted; dry; strong HCl reaction; strong caliche cementation.		
42									
43									
44									
45									
46	5	No Sieve Samples Collected	No Groundwater Samples Collected	Alluvium Deposits	SW-SM		(46.5-47.5 ft) Well graded sand with silt (SW-SM); light gray (10YR 7/1); fine to very coarse grained, subangular to subround; little silt; trace granules, subangular to subround; trace small pebbles, subangular; poorly sorted; dry; moderate HCl reaction; moderate caliche cementation.		
47									
48									
49									
50									
51	3			Alluvium Deposits	SW		(47.5-49 ft) Well graded sand with silt and gravel (SW-SM); pale orange yellow (10YR 8/2), and light gray (10YR 7/1); fine to very coarse grained, subangular to subround; little small to large pebbles, subangular to subround; little silt; trace granules, subangular to subround; poorly sorted; dry; moderate HCl reaction; moderate caliche cementation.		
52									
53									
54									
55									
56	8			Alluvium Deposits	SW		(49-50.5 ft) Well graded sand with silt and gravel (SW-SM); pale orange yellow (10YR 8/2), and light gray (10YR 7/1); fine to very coarse grained, subangular to subround; little small to large pebbles, subangular to subround; trace silt; trace granules, subangular to subround; trace clay; poorly sorted; dry; moderate HCl reaction; moderate caliche cementation.		
57									
58									
59									
60				Alluvium Deposits	SW-SM		(50.5-57 ft) Well graded sand with gravel (SW); light gray (10YR 7/2); very fine to coarse grained, subangular to subround; little small to medium pebbles, subangular to subround; little granules, subangular to subround; trace silt; trace clay; poorly sorted; dry; moderate HCl reaction; weak caliche cementation.		
				Alluvium Deposits	SW		(57-57.5 ft) Well graded sand with gravel (SW); light gray (10YR 7/2); very fine to coarse grained, subangular to subround; little small to medium pebbles, subangular to subround; little granules, subangular to subround; trace silt; trace clay; poorly sorted; dry; moderate HCl reaction; weak caliche cementation.		

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

TOPOCK SOIL BORING LOG \ARCADIS\0365\SHAREPOINT.COM\SS\DA\WWW\ROOT\TEAMS\PG&E\TOPOCK\CONSTRUCTION\SHARED_DOCUMENTATION\02_GINT FILES\00 NEW PHASE 2 GINT FILES\88 2022-10-12\GINT PROJECT\GPJ_GINT DATA TEMPLATE.GDT_10/12/22

Date Started: 08/20/2022	Surface Elevation: 551.67 ft amsl	Boring No.: FW-02B Pilot
Date Completed: 09/01/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Drill Rig Type: Boart Longyear drill head	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Driller Name: Matt Arnold	Depth to First Water: 102.0 ft bgs	
Drilling Asst: LA / IS / DH	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: 30126255
Logger: J. Anderson / L. Milando	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61	8			Alluvium Deposits	SW-SM		(57.5-62.5 ft) Well graded sand with silt and gravel (SW-SM); brown (10YR 5/3); very fine to coarse grained, subangular to subround; little granules, subangular to subround; little silt; trace small to medium pebbles, subangular to subround; trace clay; poorly sorted; dry; moderate HCl reaction; weak caliche cementation. (60-62.5 ft) Decrease in fine content.		
62				Alluvium Deposits	SW		(62.5-65 ft) Well graded sand with gravel (SW); light brownish gray (10YR 6/2); very fine to coarse grained, subangular; little granules, subangular; little small to large pebbles, subangular; trace silt; trace clay; poorly sorted; dry; moderate HCl reaction; weak caliche cementation.		
63	0				NR		(65-67 ft) No Recovery		
64									
65	7	No Sieve Samples Collected	No Groundwater Samples Collected	Alluvium Deposits	SW		(67-68 ft) Well graded sand with gravel (SW); light brownish gray (10YR 6/2); very fine to coarse grained, subangular; little granules, subangular; little small to large pebbles, subangular; trace silt; trace clay; poorly sorted; dry; moderate HCl reaction; weak caliche cementation.		
66				Alluvium Deposits	SW		(68-71 ft) Well graded sand with gravel (SW); light gray (10YR 7/2); fine to very coarse grained, subangular to subround; little granules, subangular to subround; little small to large pebbles, subangular to subround; trace silt; trace clay; poorly sorted; dry to moist; moderate HCl reaction; weak caliche cementation.		
67	7			Alluvium Deposits	SM		(71-74.5 ft) Silty sand (SM); light gray (10YR 7/2); very fine to very coarse grained, subangular to subround; some silt; trace small to large pebbles, subangular to subround; trace granules, subangular to subround; trace clay; poorly sorted; dry; moderate HCl reaction; weak caliche cementation. (72-74.5 ft) Decrease in silt, granules and pebbles, increase in sand.		
68				Alluvium Deposits	SW		(74.5-77.5 ft) Well graded sand with gravel (SW); yellowish brown (10YR 5/4); fine to very coarse grained, subangular to subround; little granules, subangular to subround; trace small to medium pebbles, subangular to subround; trace silt; trace clay; poorly sorted; dry to moist; moderate HCl reaction; weak caliche cementation.		
69	8						(77 ft) Decrease in small to large pebbles, increase in sand.		
70				Alluvium Deposits	SW-SM		(77.5-83 ft) Well graded sand with silt and gravel (SW-SM); yellowish brown (10YR 5/4); very fine to very coarse grained, subangular to subround; little silt; little small to large pebbles, subangular; trace granules, subangular to subround; trace clay; poorly sorted; dry; moderate HCl reaction; weak caliche cementation.		
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

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Date Started:	08/20/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B Pilot	
Date Completed:	09/01/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	142 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-8 inches	Location:	PG&E Topock, Needles California
Driller Name:	Matt Arnold	Depth to First Water:	102.0 ft bgs		
Drilling Asst:	LA / IS / DH	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	J. Anderson / L. Milando	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid							
81	8	No Sieve Samples Collected	No Groundwater Samples Collected	Alluvium Deposits	SW-SM	[Symbol]	(77.5-83 ft) Well graded sand with silt and gravel (SW-SM); yellowish brown (10YR 5/4); very fine to very coarse grained, subangular to subround; little silt; little small to large pebbles, subangular; trace granules, subangular to subround; trace clay; poorly sorted; dry; moderate HCl reaction; weak caliche cementation.									
82							(83-92.5 ft) Well graded sand (SW); light gray (10YR 7/2); very fine to very coarse grained, subangular to subround; trace granules, subangular to subround; trace small to medium pebbles, subangular to subround; trace silt; poorly sorted; dry; moderate HCl reaction; strong caliche cementation; increase in the percentage of finer grained sand and silt with depth.									
83				Alluvium Deposits	SW	[Symbol]										
84										85	86	87	88	89	90	91
85	3.8	FW-02B-SS-90-92.5 8/25/2022 16:05		Alluvium Deposits	SW	[Symbol]										
86										87	88	89	90	91	92	93
93	3.9	FW-02B-SS-92.5-96 8/25/2022 16:10		Alluvium Deposits	SW-SM	[Symbol]	(92.5-99 ft) Well graded sand with silt and gravel (SW-SM); light gray (10YR 7/2); very fine to very coarse grained, subangular to subround; little granules, angular to subangular; little small to medium pebbles, subangular to subround; little silt; poorly sorted; dry; trace metadiorite pebbles; approximately 25% of the core has moderate caliche cementation.									
94										95	96	97	98	99	100	
96	3.7	FW-02B-SS-96-99 8/25/2022 16:15	FW-02B-VAS-97-102 (<0.025 ppb) 8/24/2022 11:12	Alluvium Deposits	SW	[Symbol]		(97.0 - 102.0') VAS interval had to be resampled due to the Cr (VI) inadvertently not field filtered.	(97.0 - 102.0') No drilling fluid used							
97										98	99	100				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

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Date Started: 08/20/2022	Surface Elevation: 551.67 ft amsl	Boring No.: FW-02B Pilot
Date Completed: 09/01/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Drill Rig Type: Boart Longyear drill head	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Driller Name: Matt Arnold	Depth to First Water: 102.0 ft bgs	
Drilling Asst: LA / IS / DH	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: 30126255
Logger: J. Anderson / L. Milando	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid				
101	3.7	FW-02B-SS-99-104 8/25/2022 16:20		Alluvium Deposits	SW		(99-104 ft) Well graded sand with gravel (SW); light gray (10YR 7/2), some brown (10YR 5/3); very fine to very coarse grained, subangular to subround; little granules, subangular to subround; trace small to medium pebbles, subangular; trace clay; poorly sorted; dry to moist; moderate caliche cementation; sizes of cemented sediment fragments decreased with depth; the percentage of coarse grained sand increases with depth. (102) Increase in the percentage of metadiorite pebbles.						
102													
103	3.5	FW-02B-SS-104-108 8/25/2022 16:25		Alluvium Deposits	SW		(104-108 ft) Well graded sand with gravel (SW); brown (10YR 5/3); very fine to very coarse grained, subangular to subround; little small to large pebbles, subangular to subround; trace granules, subangular to subround; trace silt; trace clay; poorly sorted; moist.						
104													
105													
106	3.6	FW-02B-SS-108-112 8/25/2022 16:30		Alluvium Deposits	SW-SM		(108-112 ft) Well graded sand with silt and gravel (SW-SM); brown (10YR 5/3), some light yellowish brown (10YR 6/4); very fine to very coarse grained, subangular to subround; little silt; trace small to medium pebbles, subangular to subround; trace granules, subangular to subround; trace clay; poorly sorted; moist; majority of the core has moderate caliche cementation.	(107.0 - 112.0') Bottom of borehole collapsed before sample screen was deployed, tripped back in to clear it out and advance the 6-inch casing to 107 feet bgs. VAS interval had to be resampled due to the Cr (VI) inadvertently not field filtered.	(107.0 - 112.0') No drilling fluid used				
107													
108													
109													
110	5	FW-02B-SS-112-115 8/25/2022 16:35		Alluvium Deposits	SM		(112-115 ft) Silty sand (SM); brown (10YR 5/3); very fine to coarse grained, subangular to subround; little silt; trace granules, subangular to subround; trace small to medium pebbles, subangular to subround; trace clay; poorly sorted; moist.	(112.0 - 122.0') Tight drilling, went back down to clear it out and the rig overheated.	(112.0 - 122.0') No drilling fluid used				
111													
112													
113	5	FW-02B-SS-115-119.5 8/25/2022 16:40		Alluvium Deposits	SW		(115-119 ft) Well graded sand (SW); light yellowish brown (10YR 6/4), and brown (10YR 5/3); very fine to coarse grained, subangular to subround; trace granules, subangular to subround; trace silt; trace small to medium pebbles, subangular to subround; trace clay; poorly sorted; moist; moderate caliche cementation; cemented sediments and metadiorite pebbles were medium to large in size.						
114													
115													
116													
117													
118			FW-02B-VAS-117-122 (7.8 ppb) 8/30/2022 11:14	Alluvium Deposits	SW-SM								
119													
120													

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

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Date Started:	08/20/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B Pilot	
Date Completed:	09/01/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	142 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-8 inches	Location:	PG&E Topock, Needles California
Driller Name:	Matt Arnold	Depth to First Water:	102.0 ft bgs		
Drilling Asst:	LA / IS / DH	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	J. Anderson / L. Milando	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
121	5	FW-02B-SS-119.5-122 8/25/2022 16:45		Alluvium Deposits	SW-SM		(119-122 ft) Well graded sand with silt (SW-SM); brown (10YR 5/3); very fine to coarse grained, subangular to subround; little silt; trace clay, trace granules, subround; trace small to medium pebbles, subround; poorly sorted; moist to wet.		
123	6.8	FW-02B-SS-122-127.5 9/1/2022 15:30		Alluvium Deposits	SM		(122-124.5 ft) Silty sand (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6); very fine to coarse grained, subangular to subround; some silt; trace small to medium pebbles, angular to subangular; trace clay; poorly sorted; dry to moist.	(122.0') Drilling with the 6-inch casing getting tight. Drillers retracked approximately 70 feet of drill casing to ream the hole to assist with advancing drill casing.	(122.0') No drilling fluid used
124				Alluvium Deposits	SW-SM		(124.5-126.5 ft) Well graded sand with silt (SW-SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6); very fine to coarse grained, subangular to subround; little silt; trace small to medium pebbles, angular to subangular; trace clay; poorly sorted; dry to moist; blocky structure; moderate HCl reaction.		
125		Alluvium Deposits	SM		(126.5-127.5 ft) Silty sand with gravel (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6); very fine to very coarse grained, subangular to subround; some silt; little small pebbles, subangular to subround; trace granules, subangular to subround; trace clay; poorly sorted; dry to moist; blocky structure; moderate HCl reaction.				
126		Alluvium Deposits	SW		(127.5-131 ft) Well graded sand with gravel (SW); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6); very fine to very coarse grained, subangular to subround; little granules, subangular to subround; trace small to medium pebbles, subangular to subround; trace silt; poorly sorted; dry to moist; blocky structure; moderate HCl reaction.				
127		Alluvium Deposits	SM		(131-132 ft) Silty sand (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6); very fine to very coarse grained, subangular to subround; some silt; trace small pebbles, subangular; trace granules, subangular; trace clay; poorly sorted; dry to moist; blocky structure; moderate HCl reaction.				
128	7.2	FW-02B-SS-127.5-131 9/1/2022 15:35	FW-02B-VAS-127-132 (36 ppb) 8/31/2022 11:00	Alluvium Deposits	SW		(127.5-131 ft) Well graded sand with gravel (SW); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6); very fine to very coarse grained, subangular to subround; little granules, subangular to subround; trace small to medium pebbles, subangular to subround; trace silt; poorly sorted; dry to moist; blocky structure; moderate HCl reaction.	(132.0 - 134.5') Poor recovery	(132.0 - 134.5') No drilling fluid used
129				Alluvium Deposits	SM		(131-132 ft) Silty sand (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6); very fine to very coarse grained, subangular to subround; some silt; trace small pebbles, subangular; trace granules, subangular; trace clay; poorly sorted; dry to moist; blocky structure; moderate HCl reaction.		
130		No Sieve Samples Collected	FW-02B-VAS-135-137 (Sample results disregraded as water not likely representative of aquifer and is considered not water bearing interval) 9/1/2022 09:22	Weathered Bedrock - Conglomerate	N/A		(132-135 ft) Sedimentary Rock - Conglomerate; brown (7.5YR 5/4); fine grained to medium grained; highly weathered; soft, wet.		
131				Competent Bedrock - Conglomerate	N/A		(135-139.5 ft) Sedimentary Rock - Conglomerate; brown (7.5YR 5/4); fine grained to medium grained; moderately weathered; medium hard; friable; wet, moisture in pockets; pulverized by drilling process. (135.5-139.5 ft) Moist to dry.		
132					N/A		(135.0 - 142.0') Rough drilling, drill rig started to overheat. (135.5') The 6-inch diameter casing stick in the formation, had to vibrate to free it and retack to approximately 118 ft bgs.	(135.0 - 142.0') No drilling fluid used (135.5') No drilling fluid used	
133									
134									
135									
136									
137									
138									
139									
140									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

TOPOCK SOIL BORING LOG \\ARCADIS06\5\SHAREPOINT\COM\SS\LD\VA\WWW\ROOT\TEAMS\PG&E\TOPOCK\CONSTRUCTION\SHARED_DOCUMENTS\PHASE II DRILLING\06_FIELD_DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\38 2022-10-12\GINT PROJECT\GPIJ_GINT DATA TEMPLATE.GDT_10/12/22

Date Started: 08/20/2022	Surface Elevation: 551.67 ft amsl	Boring No.: FW-02B Pilot
Date Completed: 09/01/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Drill Rig Type: Boart Longyear drill head	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Driller Name: Matt Arnold	Depth to First Water: 102.0 ft bgs	
Drilling Asst: LA / IS / DH	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: 30126255
Logger: J. Anderson / L. Milano	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
141	7.2	No Sieve Samples Collected		Competent Bedrock - Conglomerate	N/A	XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX	(139.5-142 ft) Sedimentary Rock - Conglomerate; brown (7.5YR 5/4); fine grained to medium grained; slightly weathered; medium hard; friable; dry to moist; moisture in pockets; pulverized by drilling method.		
142							End of Boring at 142 ft bgs.		
143									
144									
145									
146									
147									
148									
149									
150									
151									
152									
153									
154									
155									
156									
157									
158									
159									
160									

Final 10/12/22

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

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Date Started: 09/01/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B Pilot
Date Completed: 09/07/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Driller Name: Matt Arnold	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Drilling Asst: LA / IS / DH	Depth to First Water: 102.0 ft bgs	
Logger: L. Milano / A. Terry	Editor: Sean McGrane	Project Number: 30126255

TOPOCK TEMP ABANDONMENT LOG \ARCADIS\0365.SHAREPOINT.COM\SSLD\WWW\ROOT\TEAMS\PG&E\TOPOCK\CONSTRUCTION\PHASE II DRILLING\06_FIELD DOCUMENTATION\02_GINT FILES\00 NEW PHASE 2_GINT FILES\98 2022-10-12\GINT PROJECT\GJ_GINT DATA TEMPLATE.GDT 10/12/22

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
1		Fluvial Deposits	SW		(0.0 - 0.5') Steel plate		Note: Steel plate used to mark pilot borehole
2					(0.5 - 4.0') Cemex #0/30 (30x50) Lapis Lustre Sand		(0.5 - 4.0') 2.8 bags
3							
4							
5			NR				
6							
7							
8							
9		Fluvial Deposits	SW		(8.0 - 135.5') 6" Diameter Borehole		
10	No Groundwater Samples Collected						
11							
12					(4.0 - 39.0') Cemex #2/12 (12x20) Lapis Lustre Sand	(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand
13			NR				
14							
15							
16							
17							
18		Fluvial Deposits	SW				
19							
20							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Granular backfill material was removed during overdrilling of the pilot borehole.

Date Started: 09/01/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B Pilot
Date Completed: 09/07/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Driller Name: Matt Arnold	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Drilling Asst: LA / IS / DH	Depth to First Water: 102.0 ft bgs	
Logger: L. Milando / A. Terry	Editor: Sean McGrane	Project Number: 30126255

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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
21	No Groundwater Samples Collected	Fluvial Deposits	SW			(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand
22							
23							
24							
25	Fluvial Deposits	SW			(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand	
26							
27	Alluvium Deposits	SW			(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand	
28							
29	Alluvium Deposits	SW-SM			(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand	
30							
31	Alluvium Deposits	SW			(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand	
32							
33	Alluvium Deposits	SW			(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand	
34							
35	Alluvium Deposits	SW			(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand	
36							
37	Alluvium Deposits	SW			(4.0 - 39.0') 15 bags	(4.0 - 39.0') 13.5 bags (90%) Note: Backfill sand	
38							
39	Alluvium Deposits	SW			(39.0 - 131.0') 36.1 bags	(39.0 - 131.0') 42 bags (116%) Note: Backfill sand	
40							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Granular backfill material was removed during overdrilling of the pilot borehole.

Date Started: 09/01/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B Pilot
Date Completed: 09/07/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Driller Name: Matt Arnold	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Drilling Asst: LA / IS / DH	Depth to First Water: 102.0 ft bgs	
Logger: L. Milano / A. Terry	Editor: Sean McGrane	Project Number: 30126255

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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
41	No Groundwater Samples Collected	Alluvium Deposits	SW			(39.0 - 131.0') 36.1 bags	(39.0 - 131.0') 42 bags (116%) Note: Backfill sand
42							
43							
44							
45							
46							
47							
48							
49							
50							
51	No Groundwater Samples Collected	Alluvium Deposits	SW			(39.0 - 131.0') 36.1 bags	(39.0 - 131.0') 42 bags (116%) Note: Backfill sand
52							
53							
54							
55							
56							
57							
58							
59							
60							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Granular backfill material was removed during overdrilling of the pilot borehole.

Date Started: 09/01/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B Pilot
Date Completed: 09/07/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Driller Name: Matt Arnold	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Drilling Asst: LA / IS / DH	Depth to First Water: 102.0 ft bgs	
Logger: L. Milando / A. Terry	Editor: Sean McGrane	Project Number: 30126255

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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
81	No Groundwater Samples Collected	Alluvium Deposits	SW-SM	[Pattern]	(39.0 - 131.0') Cemex #1/20 (20x40) Lapis Lustre Sand	(39.0 - 131.0') 36.1 bags	(39.0 - 131.0') 42 bags (116%) Note: Backfill sand
82							
83							
84							
85							
86							
87							
88							
89							
90							
91	Alluvium Deposits	SW	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
92							
93							
94							
95	Alluvium Deposits	SW-SM	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
96							
97	FW-02B-VAS-97-102 (<0.025 ppb) 8/24/2022 11:12	Alluvium Deposits	SW	[Pattern]	[Pattern]	[Pattern]	[Pattern]
98							
99							
100							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Granular backfill material was removed during overdrilling of the pilot borehole.

Date Started: 09/01/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B Pilot
Date Completed: 09/07/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Driller Name: Matt Arnold	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Drilling Asst: LA / IS / DH	Depth to First Water: 102.0 ft bgs	
Logger: L. Milando / A. Terry	Editor: Sean McGrane	Project Number: 30126255

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Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
101		Alluvium Deposits	SW	[Pattern]	[Pattern]		
102							
103		Alluvium Deposits	SW	[Pattern]	[Pattern]		
104							
105		Alluvium Deposits	SW-SM	[Pattern]	[Pattern]		
106							
107		Alluvium Deposits	SW-SM	[Pattern]	[Pattern]		
108							
109	FW-02B-VAS-107-112 (<0.025 ppb) 8/24/2022 09:15	Alluvium Deposits	SW-SM	[Pattern]	[Pattern]		
110							
111		Alluvium Deposits	SM	[Pattern]	[Pattern]		
112							
113		Alluvium Deposits	SW	[Pattern]	[Pattern]		
114							
115		Alluvium Deposits	SW	[Pattern]	[Pattern]		
116							
117		Alluvium Deposits	SW-SM	[Pattern]	[Pattern]		
118							
119	FW-02B-VAS-117-122 (7.8 ppb) 8/30/2022 11:14	Alluvium Deposits	SW-SM	[Pattern]	[Pattern]		
120							

(39.0 - 131.0')
Cemex #1/20
(20x40) Lapis Lustré Sand

(39.0 - 131.0')
36.1 bags

(39.0 - 131.0') 42 bags (116%)
Note: Backfill sand

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Granular backfill material was removed during overdrilling of the pilot borehole.

Date Started: 09/01/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B Pilot
Date Completed: 09/07/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Driller Name: Matt Arnold	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Drilling Asst: LA / IS / DH	Depth to First Water: 102.0 ft bgs	
Logger: L. Milando / A. Terry	Editor: Sean McGrane	Project Number: 30126255

TOPOCK TEMP ABANDONMENT LOG \\ARCADIS0365.SHAREPOINT.COM@SSL.DA\WWW\ROOT\TEAMS\PG&E\TOPOCK\CONSTRUCTION\PHASE II DRILLING\06_FIELD DOCUMENTATION\02_GINT FILES\08_2022-10-12\GINT PROJECT\GPJ_GINT DATA TEMPLATE.GDT 10/12/22

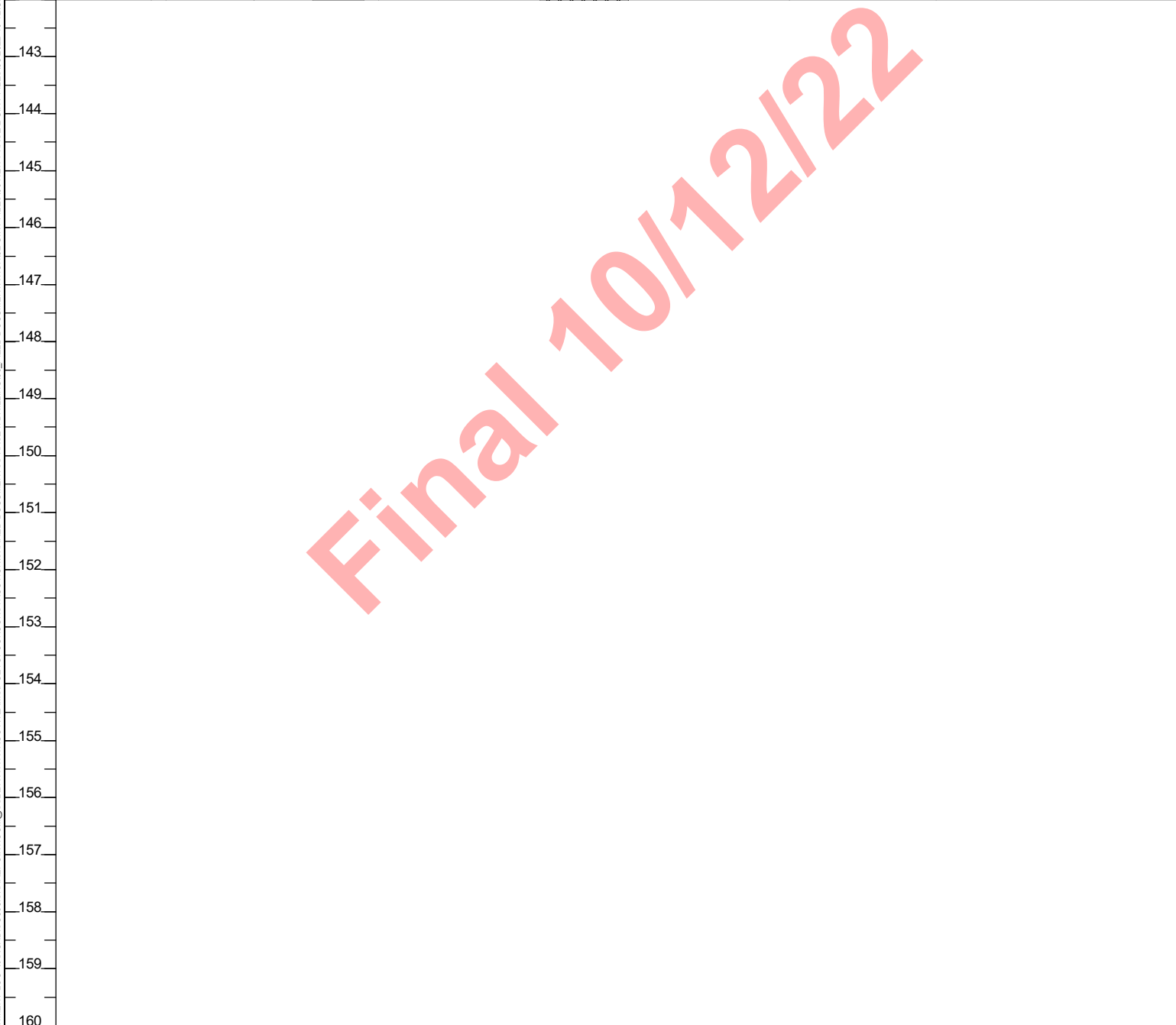
Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
121		Alluvium Deposits	SW-SM				
122		Alluvium Deposits	SM				
123		Alluvium Deposits	SM				
124		Alluvium Deposits	SM				
125		Alluvium Deposits	SW-SM				
126		Alluvium Deposits	SW-SM		(39.0 - 131.0') Cemex #1/20 (20x40) Lapis Lustre Sand	(39.0 - 131.0') 36.1 bags	(39.0 - 131.0') 42 bags (116%) Note: Backfill sand
127		Alluvium Deposits	SM				
128		Alluvium Deposits	SM				
129	FW-02B-VAS-127-132 (36 ppb) 8/31/2022 11:00	Alluvium Deposits	SW				
130		Alluvium Deposits	SW				
131		Alluvium Deposits	SM				
132		Alluvium Deposits	SM				
133		Weathered Bedrock - Conglomerate	N/A				
134		Weathered Bedrock - Conglomerate	N/A				
135		Weathered Bedrock - Conglomerate	N/A				
136	FW-02B-VAS-135-137 (Sample results disregarded as water not likely representative of aquifer and is considered not water bearing interval) 9/1/2022 09:22	Competent Bedrock - Conglomerate	N/A		(131.0 - 142.0') Cemex #8 (4x16) Mesh Lapis Lustre Sand	(131.0 - 142.0') 2.9 bags	(131.0 - 142.0') 3.0 bags (103%) Note: Indicator sand
137		Competent Bedrock - Conglomerate	N/A		(135.5 - 142.0') 4" Diameter Borehole		
138		Competent Bedrock - Conglomerate	N/A				
139		Competent Bedrock - Conglomerate	N/A				
140		Competent Bedrock - Conglomerate	N/A				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Granular backfill material was removed during overdrilling of the pilot borehole.

Date Started: 09/01/2022	Surface Elevation: 551.67 ft amsl	Well ID: FW-02B Pilot
Date Completed: 09/07/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 142 ft bgs	Project: Final GW Remedy Phase 2A
Driller Name: Matt Arnold	Borehole Diameter: 4-8 inches	Location: PG&E Topock, Needles California
Drilling Asst: LA / IS / DH	Depth to First Water: 102.0 ft bgs	
Logger: L. Milando / A. Terry	Editor: Sean McGrane	Project Number: 30126255

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Construction Details	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume	
141		Competent Bedrock - Conglomerate	N/A	XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX	(131.0 - 142.0') Cemex #8 (4x16) Mesh Lapis Lustre Sand		(131.0 - 142.0') 2.9 bags	(131.0 - 142.0') 3.0 bags (103%) Note: Indicator sand
142								

Final 10/12/22



Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, NR = No Recovery, N/A = Not Applicable, GW = groundwater, ppb = parts per billion, Notes: Solid blue and hollow blue water table marks represent depth to water (ft. bgs.) first encountered from logging and depth to water measured during the first VAS interval, respectively. Granular backfill material was removed during overdrilling of the pilot borehole.

TOPOCK_TEMP_ABANDONMENT_LOG_1\ARCADIS\0365.SHAREPOINT.COM\SSLD\WWW\ROOT\TEAMS\PG&E\TOPOCK\CONSTRUCTION\SHARED_DOCUMENTS\PHASE II DRILLING\06_FIELD_DOCUMENTATION\02_GINT_FILES\00_NEW_PHASE 2_GINT_FILES\98_2022-10-12\GINT_PROJECT\GPJ_GINT_DATA_TEMPLATE.GDT_10/12/22

Date Started:	10/12/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B	
Date Completed:	10/22/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	142.1 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Foremost DR 24HD	Conductor Casing Diameter:	24 inches	Location:	PG&E Topock, Needles
Driller Name:	Josh Saldana	Drill Casing Diameter:	22 inches	California	
Drilling Asst:	L.G. / A.A. / D.A.	Drill Bit:	23" & 20" Tricone	Project Number:	30126255
Tool-Pusher:	Arnold Lamon	Depth to First Water:	92.0 ft bgs		
Rig Geologist:	Ellen Redner	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid	
1	(0.0 - 19.6) 1.28 mins/ft	SW		(0-2 ft) Well graded sand with gravel (SW); light gray (10YR 7/2).	(0.0 - 0.5') Confirmed drill casing was lined up over pilot borehole. (0.5 - 19.6') Normal drilling	(0.5 - 19.6') 200 gallons of water used; 200 gallons of water recovered; 0 gallons of water lost	
2				(2-8 ft) No Recovery	(2.0') Observed trace amounts of Cemex #0/30 (30x50) Lapis Lustre Sand in drill cuttings.		
3		NR			(7.0') Observed trace amounts of Cemex #2/12 (12x30) Lapis Lustre Sand in drill cuttings.		
4							
5							
6							
7							
8							
9			SW		(8-10.5 ft) Well graded sand with gravel (SW); brown (10YR 5/3).		
10							
11					(10.5-17 ft) No Recovery		
12							
13							
14			NR				
15							
16							
17							
18			SW		(17-28.5 ft) Well graded sand with gravel (SW); brown (10YR 5/3).		(15.0') Observed trace amounts of Cemex #2/12 (12x30) Lapis Lustre Sand in drill cuttings.
19							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, Notes: Solid blue water table mark represents depth to water (ft. bgs.) depth to water measured during collection of the first VAS interval in the pilot borehole.

TOPOCK\IRZ\DRILLING LOG - ARCADIS\SHARED DOCUMENTS\PHASE II\DRILLING\06 - FIELD DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\46 2022-12-07\GINT PROJECT.GPJ - GINT DATA TEMPLATE.GDT - 12/7/22

Date Started:	10/12/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B	
Date Completed:	10/22/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	142.1 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Foremost DR 24HD	Conductor Casing Diameter:	24 inches	Location:	PG&E Topock, Needles California
Driller Name:	Josh Saldana	Drill Casing Diameter:	22 inches	Project Number:	30126255
Drilling Asst:	L.G. / A.A. / D.A.	Drill Bit:	23" & 20" Tricone		
Tool-Pusher:	Arnold Lamon	Depth to First Water:	92.0 ft bgs		
Rig Geologist:	Ellen Redner	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
20	(0.0 - 19.6) 1.28 mins/ft	SW		(17-28.5 ft) Well graded sand with gravel (SW); brown (10YR 5/3). (17.5-19.5 ft) Increase in the percentage of coarser grained sediments.	(19.6 - 39.6') Normal drilling 19-31' bgs, rough drilling 31-39' bgs approximately.	(19.6 - 39.6') 450 gallons of water used; 450 gallons of water recovered; 0 gallons of water lost
21				(24 ft) Increase in the percentage of coarser grained sediment and granules with depth. Lower percentage of silt percentage with depth.		
22						
23						
24						
25						
26						
27						
28						
29	(19.6 - 39.6) 2.00 mins/ft	SW		(28.5-31 ft) Well graded sand with gravel (SW); light gray (10YR 7/2).	(25.0') Observed trace amounts of Cemex #2/12 (12x30) Lapis Lustre Sand in drill cuttings.	
30						
31						
32						
33						
34						
35						
36						
37						
38		SW-SM		(37-39.5 ft) Well graded sand with silt (SW-SM); light gray (10YR 7/2).	(35.0') Observed trace amounts of Cemex #2/12 (12x30) Lapis Lustre Sand in drill cuttings.	

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Date Started:	10/12/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B	
Date Completed:	10/22/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	142.1 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Foremost DR 24HD	Conductor Casing Diameter:	24 inches	Location:	PG&E Topock, Needles California
Driller Name:	Josh Saldana	Drill Casing Diameter:	22 inches	Project Number:	30126255
Drilling Asst:	L.G. / A.A. / D.A.	Drill Bit:	23" & 20" Tricone		
Tool-Pusher:	Arnold Lamon	Depth to First Water:	92.0 ft bgs		
Rig Geologist:	Ellen Redner	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid		
39	(19.6 - 39.6) 2.00 mins/ft	SW-SM		(37-39.5 ft) Well graded sand with silt (SW-SM); light gray (10YR 7/2).				
40	(39.6 - 59.6) 2.95 mins/ft	SW		(39.5-46.5 ft) Well graded sand with gravel (SW); light brownish gray (10YR 6/2), and light gray (10YR 7/1).	(39.6 - 59.6') Hard drilling 39-53', normal drilling 53-59' bgs approximately.	(39.6 - 59.6') 750 gallons of water used; 600 gallons of water recovered; 150 gallons of water lost		
41								
42								
43								
44								
45					(45.0') Observed trace amounts of Cemex #1/20 (20x40) Lapis Lustre Sand in drill cuttings.			
46								
47		SW-SM		(46.5-47.5 ft) Well graded sand with silt (SW-SM); light gray (10YR 7/1).				
48		SW-SM		(47.5-49 ft) Well graded sand with silt and gravel (SW-SM); pale orange yellow (10YR 8/2), and light gray (10YR 7/1).				
49		SW-SM		(49-50.5 ft) Well graded sand with silt and gravel (SW-SM); pale orange yellow (10YR 8/2), and light gray (10YR 7/1).				
50		SW-SM		(49-50.5 ft) Decrease in silt to approximately 1% silt, and increase the amount moderate caliche cementation.				
51		SW		(50.5-57 ft) Well graded sand with gravel (SW); light gray (10YR 7/2).				
52								
53								
54								
55								
56							(55.0') Observed trace amounts of Cemex #1/20 (20x40) Lapis Lustre Sand in drill cuttings.	
57								

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TOPOCK (RZ) DRILLING LOG C:\USERS\SMCGRANEON\DRIVE - ARCADIS\SHARED DOCUMENTS\PHASE II\DRILLING\06 - FIELD DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\46 2022-12-07\GINT PROJECT.GPJ - GINT DATA TEMPLATE.GDT - 12/7/22

Date Started:	10/12/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B	
Date Completed:	10/22/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	142.1 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Foremost DR 24HD	Conductor Casing Diameter:	24 inches	Location:	PG&E Topock, Needles California
Driller Name:	Josh Saldana	Drill Casing Diameter:	22 inches	Project Number:	30126255
Drilling Asst:	L.G. / A.A. / D.A.	Drill Bit:	23" & 20" Tricone		
Tool-Pusher:	Arnold Lamon	Depth to First Water:	92.0 ft bgs		
Rig Geologist:	Ellen Redner	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid	
58	(39.6 - 59.6) 2.95 mins/ft	SW	(57-57.5 ft) Well graded sand with gravel (SW); light gray (10YR 7/2).				
59			(57.5-62.5 ft) Well graded sand with silt and gravel (SW-SM); brown (10YR 5/3).				
60	(59.6 - 79.1) 5.38 mins/ft	SW-SM	(60-62.5 ft) Decrease in fine content.		(59.6 - 79.1') Normal drilling, driller states that it has not been hard drilling but appears to be drilling a little slower usual.	(59.6 - 79.1') 1200 gallons of water used; 1100 gallons of water recovered; 100 gallons of water lost	
61					(59.6 - 60.7') The 24-inch diameter casing was advanced by pushing the casing without advancing drill string and the cuttings below 59.6 ft were removed by drilling with the 22-inch diameter drill casing.		
62							
63			SW	(62.5-65 ft) Well graded sand with gravel (SW); light brownish gray (10YR 6/2).			
64							
65				(65-67 ft) No Recovery		(65.0') Observed trace amounts of Cemex #1/20 (20x40) Lapis Lustre Sand in drill cuttings.	
66		NR					
67		SW	(67-68 ft) Well graded sand with gravel (SW); light brownish gray (10YR 6/2).				
68							
69		SW	(68-71 ft) Well graded sand with gravel (SW); light gray (10YR 7/2).				
70							
71							
72		SM	(71-74.5 ft) Silty sand (SM); light gray (10YR 7/2).				
73			(72-74.5 ft) Decrease in silt, granules and pebbles, increase in sand.				
74							
75		SW	(74.5-77.5 ft) Well graded sand with gravel (SW); yellowish brown (10YR 5/4).		(75.0') Observed trace amounts of Cemex #1/20 (20x40) Lapis Lustre Sand in drill cuttings.		
76							

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TOPOCK\IRZ\DRILLING LOG - ARCADIS\SHARE DOCUMENTS\PHASE II\DRILLING\06 FIELD DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\46 2022-12-07\GINT PROJECT.GPJ - GINT DATA TEMPLATE.GDT - 12/7/22

Date Started:	10/12/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B	
Date Completed:	10/22/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	142.1 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Foremost DR 24HD	Conductor Casing Diameter:	24 inches	Location:	PG&E Topock, Needles California
Driller Name:	Josh Saldana	Drill Casing Diameter:	22 inches	Project Number:	30126255
Drilling Asst:	L.G. / A.A. / D.A.	Drill Bit:	23" & 20" Tricone		
Tool-Pusher:	Arnold Lamon	Depth to First Water:	92.0 ft bgs		
Rig Geologist:	Ellen Redner	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
77	(59.6 - 79.1) 5.38 mins/ft	SW		(74.5-77.5 ft) Well graded sand with gravel (SW); yellowish brown (10YR 5/4).		
78				(77 ft) Decrease in small to large pebbles, increase in sand.		
79	(79.1 - 99.1) 4.35 mins/ft	SW-SM		(77.5-83 ft) Well graded sand with silt and gravel (SW-SM); yellowish brown (10YR 5/4).	(79.1 - 99.1') Normal drilling	(79.1 - 99.1') 1500 gallons of water used; 1800 gallons of water recovered; 300 gallons of water gained
80						
81						
82						
83				(83-92.5 ft) Well graded sand (SW); light gray (10YR 7/2).		
84						
85					(85.0') Observed trace amounts of Cemex #1/20 (20x40) Lapis Lustre Sand in drill cuttings.	
86						
87						
88						
89						
90						
91						
92						
93				(92.5-99 ft) Well graded sand with silt and gravel (SW-SM); light gray (10YR 7/2).		
94						
95						

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TOPOCK\IRZ\DRILLING LOG - ARCADIS\MCGRANE\ONE\DRIVE - ARCADIS\SHARED DOCUMENTS\PHASE II\DRILLING\06 - FIELD DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\46 2022-12-07\GINT PROJECT.GPJ - GINT DATA TEMPLATE.GDT - 12/7/22

Date Started: 10/12/2022	Surface Elevation: 551.67 ft amsl	Boring No.: FW-02B
Date Completed: 10/22/2022	Northing (NAD83): 2100637.96	
Drilling Co.: Cascade	Easting (NAD83): 7614544.74	Client: PG&E
Drilling Method: Dual Rotary	Total Depth: 142.1 ft bgs	Project: Final GW Remedy Phase 2A
Drill Rig Type: Foremost DR 24HD	Conductor Casing Diameter: 24 inches	Location: PG&E Topock, Needles
Driller Name: Josh Saldana	Drill Casing Diameter: 22 inches	California
Drilling Asst: L.G. / A.A. / D.A.	Drill Bit: 23" & 20" Tricone	Project Number: 30126255
Tool-Pusher: Arnold Lamon	Depth to First Water: 92.0 ft bgs	
Rig Geologist: Ellen Redner	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Description <small>(See Pilot boring log for full geologic descriptions)</small>	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
96	(79.1 - 99.1) 4.35 mins/ft	SW-SM		(92.5-99 ft) Well graded sand with silt and gravel (SW-SM); light gray (10YR 7/2).	(95.0') Observed trace amounts of Cemex #1/20 (20x40) Lapis Lustre Sand in drill cuttings.	
97						
98						
99	(99.1 - 119.1) 4.45 mins/ft	SW		(99-104 ft) Well graded sand with gravel (SW); light gray (10YR 7/2), some brown (10YR 5/3).	(99.1 - 119.1') Normal drilling approximately 99-111' bgs, soft drilling approximately 111-113' bgs, normal drilling approximately 113-119' bgs.	(99.1 - 119.1') 1300 gallons of water used; 1300 gallons of water recovered; 0 gallons of water lost
100						
101						
102						
103						
104						
105	SW		(104-108 ft) Well graded sand with gravel (SW); brown (10YR 5/3).	(105.0') Observed trace amounts of Cemex #1/20 (20x40) Lapis Lustre Sand in drill cuttings.		
106						
107	SW-SM		(108-112 ft) Well graded sand with silt and gravel (SW-SM); brown (10YR 5/3), some light yellowish brown (10YR 6/4).			
108						
109	SM		(112-115 ft) Silty sand (SM); brown (10YR 5/3).			
110						
111						
112						
113						
114						

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, Notes: Solid blue water table mark represents depth to water (ft. bgs.) depth to water measured during collection of the first VAS interval in the pilot borehole.

TOPOCK IRZ DRILLING LOG C:\USERS\SMC\GRANE\DRIVE - ARCADIS\SHARED DOCUMENTS\PHASE II DRILLING\06 FIELD DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\46 2022-12-07\GINT PROJECT.GPJ GINT DATA TEMPLATE.GDT 12/7/22

Date Started:	10/12/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B	
Date Completed:	10/22/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	142.1 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Foremost DR 24HD	Conductor Casing Diameter:	24 inches	Location:	PG&E Topock, Needles California
Driller Name:	Josh Saldana	Drill Casing Diameter:	22 inches	Project Number:	30126255
Drilling Asst:	L.G. / A.A. / D.A.	Drill Bit:	23" & 20" Tricone		
Tool-Pusher:	Arnold Lamon	Depth to First Water:	92.0 ft bgs		
Rig Geologist:	Ellen Redner	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
115	(99.1 - 119.1) 4.45 mins/ft	SM		(112-115 ft) Silty sand (SM); brown (10YR 5/3).	(115.0') Observed trace amounts of Cemex #1/20 (20x40) Lapis Lustre Sand in drill cuttings.	
116		SW		(115-119 ft) Well graded sand (SW); light yellowish brown (10YR 6/4), and brown (10YR 5/3).		
117	(119.1 - 130.0) 6.61 mins/ft	SW-SM		(119-122 ft) Well graded sand with silt (SW-SM); brown (10YR 5/3).	(119.1 - 130.0') Normal drilling	(119.1 - 130.0') 900 gallons of water used; 1200 gallons of water recovered; 300 gallons of water gained
118		SW-SM		(122-124.5 ft) Silty sand (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6).		
119		SM		(124.5-126.5 ft) Well graded sand with silt (SW-SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6).		
120		SM		(126.5-127.5 ft) Silty sand with gravel (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6).		
121		SW		(127.5-131 ft) Well graded sand with gravel (SW); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6).		
122		SM		(131-132 ft) Silty sand (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6).		
123	(130.0 - 140.0) 5.40 mins/ft	N/A		(132-135 ft) Sedimentary Rock - Conglomerate; brown (7.5YR 5/4).	(130.0 - 140.0') Normal drilling	(130.0 - 140.0') 1000 gallons of water used; 1000 gallons of water recovered; 0 gallons of water lost
124		SM		(131-132 ft) Silty sand (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6).		
125		SM		(131-132 ft) Silty sand (SM); dark grayish brown (2.5Y 4/2), and reddish yellow (7.5YR 7/6).		
126						
127						
128						
129						
130						
131						
132						
133						

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, Notes: Solid blue water table mark represents depth to water (ft. bgs.) depth to water measured during collection of the first VAS interval in the pilot borehole.

TOPOCK\IRZ\DRILLING LOG - ARCADIS\SHARE DOCUMENTS\PHASE II\DRILLING\06 - FIELD DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\46 2022-12-07\GINT PROJECT.GPJ - GINT DATA TEMPLATE.GDT - 12/7/22

Date Started:	10/12/2022	Surface Elevation:	551.67 ft amsl	Boring No.: FW-02B	
Date Completed:	10/22/2022	Northing (NAD83):	2100637.96		
Drilling Co.:	Cascade	Easting (NAD83):	7614544.74	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	142.1 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Foremost DR 24HD	Conductor Casing Diameter:	24 inches	Location:	PG&E Topock, Needles California
Driller Name:	Josh Saldana	Drill Casing Diameter:	22 inches	Project Number:	30126255
Drilling Asst:	L.G. / A.A. / D.A.	Drill Bit:	23" & 20" Tricone		
Tool-Pusher:	Arnold Lamon	Depth to First Water:	92.0 ft bgs		
Rig Geologist:	Ellen Redner	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
134	(130.0 - 140.0) 5.40 mins/ft	N/A	XXXXX	(132-135 ft) Sedimentary Rock - Conglomerate; brown (7.5YR 5/4).		
135			XXXXX			
136		N/A	XXXXX	(135-139.5 ft) Sedimentary Rock - Conglomerate; brown (7.5YR 5/4). (135.5-139.5 ft) Moist to dry.		
137			XXXXX			
138			XXXXX			
139			XXXXX			
140			XXXXX			
141			XXXXX			
142			XXXXX			
143			N/A	N/A		
144	XXXXX					
145	XXXXX					
146	XXXXX					
147	XXXXX					
148						
149						
150						
151						
152						

End of Boring at 142.06 ft bgs.

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TOPOCK\IRZ\DRILLING LOG - ARCADIS\MCGRAWHILL\DRILLING\06 FIELD DOCUMENTATION\02 GINT FILES\00 NEW PHASE 2 GINT FILES\46 2022-12-07\GINT PROJECT.GPJ GINT DATA TEMPLATE.GDT 12/7/22