TOPOCK BOREHOLE DECOMMISSIONING AND ACCEPTANCE REPORT - REMEDIATION WELLS

Borehole Location Name: TWB-02 (Note: Documentation referencing TWB-2 is in reference to TWB-02.)

Screen Zone (feet below ground surface [bgs]): Borehole decommissioned. No well installed

Dates Pilot Borehole Drilling: 3/22/2022 – 3/24/2022

Dates Pilot Borehole Decommissioning: 3/29/2022 – 3/31/2022

Dates Well Head Completion: NA

Dates of Development: NA

Well Testing Conducted	Required (Y/N)	Dates	Comments*
Alignment Test	N	--	--
Specific Capacity Test	N	--	--
Injectivity Test	N	--	--
Plumbness Test (Gyroscope)	N	--	--
Spinner Log	N	--	--
Downhole Video	N	--	--

*Borehole decommissioned. No testing required.

Acceptance Criteria

☒ **Meets Design Criteria for Construction** – The borehole did not meet the design criteria for the construction of the extraction well.

- Comments: The alluvial aquifer targeted for the extraction zone was not present at this location. Bedrock was encountered at a higher elevation (shallower) than observed at other nearby monitoring wells. The alluvial aquifer was also thinner than expected at TWB-01, which is an extraction well installed east of the abandoned TWB-02 borehole.
- The collection of a vertical aquifer sample was attempted from 85 to 90 feet bgs. The water quality parameters suggested that the water purged from the interval was drilling water and not representative of the aquifer. A water sample was not collected.
- A vertical aquifer sample was collected from 97 to 102 feet bgs. The formation for this interval was lower yielding and the analytical results were below detectable limits for Cr6 and the sampled interval was low yielding.
- The lack of an alluvial aquifer and the low yielding bedrock aquifer suggested that an extraction well installed at this location would not meet the design criteria and the borehole was permanently decommissioned (see Pilot Boring Decommissioning Log).

☐ **Meets Design Criteria for Design Rate**

Goal from 100% Design:	NA
Tested Rates (gallons per minute [gpm]):	NA
Specific Injectivity	NA
Comments	Borehole decommissioned

☐ **Well Functions as Designed**

Comments: Not applicable. Borehole decommissioned.

☐ **Meets Design Criteria for Plumbness and Equipment Install** –

Comments: Not applicable. Borehole decommissioned.

☒ **Meets Design Criteria for Turbidity (Turbidity less than 50 NTU)**

Comments: Not applicable. Borehole decommissioned.

Final Turbidity for Vertical Aquifer Sample

Screen Zone	Turbidity (NTUs)
Not applicable. Borehole decommissioned.	>1000

☒ **Other Water Quality Parameters**

Water Quality Parameters for Vertical Aquifer Sample

Screen Depths	Temp (C)	pH	ORP (mV)	Cond (m*S*/cm)	DO
97 to 102	26.8	9.11	-232.4	7.897	1.85

ATTACHMENTS

- Pilot Boring Log
- Pilot Boring Decommissioning Log
- Photo Logs

NOTE: Field documentation for all phases of pilot boring drilling and decommissioning are included in the Daily Well Construction Reports. The Daily Well Construction Reports for the drilling program during Phase 2a are compiled and organized by date in the Appendix A - Daily Well Construction Report Catalog. The DoR Daily Well Construction Quality Control Reports for the drilling program during Phase 2a are compiled and organized by date in the Appendix B - DoR Daily Well Construction Quality Control Reports Catalog. Analytical reports are compiled and organized by well in Appendix C – Analytical Reports The technical scopes were performed by or under the direct supervision of Designer of Record (DoR) Professional Geologists (see attached Certification Statement).

ACCEPTANCE APPROVAL

DoR Approver Name: Greg Foote

Approval Signature/Date:  DATE 1/31/23

Attachment 1

Boring Log

Boring Log

ARCADIS

Sheet: 1 of 6

Boring No.: TWB-02 Pilot

Date Started:	03/20/2022	Surface Elevation:	537.23 ft amsl	Client:	PG&E
Date Completed:	03/29/2022	Northing (NAD83):	2100953.17	Project:	Final GW Remedy Phase 2A
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Location:	PG&E Topock, Needles California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-7 inches		
Driller Name:	Matt Arnold	Depth to First Water:	93.2 ft bgs		
Drilling Asst:	D Hoeppner / R West	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	S McGrane / G Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1–5		No Sieve Samples Collected	No Groundwater Samples Collected	Alluvium Deposits	SM		(0-19.5 ft) Silty sand with gravel (SM); brown (7.5YR 5/4); very fine to very coarse grained, angular to subround; little granules, angular to subangular; little small to large pebbles, angular to subangular; little silt; trace clay; dry; NOTE: Pebbles component composed of mixed lithology; mostly metadiorite.	(0.0 - 5.0') Air-knifed for utility clearance on 3/20/22. Samples collected for logging at approximately 1 ft., 3 ft., and 5 ft. bgs.	(0.0 - 5.0') No drilling fluid used
5–8	2								
8–17	7							(8.0 - 17.0') Smooth drilling	(8.0 - 17.0') No drilling fluid used
17–20	7			Alluvium	SM				

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 water table marks represent depth to water (ft. bgs.) measured during the first VAS interval, depth to water could not be determined from soil cores. Apparent partial recoveries can be the result of potential compaction of sediments in the core bag.

Boring Log

ARCADIS

Boring No.: TWB-02 Pilot

Date Started:	03/20/2022	Surface Elevation:	537.23 ft amsl	Client:	PG&E
Date Completed:	03/29/2022	Northing (NAD83):	2100953.17	Project:	Final GW Remedy Phase 2A
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Location:	PG&E Topock, Needles California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-7 inches		
Driller Name:	Matt Arnold	Depth to First Water:	93.2 ft bgs		
Drilling Asst:	D Hoeppner / R West	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	S McGrane / G Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21				Deposits			(19.5-27 ft) Silty sand with gravel (SM); brown (7.5YR 5/4); very fine to very coarse grained, angular to subangular; little small to large pebbles, angular to subangular; little granules, angular to subangular; trace small cobbles, angular; little silt; trace clay; dry; NOTE: Pebbles component composed of mixed lithology.		
22									
23	7			Alluvium Deposits	SM			(23.0 - 24.0') Rough drilling	(23.0 - 24.0') No drilling fluid used
24									
25									
26								(26.0 - 27.0') Rough drilling	(26.0 - 27.0') No drilling fluid used
27									
28				Alluvium Deposits	SM		(27-29 ft) Silty sand (SM); brown (7.5YR 5/4); very fine to very coarse grained, angular to subangular; little silt; trace granules, angular to subangular; trace small to medium pebbles, angular to subangular; trace clay; dry.	(27.0 - 32.0') Rough drilling drill rod broke.	(27.0 - 32.0') No drilling fluid used
29									
30	3.5	No Sieve Samples Collected	No Groundwater Samples Collected				(29-45 ft) Silty sand with gravel (SM); brown (7.5YR 5/4); very fine to very coarse grained, angular to subangular; little small to large pebbles, angular to subangular; little granules, angular to subangular; trace small cobbles, angular; little silt; trace clay; dry; NOTE: Gravel component composed of mixed lithology.	(29.0 - 32.0') Hard drilling	(29.0 - 32.0') No drilling fluid used
31									
32								(32.0 - 37.0') Rough drilling	(32.0 - 37.0') No drilling fluid used
33									
34	4			Alluvium Deposits	SM				
35									
36									
37								(37.0 - 47.0') Rough drilling	(37.0 - 47.0') No drilling fluid used
38									
39	7.9								
40									

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Boring Log

ARCADIS

Boring No.: TWB-02 Pilot

Date Started:	03/20/2022	Surface Elevation:	537.23 ft amsl	Client:	PG&E
Date Completed:	03/29/2022	Northing (NAD83):	2100953.17	Project:	Final GW Remedy Phase 2A
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Location:	PG&E Topock, Needles California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-7 inches		
Driller Name:	Matt Arnold	Depth to First Water:	93.2 ft bgs		
Drilling Asst:	D Hoeppner / R West	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	S McGrane / G Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41–47	7.9	No Sieve Samples Collected	No Groundwater Samples Collected	Alluvium Deposits	SM		(29-45 ft) Silty sand with gravel (SM); brown (7.5YR 5/4); very fine to very coarse grained, angular to subangular; little small to large pebbles, angular to subangular; little granules, angular to subangular; trace small cobbles, angular; little silt; trace clay; dry; NOTE: Gravel component composed of mixed lithology.		
47–54	5.4			Alluvium Deposits	SM		(45-64 ft) Silty sand with gravel (SM); brown (7.5YR 5/4) little greenish gray (5GY 6/1); very fine to very coarse grained, angular to subangular; little small to large pebbles, angular to subangular; little granules, angular to subangular; trace small cobbles, angular; little silt; trace clay; weak cementation; dry; NOTE: Gravel component composed of mixed lithology. (52.2-52.5 ft) Pulverized metadiorite fragments.	(47.0 - 54.0') Rough drilling (54.0') Core barrel plugged up. (54.1 - 64.0') Rough drilling	(47.0 - 54.0') No drilling fluid used (54.0') No drilling fluid used (54.1 - 64.0') No drilling fluid used
54–64	8								

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ARCADIS

Boring No.: TWB-02 Pilot

Date Started:	03/20/2022	Surface Elevation:	537.23 ft amsl		
Date Completed:	03/29/2022	Northing (NAD83):	2100953.17		
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-7 inches	Location:	PG&E Topock, Needles California
Driller Name:	Matt Arnold	Depth to First Water:	93.2 ft bgs		
Drilling Asst:	D Hoeppner / R West	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	S McGrane / G Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61									
62	8			Alluvium Deposits	SM		(45-64 ft) Silty sand with gravel (SM); brown (7.5YR 5/4) little greenish gray (5GY 6/1); very fine to very coarse grained, angular to subangular; little small to large pebbles, angular to subangular; little granules, angular to subangular; trace small cobbles, angular; little silt; trace clay; weak cementation; dry; NOTE: Gravel component composed of mixed lithology.		
63									
64									
65	4			Alluvium Deposits	SM		(64-65 ft) Silty sand with gravel (SM); light reddish brown (5YR 6/4); very fine to very coarse grained, angular to subangular; little granules, angular to subangular; little small to medium pebbles, angular to subangular; little silt; trace clay; dry.	(64.0 - 67.0') Rough drilling, 1 ft. of slough was included in the core bag sample.	(64.0 - 67.0') No drilling fluid used
66							(65-69 ft) Silty sand with gravel (SM); light brown (7.5YR 6/4); very fine to very coarse grained, angular to subangular; little granules, angular to subangular; little small to medium pebbles, angular to subangular; little silt; trace clay; dry.		
67				Alluvium Deposits	SM				
68								(67.0 - 77.0') Rough drilling	(67.0 - 77.0') No drilling fluid used
69									
70		No Sieve Samples Collected	No Groundwater Samples Collected	Alluvium Deposits	SM		(69-69.5 ft) Silty sand with gravel (SM); very dark gray (7.5YR 3/1); very fine to very coarse grained, angular to subangular; little granules, angular to subangular; little small to medium pebbles, angular to subangular; little silt; trace clay; dry.		
71							(69.5-74.5 ft) Silty sand with gravel (SM); light brown (7.5YR 6/4); very fine to very coarse grained, angular to subangular; little granules, angular to subangular; little small to medium pebbles, angular to subangular; little silt; trace clay; dry.		
72	7								
73									
74									
75				Weathered Bedrock - Conglomerate	N/A		(74.5-76.25 ft) Sedimentary Rock; light reddish brown (2.5YR 6/4); fine grained to coarse grained, angular; highly weathered; massive; rock clasts within matrix composed of mixed lithology; friable; dry; NOTE: Rock pulverized into mostly powder by the sonic drilling methodology.		
76									
77				Competent Bedrock - Conglomerate	N/A		(76.25-102 ft) Sedimentary Rock; light reddish brown (2.5YR 6/4); fine grained to coarse grained, angular; slightly weathered; hard; massive; rock clasts within matrix composed of mixed lithology; some rock fragments 1.5 to 3 inches in length; friable; dry . NOTE: Rock pulverized into mostly powder by the sonic drilling methodology.	(77.0 - 87.0') Very hard drilling, core barrel locked up in hole, had to flush casing over it to free the barrel.	(77.0 - 87.0') 280 gallons of water used; 250 gallons of water recovered; 30 gallons of water lost
78	7								
79									
80									

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Boring Log

ARCADIS

Boring No.: TWB-02 Pilot

Date Started:	03/20/2022	Surface Elevation:	537.23 ft amsl	Client:	PG&E
Date Completed:	03/29/2022	Northing (NAD83):	2100953.17	Project:	Final GW Remedy Phase 2A
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Location:	PG&E Topock, Needles California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-7 inches		
Driller Name:	Matt Arnold	Depth to First Water:	93.2 ft bgs		
Drilling Asst:	D Hoeppner / R West	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	S McGrane / G Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81							(76.25-102 ft) Sedimentary Rock; light reddish brown (2.5YR 6/4); fine grained to coarse grained, angular; slightly weathered; hard; massive; rock clasts within matrix composed of mixed lithology; some rock fragments 1.5 to 3 inches in length; friable; dry . NOTE: Rock pulverized into mostly powder by the sonic drilling methodology.		
82									
83	7		No Groundwater Samples Collected						
84									
85									
86									
87								(87.0 - 92.0') Rough drilling	(87.0 - 92.0') No drilling fluid used
88			No Sample (85-90 water was not representative of aquifer) 3/24/2022						
89	4	No Sieve Samples Collected		Competent Bedrock - Conglomerate	N/A				
90									
91									
92								(92.0 - 97.0') Rough drilling	(92.0 - 97.0') No drilling fluid used
93									
94	3.5								
95									
96									
97									
98	3.9		TWB-2-VAS-97-102 (<0.025 ppb) 3/29/2022 10:01						
99									
100									

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ARCADIS

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Date Started:	03/20/2022	Surface Elevation:	537.23 ft amsl		
Date Completed:	03/29/2022	Northing (NAD83):	2100953.17		
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 2A
Drill Rig Type:	Boart Longyear drill head	Borehole Diameter:	4-7 inches	Location:	PG&E Topock, Needles California
Driller Name:	Matt Arnold	Depth to First Water:	93.2 ft bgs		
Drilling Asst:	D Hoeppner / R West	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	30126255
Logger:	S McGrane / G Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (ft)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
101	3.9	No Sieve Samples Collected		Competent Bedrock - Conglomerate	N/A		(76.25-102 ft) Sedimentary Rock; light reddish brown (2.5YR 6/4); fine grained to coarse grained, angular; slightly weathered; hard; massive; rock clasts within matrix composed of mixed lithology; some rock fragments 1.5 to 3 inches in length; friable; dry . NOTE: Rock pulverized into mostly powder by the sonic drilling methodology.		
102							End of Boring at 102 ft bgs.		

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Attachment 2

Borehole Decommissioning Log

Borehole Decommissioning Log

ARCADIS

Sheet: 1 of 6

Well ID: TWB-02 Pilot

Date Started:	03/29/2022	Surface Elevation:	537.23 ft amsl		
Date Completed:	03/31/2022	Northing (NAD83):	2100953.17		
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 2A
Driller Name:	Matt Arnold	Borehole Diameter:	4-7 inches	Location:	PG&E Topock, Needles California
Drilling Asst:	D Hoeppner / R West	Depth to First Water:	93.2 ft bgs		
Logger:	Ellen Redner	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
1					(0.0 - 8.0') 7" Diameter Borehole		
2					(0.0 - 4.0') Native material from SPY		Note: Backfill material
3							
4							
5							
6							
7					(4.0 - 10.0') Portland Type I, II and V w/ up to 6% Bentonite	(4.0 - 10.0') 10.9 gallons	(4.0 - 10.0') 13 gallons (119%) Note: Grout seal
8					(8.0 - 98.0') 6" Diameter Borehole		
9							
10	No Groundwater Samples Collected	Alluvium Deposits	SM				
11							
12							
13							
14							
15					(10.0 - 60.0') Portland Type I, II and V w/ up to 6% Bentonite	(10.0 - 60.0') 73.4 gallons	(10.0 - 60.0') 100 gallons (136%) Note: Grout seal, used >20% of the calculated volume due to potential grout migration and voids forming during drilling.
16							
17							
18							
19							
20		Alluvium Deposits	SM				

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Borehole Decommissioning Log

Well ID: TWB-02 Pilot

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Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 2A
Driller Name:	Matt Arnold	Borehole Diameter:	4-7 inches	Location:	PG&E Topock, Needles California
Drilling Asst:	D Hoeppner / R West	Depth to First Water:	93.2 ft bgs		
Logger:	Ellen Redner	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
21							
22							
23		Alluvium Deposits	SM				
24							
25							
26							
27							
28		Alluvium Deposits	SM				
29							
30	No Groundwater Samples Collected				(10.0 - 60.0') Portland Type I, II and V w/ up to 6% Bentonite	(10.0 - 60.0') 73.4 gallons	(10.0 - 60.0') 100 gallons (136%) Note: Grout seal, used >20% of the calculated volume due to potential grout migration and voids forming during drilling.
31							
32							
33							
34		Alluvium Deposits	SM				
35							
36							
37							
38							
39							
40							

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Drilling Asst:	D Hoeppner / R West	Depth to First Water:	93.2 ft bgs		
Logger:	Ellen Redner	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
41							
42		Alluvium Deposits	SM				
43							
44							
45							
46							
47							
48							
49							
50	No Groundwater Samples Collected				(10.0 - 60.0') Portland Type I, II and V w/ up to 6% Bentonite	(10.0 - 60.0') 73.4 gallons	(10.0 - 60.0') 100 gallons (136%) Note: Grout seal, used >20% of the calculated volume due to potential grout migration and voids forming during drilling.
51							
52		Alluvium Deposits	SM		(44.0 - 94.0')		Note: The formation locked the drill casing at approximately 94 ft. bgs. 50 feet of 6-inch diameter drill casing was cemented in place from approximately 44 ft. bgs to 94 ft. bgs.
53							
54							
55							
56							
57							
58							
59							
60							

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Date Started:	03/29/2022	Surface Elevation:	537.23 ft amsl	**Well ID: TWB-02 Pilot**	
Date Completed:	03/31/2022	Northing (NAD83):	2100953.17		
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 2A
Driller Name:	Matt Arnold	Borehole Diameter:	4-7 inches	Location:	PG&E Topock, Needles California
Drilling Asst:	D Hoeppner / R West	Depth to First Water:	93.2 ft bgs		
Logger:	Ellen Redner	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
61							
62		Alluvium Deposits	SM				
63							
64		Alluvium Deposits	SM		(60.0 - 102.0') Portland Cement Type I, II and V w/ up to 6% Bentonite mixed with saline water	(60.0 - 102.0') 58.4 gallons	(60.0 - 102.0') 50 gallons (86%) Note: Grout seal.
65							
66		Alluvium Deposits	SM				
67							
68							
69		Alluvium Deposits	SM				
70	No Groundwater Samples Collected				(44.0 - 94.0')		Note: The formation locked the drill casing at approximately 94 ft. bgs. 50 feet of 6-inch diameter drill casing was cemented in place from approximately 44 ft. bgs to 94 ft. bgs.
71							
72		Alluvium Deposits	SM				
73							
74							
75		Weathered Bedrock - Conglomerate	N/A				
76							
77							
78		Competent Bedrock - Conglomerate	N/A				
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 water table marks represent depth to water (ft. bgs.) measured during the first VAS interval, depth to water could not be determined from soil cores. Granular backfill material was removed during overdrilling of the pilot borehole.

Borehole Decommissioning Log

ARCADIS

Date Started:	03/29/2022	Surface Elevation:	537.23 ft amsl	**Well ID: TWB-02 Pilot**	
Date Completed:	03/31/2022	Northing (NAD83):	2100953.17		
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 2A
Driller Name:	Matt Arnold	Borehole Diameter:	4-7 inches	Location:	PG&E Topock, Needles California
Drilling Asst:	D Hoeppner / R West	Depth to First Water:	93.2 ft bgs		
Logger:	Ellen Redner	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
81							
82	No Groundwater Samples Collected						
83							
84							
85							
86							
87	No Sample (85-90 water was not representative of aquifer) 3/24/2022				(44.0 - 94.0')		Note: The formation locked the drill casing at approximately 94 ft. bgs. 50 feet of 6-inch diameter drill casing was cemented in place from approximately 44 ft. bgs to 94 ft. bgs.
88							
89							
90		Competent Bedrock - Conglomerate	N/A		(60.0 - 102.0') Portland Cement Type I, II and V w/ up to 6% Bentonite mixed with saline water	(60.0 - 102.0') 58.4 gallons	(60.0 - 102.0') 50 gallons (86%) Note: Grout seal.
91							
92							
93							
94							
95							
96							
97							
98	TWB-2-VAS-97-102 (<0.025 ppb) 3/29/2022 10:01				(98.0 - 102.0') 4" Diameter Rathole		
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 water table marks represent depth to water (ft. bgs.) measured during the first VAS interval, depth to water could not be determined from soil cores. Granular backfill material was removed during overdrilling of the pilot borehole.

ARCADIS Borehole Decommissioning Log

Well ID: TWB-02 Pilot

Date Started:	03/29/2022	Surface Elevation:	537.23 ft amsl		
Date Completed:	03/31/2022	Northing (NAD83):	2100953.17		
Drilling Co.:	Cascade	Easting (NAD83):	7616017.20	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 2A
Driller Name:	Matt Arnold	Borehole Diameter:	4-7 inches	Location:	PG&E Topock, Needles California
Drilling Asst:	D Hoeppner / R West	Depth to First Water:	93.2 ft bgs		
Logger:	Ellen Redner	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
101		Competent Bedrock - Conglomerate	N/A		(60.0 - 102.0') Portland Cement Type I, II and V w/ up to 6% Bentonite mixed with saline water	(60.0 - 102.0') 58.4 gallons	(60.0 - 102.0') 50 gallons (86%) Note: Grout seal.
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
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 water table marks represent depth to water (ft. bgs.) measured during the first VAS interval, depth to water could not be determined from soil cores. Granular backfill material was removed during overdrilling of the pilot borehole.

Attachment 3

Photo Logs

ARCADIS

CLIENT NAME: PG&E	**WELL CORE PHOTO LOG**	**PROJECT NAME / LOCATION:** Topock Compressor Station, Needles, California
Arcadis PROJECT NO: 30126255	**TWB-02 Pilot 0 to 102 ft**	**PHOTOS LAST ADDED:** 3/29/2022

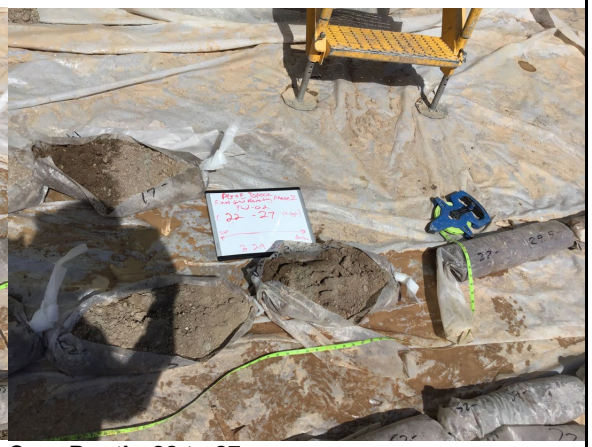
Core Depth: 5 to 8
Description: Samples (0-5' bgs) previously collected for logging during air knifing activities.
Date: 3/29/2022

Core Depth: 8 to 17
Description:
Date: 3/29/2022

Core Depth: 8 to 17
Description:
Date: 3/29/2022

Core Depth: 8 to 17
Description:
Date: 3/29/2022

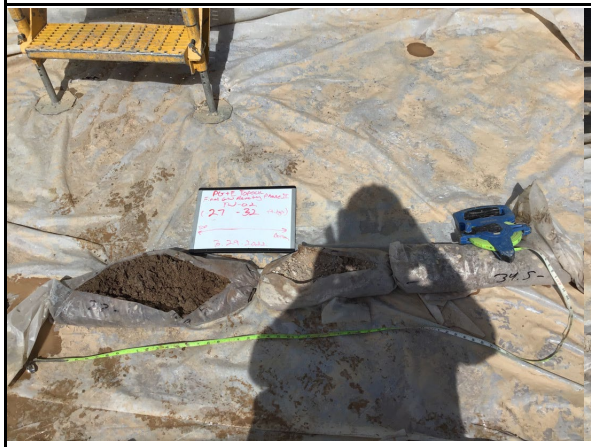
Core Depth: 17 to 22
Description:
Date: 3/29/2022



Core Depth: 22 to 27
Description:
Date: 3/29/2022

ARCADIS

CLIENT NAME: PG&E	**WELL CORE PHOTO LOG**	**PROJECT NAME / LOCATION:** Topock Compressor Station, Needles, California
Arcadis PROJECT NO: 30126255	**TWB-02 Pilot 0 to 102 ft**	**PHOTOS LAST ADDED:** 3/29/2022



Core Depth: 27 to 32
Description:
Date: 3/29/2022

Core Depth: 32 to 37
Description:
Date: 3/29/2022

Core Depth: 37 to 42
Description:
Date: 3/29/2022

Core Depth: 42 to 47
Description:
Date: 3/29/2022

Core Depth: 47 to 54
Description:
Date: 3/29/2022

Core Depth: 47 to 54
Description:
Date: 3/29/2022

ARCADIS

CLIENT NAME: PG&E	**WELL CORE PHOTO LOG**	**PROJECT NAME / LOCATION:** Topock Compressor Station, Needles, California
Arcadis PROJECT NO: 30126255	**TWB-02 Pilot 0 to 102 ft**	**PHOTOS LAST ADDED:** 3/29/2022

Core Depth: 54 to 59
Description:
Date: 3/29/2022

Core Depth: 59 to 64
Description:
Date: 3/29/2022

Core Depth: 64 to 67
Description:
Date: 3/23/2022

Core Depth: 67 to 72
Description:
Date: 3/23/2022

Core Depth: 72 to 77
Description:
Date: 3/23/2022

Core Depth: 77 to 82
Description:
Date: 3/23/2022

ARCADIS

CLIENT NAME: PG&E	**WELL CORE PHOTO LOG**	**PROJECT NAME / LOCATION:** Topock Compressor Station, Needles, California
Arcadis PROJECT NO: 30126255	**TWB-02 Pilot 0 to 102 ft**	**PHOTOS LAST ADDED:** 3/29/2022

Core Depth: 82 to 87.5
Description:
Date: 3/23/2022

Core Depth: 84.5 to 87
Description:
Date: 3/23/2022

Core Depth: 87 to 92
Description:
Date: 3/23/2022

Core Depth: 92 to 97
Description:
Date: 3/23/2022

Core Depth: 97 to 102
Description:
Date: 3/29/2022