Well Construction Log

Sheet: 1 of 5

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/26/2020	Surface Elevation:	504.95 ft amsl	**Well ID: IRZ-35**	
Date Completed:	03/29/2020	Shallow Well Elevation:	N/A		
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client:	PG&E
Drilling Method:	Dual Rotary	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Driller Name:	Jon Martinez	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Asst:	A. & H. Amezguita	Borehole Diameter:	18 inches		
Logger:	Kendra Keon	Static Water Level:	See Log for Depths	Project Number:	RC000753.0051
Editor:	Sean McGrane	Development End Date:	7/24/2020		
Total Depth:	97.03 ft bgs	Well Completion:	☐ Flush ☐ Stick-up ☒ To Be Completed in Well Vault		

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
1–20		Topock - Fill	NR	SW-SM	(0.0 - 53.1') 10" Suregrip 17 Casing (0.0 - 4.0') Cemex #60 Mesh (40x70) Lapis Lustre Sand (4.0 - 10.0') Portland Cement 3% Bentonite Type I, II and V Type I, II and V with Hydrogel (0.0 - 37.9') Schedule 80 PVC liner 8 inches in diameter.Portland Cement 3% Bentonite Type I, II and V Type I, II and V with Hydrogel (10.0 - 41.6') Portland Cement 3% Bentonite TypeI, II and V Type I, II and V with Hydrogel (0.0 - 21.0') 18.0" Borehole	(0.0 - 4.0') 9.8 bags (4.0 - 10.0') 54.8 gallons (0.0 - 37.9') 23 gallons (10.0 - 41.6') 288.2 gallons	(0.0 - 4.0') 12 bags (122%) Note: Temporary backfill sand to fill annular space prior to vault installation. Used >20% of the calculated volume due to potential voids forming during drilling. (4.0 - 10.0') 50 gallons (91%) Note: Grout seal, topped off on 3/29 (0.0 - 37.9') 25 gallons (109%) Note: Annulus space between the well casing and the PVC liner was grouted to approximately 2 ft. below top of well casing. (10.0 - 41.6') 360 gallons (125%) Note: Grout seal, used >20% of the calculated volume due to potential voids forming during drilling.
		Topock - Alluvium Deposits		SM			

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, NR = no recovery; Notes: solid blue water table marks represent depth to water (ft. bgs.) measured pre-specific capacity

Well Construction Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/26/2020	Surface Elevation:	504.95 ft amsl	**Well ID: IRZ-35**	
Date Completed:	03/29/2020	Shallow Well Elevation:	N/A		
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client:	PG&E
Drilling Method:	Dual Rotary	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Driller Name:	Jon Martinez	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Asst:	A. & H. Amezguita	Borehole Diameter:	18 inches		
Logger:	Kendra Keon	Static Water Level:	See Log for Depths	Project Number:	RC000753.0051
Editor:	Sean McGrane	Development End Date:	7/24/2020		
Total Depth:	97.03 ft bgs	Well Completion:	☐ Flush ☐ Stick-up ☒ To Be Completed in Well Vault		

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
21–40		Topock - Alluvium Deposits	SM		(0.0 - 53.1') 10" Suregrip 17 Casing; (0.0 - 21.0') 18.0" Borehole		
25–28		Topock - Alluvium Deposits	SW				
28–40		Topock - Alluvium Deposits	SM		(0.0 - 37.9') Schedule 80 PVC liner 8 inches in diameter.Portland Cement 3% Bentonite Type I, II and V Type I, II an dV with Hydrogel; (21.0 - 42.2') 18.0" Borehole; (10.0 - 41.6') Portland Cement 3% Bentonite TypeI, II and V Type I, II and V with Hydrogel; (38.5 - 39.5') Centralizer	(0.0 - 37.9') 23 gallons; (10.0 - 41.6') 288.2 gallons	(0.0 - 37.9') 25 gallons (109%) Note: Annulus space between the well casing and the PVC liner was grouted to approximately 2 ft. below top of well casing.; (10.0 - 41.6') 360 gallons (125%) Note: Grout seal, used >20% of the calculated volume due to potential voids forming during drilling.

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, NR = no recovery; Notes: solid blue water table marks represent depth to water (ft. bgs.) measured pre-specific capacity

Well Construction Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/26/2020	Surface Elevation:	504.95 ft amsl	**Well ID: IRZ-35**	
Date Completed:	03/29/2020	Shallow Well Elevation:	N/A		
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client:	PG&E
Drilling Method:	Dual Rotary	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Driller Name:	Jon Martinez	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Asst:	A. & H. Amezguita	Borehole Diameter:	18 inches		
Logger:	Kendra Keon	Static Water Level:	See Log for Depths	Project Number:	RC000753.0051
Editor:	Sean McGrane	Development End Date:	7/24/2020		
Total Depth:	97.03 ft bgs	Well Completion:	☐ Flush ☐ Stick-up ☒ To Be Completed in Well Vault		

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
41		Topock - Alluvium Deposits	SM		(0.0 - 53.1') 10" Suregrip 17 Casing; (40.4') Damage to Shurgrip 17 well casing		Note: Crack and bulge to the casing identified during the downhole camera survey.
42					(21.0 - 42.2') 18.0" Borehole		(41.6 - 44.6') 7 bags (96%) Note: Transition sand
43					(41.6 - 44.6') Cemex #60 Mesh (40x70) Lapis Lustre Sand; (37.9 - 42.9') Schedule 80 PVC liner 8 inches in diameter. Four k-packer glued to liner and packer with Halliburton granular Benseal.	(41.6 - 44.6') 7.3 bags	Note: Seal used to prevent grout migration into the screen interval
44							
45							
46		Topock - Alluvium Deposits	GW-GM				
47							
48							
49							
50							
51					(42.2 - 61.3') 18.0" Borehole		
52		Topock - Alluvium Deposits	GM		(44.6 - 97.0') Cemex #30 Mesh (30x70) Lapis Lustre Sand	(44.6 - 97.0') 131.7 bags	(44.6 - 97.0') 147 bags (112%) Note: Filter pack, ran dummy tool and swabbed for approximately 92 minutes.
53							
54	IRZ-35-VAS-52-57 (810 ppb) 1/13/2020 10:45				(53.1 - 88.0') 10" 10-Slot 316L SS Wire Wrap Screen		
55							
56		Topock - Alluvium Deposits	SW				
57							
58		Topock - Alluvium Deposits	SM				
59							
60							

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Well Construction Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/26/2020	Surface Elevation:	504.95 ft amsl	**Well ID: IRZ-35**	
Date Completed:	03/29/2020	Shallow Well Elevation:	N/A		
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client:	PG&E
Drilling Method:	Dual Rotary	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Driller Name:	Jon Martinez	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Asst:	A. & H. Amezguita	Borehole Diameter:	18 inches		
Logger:	Kendra Keon	Static Water Level:	See Log for Depths	Project Number:	RC000753.0051
Editor:	Sean McGrane	Development End Date:	7/24/2020		
Total Depth:	97.03 ft bgs	Well Completion:	☐ Flush ☐ Stick-up ☒ To Be Completed in Well Vault		

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
61–67		Topock - Alluvium Deposits	SM		(53.1 - 88.0') 10" 10-Slot 316L SS Wire Wrap Screen; (42.2 - 61.3') 18.0" Borehole		
67–72	IRZ-35-VAS-67-72 (920 ppb) 1/13/2020 15:40	Topock - Alluvium Deposits	SW		(44.6 - 97.0') Cemex #30 Mesh (30x70) Lapis Lustre Sand; (61.3 - 81.5') 18.0" Borehole	(44.6 - 97.0') 131.7 bags	(44.6 - 97.0') 147 bags (112%) Note: Filter pack, ran dummy tool and swabbed for approximately 92 minutes.
72–77		Topock - Alluvium Deposits	SM				
77–80		Topock - Alluvium Deposits	GM				

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Well Construction Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/26/2020	Surface Elevation:	504.95 ft amsl	**Well ID: IRZ-35**	
Date Completed:	03/29/2020	Shallow Well Elevation:	N/A		
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client:	PG&E
Drilling Method:	Dual Rotary	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Driller Name:	Jon Martinez	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Asst:	A. & H. Amezguita	Borehole Diameter:	18 inches		
Logger:	Kendra Keon	Static Water Level:	See Log for Depths	Project Number:	RC000753.0051
Editor:	Sean McGrane	Development End Date:	7/24/2020		
Total Depth:	97.03 ft bgs	Well Completion:	☐ Flush ☐ Stick-up ☒ To Be Completed in Well Vault		

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
81–100	IRZ-35-VAS-82-87 (2500 ppb) 1/14/2020 12:15	Topock - Alluvium Deposits	GM		(53.1 - 88.0') 10" 10-Slot 316L SS Wire Wrap Screen; (61.3 - 81.5') 18.0" Borehole; (44.6 - 97.0') Cemex #30 Mesh (30x70) Lapis Lustre Sand; (81.5 - 97.0') 18.0" Borehole; (89.5 - 90.5') Centralizer; (88.0 - 93.8') Sump and End Cap	(44.6 - 97.0') 131.7 bags	(44.6 - 97.0') 147 bags (112%) Note: Filter pack, ran dummy tool and swabbed for approximately 92 minutes.
		Topock - Alluvium Deposits	SM				
		Topock - Weathered Bedrock - conglomerate	SM				
		Topock - Competent Bedrock - conglomerate					

End of Boring at 97.0 ft bgs.

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Drilling Log

Sheet: 1 of 5

Date Started:	03/24/2020	Surface Elevation:	504.95 ft amsl	**Boring No.:**	**IRZ-35**
Date Completed:	03/25/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	97.0 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Foremost DR-24HD	Conductor Casing Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Jon Martinez	Drill Casing Diameter:	18 inches		
Drilling Asst:	A. & H. Amezguita	Drill Bit:	17.5 Tricone	Project Number:	RC000753.0051
Tool-Pusher:	Arnold Lamon	Depth to First Water:	51.5 ft bgs		
Rig Geologist:	Kendra Keon	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
1–20	(0.0 - 21.0) 1.40 mins/ft	NR		(0.0 - 21.0') 18.0" Steel Casing	(0.0 - 8.0') No recovery (NR)	(0.0 - 10.0') Observed trace amounts of Cemex #3 Mesh(8x20) Lapis Luster Sand in drill cuttings.	(0.0 - 21.0') 353 gallons of water used; 100 gallons of water recovered; 253 gallons of water lost
8–9		SW-SM			(8.0 - 9.0') Topock - Fill; Well graded sand with silt and gravel (SW-SM); yellowish brown / moderate yellowish brown (10YR 5/4)		
9–10					(9.0 - 24.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4)	(10.0') Observed trace amounts of Cemex #3 Mesh (8x20) Lapis Luster Sand in drill cuttings.	
10–20		SM					

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Drilling Log

ARCADIS Design & Consultancy for natural and built assets

Boring No.: IRZ-35

Date Started:	03/24/2020	Surface Elevation:	504.95 ft amsl		
Date Completed:	03/25/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	97.0 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Foremost DR-24HD	Conductor Casing Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Jon Martinez	Drill Casing Diameter:	18 inches		
Drilling Asst:	A. & H. Amezguita	Drill Bit:	17.5 Tricone	Project Number:	RC000753.0051
Tool-Pusher:	Arnold Lamon	Depth to First Water:	51.5 ft bgs		
Rig Geologist:	Kendra Keon	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
21	(0.0 - 21.0) 1.40 mins/ft			(0.0 - 21.0') 18.0" Steel Casing		(20.0') Observed trace amounts of Cemex #3 Mesh (8x20) Lapis Luster Sand in drill cuttings.	(21.0 - 42.2') 454 gallons of water used; 100 gallons of water recovered; 354 gallons of water lost
22		SM					
23							
24							
25					(24.5 - 28.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); brown (7.5YR 4/4)		
26		SW					
27							
28					(28.0 - 43.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4)		
29							
30	(21.0 - 42.2) 1.32 mins/ft			(21.0 - 42.2') 18.0" Steel Casing		(30.0') Observed trace amounts of Cemex #3 Mesh (8x20) Lapis Luster Sand in drill cuttings.	
31							
32							
33							
34		SM					
35							
36							
37							
38							
39							
40							

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Drilling Log

Sheet: 3 of 5

Date Started:	03/24/2020	Surface Elevation:	504.95 ft amsl	**Boring No.:**	**IRZ-35**
Date Completed:	03/25/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	97.0 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Foremost DR-24HD	Conductor Casing Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Jon Martinez	Drill Casing Diameter:	18 inches		
Drilling Asst:	A. & H. Amezguita	Drill Bit:	17.5 Tricone	Project Number:	RC000753.0051
Tool-Pusher:	Arnold Lamon	Depth to First Water:	51.5 ft bgs		
Rig Geologist:	Kendra Keon	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
41	(21.0 - 42.2) 1.32 mins/ft	SM		(21.0 - 42.2') 18.0" Steel Casing		(40.0') Observed trace amounts of Cemex #3 Mesh (8x20) Lapis Luster Sand in drill cuttings.	
42							(42.2 - 62.3') 353 gallons of water used; 200 gallons of water recovered; 153 gallons of water lost
43					(43.0 - 49.5') Topock - Alluvium Deposits; Well graded gravel with silt and sand (GW-GM); brown (7.5YR 5/4)		
44							
45							
46		GW-GM					
47							
48							
49							
50					(49.5 - 55.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 5/4)	(50.0') Observed trace amounts of Cemex #3 Mesh (8x20) Lapis Luster Sand in drill cuttings.	
51	(42.2 - 61.3) 2.23 mins/ft			(42.2 - 61.3') 18.0" Steel Casing			
52		GM					
53							
54							
55					(55.0 - 57.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW)		
56		SW					
57					(57.0 - 71.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4)		
58							
59		SM					
60							

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Drilling Log

Sheet: 4 of 5

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/24/2020	Surface Elevation:	504.95 ft amsl	**Boring No.:**	**IRZ-35**
Date Completed:	03/25/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	97.0 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Foremost DR-24HD	Conductor Casing Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Jon Martinez	Drill Casing Diameter:	18 inches		
Drilling Asst:	A. & H. Amezguita	Drill Bit:	17.5 Tricone	Project Number:	RC000753.0051
Tool-Pusher:	Arnold Lamon	Depth to First Water:	51.5 ft bgs		
Rig Geologist:	Kendra Keon	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
61	(42.2 - 61.3) 2.23 mins/ft			(42.2 - 61.3') 18.0" Steel Casing		(60.0') Observed trace amounts of Cemex #3 Mesh (8x20) Lapis Luster Sand in drill cuttings.	
62							
63							(62.3 - 81.5') 151 gallons of water used; 200 gallons of water recovered; 49 gallons of water gained
64							
65							
66		SM					
67							
68							
69							
70							
71	(61.3 - 81.5) 1.29 mins/ft			(61.3 - 81.5') 18.0" Steel Casing		(70.0') Observed trace amounts of Cemex #3 Mesh (8x20) Lapis Luster Sand in drill cuttings.	
72		SW			(71.5 - 73.5') Topock - Alluvium Deposits; Well graded sand with gravel (SW); brown (7.5YR 5/4)		
73							
74		SM			(73.5 - 77.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4)		
75							
76							
77		GM			(77.0 - 85.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 5/4)		
78							
79							
80							

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ARCADIS Design & Consultancy for natural and built assets

Drilling Log

Sheet: 5 of 5

Boring No.: IRZ-35

Date Started:	03/24/2020	Surface Elevation:	504.95 ft amsl		
Date Completed:	03/25/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Dual Rotary	Total Depth:	97.0 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Foremost DR-24HD	Conductor Casing Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Jon Martinez	Drill Casing Diameter:	18 inches		
Drilling Asst:	A. & H. Amezguita	Drill Bit:	17.5 Tricone	Project Number:	RC000753.0051
Tool-Pusher:	Arnold Lamon	Depth to First Water:	51.5 ft bgs		
Rig Geologist:	Kendra Keon	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
81	(61.3 - 81.5) 1.29 mins/ft	GM		(61.3 - 81.5') 18.0" Steel Casing		(80.0') Observed trace amounts of Cemex #3 Mesh (8x20) Lapis Luster Sand in drill cuttings.	(81.5 - 97.0') 403 gallons of water used; 838 gallons of water recovered; 435 gallons of water gained
82							
83							
84						(84.0 - 86.0') Rough drilling	
85					(85.0 - 87.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4)		
86		SM					
87		SM			(87.0 - 88.0') Topock - Weathered Bedrock - conglomerate; Silty sand (SM); reddish brown / moderate brown (5YR 4/4)		
88						(88.0 - 97.0') Rough drilling	
89	(81.5 - 97.0) 2.06 mins/ft			(81.5 - 97.0') 18.0" Steel Casing	(88.0 - 97.0') Topock - Competent Bedrock - conglomerate		
90						(90.0') Observed trace amounts of Cemex #2/12 Mesh (16x30) Lapis Luster Sand in drill cuttings.	
91							
92							
93							
94							
95							
96							
97							
					End of Boring at 97.0 ft bgs.		
98							
99							
100							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, NR = no recovery; Notes: water level and groundwater samples were collected during drilling of the pilot borehole

Boring Log

ARCADIS Design & Consultancy for natural and built assets

Boring No.: IRZ-35 Pilot

Date Started:	01/12/2020	Surface Elevation:	504.95 ft amsl	Client:	PG&E
Date Completed:	01/14/2020	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear Track Mount	Borehole Diameter:	6-10 inches		
Driller Name:	Eddie Ramos	Depth to First Water:	51.5 ft bgs		
Drilling Asst:	J. Candelaria / F. Sandoval	Sampling Method:	4 inch x 10ft Core Barrel	Project Number:	RC000753.0051
Logger:	Joe Latham	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1–7					NR		(0.0 - 8.0') No recovery (NR); see drilling notes	(0.0 - 8.0') Core not collected drilled with 10-inch conductor casing to 8 ft. bgs.	(0.0 - 102.0') No water used
7–17	120							(7.0 - 17.0') Soft drilling	
8–9	108			Topock - Fill	SW-SM		(8.0 - 9.0') Topock - Fill; Well graded sand with silt and gravel (SW-SM); yellowish brown / moderate yellowish brown (10YR 5/4); very fine grained to very coarse grained, subangular to round; and granules to very large pebbles, angular to subangular; little silt; and coarser clasts composed of metadiorite; moist; iron oxide staining	(8.0 - 17.0') Soft drilling	
9–17				Topock - Alluvium Deposits	SM		(9.0 - 24.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subround; little silt; trace small cobbles; some coarser clasts composed of metadiorite; dry to moist; iron oxide staining (15'); moist		
17–18								(17.0 - 35.0') Normal Drilling	
18–20	120						(18.5') brown (10YR 5/3); subangular to round; some granules to very large pebbles, angular to subangular; little silt; trace small cobbles; dry to moist; increase in silt, decrease in granules to very large pebbles		

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ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-35 Pilot

Date Started:	01/12/2020	Surface Elevation:	504.95 ft amsl	Client:	PG&E
Date Completed:	01/14/2020	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear Track Mount	Borehole Diameter:	6-10 inches		
Driller Name:	Eddie Ramos	Depth to First Water:	51.5 ft bgs		
Drilling Asst:	J. Candelaria / F. Sandoval	Sampling Method:	4 inch x 10ft Core Barrel	Project Number:	RC000753.0051
Logger:	Joe Latham	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21							(21'); dry		
22				Topock - Alluvium Deposits	SM		(22'); dry to moist		
23									
24	120								
25				Topock - Alluvium Deposits	SW		(24.5 - 28.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); brown (7.5YR 4/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; trace silt; little coarser clasts composed of metadiorite; dry to moist		
26									
27									
28							(28.0 - 43.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; little silt; some coarser clasts composed of metadiorite; dry to moist		
29									
30							(30'); dry		
31									
32	120								
33									
34				Topock - Alluvium Deposits	SM				
35								(35.0 - 37.0') Rough drilling	
36							(36'); some silt; little granules to very large pebbles, angular to subangular; dry to moist; increase in sand		
37							(37'); moist	(37.0 - 42.0') Normal drilling	
38									
39	120						(38.5'); some granules to very large pebbles, angular to subangular; little silt; trace small cobbles; dry to moist; decrease in sand		
40									

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ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-35 Pilot

Date Started:	01/12/2020	Surface Elevation:	504.95 ft amsl	Client:	PG&E
Date Completed:	01/14/2020	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear Track Mount	Borehole Diameter:	6-10 inches		
Driller Name:	Eddie Ramos	Depth to First Water:	51.5 ft bgs		
Drilling Asst:	J. Candelaria / F. Sandoval	Sampling Method:	4 inch x 10ft Core Barrel	Project Number:	RC000753.0051
Logger:	Joe Latham	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41				Topock - Alluvium Deposits	SM		(41.5'); moist (42.5'); some granules to large pebbles, angular; dry	(42.0 - 47.0') Rough drilling	
42									
43									
44	120			Topock - Alluvium Deposits	GW-GM		(43.0 - 49.5') Topock - Alluvium Deposits; Well graded gravel with silt and sand (GW-GM); brown (7.5YR 5/4); granules to very large pebbles, angular; little silt; and coarser clasts composed of metadiorite; dry		
45									
46									
47		IRZ-35-SS-45-50 1/15/2020 14:45					(47'); trace small cobbles, subangular to round; moist	(47.0 - 57.0') Normal Drilling	
48									
49									
50				Topock - Alluvium Deposits	GM		(49.5 - 55.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 5/4); granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subangular; little silt; some coarser clasts composed of metadiorite; moist to wet; iron oxide staining		
51									
52	120	IRZ-35-SS-50-55 1/15/2020 14:50	IRZ-35-VAS-52-57 (810 ppb) 1/13/2020 10:45						
53									
54							(54'); dry to moist		
55				Topock - Alluvium Deposits	SW		(55.0 - 57.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); very fine grained to very coarse grained, angular to subround; and granules to very large pebbles, angular; trace silt; and coarser clasts composed of metadiorite; wet; iron oxide staining		
56									
57		IRZ-35-SS-55-60 1/15/2020 14:53		Topock - Alluvium Deposits	SM		(57.0 - 71.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; little silt; some coarser clasts composed of metadiorite; moist; iron oxide staining (58'); trace small cobbles, subround; dry to moist	(57.0 - 67.0') Rough drilling	
58	120								
59									
60									

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ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-35 Pilot

Date Started:	01/12/2020	Surface Elevation:	504.95 ft amsl	Client:	PG&E
Date Completed:	01/14/2020	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear Track Mount	Borehole Diameter:	6-10 inches		
Driller Name:	Eddie Ramos	Depth to First Water:	51.5 ft bgs		
Drilling Asst:	J. Candelaria / F. Sandoval	Sampling Method:	4 inch x 10ft Core Barrel	Project Number:	RC000753.0051
Logger:	Joe Latham	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61									
62		IRZ-35-SS-60-65 1/15/2020 15:00							
63	120								
64							(64'); moist		
65				Topock - Alluvium Deposits	SM				
66									
67		IRZ-35-SS-65-70 1/15/2020 15:05						(67.0 - 68.0') Soft drilling	
68							(68'); dry to moist	(68.0 - 72.0') Rough drilling	
69	60		IRZ-35-VAS-67-72 (920 ppb) 1/13/2020 15:40				(69'); moist		
70									
71									
72		IRZ-35-SS-70-75 1/15/2020 15:10		Topock - Alluvium Deposits	SW		(71.5 - 73.5') Topock - Alluvium Deposits; Well graded sand with gravel (SW); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; trace silt; little coarser clasts composed of metadiorite; moist (72.5'); wet	(72.0 - 77.0') Normal drilling	
73									
74				Topock - Alluvium Deposits	SM		(73.5 - 77.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; little coarser clasts composed of metadiorite; moist to wet; iron oxide staining (74'); dry to moist (74.5'); moist to wet		
75	600								
76									
77		IRZ-35-SS-75-80 1/15/2020 15:20							
78				Topock - Alluvium Deposits	GM		(77.0 - 85.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 5/4); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little silt; and coarser clasts composed of metadiorite; moist to wet	(77.0 - 97.0') Soft drilling	
79	120								
80									

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ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-35 Pilot

Date Started:	01/12/2020	Surface Elevation:	504.95 ft amsl	Client:	PG&E
Date Completed:	01/14/2020	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear Track Mount	Borehole Diameter:	6-10 inches		
Driller Name:	Eddie Ramos	Depth to First Water:	51.5 ft bgs		
Drilling Asst:	J. Candelaria / F. Sandoval	Sampling Method:	4 inch x 10ft Core Barrel	Project Number:	RC000753.0051
Logger:	Joe Latham	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81							(81'); wet		
82		IRZ-35-SS-80-85 1/15/2020 15:25		Topock - Alluvium Deposits	GM				
83									
84	120		IRZ-35-VAS-82-87 (2500 ppb) 1/14/2020 12:15						
85							(85.0 - 87.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; some silt; little coarser clasts composed of metadiorite; wet; iron oxide staining		
86		IRZ-35-SS-85-88 1/15/2020 15:30		Topock - Alluvium Deposits	SM				
87				Topock - Weathered Bedrock - conglomerate	SM		(87.0 - 88.0') Topock - Weathered Bedrock - conglomerate; Silty sand (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to coarse grained, subangular; little granules to large pebbles, angular to subangular; little silt; little coarser clasts composed of metadiorite; moist; iron oxide staining		
88							(88.0 - 102.0') Topock - Competent Bedrock - conglomerate		
89									
90									
91									
92	120								
93									
94				Topock - Competent Bedrock - conglomerate					
95									
96									
97									
98	60							(97.0 - 102.0') Rough drilling likely due to broken metal drilling piece getting caught, found piece in soil core.	
99									
100									

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ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-35 Pilot

Date Started:	01/12/2020	Surface Elevation:	504.95 ft amsl	Client:	PG&E
Date Completed:	01/14/2020	Northing (NAD83):	2101643.14	Project:	Final GW Remedy Phase 1
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Location:	PG&E Topock, Needles, California
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs		
Drill Rig Type:	Boart Longyear Track Mount	Borehole Diameter:	6-10 inches		
Driller Name:	Eddie Ramos	Depth to First Water:	51.5 ft bgs		
Drilling Asst:	J. Candelaria / F. Sandoval	Sampling Method:	4 inch x 10ft Core Barrel	Project Number:	RC000753.0051
Logger:	Joe Latham	Sampling Interval:	Continuous		
Editor:	Grant Willford	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
101	60			Topock - Competent Bedrock - conglomerate			End of Boring at 102.0 ft bgs.		
102									
103									
104									
105									
106									
107									
108									
109									
110									
111									
112									
113									
114									
115									
116									
117									
118									
119									
120									

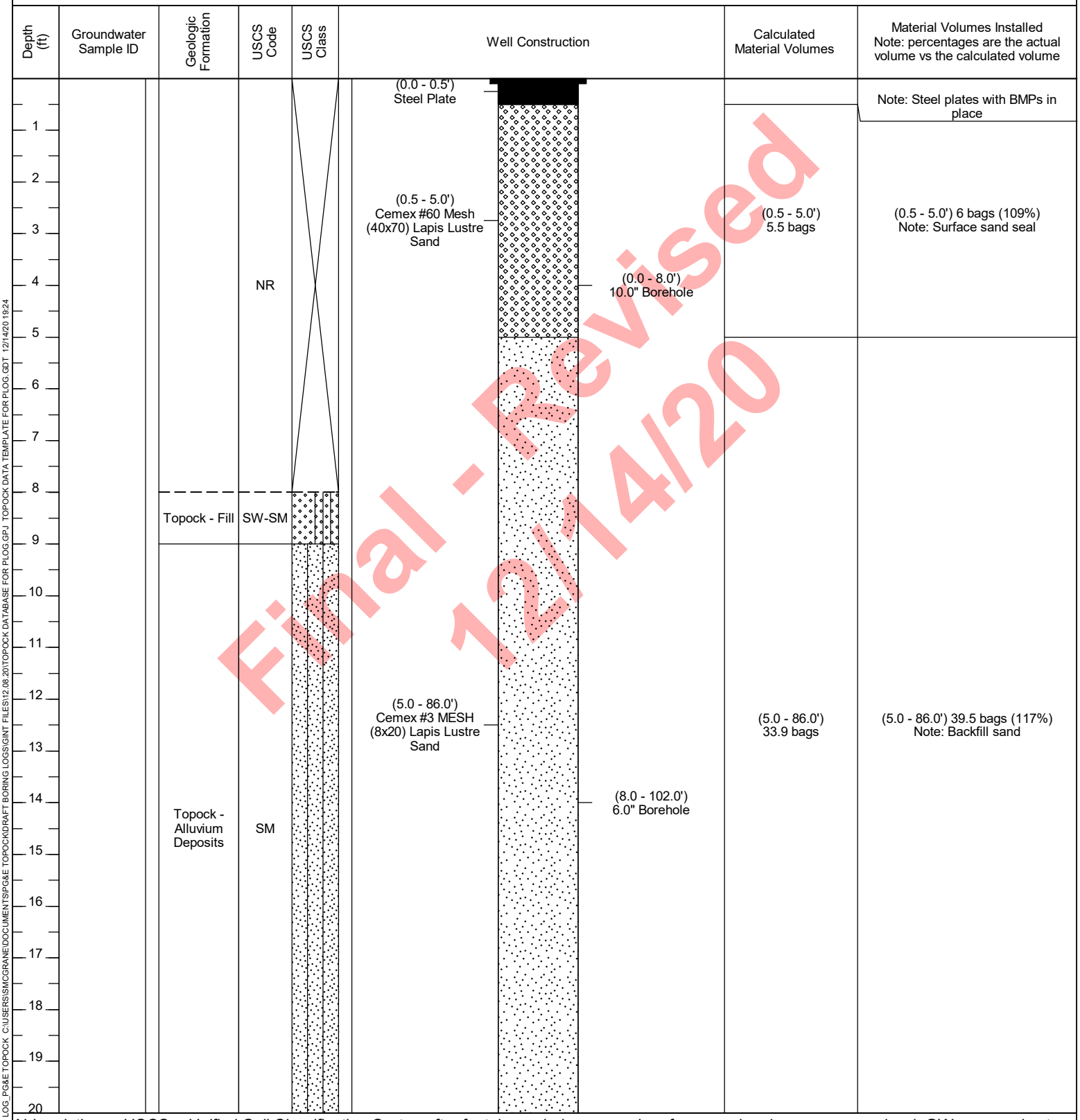
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; apparent partial recoveries can be the result of potential compaction of sediments in the core bag

ARCADIS Design & Consultancy for natural and built assets

Temporary Backfill Log

Sheet: 1 of 6

Date Started:	01/15/2020	Surface Elevation:	504.95 ft amsl	**Well ID: IRZ-35 Pilot**	
Date Completed:	01/15/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-10 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	J. Candelaria / F. Sandoval	Depth to First Water:	51.5 ft bgs		
Logger:	Joe Latham	Editor:	Grant Willford	Project Number:	RC000753.0051



Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

ARCADIS Design & Consultancy for natural and built assets

Temporary Backfill Log

Well ID: IRZ-35 Pilot

Date Started:	01/15/2020	Surface Elevation:	504.95 ft amsl		
Date Completed:	01/15/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-10 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	J. Candelaria / F. Sandoval	Depth to First Water:	51.5 ft bgs		
Logger:	Joe Latham	Editor:	Grant Willford	Project Number:	RC000753.0051

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
21–40		Topock - Alluvium Deposits	SM		(5.0 - 86.0') Cemex #3 MESH (8x20) Lapis Lustre Sand; (8.0 - 102.0') 6.0" Borehole	(5.0 - 86.0') 33.9 bags	(5.0 - 86.0') 39.5 bags (117%) Note: Backfill sand
22–25		Topock - Alluvium Deposits	SW				
25–40		Topock - Alluvium Deposits	SM				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

ARCADIS Design & Consultancy for natural and built assets

Temporary Backfill Log

Date Started:	01/15/2020	Surface Elevation:	504.95 ft amsl	**Well ID: IRZ-35 Pilot**	
Date Completed:	01/15/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-10 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	J. Candelaria / F. Sandoval	Depth to First Water:	51.5 ft bgs		
Logger:	Joe Latham	Editor:	Grant Willford	Project Number:	RC000753.0051

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
41		Topock - Alluvium Deposits	SM				
42							
43							
44		Topock - Alluvium Deposits	GW-GM				
45							
46							
47							
48							
49							
50					(5.0 - 86.0') Cemex #3 MESH (8x20) Lapis Lustre Sand	(5.0 - 86.0') 33.9 bags	(5.0 - 86.0') 39.5 bags (117%) Note: Backfill sand
51							
52		Topock - Alluvium Deposits	GM				
53							
54	IRZ-35-VAS-52-57 (810 ppb) 1/13/2020 10:45						
55							
56		Topock - Alluvium Deposits	SW				
57							
58		Topock - Alluvium Deposits	SM				
59							
60							

(8.0 - 102.0') 6.0" Borehole

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

ARCADIS Design & Consultancy for natural and built assets

Temporary Backfill Log

Well ID: IRZ-35 Pilot

Date Started:	01/15/2020	Surface Elevation:	504.95 ft amsl	Client:	PG&E
Date Completed:	01/15/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Project:	Final GW Remedy Phase 1
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Borehole Diameter:	6-10 inches		
Drilling Asst:	J. Candelaria / F. Sandoval	Depth to First Water:	51.5 ft bgs		
Logger:	Joe Latham	Editor:	Grant Willford	Project Number:	RC000753.0051

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
61–80	IRZ-35-VAS-67-72 (920 ppb) 1/13/2020 15:40	Topock - Alluvium Deposits	SM		(5.0 - 86.0') Cemex #3 MESH (8x20) Lapis Lustre Sand; (8.0 - 102.0') 6.0" Borehole	(5.0 - 86.0') 33.9 bags	(5.0 - 86.0') 39.5 bags (117%) Note: Backfill sand
		Topock - Alluvium Deposits	SW				
		Topock - Alluvium Deposits	SM				
		Topock - Alluvium Deposits	GM				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

ARCADIS Design & Consultancy for natural and built assets

Temporary Backfill Log

Well ID: IRZ-35 Pilot

Date Started:	01/15/2020	Surface Elevation:	504.95 ft amsl	Client:	PG&E
Date Completed:	01/15/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00		
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-10 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	J. Candelaria / F. Sandoval	Depth to First Water:	51.5 ft bgs		
Logger:	Joe Latham	Editor:	Grant Willford	Project Number:	RC000753.0051

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
81							
82		Topock - Alluvium Deposits	GM		(5.0 - 86.0') Cemex #3 MESH (8x20) Lapis Lustre Sand	(5.0 - 86.0') 33.9 bags	(5.0 - 86.0') 39.5 bags (117%) Note: Backfill sand
83							
84	IRZ-35-VAS-82-87 (2500 ppb) 1/14/2020 12:15						
85		Topock - Alluvium Deposits	SM				
86							
87		Topock - Weathered Bedrock - conglomerate	SM				
88							
89							
90					(8.0 - 102.0') 6.0" Borehole		
91					(86.0 - 96.0') Cemex # 2/12 MESH (16x30) Lapis Lustre Sand	(86.0 - 96.0') 3.9 bags	(86.0 - 96.0') 3.5 bags (90%) Note: Indicator sand
92							
93							
94		Topock - Competent Bedrock - conglomerate					
95							
96							
97							
98					(96.0 - 102.0') Bentonite seal chips Puregold Medium Chips	(96.0 - 102.0') 0.6 bags	(96.0 - 102.0') 0.5 bags (83%) Note: Decommissioned rathole
99							
100							

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ARCADIS Design & Consultancy for natural and built assets

Temporary Backfill Log

Sheet: 6 of 6

Well ID: IRZ-35 Pilot

Date Started:	01/15/2020	Surface Elevation:	504.95 ft amsl		
Date Completed:	01/15/2020	Northing (NAD83):	2101643.14		
Drilling Co.:	Cascade	Easting (NAD83):	7615918.00	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	102 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-10 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	J. Candelaria / F. Sandoval	Depth to First Water:	51.5 ft bgs		
Logger:	Joe Latham	Editor:	Grant Willford	Project Number:	RC000753.0051

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
101		Topock - Competent Bedrock - conglomerate			(96.0 - 102.0') Bentonite seal chips Puregold Medium Chips; (8.0 - 102.0') 6.0" Borehole	(96.0 - 102.0') 0.6 bags	(96.0 - 102.0') 0.5 bags (83%) Note: Decommissioned rathole
102							
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104							
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Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole