

Date Started: 10/21/2019	Surface Elevation: 482.84 ft amsl	Well ID: IRZ-39
Date Completed: 10/23/2019	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2101375.71	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7616112.47	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 8-12 inches	
Logger: CB / JL/ GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 11/4/2019	
Total Depth: 47 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	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
0 - 1		Topsoil	SM		(0.0 - 28.0') 8" PVC Sch 80 Casing		
1 - 2		Topock - Fill					
2 - 3		Topock - Alluvium Deposits	SM				
3 - 4		Topock - Alluvium Deposits	GP		(0.0 - 5.0') Cemex #60 Mesh	(0.0 - 5.0') 4.4 bags	(0.0 - 5.0') 6 bags (136%) 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 - 6		Topock - Alluvium Deposits	GC				
6 - 11		Topock - Alluvium Deposits	SC		(5.0 - 18.0') Portland Cement 3% Bentonite Type I, II, and V with Hydrogel	(5.0 - 18.0') 42.4 gallons	(5.0 - 18.0') 70 gallons (165%) Note: Grout seal, used >20% of the calculated volume due to potential voids forming during drilling.
11 - 17					(8.0 - 17.0') 12.0" Borehole		
17 - 18					(16.5 - 17.5') Centralizer		
18 - 19		Topock - Alluvium Deposits	SC				
19 - 20					(18.0 - 47.0') Cemex #60 Mesh (40x70) Lapis Lustre Sand	(18.0 - 47.0') 29.4 bags	(18.0 - 47.0') 34 bags (116%) Note: Filter pack, swabbed sand pack for approximately 30 minutes prior to installing grout.
					(17.0 - 27.0') 12.0" Borehole		

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

WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\SMC\GRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT\BORING LOGS\GINT FILES\11.30.20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/08/20 14:38

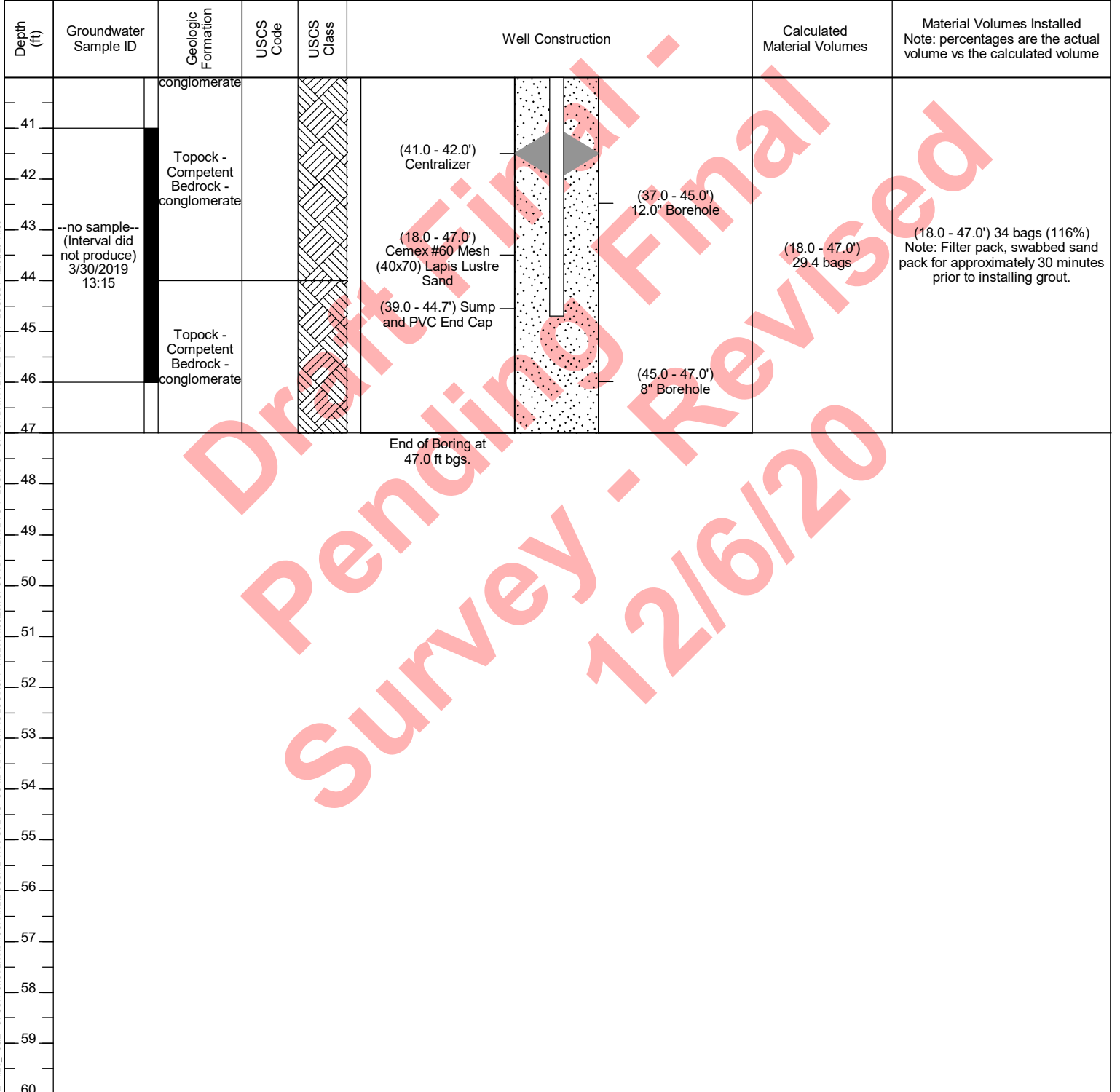
Date Started: 10/21/2019	Surface Elevation: 482.84 ft amsl	Well ID: IRZ-39
Date Completed: 10/23/2019	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2101375.71	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7616112.47	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 8-12 inches	
Logger: CB / JL / GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 11/4/2019	
Total Depth: 47 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	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
21		Topock - Alluvium Deposits	SC	[Hatched Pattern]	(0.0 - 28.0') 8" PVC Sch 80 Casing		
22							
23		Topock - Alluvium Deposits	SC	[Hatched Pattern]			
24							
25		Topock - Alluvium Deposits	SC	[Hatched Pattern]			
26							
27		Topock - Alluvium Deposits	SC	[Hatched Pattern]			
28							
29	IRZ-39-VAS-27-32 (29 ppb) 3/30/2019 09:16	Topock - Alluvium Deposits	SC	[Hatched Pattern]	(28.0 - 39.0') 8" 8-Slot 316L SS Wire Wrap Screen		
30							
31		Topock - Alluvium Deposits	SC	[Hatched Pattern]	(18.0 - 47.0') Cemex #60 Mesh (40x70) Lapis Lustre Sand	(18.0 - 47.0') 29.4 bags	(18.0 - 47.0') 34 bags (116%) Note: Filter pack, swabbed sand pack for approximately 30 minutes prior to installing grout.
32							
33		Topock - Weathered Bedrock - conglomerate	SC	[Hatched Pattern]			
34							
35		Topock - Weathered Bedrock - conglomerate	SC	[Hatched Pattern]			
36							
37		Topock - Weathered Bedrock - conglomerate	SC	[Hatched Pattern]			
38							
39		Topock - Competent Bedrock -	SC	[Hatched Pattern]			
40							

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Date Started: 10/21/2019	Surface Elevation: 482.84 ft amsl	Well ID: IRZ-39
Date Completed: 10/23/2019	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2101375.71	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7616112.47	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 8-12 inches	
Logger: CB / JL/ GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 11/4/2019	
Total Depth: 47 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input checked="" type="checkbox"/> To Be Completed in Well Vault	



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 DETAILS_PG&E_TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\11.30.20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/08/20 14:38

Date Started:	10/18/2019	Surface Elevation:	482.84 ft amsl	Boring No.: IRZ-39	
Date Completed:	10/20/2019	Northing (NAD83):	2101375.71		
Drilling Co.:	Cascade	Easting (NAD83):	7616112.47	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	47.0 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	12 inches	Project Number:	RC000753.0051
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	Cutting Shoe		
Tool-Pusher:	NA	Depth to First Water:	26.6 ft bgs		
Rig Geologist:	CB / JL/ GW	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	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	(0.0 - 8.0) 1.00 mins/ft	SM	(0.0 - 0.5') Topsoil; Silty sand with gravel (SM)	(0.0 - 8.0') 12.0" Steel Casing	(0.0 - 0.5') Topsoil; Silty sand with gravel (SM)	(0.0 - 8.0') Advancement of the 12 inch required pulling the casing back and advance forward, observed plastering sand and pea gravel in drill cuttings (see Photo Log).	(0.0 - 8.0') 5 gallons of water used; 0 gallons of water recovered; 5 gallons of water lost
2		SM	(0.5 - 0.6') Topock - Fill (0.6 - 2.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4)				
3		GP	(2.5 - 3.0') Topock - Alluvium Deposits; Poorly graded gravel (GP); (10YR 2.5/1)				
4		GC	(3.0 - 5.5') Topock - Alluvium Deposits; Clayey gravel with sand (GC); reddish brown / moderate brown (5YR 4/4)				
5							
6	(8.0 - 17.0) 0.33 mins/ft		(5.5 - 16.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown (5YR 5/4)	(8.0 - 17.0') 12.0" Steel Casing		(8.0 - 17.0') Normal drilling	(8.0 - 27.0') No water used
7							
8							
9							
10							
11		SC					
12							
13							
14							
15							
16							
17	(17.0 - 27.0) 0.30 mins/ft		(16.0 - 20.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); brown (7.5YR 4/4)	(17.0 - 27.0') 12.0" Steel Casing		(17.0') Observed temporary backfill material pea gravel in drill cuttings (see Photo Log).	
18		SC					
19							
20							

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IRZ-DRILLING LOG_PG&E-TOPOCK_C:\USERS\SMC\GRAND\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\11_30_20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/06/20 13:44

Date Started:	10/18/2019	Surface Elevation:	482.84 ft amsl	Boring No.: IRZ-39	
Date Completed:	10/20/2019	Northing (NAD83):	2101375.71		
Drilling Co.:	Cascade	Easting (NAD83):	7616112.47	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	47.0 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	12 inches	Project Number:	RC000753.0051
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	Cutting Shoe		
Tool-Pusher:	NA	Depth to First Water:	26.6 ft bgs		
Rig Geologist:	CB / JL/ GW	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	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	(17.0 - 27.0) 0.30 mins/ft	SC	[Diagonal Hatching]	(17.0 - 27.0') 12.0" Steel Casing	(20.0 - 25.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown / moderate brown (5YR 4/4)		
22					(25.0 - 26.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown (5YR 5/4)		
23					(26.0 - 29.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); dark reddish gray (5YR 4/2)		
24	(27.0 - 28.0) 1.00 mins/ft	SC	[Diagonal Hatching]	(27.0 - 28.0') 12.0" Steel Casing	(26.9') Observed temporary backfill material pea gravel in drill cuttings (see Photo Log).		(27.0 - 37.0') 250 gallons of water used; 250 gallons of water recovered; 0 gallons of water lost
25					(27.0 - 37.0') Drill rod snapped flushed 12-inch casing over core barrel to retrieve. Drill rod broke again. Core barrel was able to be retrieved.		
26					(27.1 - 28.0') Normal drilling, core barrel plugged up, had to retrieve.		
27	(28.0 - 37.0) 0.44 mins/ft	SC	[Diagonal Hatching]	(28.0 - 37.0') 12.0" Steel Casing	(29.0 - 30.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); red (2.5YR 4/6)		
28					(30.0 - 39.0') Topock - Weathered Bedrock - conglomerate; Clayey sand with gravel (SC); red (2.5YR 4/6)		
29					(28.0 - 34.0') Normal drilling		
30	(37.0 - 45.0) 0.80 mins/ft	SC	[Diagonal Hatching]	(37.0 - 45.0') 12.0" Steel Casing	(34.0 - 37.0') Very rough drilling, lots of chattering, whole rig was shaking.		
31					(36.0 - 37.0') Observed temporary backfill material pea gravel and Cemex #3 sand in drill cuttings (see Photo Log).		
32					(37.0 - 47.0') Core barrel got locked up and crew struggled to retrieve.		
33					(39.0 - 44.0') Topock - Competent Bedrock - conglomerate; red (2.5YR 5/6)		(37.0 - 47.0') No water used
34							
35							
36							
37							
38							
39							
40							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, Notes: blue water table symbol represents depth to water measured during the first pilot borehole VAS interval; drilling run and average penetration rate for 8-inch core barrel

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Date Started:	10/18/2019	Surface Elevation:	482.84 ft amsl	Boring No.: IRZ-39	
Date Completed:	10/20/2019	Northing (NAD83):	2101375.71		
Drilling Co.:	Cascade	Easting (NAD83):	7616112.47	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	47.0 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	12 inches	Project Number:	RC000753.0051
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	Cutting Shoe		
Tool-Pusher:	NA	Depth to First Water:	26.6 ft bgs		
Rig Geologist:	CB / JL/ GW	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	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	(37.0 - 45.0) 0.80 mins/ft		[Hatched Pattern]	(37.0 - 45.0') 12.0" Steel Casing			
42							
43							
44							
45					(44.0 - 47.0') Topock - Competent Bedrock - conglomerate; red (2.5YR 5/6)		
46	(45.0 - 47.0) 0.80 mins/ft			(45.0 - 47.0') 8" Steel Casing		(46.0 - 47.0') Soft drilling, observed temporary backfill material Cemex #3 sand in drill cuttings (see Photo Log).	
47					End of Boring at 47.0 ft bgs.		
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							

Final - Revised 12/6/20

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Date Started: 03/29/2019	Surface Elevation: 482.84 ft amsl	Boring No.: IRZ-39 Pilot
Date Completed: 03/30/2019	Northing (NAD83): 2101375.71	
Drilling Co.: Cascade	Easting (NAD83): 7616112.47	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 54 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Terrasonic Track Mount	Borehole Diameter: 4-12 inches	Location: PG&E Topock, Needles, California
Driller Name: Dan O'Mara	Depth to First Water: 26.6 ft bgs	Project Number: RC000753.0051
Drilling Asst: E. Huellmantel / J. Pacheco	Sampling Method: 4 inch x 10 ft. Core Barrel	
Logger: Grant Willford	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1	12			Topsoil	SM		(0.0 - 0.5') Topsoil; Silty sand with gravel (SM); very fine grained to very coarse grained, angular to subangular; little granules to medium pebbles, angular to subround; little silt; little clay; dry; homogeneous; some organics, small pieces of grass		(0.0 - 54.0') No water used
2	30			Topock - Fill			(0.5 - 0.6') Topock - Fill; asphalt		
3				Topock - Alluvium Deposits	SM		(0.6 - 2.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granules to medium pebbles, angular to subround; little silt; little clay; dry; homogeneous	(2.5 - 6.0') Soft drilling	
4				Topock - Alluvium Deposits	GP		(2.5 - 3.0') Topock - Alluvium Deposits; Poorly graded gravel (GP); (10YR 2.5/1); boulders, angular; dry; boulder composed of metadiorite		
5	42			Topock - Alluvium Deposits	GC		(3.0 - 5.5') Topock - Alluvium Deposits; Clayey gravel with sand (GC); reddish brown / moderate brown (5YR 4/4) some red (2.5YR 5/6); granules to large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; little silt; little clay; dry; iron oxide staining; gravel composed of mixed lithology; mostly metadiorite, few organics observed, small pieces of grass		
6				Topock - Alluvium Deposits	SC		(5.5 - 16.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown (5YR 5/4) some reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granules to large pebbles, angular to subangular; dry; iron oxide staining; gravel composed of mixed lithology; mostly metadiorite	(6.0 - 16.0') Soft drilling	
7									
8									
9									
10									
11	114								
12									
13									
14									
15									
16									
17									
18	120			Topock - Alluvium Deposits	SC		(16.0 - 20.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); brown (7.5YR 4/4) with reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subround; some granules to large pebbles, angular to subangular; some clay; little silt; dry; weak cementation; iron oxide staining	(16.0 - 26.0') Soft drilling	
19									
20									

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SOIL BORING LOG: PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\1130_20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/06/20 13:05

Date Started:	03/29/2019	Surface Elevation:	482.84 ft amsl	Boring No.: IRZ-39 Pilot	
Date Completed:	03/30/2019	Northing (NAD83):	2101375.71		
Drilling Co.:	Cascade	Easting (NAD83):	7616112.47	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	54 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic Track Mount	Borehole Diameter:	4-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	26.6 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft. Core Barrel		
Logger:	Grant Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21	120			Topock - Alluvium Deposits	SC		(20.0 - 25.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown / moderate brown (5YR 4/4) little red (2.5YR 5/6); very fine grained to very coarse grained, angular to subangular; some clay; little granules to medium pebbles, angular to subangular; little silt; dry; weak cementation; iron oxide staining		
22									
23									
24									
25									
26				Topock - Alluvium Deposits	SC		(25.0 - 26.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown (5YR 5/4) some reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granules to large pebbles, angular to subangular; little silt; little clay; dry to moist; weak cementation; gravel composed of mixed lithology; mostly metadiorite, moist at 25.6'	(26.0 - 36.0') Rough drilling	
27									
28				Topock - Alluvium Deposits	SC		(26.0 - 29.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); dark reddish gray (5YR 4/2) with red (2.5YR 4/6); very fine grained to very coarse grained, angular to subround; little granules to medium pebbles, angular to subangular; little silt; little clay; moist; moderate cementation; iron oxide staining; gravel composed of mixed lithology; mostly metadiorite	(27.8') Approximate depth to water table	
29		IRZ-39-SS-26-31 3/31/2019 10:27							
30			IRZ-39-VAS-27-32 (29 ppb) 3/30/2019 09:16	Topock - Alluvium Deposits	SC		(29.0 - 30.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); red (2.5YR 4/6) some red / moderate reddish brown (10R 4/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; little subangular; little silt; little clay; moist to dry; moderate cementation; iron oxide staining; gravel composed of mixed lithology, mostly metadiorite, moist from 29-30', dry from 30-36'		
31	120								
32							(30.0 - 39.0') Topock - Weathered Bedrock - conglomerate; Clayey sand with gravel (SC); red (2.5YR 4/6) some red / moderate reddish brown (10R 4/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; little subangular; little silt; little clay; moist to dry; moderate cementation; iron oxide staining; gravel composed of mixed lithology, mostly metadiorite		
33									
34		IRZ-39-SS-31-36 3/31/2019 10:31		Topock - Weathered Bedrock - conglomerate	SC				
35									
36									
37	36							(36.0 - 46.0') Rough drilling	
38		IRZ-39-SS-36-41 3/31/2019 10:34							
39									
40	84			Topock - Competent Bedrock -			(39.0 - 44.0') Topock - Competent Bedrock - conglomerate; red (2.5YR 5/6); dry; iron oxide staining; friable conglomerate, highly fractured and pulverized, when moist pulverized rock has low		

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Date Started:	03/29/2019	Surface Elevation:	482.84 ft amsl	Boring No.: IRZ-39 Pilot	
Date Completed:	03/30/2019	Northing (NAD83):	2101375.71		
Drilling Co.:	Cascade	Easting (NAD83):	7616112.47	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	54 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic Track Mount	Borehole Diameter:	4-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	26.6 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft. Core Barrel		
Logger:	Grant Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41				conglomerate			plasticity, moderate to strong cementation		
42				Topock - Competent Bedrock - conglomerate					
43	84	IRZ-39-SS-41-46	--no sample-- (Interval did not produce)						
44		3/31/2019 10:40	3/30/2019 13:15						
45							(44.0 - 54.0') Topock - Competent Bedrock - conglomerate; red (2.5YR 5/6); dry; moderate cementation; iron oxide staining; friable conglomerate, core not as pulverized as from 39-44 feet bgs		
46								(46.0 - 54.0') Rough drilling, lost core down the borehole, had to go back in to retrieve 49 to 54 ft bgs.	
47									
48									
49				Topock - Competent Bedrock - conglomerate					
50	96								
51									
52									
53									
54									
End of Boring at 54.0 ft bgs.									
55									
56									
57									
58									
59									
60									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, 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

SOIL BORING LOG: PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\11.30.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/06/20 13:05

Date Started: 03/31/2019	Surface Elevation: 482.84 ft amsl	Well ID: IRZ-39 Pilot
Date Completed: 03/31/2019	Northing (NAD83): 2101375.71	
Drilling Co.: Cascade	Easting (NAD83): 7616112.47	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 54 ft bgs	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Borehole Diameter: 4-12 inches	Location: PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / J. Pacheco	Depth to First Water: 26.6 ft bgs	
Logger: Grant Willford	Editor: Sean McGrane	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
0 - 1		Topsoil	SM		(0.0 - 0.5') Steel Plate		Note: Steel plate BMPs in place
1 - 2		Topock - Alluvium Deposits	SM		(0.0 - 4.0') 12" Borehole	(0.5 - 5.0') 6.3 bags	(0.5 - 5.0') 6 bags (95%) Note: Surface seal sand
2 - 3		Topock - Alluvium Deposits	GP				
3 - 4		Topock - Alluvium Deposits	GC		(0.5 - 5.0') Wildcat Washed Plastering Sand		
4 - 5		Topock - Alluvium Deposits	GC				
5 - 11		Topock - Alluvium Deposits	SC				
11 - 13		Topock - Alluvium Deposits	SC		(5.0 - 36.0') Cal-Silica 1/4"-3/8" pea gravel	(5.0 - 36.0') 13.7 bags	(5.0 - 36.0') 12 bags (88%) Note: Backfill gravel
13 - 16		Topock - Alluvium Deposits	SC		(4.0 - 42.0') 6" Borehole		
16 - 17		Topock - Alluvium Deposits	SC				
17 - 18		Topock - Alluvium Deposits	SC				
18 - 19		Topock - Alluvium Deposits	SC				
19 - 20		Topock - Alluvium Deposits	SC				

TEMP ABANDONMENT LOG_PG&E_TOPOCK_C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/06/20 15:06

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, 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

Date Started: 03/31/2019	Surface Elevation: 482.84 ft amsl	Well ID: IRZ-39 Pilot
Date Completed: 03/31/2019	Northing (NAD83): 2101375.71	
Drilling Co.: Cascade	Easting (NAD83): 7616112.47	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 54 ft bgs	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Borehole Diameter: 4-12 inches	Location: PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / J. Pacheco	Depth to First Water: 26.6 ft bgs	
Logger: Grant Willford	Editor: Sean McGrane	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		Topock - Alluvium Deposits	SC				
22							
23		Topock - Alluvium Deposits	SC				
24							
25		Topock - Alluvium Deposits	SC				
26							
27		Topock - Alluvium Deposits	SC				
28							
29	IRZ-39-VAS-27-32 (29 ppb) 3/30/2019 09:16	Topock - Alluvium Deposits	SC		(5.0 - 36.0') Cal-Silica 1/4"-3/8" pea gravel	(5.0 - 36.0') 13.7 bags	(5.0 - 36.0') 12 bags (88%) Note: Backfill gravel
30							
31		Topock - Weathered Bedrock - conglomerate	SC				
32							
33		Topock - Weathered Bedrock - conglomerate	SC				
34							
35		Topock - Weathered Bedrock - conglomerate	SC				
36							
37		Topock - Weathered Bedrock - conglomerate	SC				
38							
39		Topock - Competent Bedrock -			(36.0 - 46.0') Cemex #3 Mesh (8x20) Lapis Lustre Sand Lapis	(36.0 - 46.0') 3.9 bags	(36.0 - 46.0') 4 bags (103%) Note: Indicator sand
40							

Final Revised 16/20

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TEMP ABANDONMENT LOG_PG&E_TOPOCK_C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/06/20 15:06

Date Started: 03/31/2019	Surface Elevation: 482.84 ft amsl	Well ID: IRZ-39 Pilot
Date Completed: 03/31/2019	Northing (NAD83): 2101375.71	
Drilling Co.: Cascade	Easting (NAD83): 7616112.47	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 54 ft bgs	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Borehole Diameter: 4-12 inches	Location: PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / J. Pacheco	Depth to First Water: 26.6 ft bgs	
Logger: Grant Willford	Editor: Sean McGrane	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		conglomerate					
42		Topock - Competent Bedrock - conglomerate					
43	--no sample-- (Interval did not produce) 3/30/2019 13:15				(36.0 - 46.0') Cemex #3 Mesh (8x20) Lapis Lustre Sand Lapis	(36.0 - 46.0') 3.9 bags	(36.0 - 46.0') 4 bags (103%) Note: Indicator sand
44							
45							
46							
47							
48		Topock - Competent Bedrock - conglomerate					
49							
50					(46.0 - 54.0') Bentonite seal chips Enviroplug medium chips	(46.0 - 54.0') 1 bags	(46.0 - 54.0') 1 bags (100%) Note: Decommissioned rathole
51							
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, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, 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

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