APPENDIX A-1

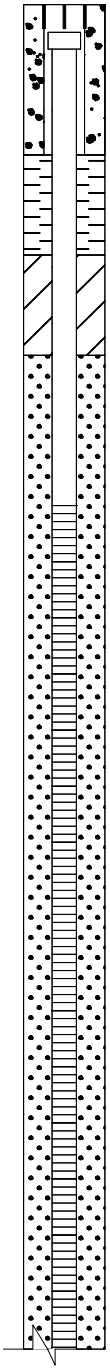
Monitoring Well Borehole Logs

Porter Geotechnical
5560 Wildwood Drive
Reno, Nevada 89511
(775) 849-0668
(775) 849-0895 FAX

Monitoring Well: **MW-18A**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: Maple Street, Alturas (W shldr)			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 15.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod		**TOC ELEV:** 4372.77
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 3.75		**DATE:** 06-04-2013

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
0						AC Pavement	Recessed cover
					GP-SP	0.3 Brown Sandy GRAVEL (Hand clear to 5') No Samples	Top of 2"ø ID SCHD 40 PVC Casing 8"ø hole Concrete Granular bentonite: 1.5 to 2.5'
1	4372						
2							Bentonite chips: 2.5'to 3.5'
3	4370						
4							Top of filter pack @ 3.5' No. 8 mesh sand
5	4368	S-1 S-1B	21 50/4.5"	88	GP	5.0 Very dense, gray-brown GRAVEL with Sand; angular, wet	Top of screen @ 5.0' 10' long screen w/ 0.020" slots No. 8 Mesh Sand
					ML	5.5 Hard, olive-brown SILT with tuffaceous Gravel, trace Clay, dry to moist, weakly to moderately cemented (can be broken w/ hand) [Subaqueous Ashfall Welded Tuff] LL = 41 (-No. 40 fraction) @ 5.5 ft PI = 5 (-No. 40 fraction) @ 5.5 ft	
6							
7	4366	S-2	32 50/5.5"	96			
					GM	LL = 42 (-No. 40 fraction) @ 6.5 ft PI = 7 (-No. 40 fraction) @ 6.5 ft	
8							
9	4364	S-3 S-3A	23 50/5.5"	96	SM-ML	7.5 Brown Silty GRAVEL with Sand, wet	
					SM	8.5 9.0 Very dense, gray-brown, mottled, fine SAND with Elastic Silt, dry to moist Gas odor K_V = 7.81x10^{-7} cm/s @ 9.0 ft γ_{dry} = 73.8 pcf @ 9.0 ft porosity, n = 0.56 @ 9.0 ft LL = 50 (-No. 40 fraction) @ 9.0 ft PI = 14 (-No. 40 fraction) @ 9.0 ft	
10		S-4	15 50/5.8"	98			
11	4362	S-5	35 50/4.5"	60			
12						Very dense, olive Silty SAND, some Gravel, wet	
						Very dense, brown, Silty fine to medium SAND, trace Gravel, moist	
13	4360	S-6	17 38 38	100		Medium dense, brown, Silty fine SAND, moist	



NOTES:

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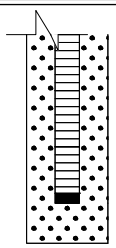
Monitoring Well: **MW-18A**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: Maple Street, Alturas (W shldr)			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 15.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod		**TOC ELEV:** 4372.77
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 3.75		**DATE:** 06-04-2013

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
						SM	13.5 Medium dense, brown, fine SAND with Silt, moist	 Bottom of screen @ 15.0' PVC end cap Bottom of filter pack @ 15.5'
14								
15	4358						15.5 Bottom of Boring@ 15.5'	
16								
17	4356							
18								
19	4354							
20								
21	4352							
22								
23	4350							
24								
25	4348							
26								

NOTES:

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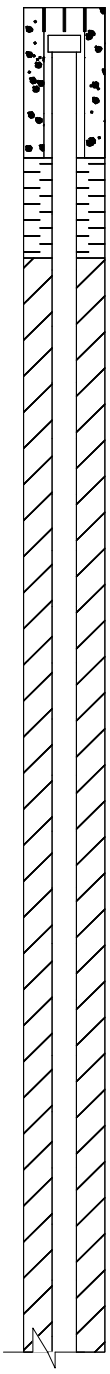
Monitoring Well: **MW-18B**

PROJECT: Former Gil's Gas Alturas		**PROJECT NO:** Case 250006	
CLIENT: Porter Geotechnical		**LOGGED BY:** Steve Devin	
LOCATION: Maple Street, Alturas (W shldr 3.2' N of MW-18A)		**DRILL CO:** Diamond Core Drilling	
DRILL METHOD: Rotary - Hollow Stem Auger		**DRILLER:** Ted Olgive	
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 30.5	**DRILL RIG:** Mobile Drill B-59	
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod	**TOC ELEV:** 4372.95	
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 14.68	**DATE:** 06-04-2013	

Depth (ft) / Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
0						AC Pavement	Recessed cover
					GP-SP	0.3 Brown Sandy GRAVEL (Hand clear to 5') No Samples	Top of 2"ø ID SCHD 40 PVC Casing 8"ø hole Concrete Granular bentonite: 1.5 to 2.5'
1 / 4372							
2							Bentonite chips: 2.5' to 17.0'
3 / 4370							
4							
5 / 4368					GP	5.0 Very dense, gray-brown GRAVEL with Sand; angular, wet	
					ML	5.5 Hard, olive-brown SILT with tuffaceous Gravel, trace Clay, dry to moist, weakly to moderately cemented (can be broken w/ hand) [Subaqueous Ashfall Welded Tuff] LL = 41 (-No. 40 fraction) @ 5.5 ft PI = 5 (-No. 40 fraction) @ 5.5 ft	
6							
7 / 4366							
					GM	w = 45.5 % @ 6.5 ft LL = 42 (-No. 40 fraction) @ 6.5 ft PI = 7 (-No. 40 fraction) @ 6.5 ft	
8							
					SM-ML	7.5 Brown Silty GRAVEL with Sand, wet	
9 / 4364							
					SM	8.5 Very dense, gray-brown, mottled, fine SAND with Elastic Silt, dry to moist LL = 50 (-No. 40 fraction) @ 9.0 ft PI = 14 (-No. 40 fraction) @ 9.0 ft	
10							
						9.5 Very dense, olive Silty SAND, some Gravel, wet	
11 / 4362							
12						Very dense, brown, Silty fine to medium SAND, trace Gravel, moist	
13 / 4360						Medium dense, brown, Silty fine SAND, moist	



NOTES: No Samples from 0' to 20'. Stratigraphy shown for these depths is from MW-18A located 3.2' to the south.

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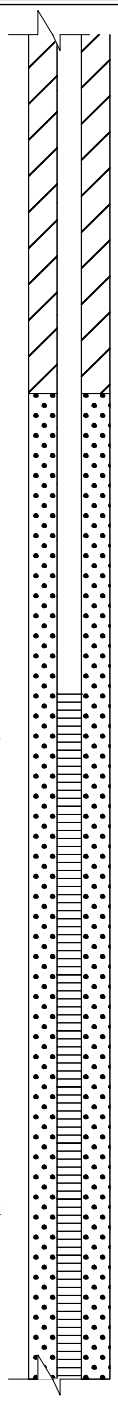
Monitoring Well: **MW-18B**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: Maple Street, Alturas (W shldr 3.2' N of MW-18A)			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 30.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod		**TOC ELEV:** 4372.95
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 14.68		**DATE:** 06-04-2013

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
						SM	13.5 Medium dense, brown, Silty fine SAND, moist	
14								
15	4358							
16								
17	4356							Top of filter pack @ 17.0' No. 8 mesh sand
18								
19	4354							
20		S-1	14 40 50/3"	83		SM	20.0 Medium dense to dense, light brown, Silty fine SAND, moist -No.40 = 52.8 % -No. 200 = 18.6 %	Top of screen @ 20.0' 10' long screen w/ 0.020" slots No. 8 Mesh Sand
21	4352							
22								
23	4350							
24								
25	4348	S-2	10 20 40	100		SM	25.0 Medium dense to dense, blue-gray, Silty fine to medium SAND, moist -No.40 = 67.3 % -No. 200 = 20.5 %	Theis-Jacob Recovery Method K= 1.31×10^{-4} cm/s
26								



NOTES: No Samples from 0' to 20'. Stratigraphy shown for these depths is from MW-18A located 3.2' to the south.

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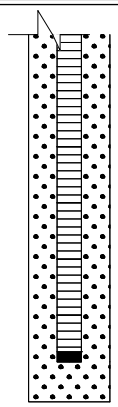
Monitoring Well: **MW-18B**

PROJECT: Former Gil's Gas Alturas		**PROJECT NO:** Case 250006	
CLIENT: Porter Geotechnical		**LOGGED BY:** Steve Devin	
LOCATION: Maple Street, Alturas (W shldr 3.2' N of MW-18A)		**DRILL CO:** Diamond Core Drilling	
DRILL METHOD: Rotary - Hollow Stem Auger		**DRILLER:** Ted Olgive	
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 30.5	**DRILL RIG:** Mobile Drill B-59	
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod	**TOC ELEV:** 4372.95	
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 14.68	**DATE:** 06-04-2013	

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
27	4346							
28								
29	4344	S-3	13 27 31	100		SM	29.0 Medium dense to dense, blue-gray, Silty SAND, trace Gravel, wet -No.40 = 58.0 % -No. 200 = 30.5 %	Bottom of screen @ 30.0' PVC end cap Bottom of filter pack @ 30.5'
30							30.5 Bottom of Boring @ 30.5'	
31	4342							
32								
33	4340							
34								
35	4338							
36								
37	4336							
38								
39	4334							
40								



NOTES: No Samples from 0' to 20'. Stratigraphy shown for these depths is from MW-18A located 3.2' to the south.

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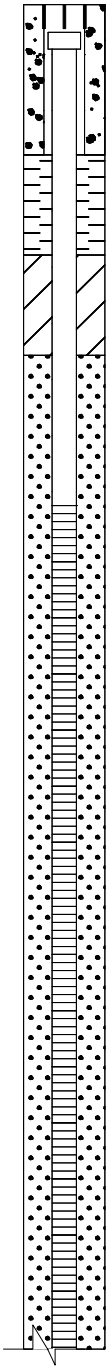
Monitoring Well: **MW-19A**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: 10th Street, Alturas (60' E curb W end 10th; 12' N			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 15.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod		**TOC ELEV:** 4372.30
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.00		**DATE:** 06-05-2013

Depth (ft) / Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
0						AC Pavement	Recessed cover
					GP-SP	0.3 Brown Sandy GRAVEL (Hand clear to 5') No Samples	Top of 2"ø ID SCHD 40 PVC Casing 8"ø hole Concrete Granular bentonite: 1.5 to 2.5' Bentonite chips: 2.5' to 3.5' Top of filter pack @ 3.5' No. 8 mesh sand
1 / 4372							
2							
3 / 4370							
4							
5 / 4368					GP	5.0 Dense to very dense, light gray-brown Sandy GRAVEL	Top of screen @ 5.0' 10' long screen w/ 0.020" slots No. 8 Mesh Sand
6							
7 / 4366					SM-ML	6.5 Very Stiff to Hard, light brown, Sandy SILT, with tuffaceous Gravel fragments, dry (broken with moderate to strong hand pressure) [Subaqueous Ashfall Welded Tuff] LL = 48 (-No. 40 fraction) @ 8.0 ft PI = 11 (-No. 40 fraction) @ 8.0 ft	
8							
9 / 4364							
10							
11 / 4362					SP	10.5 Dense to very dense, light brown, Silty fine to medium SAND, some Gravel (platey, cannot be broken by hand), dry	
12							
13 / 4360						sample transitions from dry to wet @ 13' - darker brown	



NOTES: No samples obtained. Stratigraphy shown is from MW-19B located 3.8' to the west.

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Monitoring Well: **MW-19A**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: 10th Street, Alturas (60' E curb W end 10th; 12' N			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 15.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod		**TOC ELEV:** 4372.30
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.00		**DATE:** 06-05-2013

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
14						SP-SM	14.0 Dense to very dense, brown, medium to coarse, poorly graded SAND with Silt, wet	
15	4358							Bottom of screen @ 15.0' PVC end cap Bottom of filter pack @ 15.5'
16							15.5 Bottom of Boring @ 15.5'	
17	4356							
18								
19	4354							
20								
21	4352							
22								
23	4350							
24								
25	4348							
26								
	4346							

NOTES: No samples obtained. Stratigraphy shown is from MW-19B located 3.8' to the west.

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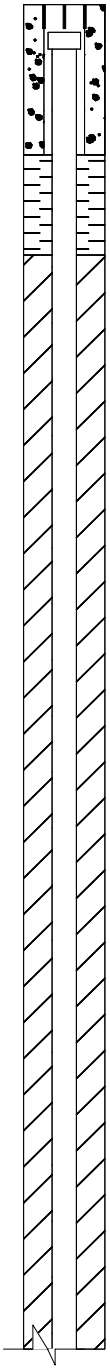
Monitoring Well: **MW-19B**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: 10th Street, Alturas, (3.5' W of MW-19A)			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 30.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod		**TOC ELEV:** 4372.08
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.73		**DATE:** 06-04-2013

Depth (ft) / Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
0						AC Pavement	Recessed cover
4372 (1)					GP-SP	0.3 Brown Sandy GRAVEL (Hand clear to 5') No Samples	Top of 2"ø ID SCHD 40 PVC Casing 8"ø hole Concrete Granular bentonite: 1.5 to 2.5'
4370 (3)							Bentonite chips: 2.5' to 17.0'
4368 (5)	S-1	17 36 49	17		GP	5.0 Dense to very dense, light gray-brown Sandy GRAVEL	
4366 (7)	S-2	17 29 50/5"	94		SM-ML	6.5 Very Stiff to Hard, light brown, Sandy SILT, with tuffaceous Gravel fragments, dry (broken with moderate to strong hand pressure) [Subaqueous Ashfall Welded Tuff] K_V = 1.13x10^{-6} cm/s @ 6.5 ft γ_{dry} = 78.9 pcf @ 6.5 ft w = 37.0 % @ 6.5 ft porosity, n = 0.53 @ 6.5 ft	
4364 (9)	S-3	16 26 45	100			trace very thin (< 0.1 mm), light yellow clay coatings on fissures, dry LL = 48 (-No. 40 fraction) @ 8.0 ft PI = 11 (-No. 40 fraction) @ 8.0 ft	
	S-4	15 38 50/3"	83				
4362 (11)	S-5	50/5.5"	92		SM	10.5 Dense to very dense, light brown, Silty fine to medium SAND, some Gravel (platey, cannot be broken by hand), dry	
4360 (13)	S-6	35 38 50/3"	83			sample transitions from dry to wet @ 13' - darker brown -No.40 = 66.0 %	



NOTES:

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Monitoring Well: **MW-19B**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: 10th Street, Alturas, (3.5' W of MW-19A)			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 30.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod		**TOC ELEV:** 4372.08
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.73		**DATE:** 06-04-2013

Depth (ft) / Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
					-No. 200 = 14.3 %	
14	S-7	28 50/4.5"	88	SP-SM	14.0 Dense to very dense, brown, medium to coarse, poorly graded SAND with Silt, wet -No.40 = 45.0 % -No. 200 = 9.5 %	
15 / 4358						
16						
17 / 4356				ML	16.7 more difficult augering; transition to stiffer layer Very stiff, light yellow brown, Sandy SILT with Clay, moist	Top of filter pack @ 17.0' No. 8 mesh sand
18						
19 / 4354						
20	S-8	17 34 36	83		Very stiff, light yellow brown, Sandy SILT with Clay, moist K_v = 3.33x10^{-7} cm/s @ 20.0 ft γ_{dry} = 74.8 pcf @ 20.0 ft porosity, n = 0.56 @ 20.0 ft LL = 43 (-No. 40 fraction) @ 20.0 ft PI = 3 (-No. 40 fraction) @ 20.0 ft	Top of screen @ 20.0' 10' long screen w/ 0.020" slots No. 8 Mesh Sand
21 / 4352						
22	S-9	9 20 24	10			
23 / 4350						
24	S-10	14 29 50/6"	100			
25 / 4348	S-11	17 34 50/6"	100		Very stiff to hard, light brown Sandy SILT with Clay, moist K_v = 8.47x10^{-7} cm/s @ 25.0 ft γ_{dry} = 80.8 pcf @ 25.0 ft w = 38.5 % @ 25.0 ft porosity, n = 0.52 @ 25.0 ft	Theis-Jacob Recovery Method K= 6.67x10^{-4} cm/s (avg over full screen length)
26 / 4346						

NOTES:

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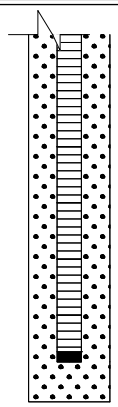
Monitoring Well: **MW-19B**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: 10th Street, Alturas, (3.5' W of MW-19A)			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 8.25	**TOTAL DEPTH (ft):** 30.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod		**TOC ELEV:** 4372.08
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.73		**DATE:** 06-04-2013

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
27		S-12	42 50/5"	92		SM	27.0 Very dense, olive-gray Silty SAND with Gravel, wet -No.40 = 49.9 % -No. 200 = 32.9 %	
28								
	4344							
29		S-13	24 50/5.5"	96		SM-ML	29.0 Very dense, olive-gray Silty SAND / Sandy SILT with Gravel, wet -No.40 = 66.5 % -No. 200 = 48.0 %	Bottom of screen @ 30.0' PVC end cap Bottom of filter pack @ 30.5'
30								
	4342						30.5 Bottom of Boring @ 30.5'	
31								
32								
	4340							
33								
34								
	4338							
35								
36								
	4336							
37								
38								
	4334							
39								
40								

NOTES:

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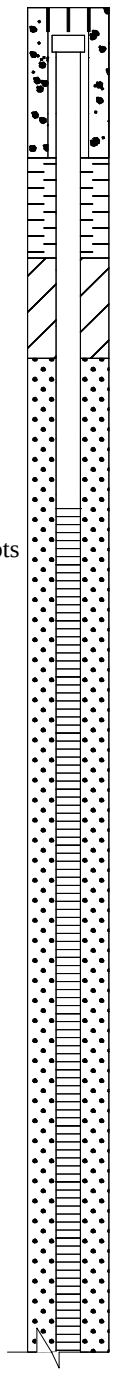
Monitoring Well: EW-1

PROJECT: Former Gil's Gas Alturas		**PROJECT NO:** Case 250006	
CLIENT: Porter Geotechnical		**LOGGED BY:** Steve Devin	
LOCATION: Modoc Mini-Mart between MW-2, MW-7, and MW-		**DRILL CO:** Diamond Core Drilling	
DRILL METHOD: Rotary - Hollow Stem Auger		**DRILLER:** Ted Olgive	
HOLE DIA. (in): 12	**TOTAL DEPTH (ft):** 25.5	**DRILL RIG:** Mobile Drill B-59	
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod	**TOC ELEV:** 4374.54	
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.36	**DATE:** 06-05-2013	

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
0						AC Pavement	Recessed cover
					GP-SP 0.3	Clear from 0' to 2±' by hand	Top of 4"ø SCHD 40 PVC casing
1	4374						12"ø hole
						Brown Gravelly SAND	concrete
							Granular bentonite: 1.5' to 2.5'
2						TANK BACKFILL	
							Bentonite chips: 2.5' to 3.5'
3	4372						
							Top of filter pack @ 3.5'
							No. 8 mesh Sand
4						rubble @ 4'±	
						clear with vacuum	
5	4370						Top of screen @ 5.0'
							20' long screen with 0.020" slots
							No. 8 mesh Sand
6		Bag1	grab			strong gas odor@ 6'	
7	4368						
8							
9	4366						
10		S-1	10 20 27	100	SC-SM 10.0	Medium dense, brown-gray, mottled Silty SAND, trace Clay, moist TPH-E = 0.00 mg/Kg TPH-P = 8.8 mg/Kg MTBE = 5.8 µg/Kg Benzene = ND µg/Kg Toluene = ND µg/Kg Ethylbenzene = 56 µg/Kg Xylenes, Total = 140 µg/Kg	
11	4364						
12							
13	4362						



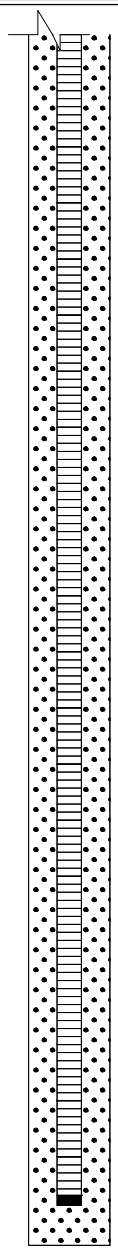
NOTES: Inital 8"ø boring enlarged with 12"ø auger prior to MW construction

Porter Geotechnical
5560 Wildwood Drive
Reno, Nevada 89511
(775) 849-0668
(775) 849-0895 FAX

Monitoring Well: **EW-1**

PROJECT: Former Gil's Gas Alturas		**PROJECT NO:** Case 250006	
CLIENT: Porter Geotechnical		**LOGGED BY:** Steve Devin	
LOCATION: Modoc Mini-Mart between MW-2, MW-7, and MW-		**DRILL CO:** Diamond Core Drilling	
DRILL METHOD: Rotary - Hollow Stem Auger		**DRILLER:** Ted Olgive	
HOLE DIA. (in): 12	**TOTAL DEPTH (ft):** 25.5	**DRILL RIG:** Mobile Drill B-59	
HAMMER WT (lb): 140	**SAMPLER:** 2" ID Cal Mod	**TOC ELEV:** 4374.54	
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.36	**DATE:** 06-05-2013	

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
14								
15	4360	S-2	7 17 27	100		ML	15.0 Very Stiff, very dark gray SILT with fine Sand, moist TPH-E = 0.00 mg/Kg TPH-P = ND mg/Kg MTBE = ND µg/Kg Benzene = ND µg/Kg Toluene = ND µg/Kg Ethylbenzene = ND µg/Kg Xylenes, Total = 5.5 µg/Kg	
16								
17	4358							
18								
19	4356							
20		S-3	17 36 50/3"	83		SM	20.0 Medium dense to dense, light brown Silty SAND, moist (no significant soil odor) Switch to 2.5" ID Cal Mod Sampler @ 20.0'	
21	4354							
22								
23	4352							
24								
25	4350							Bottom of screen @ 25.0' PVC end cap Bottom of filter pack @ 25.5'
26							25.5 Bottom of Boring @ 25.5'	



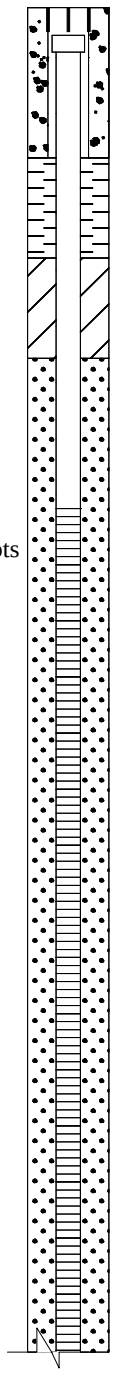
NOTES: Inital 8"ø boring enlarged with 12"ø auger prior to MW construction

Porter Geotechnical
5560 Wildwood Drive
Reno, Nevada 89511
(775) 849-0668
(775) 849-0895 FAX

Monitoring Well: **EW-2**

PROJECT: Former Gil's Gas Alturas		**PROJECT NO:** Case 250006	
CLIENT: Porter Geotechnical		**LOGGED BY:** Steve Devin	
LOCATION: Modoc Mini-Mart south of covered fuel island		**DRILL CO:** Diamond Core Drilling	
DRILL METHOD: Rotary - Hollow Stem Auger		**DRILLER:** Ted Olgive	
HOLE DIA. (in): 12	**TOTAL DEPTH (ft):** 25.5	**DRILL RIG:** Mobile Drill B-59	
HAMMER WT (lb): 140	**SAMPLER:** 2.5" ID Cal Mod	**TOC ELEV:** 4375.54	
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.29	**DATE:** 06-05-2013	

Depth (ft) / Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
0					AC Pavement	Recessed cover
				GP-SP	0.3 Brown Gravelly SAND	Top of 4"ø SCHD 40 PVC casing 12"ø hole concrete Granular bentonite: 1.5' to 2.5'
1						
4374						
2						Bentonite chips: 2.5' to 3.5'
3						
4372						Top of filter pack @ 3.5' No. 8 mesh Sand
4						
5		13 19	100	SP	5.0 Medium dense, dark gray, fine to medium SAND Strong petroleum odor TPH-E = 47.00 mg/Kg TPH-P = ND mg/Kg MTBE = 110 µg/Kg Benzene = ND µg/Kg Toluene = ND µg/Kg Ethylbenzene = ND µg/Kg Xylenes, Total = 11 µg/Kg	Top of screen @ 5.0' 20' long screen with 0.020" slots No. 8 mesh Sand
4370	S-1					
6				GP-SP		
7						
4368						
8					6.5 3" to 4"ø, rounded to subrounded COBBLES @ 6.5'± to 7.5'±	
9						
4366						
10		50/5"	0	SM-ML	10.0 No Recovery	
11			0		No Recovery	
4364						
12					Probable Silty SAND and Sandy SILT (No Recovered Samples)	
13						



NOTES: Inital 8"ø boring enlarged with 12"ø auger prior to MW construction

Porter Geotechnical
5560 Wildwood Drive
Reno, Nevada 89511
(775) 849-0668
(775) 849-0895 FAX

Monitoring Well: EW-2

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: Modoc Mini-Mart south of covered fuel island			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 12	**TOTAL DEPTH (ft):** 25.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2.5" ID Cal Mod		**TOC ELEV:** 4375.54
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.29		**DATE:** 06-05-2013

Depth (ft) / Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
4362						
14						
15	S-2	27 50/5"	96	ML	15.0 Stiff, light brown, Sandy SILT, some Gravel, dry to moist Petroleum odor -No.40 = 73.1 % -No. 200 = 52.4 % TPH-E = 0.00 mg/Kg TPH-P = ND mg/Kg MTBE = 670 µg/Kg Benzene = ND µg/Kg Toluene = ND µg/Kg Ethylbenzene = ND µg/Kg Xylenes, Total = ND µg/Kg	
4360				SP		
16						
17				SM		
4358						
18					15.5 Dense, light brown, fine to medium SAND with Gravel, wet	
19					17.0 becomes very dense @ 17' slow drilling	
4356						
20	S-3	32 50	67		Medium dense to dense, brown, Silty fine to medium SAND, moist -No.40 = 60.4 % -No. 200 = 28.4 %	
21				ML	21.0 K_v = 6.09x10^{-6} cm/s @ 21.3 ft γ_{dry} = 80.8 pcf @ 21.3 ft w = 40.9 % @ 21.3 ft porosity, n = 0.52 @ 21.3 ft slow drilling @ 22' - hard	
4354						
22						
23						
4352						
24	S-4	25 38	100	SP	Very Stiff, brown and dark blueish gray SILT and fine Sand, trace Clay, moist (thinly bedded) K_v = 5.86x10^{-5} cm/s @ 24.0 ft γ_{dry} = 72.8 pcf @ 24.0 ft w = 47.9 % @ 24.0 ft porosity, n = 0.57 @ 24.0 ft	
25						Bottom of screen @ 25.0' PVC end cap Bottom of filter pack @ 25.5'
4350						
26					24.2	

NOTES: Inital 8"ø boring enlarged with 12"ø auger prior to MW construction

Porter Geotechnical
5560 Wildwood Drive
Reno, Nevada 89511
(775) 849-0668
(775) 849-0895 FAX

Monitoring Well: EW-2

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: Modoc Mini-Mart south of covered fuel island			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 12	**TOTAL DEPTH (ft):** 25.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2.5" ID Cal Mod		**TOC ELEV:** 4375.54
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 5.29		**DATE:** 06-05-2013

Depth (ft) / Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
27						Dense, dark blueish gray, fine to coarse SAND, wet	
4348						25.5 Bottom of Boring @ 25.5'	
28							
29							
4346							
30							
31							
4344							
32							
33							
4342							
34							
35							
4340							
36							
37							
4338							
38							
39							
4336							
40							

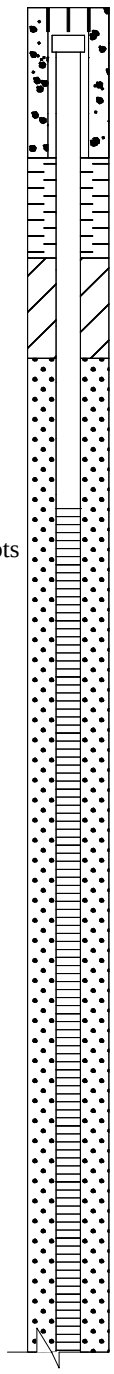
NOTES: Inital 8"ø boring enlarged with 12"ø auger prior to MW construction

Porter Geotechnical
5560 Wildwood Drive
Reno, Nevada 89511
(775) 849-0668
(775) 849-0895 FAX

Monitoring Well: **EW-3**

PROJECT: Former Gil's Gas Alturas			**PROJECT NO:** Case 250006
CLIENT: Porter Geotechnical			**LOGGED BY:** Steve Devin
LOCATION: Modoc Mini-Mart between diesel islands			**DRILL CO:** Diamond Core Drilling
DRILL METHOD: Rotary - Hollow Stem Auger			**DRILLER:** Ted Olgive
HOLE DIA. (in): 12	**TOTAL DEPTH (ft):** 25.5		**DRILL RIG:** Mobile Drill B-59
HAMMER WT (lb): 140	**SAMPLER:** 2.5" ID Cal Mod		**TOC ELEV:** 4375.33
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 6.57		**DATE:** 06-05-2013

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
0						Concrete slab	Recessed cover
					GP-SP	0.3 Brown Gravelly SAND	Top of 4"ø SCHD 40 PVC casing 12"ø hole concrete Granular bentonite: 1.5' to 2.5'
1	4374						
2							Bentonite chips: 2.5' to 3.5'
3	4372						Top of filter pack @ 3.5' No. 8 mesh Sand
4							
5	4370	S-1	25 50/4"	83	SP	5.0 Medium dense to dense, brown Gravelly SAND mild petroleum odor	Top of screen @ 5.0' 20' long screen with 0.020" slots No. 8 mesh Sand
6							
7	4368						
8					ML	8.0 increased resistance to auger; stiffer layer	
9	4366						
10		ST-1		35		Very stiff, brown, mottled SILT with Sand, weakly cemented, dry	
11	4364					Crimpled end of 3"ø x 10"L tube. Sample did not fill entire tube circumference and was lost while trying to seal tube with wax.	
12							
13	4362						



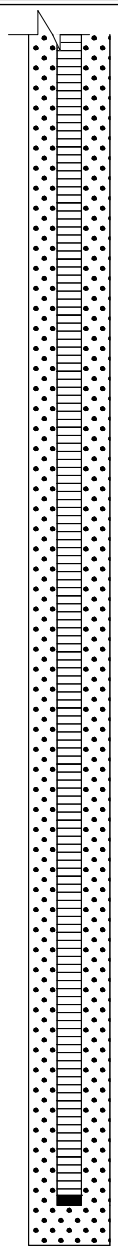
NOTES: Inital 8"ø boring enlarged with 12"ø auger prior to MW construction

Porter Geotechnical
5560 Wildwood Drive
Reno, Nevada 89511
(775) 849-0668
(775) 849-0895 FAX

Monitoring Well: **EW-3**

PROJECT: Former Gil's Gas Alturas		**PROJECT NO:** Case 250006	
CLIENT: Porter Geotechnical		**LOGGED BY:** Steve Devin	
LOCATION: Modoc Mini-Mart between diesel islands		**DRILL CO:** Diamond Core Drilling	
DRILL METHOD: Rotary - Hollow Stem Auger		**DRILLER:** Ted Olgive	
HOLE DIA. (in): 12	**TOTAL DEPTH (ft):** 25.5	**DRILL RIG:** Mobile Drill B-59	
HAMMER WT (lb): 140	**SAMPLER:** 2.5" ID Cal Mod	**TOC ELEV:** 4375.33	
HAMMER FALL (in): 30	**WATER LEVEL (ft):** 6.57	**DATE:** 06-05-2013	

Depth (ft)	Elevation (ft)	Sample Number	Blows per 6 inches	Recovery (%)	Graphic Log	USCS	Lithology and Geotechnical Testing Summary	Monitoring Well Construction and Aquifer Testing Results
14								
15	4360	S-2	26 50/5"	91		SM-ML	15.0 Dense to very dense, brown and gray, mottled, fine to medium SAND with Silt, trace Gravel, some cementation, dry to moist	
16								
17	4358							
18								
19	4356							
20								
21	4354							
22								
23	4352							
24								
25	4350	S-3	grab			SC	25.0 Medium brown Clayey SAND, moist Grab sample from auger flights	Bottom of screen @ 25.0' PVC end cap Bottom of filter pack @ 25.5'
26							25.5 Bottom of Boring @ 25.5'	

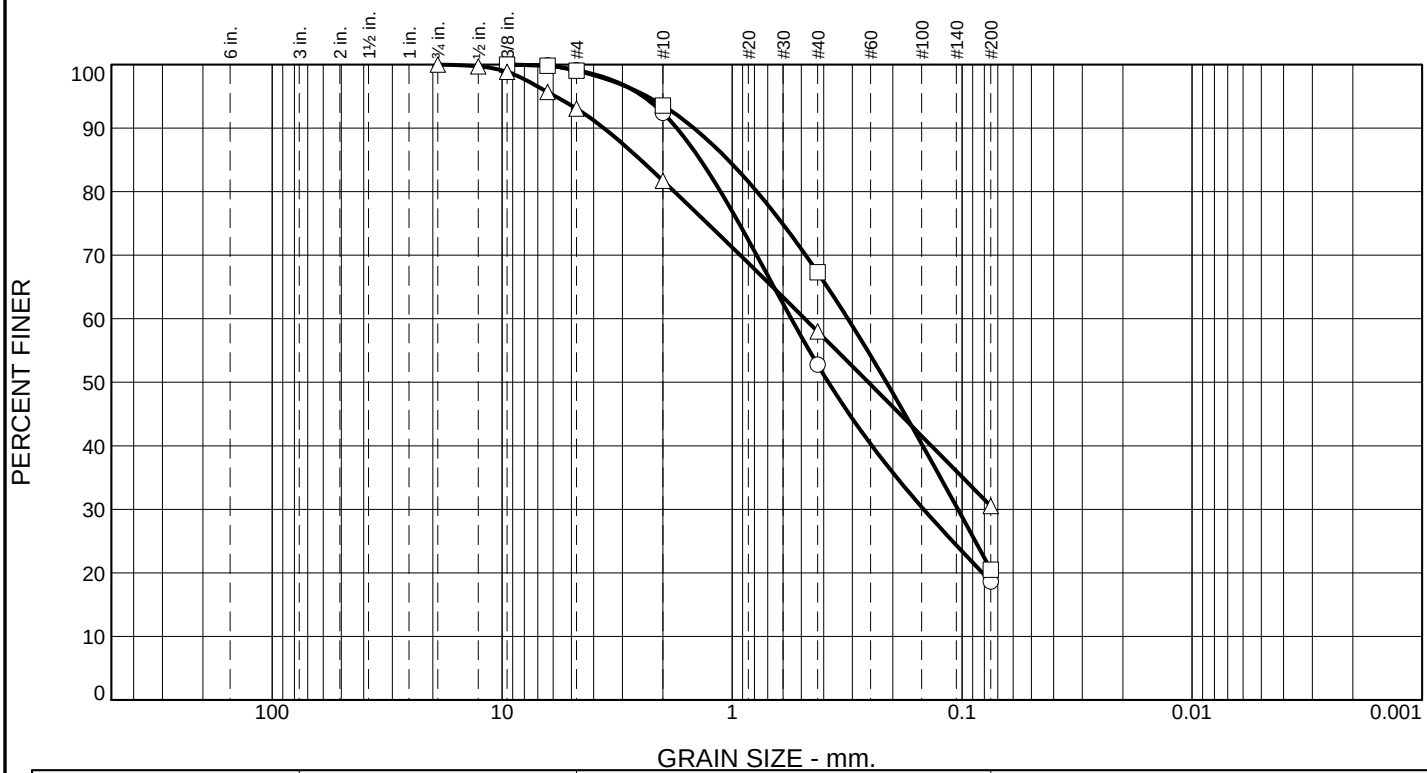


NOTES: Inital 8"ø boring enlarged with 12"ø auger prior to MW construction

APPENDIX A-2

Grain Size Distribution Curves and Plasticity Charts

Particle Size Distribution Summary



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.9	6.7	39.6	34.2	18.6	
□	0.0	0.0	1.0	5.4	26.3	46.8	20.5	
△	0.0	0.0	6.9	11.4	23.7	27.5	30.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.3730	0.5528	0.3813	0.1469				
□			1.0404	0.3138	0.2134	0.1043				
△			2.4992	0.4831	0.2556					

Material Description	USCS	AASHTO
○ Medium dense to dense, light brown , Silty fine to medium SAND, moist	SM	
□ Medium dense to dense, blue-gray, Silty fine to medium SAND, moist	SM	
△ Medium dense to dense, blue-gray, Silty fine to coarse SAND, trace tuffaceous Gravel, wet	SM	

Project No. Case 250006 **Client:** Porter Geotechnical

Project: Former Gil's Gas Alturas

○ **Source of Sample:** MW-18B **Depth:** 20.0 **Sample Number:** S-1

□ **Source of Sample:** MW-18B **Depth:** 25.0 **Sample Number:** S-2

△ **Source of Sample:** MW-18B **Depth:** 29.0 **Sample Number:** S-3

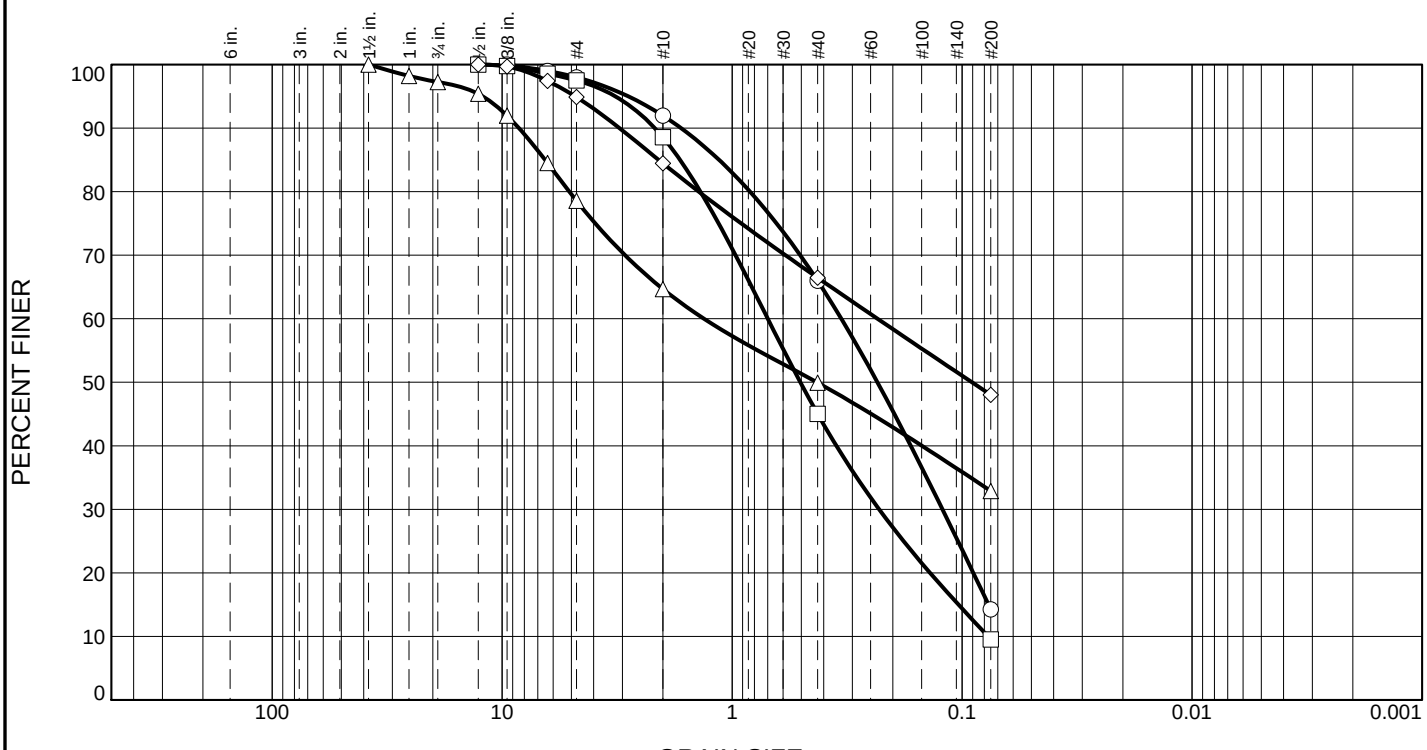
Remarks:

Steven C. Devin, P.E.
Civil and Geotechnical Engineering Services
P.O. Box 1782 ✦ Quincy, California 95971 ✦ (530) 283-2553

Figure MW-18B

Tested By: S Devin **Checked By:** SCD

Particle Size Distribution Summary



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.0	6.0	26.0	51.7	14.3	
□	0.0	0.0	2.5	8.9	43.6	35.5	9.5	
△	0.0	2.7	18.7	13.9	14.8	17.0	32.9	
◇	0.0	0.0	5.1	10.4	18.0	18.5	48.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.1391	0.3350	0.2334	0.1218	0.0767			
□			1.6835	0.6995	0.5050	0.2295	0.1037	0.0772	0.98	9.07
△			6.5052	1.3253	0.4281					
◇			2.0869	0.2333	0.0906					

Material Description	USCS	AASHTO
○ Dense to very dense, brown, Silty SAND, fine to medium, wet	SM	
□ Dense to very dense, brown, medium to coarse poorly graded SAND with Silt, wet	SP-SM	
△ Very dense, olive-gray Clayey SAND with fine tuffaceous Gravel, wet	SM	
◇ Very dense, olive-gray Silty SAND, wet	SM-ML	

Project No. Case 250006 **Client:** Porter Geotechnical

Project: Former Gil's Gas Alturas

○ **Source of Sample:** MW-19B **Depth:** 12.5 **Sample Number:** S-6

□ **Source of Sample:** MW-19B **Depth:** 14.0 **Sample Number:** S-7

△ **Source of Sample:** MW-19B **Depth:** 27.0 **Sample Number:** S-12

◇ **Source of Sample:** MW-19B **Depth:** 29.0 **Sample Number:** S-13

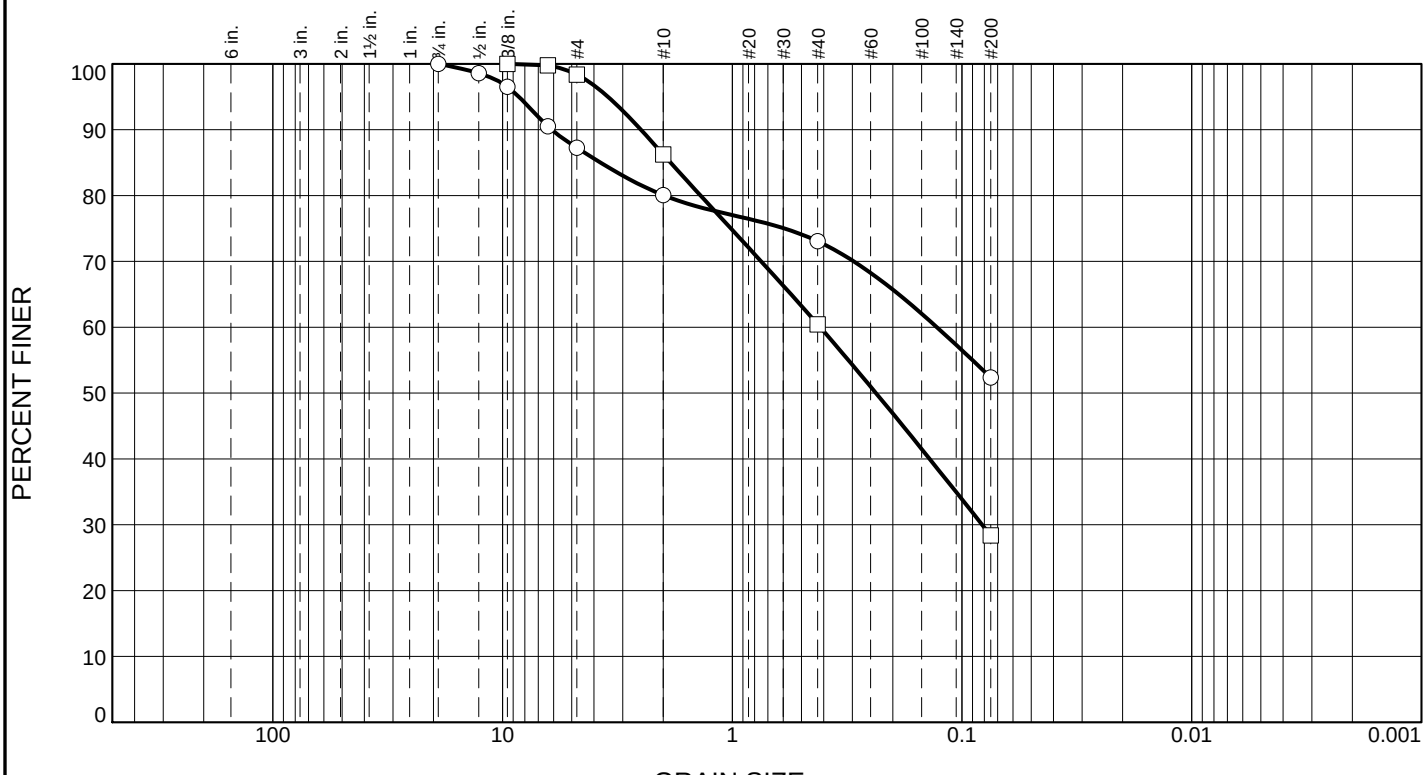
Remarks:

Steven C. Devin, P.E.
Civil and Geotechnical Engineering Services
P.O. Box 1782 ✦ Quincy, California 95971 ✦ (530) 283-2553

Figure MW-19B

Tested By: S Devin

Particle Size Distribution Summary



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	12.7	7.2	7.0	20.7	52.4	
□	0.0	0.0	1.6	12.2	25.8	32.0	28.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.7497	0.1287						
□			1.8575	0.4147	0.2370	0.0817				

Material Description	USCS	AASHTO
○ Medium dense, light brown, Sandy SILT, dry to moist	ML	
□ Medium dense to dense, brown, Silty fine SAND, moist	SM	

Project No. Case **Client:** Porter Geotechnical

Project: Former Gil's Gas Alturas

○ **Source of Sample:** EW-2 **Depth:** 15.0 **Sample Number:** S-2

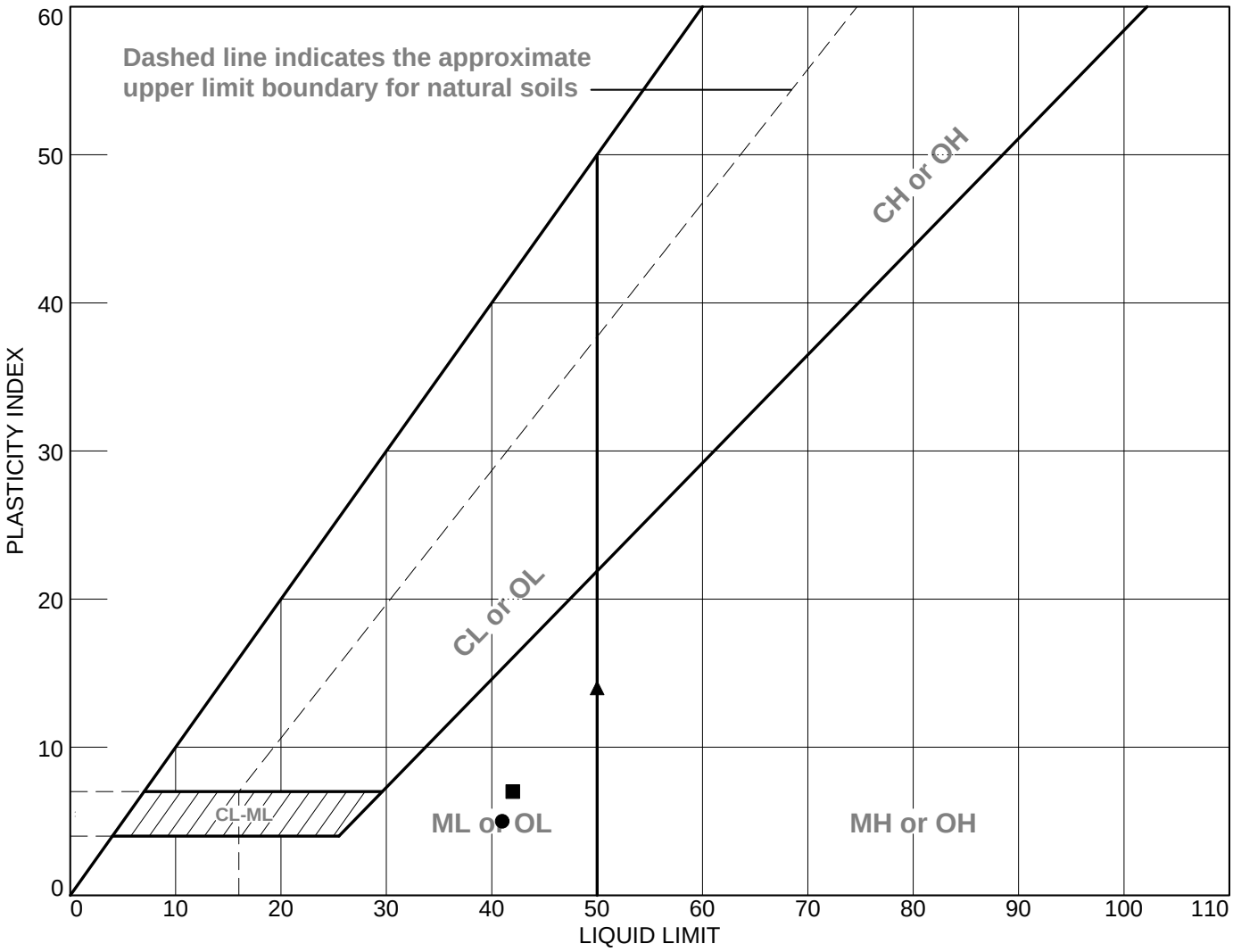
□ **Source of Sample:** EW-2 **Depth:** 20.0 **Sample Number:** S-3

Remarks:

Steven C. Devin, P.E.
Civil and Geotechnical Engineering Services
P.O. Box 1782 ✦ Quincy, California 95971 ✦ (530) 283-2553

Figure EW-2

Atterberg Limits Summary



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	MW-18A	S-1B	5.5		36	41	5	ML
■	MW-18A	S-2	6.5	45.5	35	42	7	
▲	MW-18A	S-3A	9.0		36	50	14	SM

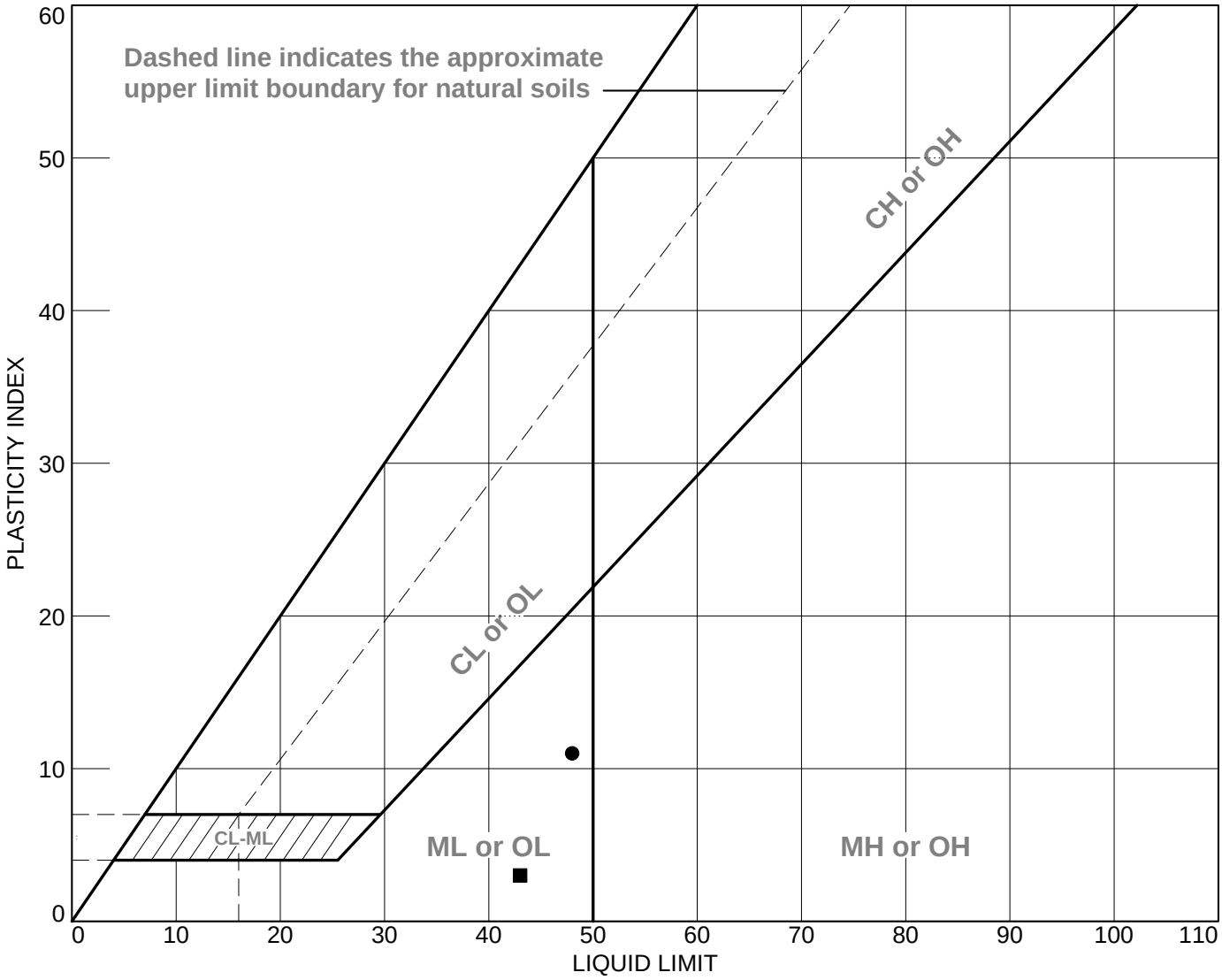
Steven C. Devin, P.E.
Civil and Geotechnical Engineering Services
P.O. Box 1782 ✦ Quincy, California 95971 ✦ (530) 283-2553

Client: Porter Geotechnical
Project: Former Gil's Gas Alturas

Project No.: Case 250006 **Figure** MW-18A

Tested By: S Devin **Checked By:** SCD

Atterberg Limits Summary



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	MW-19B	S-3	8.0		37	48	11	
■	MW-19B	S-8	20.0	43.1	40	43	3	

Steven C. Devin, P.E.
Civil and Geotechnical Engineering Services
P.O. Box 1782 ✦ Quincy, California 95971 ✦ (530) 283-2553

Client: Porter Geotechnical
Project: Former Gil's Gas Alturas

Project No.: Case 250006 **Figure** MW-19B

APPENDIX A-3

Laboratory Hydraulic Conductivity Test Results

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

June 20, 2013

Porter Geotechnical, Ltd.
Attn Chip Porter
5560 Wildwood Drive
Reno, NV 89511

STL Project No:	**13-058**
Subject:	**Gil's Shell** **123 West St., Alturas, CA**
Project No:	**2145.1**
Invoice No:	**10059**

LABORATORY TEST RESULTS

Dear Mr. Hutchinson:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **nine samples** of material from the subject site. The samples were identified as:

1. **EW-2 @ 25.5-25'**
2. **MW-19B @ 24-25'**
3. **MW-19B @ 20-21.5'**
4. **MW-19B @ 23.5-24'**
5. **MW-19B @ 6.5-8'**
6. **MW-19B @ 29.5-30'**
7. **MW-19B @ 25-26.5'**
8. **MW-18A @ 8.4-9'**
9. **EW-2 @ 21-21.5'**

Our laboratory received the samples on **June 10, 2013**. The test performed on six of the submitted sample was as follows:

1. **Flexible Wall Permeability 1.4"-3.0" sample diameter(D5084)**

The results of the above referenced testing are presented on the attached figure(s).

We appreciate the opportunity to be of service to you on this project and look forward to providing additional service, as needed, in the future.

Should you have any questions or require additional information, please contact our office at your convenience.

Respectfully submitted,

Michael Walker
Project Manager
Enclosure(s)/ jo

5040 Robert J. Mathews, Suite 1, El Dorado Hills, CA 95762 (916) 939-3460 Fax (916) 939-3507
www.sierratestinglaboratories.com

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: MW-19B
Visual Description: N/A
Remarks:

Sample Depth, ft.: 25-26.5'
Sample Type: Liner

Lab No.: S41643

TEST RESULTS

Permeability, cm/sec.: 8.47E-07

Average Hydraulic Gradient: 13.5

Effective Cell Pressure, psi: 10

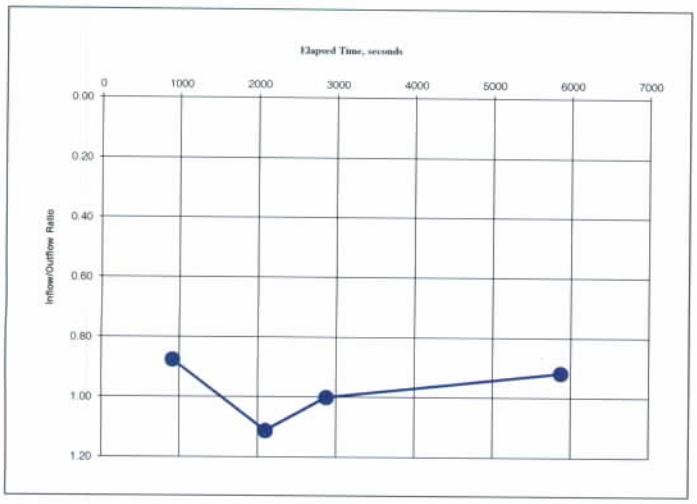
TEST SAMPLE DATA

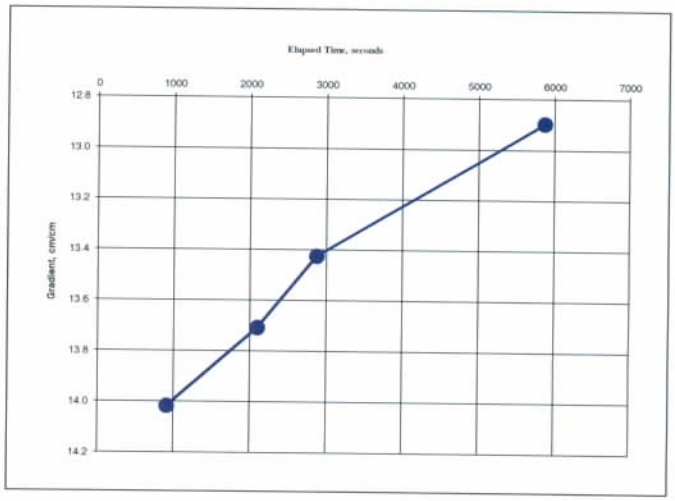
Before Test

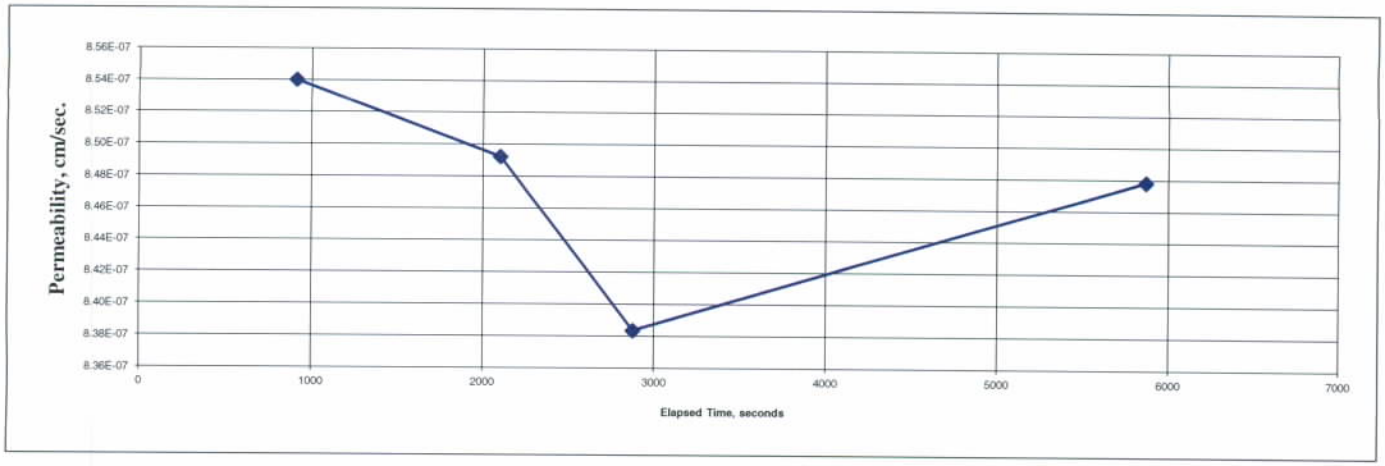
Specimen Height, cm: 5.56
Specimen Diameter, cm: 4.83
Dry Unit Weight, pcf: 80.8
Moisture Content, % 38.5

After Test

Specimen Height, cm: 5.49
Specimen Diameter, cm: 4.83
Dry Unit Weight, pcf: 85.5
Moisture Content, % 40.2







Test Method: ASTM D5084 Method C

PROJECT NUMBER:	13-058	June 11, 2013

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

5040 Robert J. Mathews Blvd., El Dorado Hills, CA 95762
Phone: (916) 939-3460 FAX: (916) 939-3507

Gil's Shell

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: MW-18A
Visual Description: N/A
Remarks:

Sample Depth, ft.: 8.4-9'
Sample Type: Liner

Lab No.: S41644

TEST RESULTS

Permeability, cm/sec.: 7.81E-07

Average Hydraulic Gradient: 23.9

Effective Cell Pressure, psi: 10

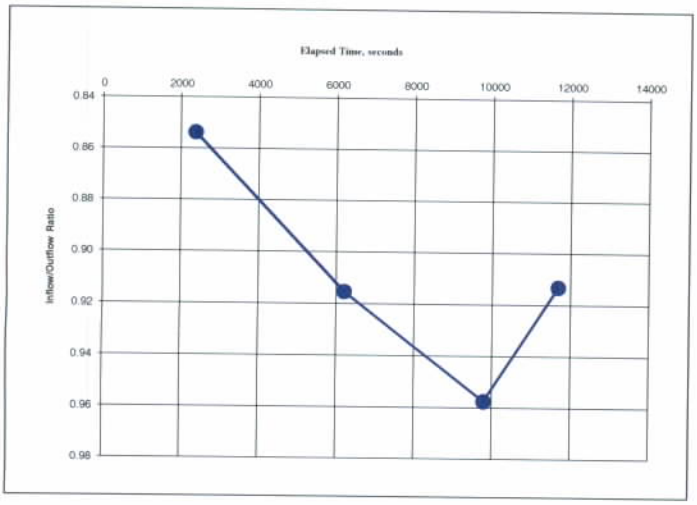
TEST SAMPLE DATA

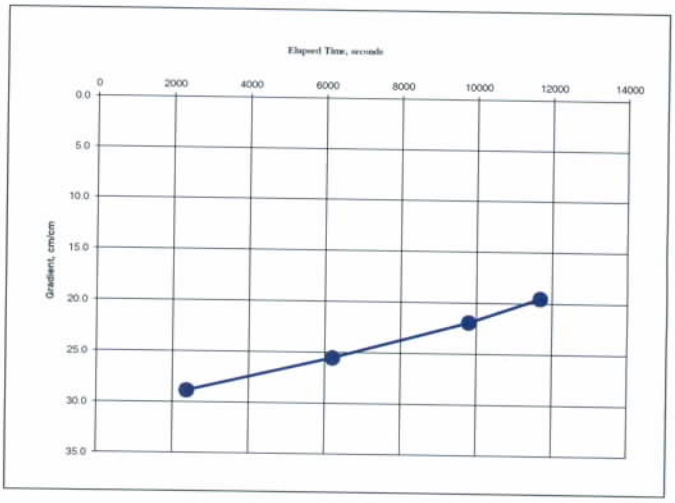
Before Test

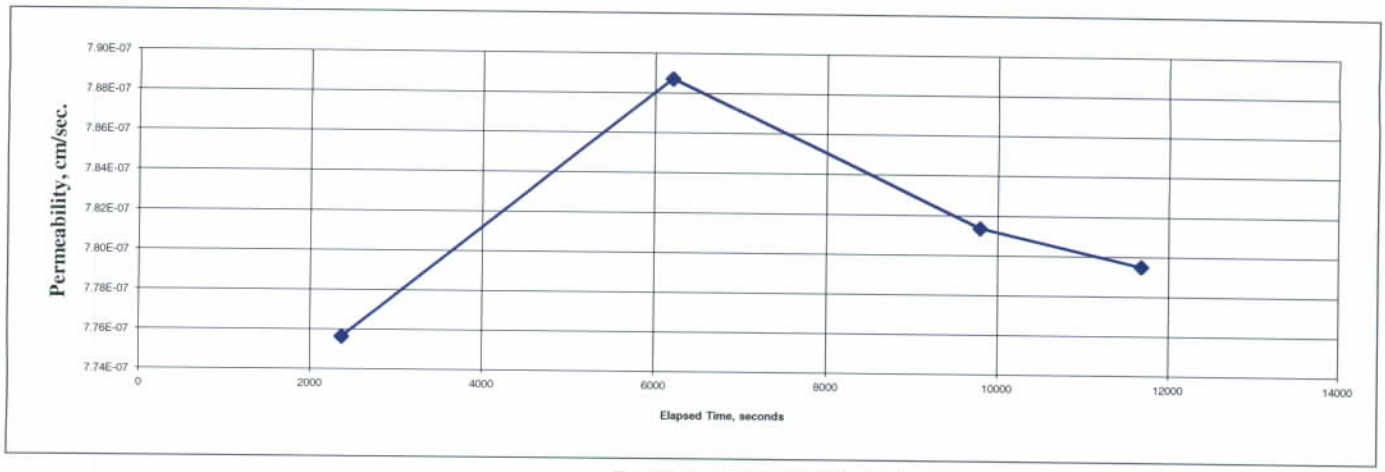
Specimen Height, cm: 2.97
Specimen Diameter, cm: 4.83
Dry Unit Weight, pcf: 73.8
Moisture Content, % 45.5

After Test

Specimen Height, cm: 2.84
Specimen Diameter, cm: 4.83
Dry Unit Weight, pcf: 76.3
Moisture Content, % 46.6







Test Method: ASTM D5084 Method C

PROJECT NUMBER:	13-058	June 11, 2013

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GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Gil's Shell

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: EW-2
Visual Description: N/A
Remarks:

Sample Depth, ft.: 21-21.5'
Sample Type: Liner

Lab No.: S41645

TEST RESULTS

Permeability, cm/sec.: 6.09E-06

Average Hydraulic Gradient: 11.8

Effective Cell Pressure, psi: 10

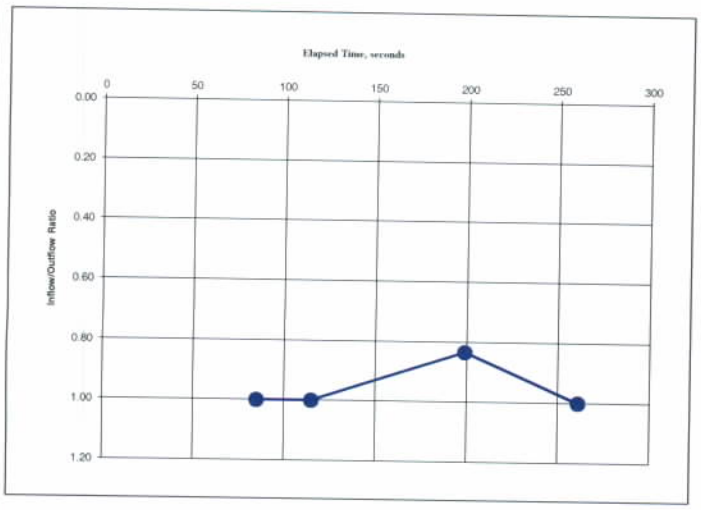
TEST SAMPLE DATA

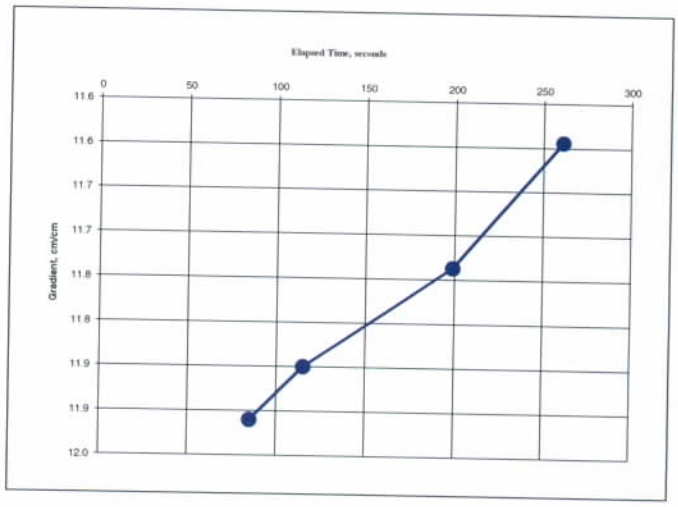
Before Test

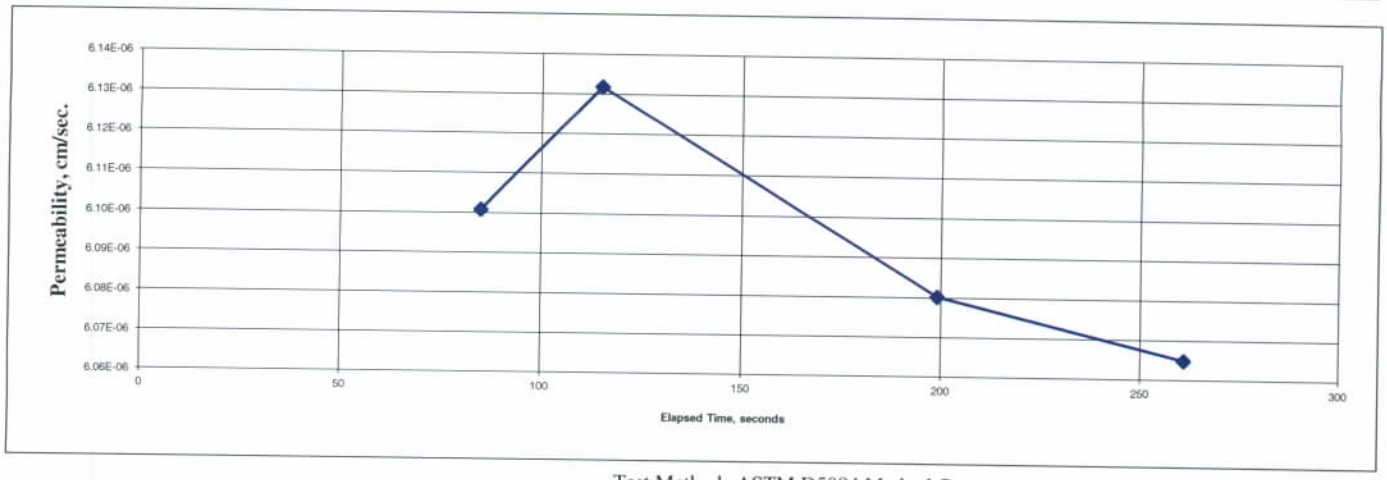
Specimen Height, cm: 6.83
Specimen Diameter, cm: 5.92
Dry Unit Weight, pcf: 80.8
Moisture Content, % 40.9

After Test

Specimen Height, cm: 6.65
Specimen Diameter, cm: 5.92
Dry Unit Weight, pcf: 82.6
Moisture Content, % 41.3







Test Method: ASTM D5084 Method C

PROJECT NUMBER:	13-058	June 11, 2013

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GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Gil's Shell

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: EW-2
Visual Description: N/A
Remarks:

Sample Depth, ft.: 25.5-25'
Sample Type: Liner

Lab No.: S41637

TEST RESULTS

Permeability, cm/sec.: 5.86E-05

Average Hydraulic Gradient: 8.7

Effective Cell Pressure, psi: 10

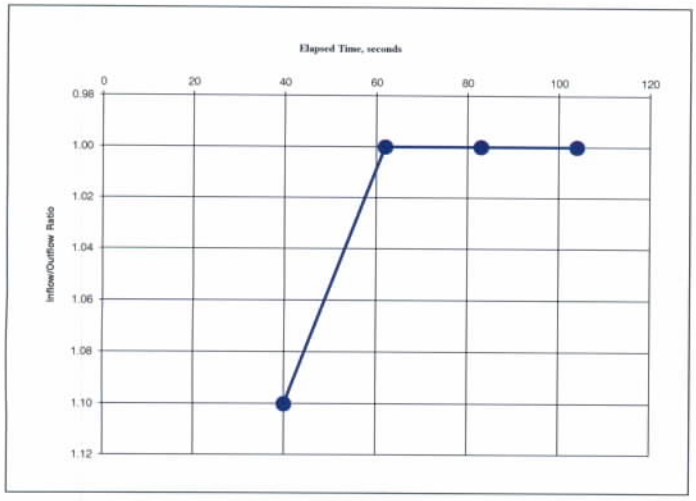
TEST SAMPLE DATA

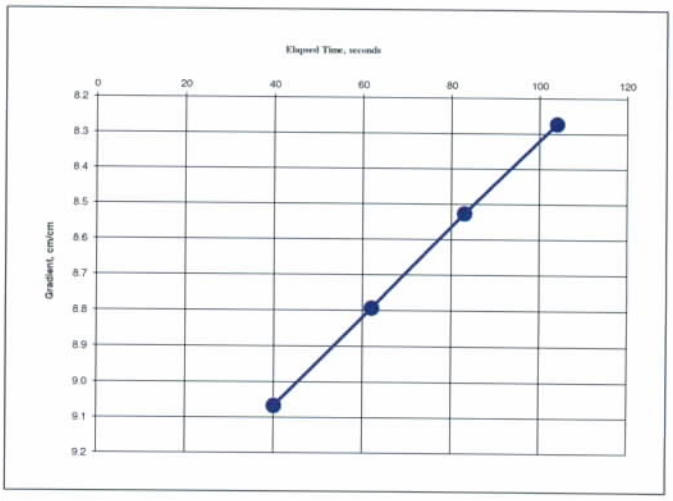
Before Test

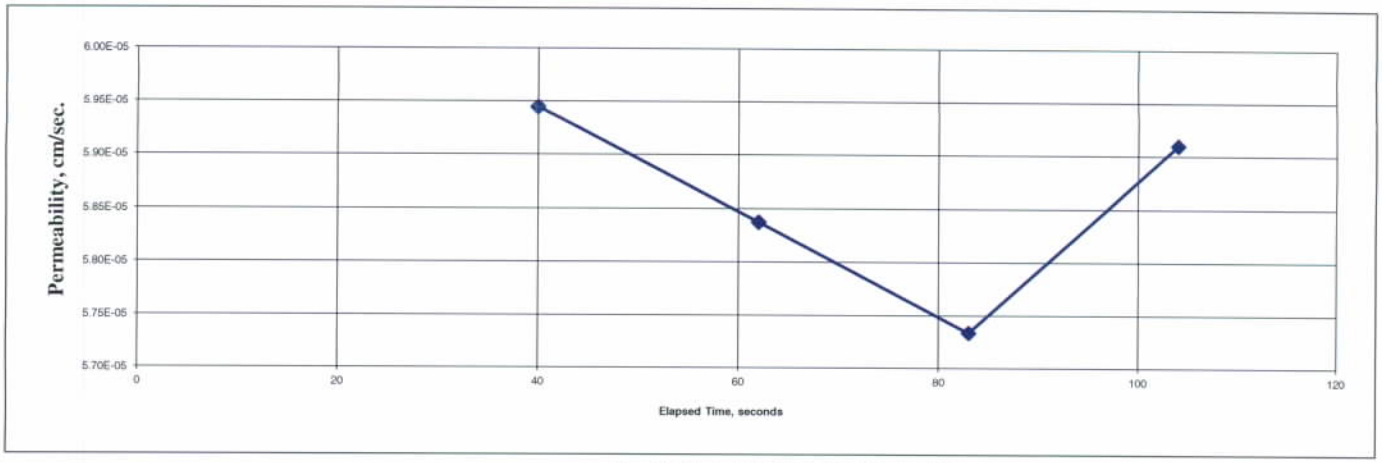
Specimen Height, cm: 8.00
Specimen Diameter, cm: 6.10
Dry Unit Weight, pcf: 72.8
Moisture Content, % 47.9

After Test

Specimen Height, cm: 7.87
Specimen Diameter, cm: 6.10
Dry Unit Weight, pcf: 73.0
Moisture Content, % 48.2







Test Method: ASTM D5084 Method C

PROJECT NUMBER:	13-058	June 11, 2013

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GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Gil's Shell

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: MW-19B
Visual Description: N/A
Remarks:

Sample Depth, ft.: 20-21.5'
Sample Type: Liner

Lab No.: S41639

TEST RESULTS

Permeability, cm/sec.: 3.33E-07

Average Hydraulic Gradient: 12.8

Effective Cell Pressure, psi: 10

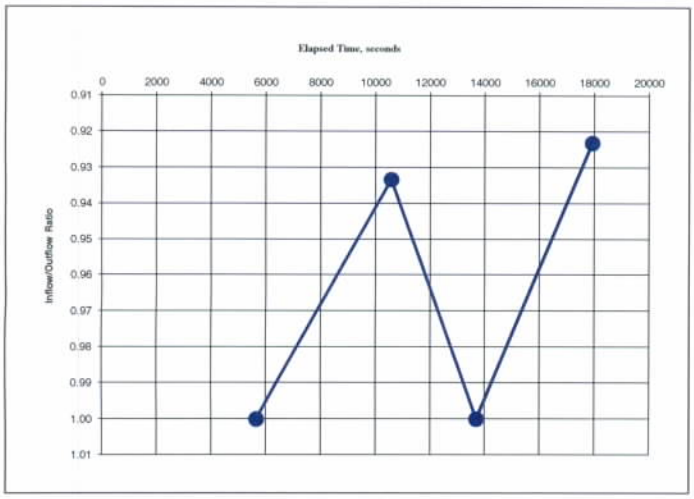
TEST SAMPLE DATA

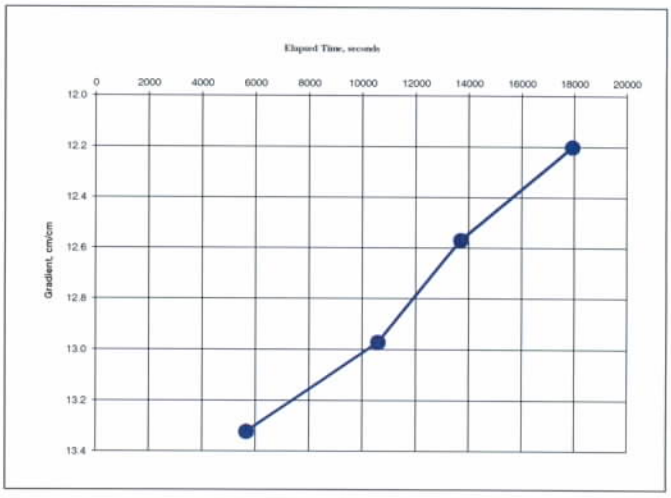
Before Test

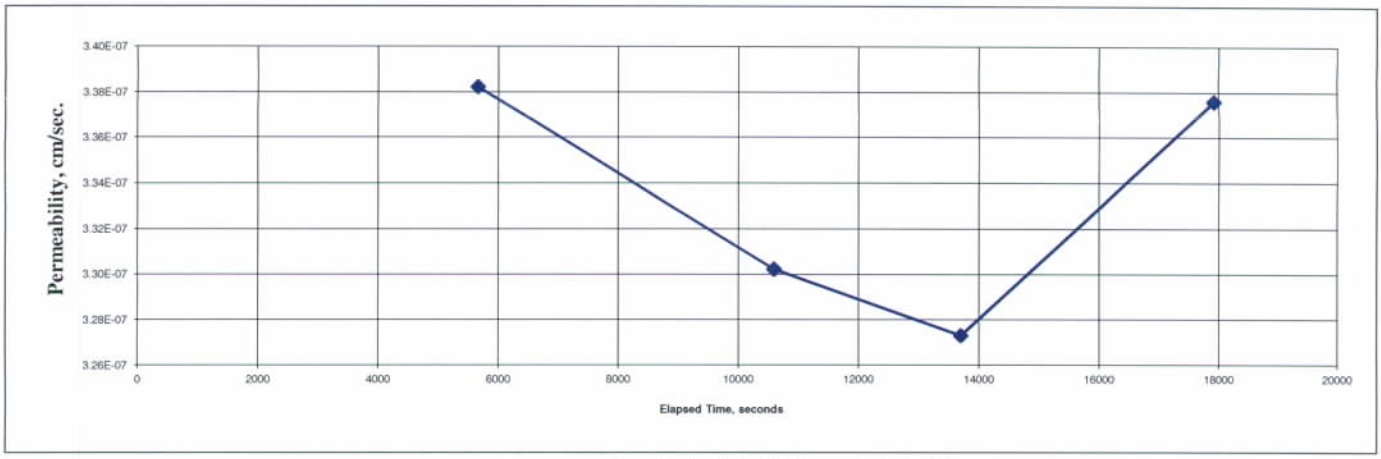
Specimen Height, cm: 5.84
Specimen Diameter, cm: 4.83
Dry Unit Weight, pcf: 74.8
Moisture Content, % 43.1

After Test

Specimen Height, cm: 5.84
Specimen Diameter, cm: 4.83
Dry Unit Weight, pcf: 73.8
Moisture Content, % 45.1







Test Method: ASTM D5084 Method C

PROJECT NUMBER:	13-058	June 11, 2013

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GEOTECHNICAL AND MATERIALS TESTING SERVICES

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Gil's Shell

HYDRAULIC CONDUCTIVITY TEST REPORT

SAMPLE DATA

Sample Identification: MW-19B
Visual Description: N/A
Remarks:

Sample Depth, ft.: 6.5-8'
Sample Type: Liner

Lab No.: S41641

TEST RESULTS

Permeability, cm/sec.: 1.13E-06

Average Hydraulic Gradient: 17.9

Effective Cell Pressure, psi: 10

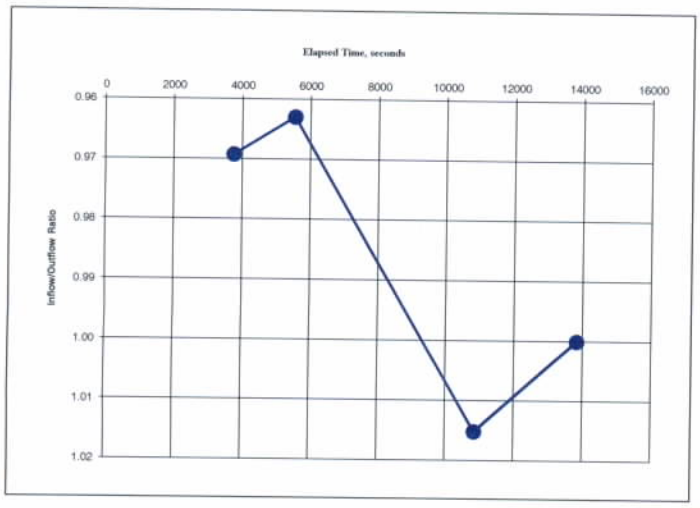
TEST SAMPLE DATA

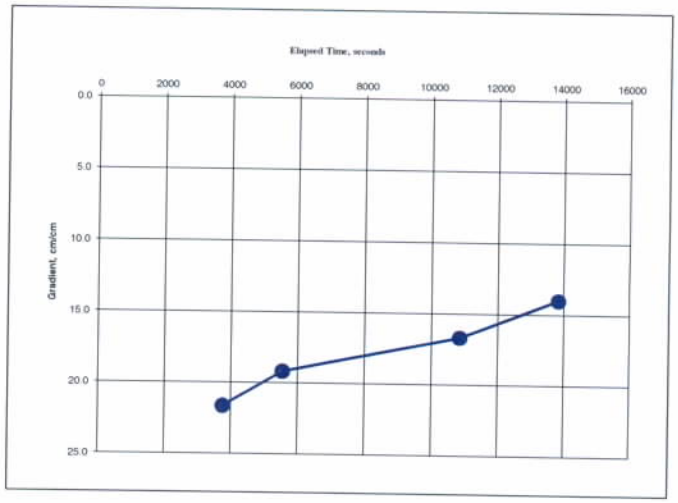
Before Test

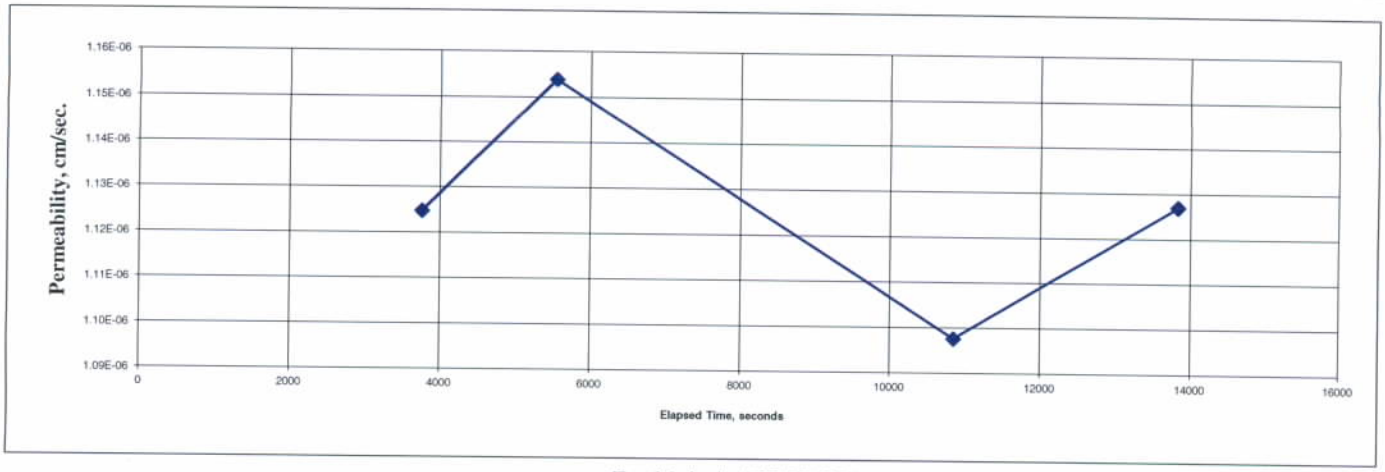
Specimen Height, cm: 3.76
Specimen Diameter, cm: 4.83
Dry Unit Weight, pcf: 78.9
Moisture Content, % 37.0

After Test

Specimen Height, cm: 3.71
Specimen Diameter, cm: 4.83
Dry Unit Weight, pcf: 80.9
Moisture Content, % 41.2







Test Method: ASTM D5084 Method C

PROJECT NUMBER:	13-058	June 11, 2013

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GEOTECHNICAL AND MATERIALS TESTING SERVICES

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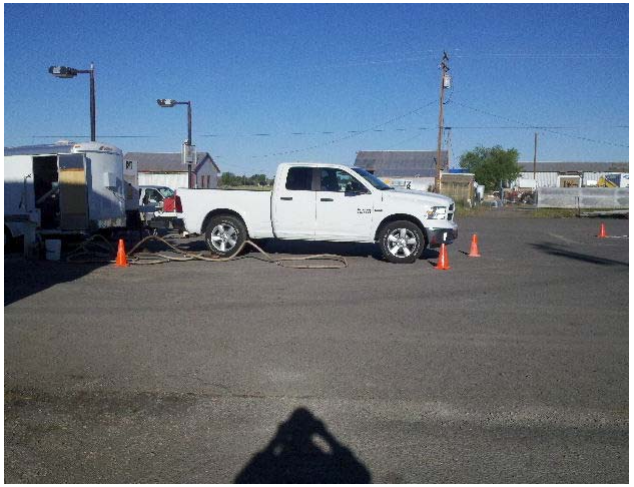
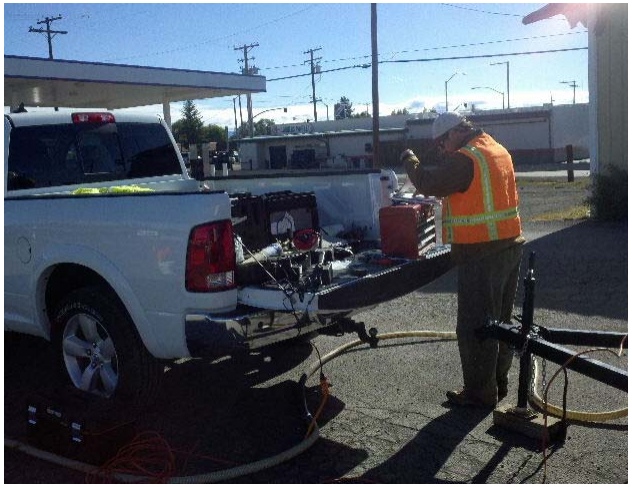
Gil's Shell

APPENDIX A-4

Photographs of the Site Testing Work





APPENDIX A-5

Aquifer Constant Discharge Pumping Test Solutions and Analysis Reports

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Consulting Engineer
P.O. Box 1782
Quincy, California 95971
(530) 251-7087
Devin.Geotech@gmail.com

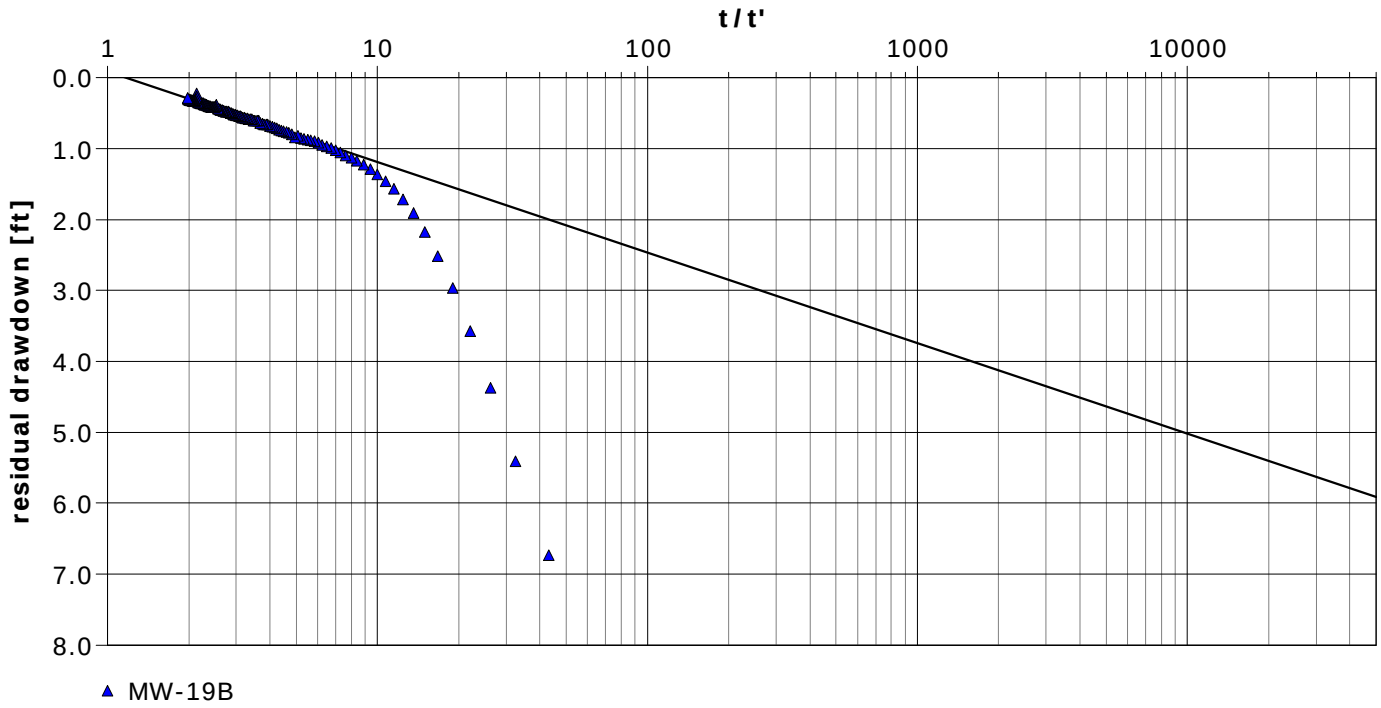
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19B Theis Recovery	Analysis Date: 6/22/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using THEIS & JACOB

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Radial Distance to PW [ft]	
MW-19B	1.89×10^{1}	1.89×10^{0}	0.2	

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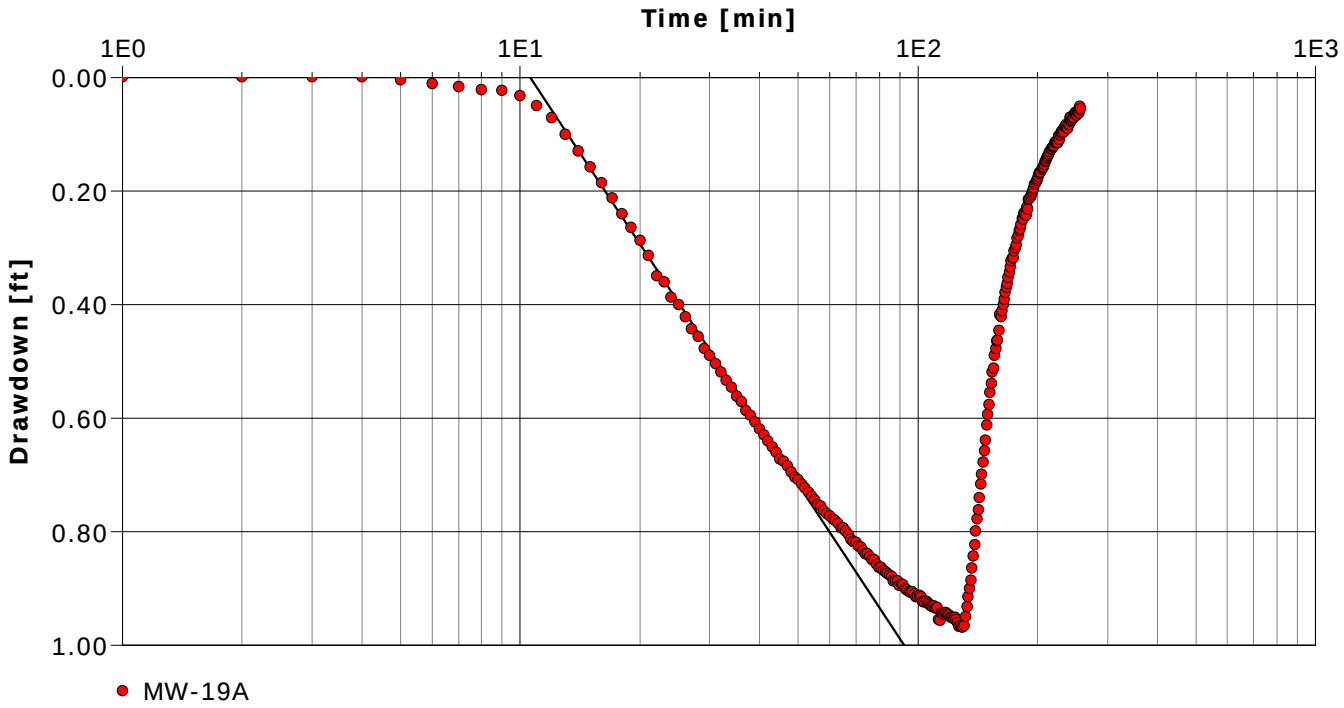
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19A Copper & Jacob I	Analysis Date: 6/24/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using COOPER & JACOB

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-19A	2.26×10^{1}	2.26×10^{0}	2.34×10^{-2}	4.0	

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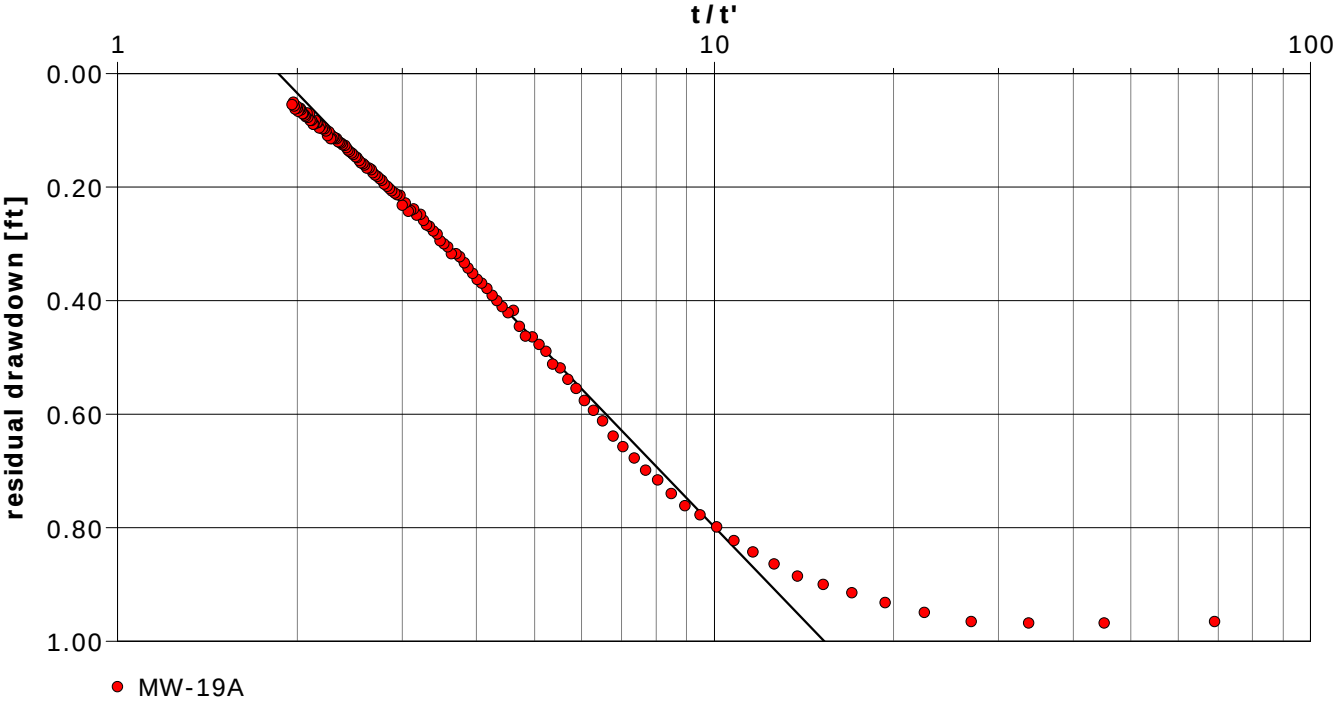
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19A Theis Recovery	Analysis Date: 7/3/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using THEIS & JACOB

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Radial Distance to PW [ft]	
MW-19A	2.20×10^{1}	2.20×10^{0}	4.0	

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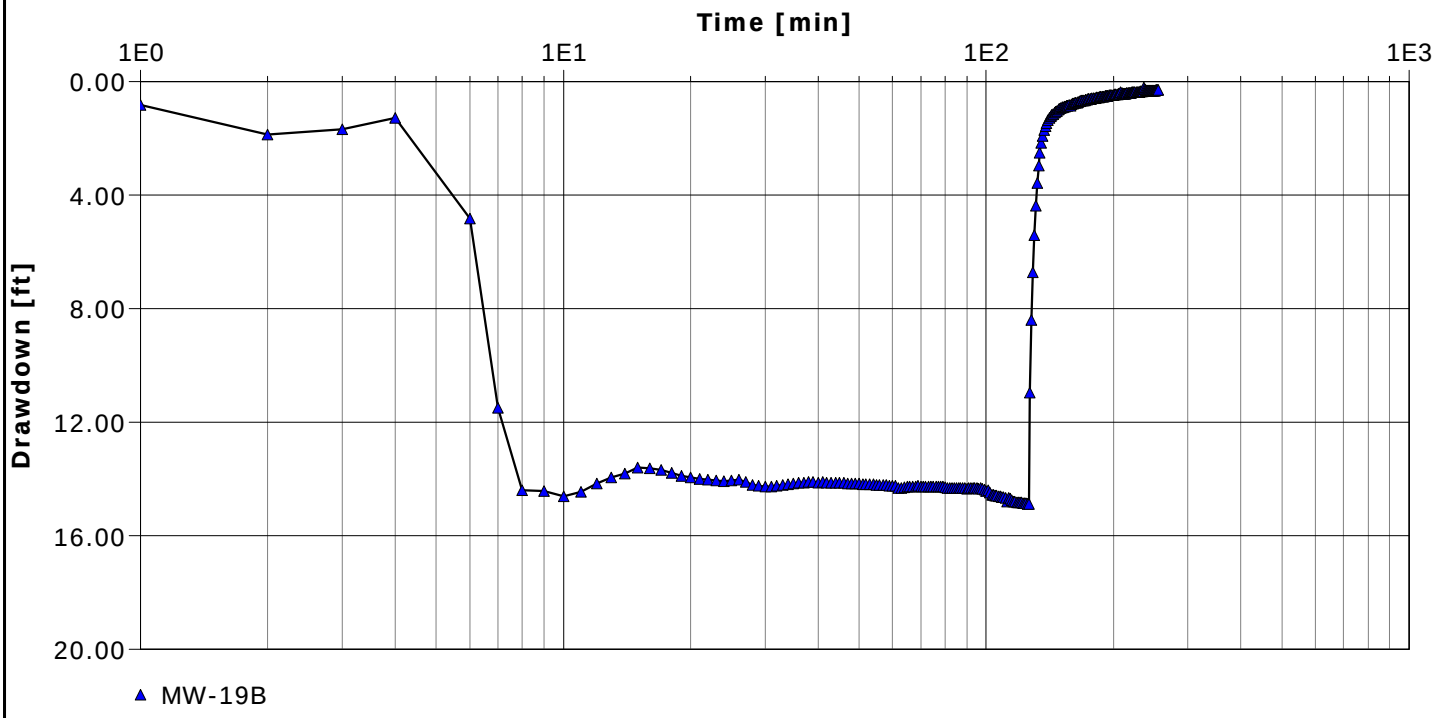
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by:	Time-Drawdown	Analysis Date: 7/6/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



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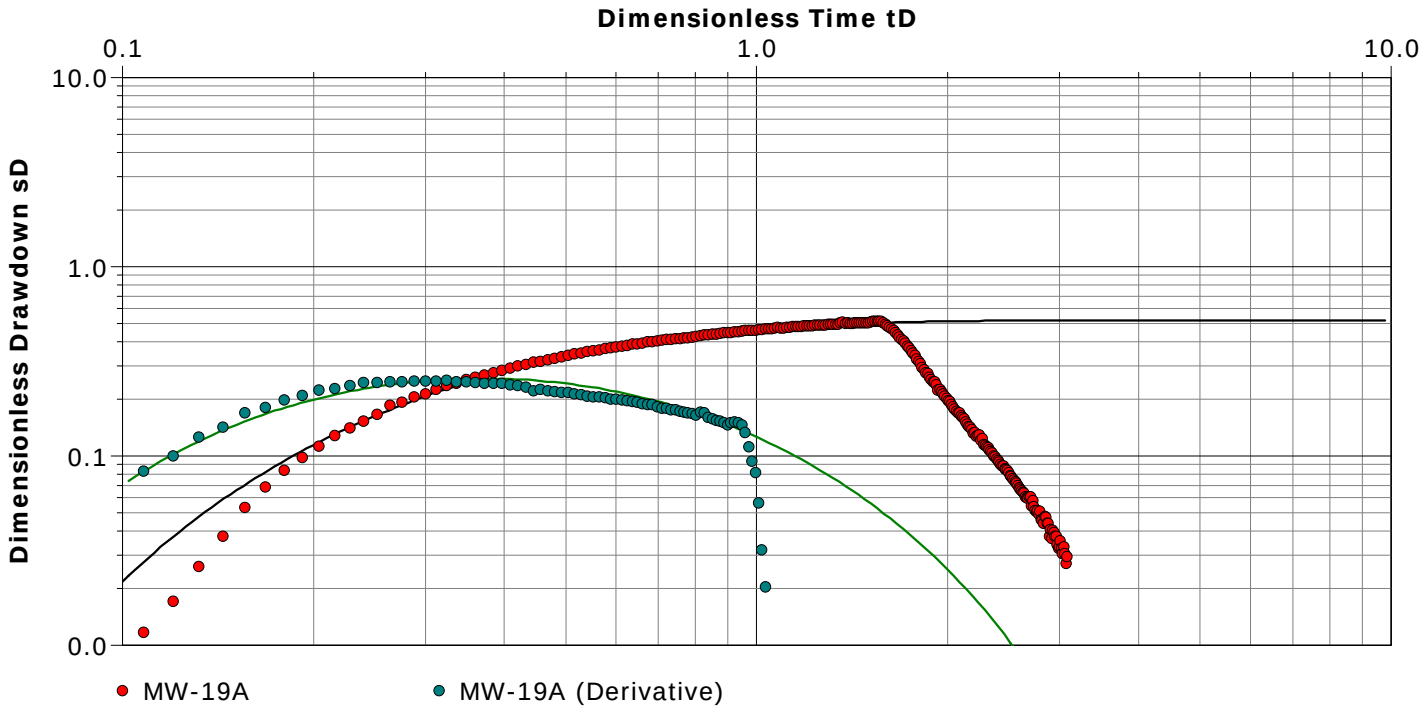
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19A Hantush Leaky - Derivative	Analysis Date: 7/6/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using Hantush

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Hydr. resistance [min]	Leakage factor [ft]	Radial Distance to PW [ft]
MW-19A	5.57×10^{0}	5.57×10^{-1}	2.01×10^{-2}	2.27×10^{3}	2.96124576931063	4.0

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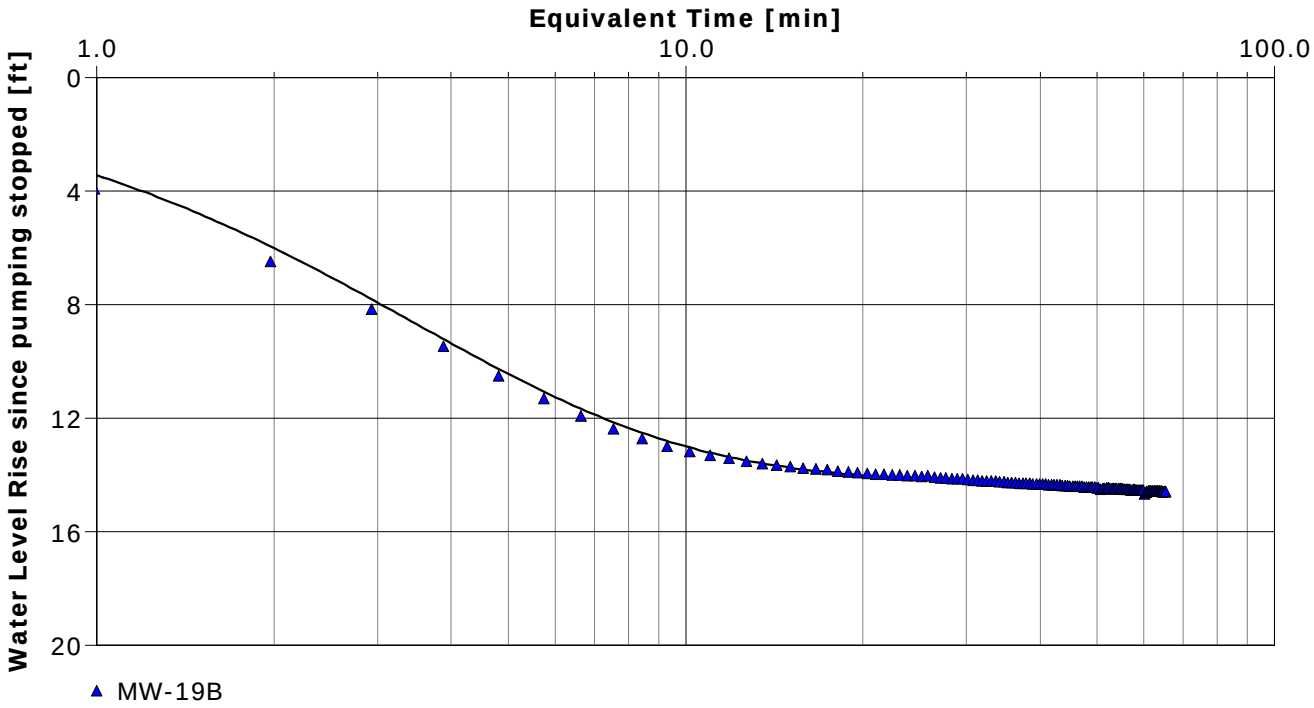
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19B Agarwal Recovery	Analysis Date: 6/22/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using AGARWAL + Agarwal skin

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Skin factor	Radial Distance to PW [ft]	
MW-19B	2.82×10^{1}	2.82×10^{0}	1.85×10^{1}	0.2	

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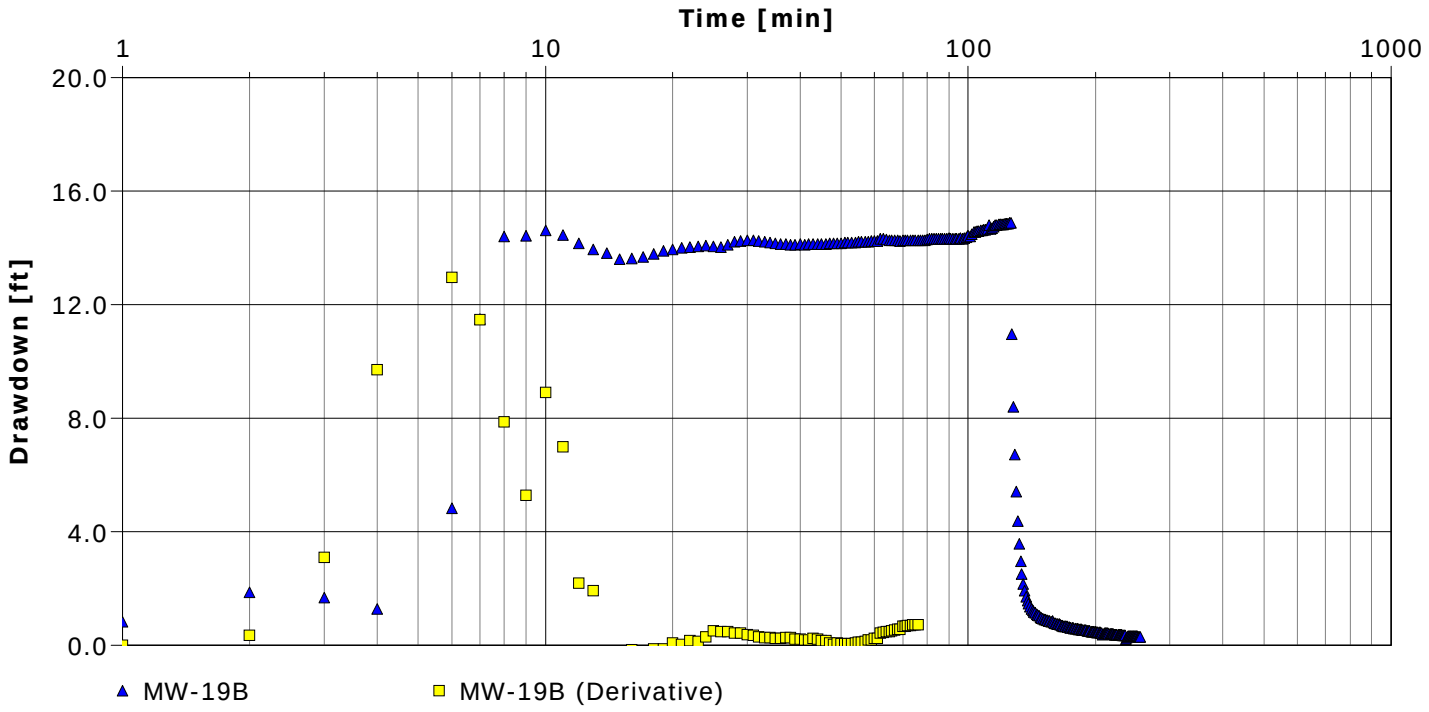
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19B Diagnostic Semi-log	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using Theis

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-19B	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}	0.2	

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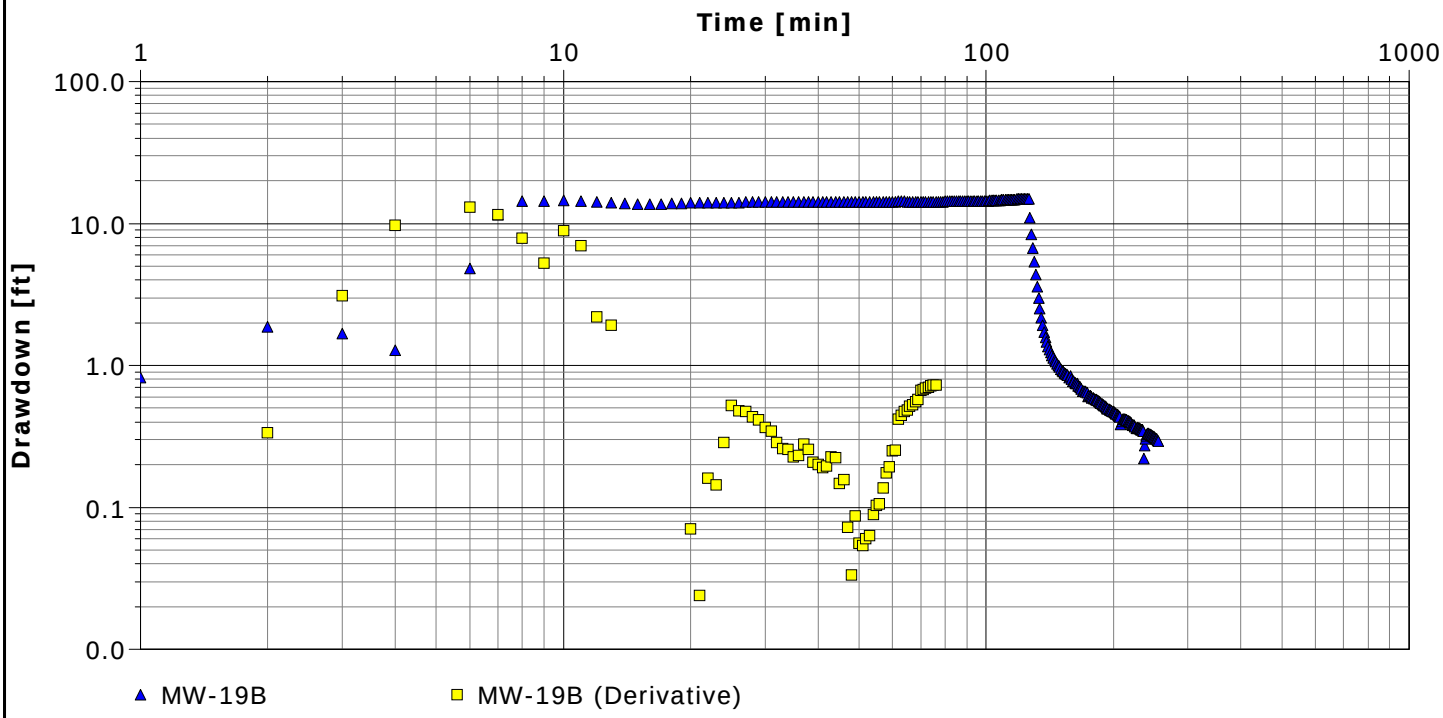
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19B Diagnostic log-log	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using Theis

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-19B	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}	0.2	

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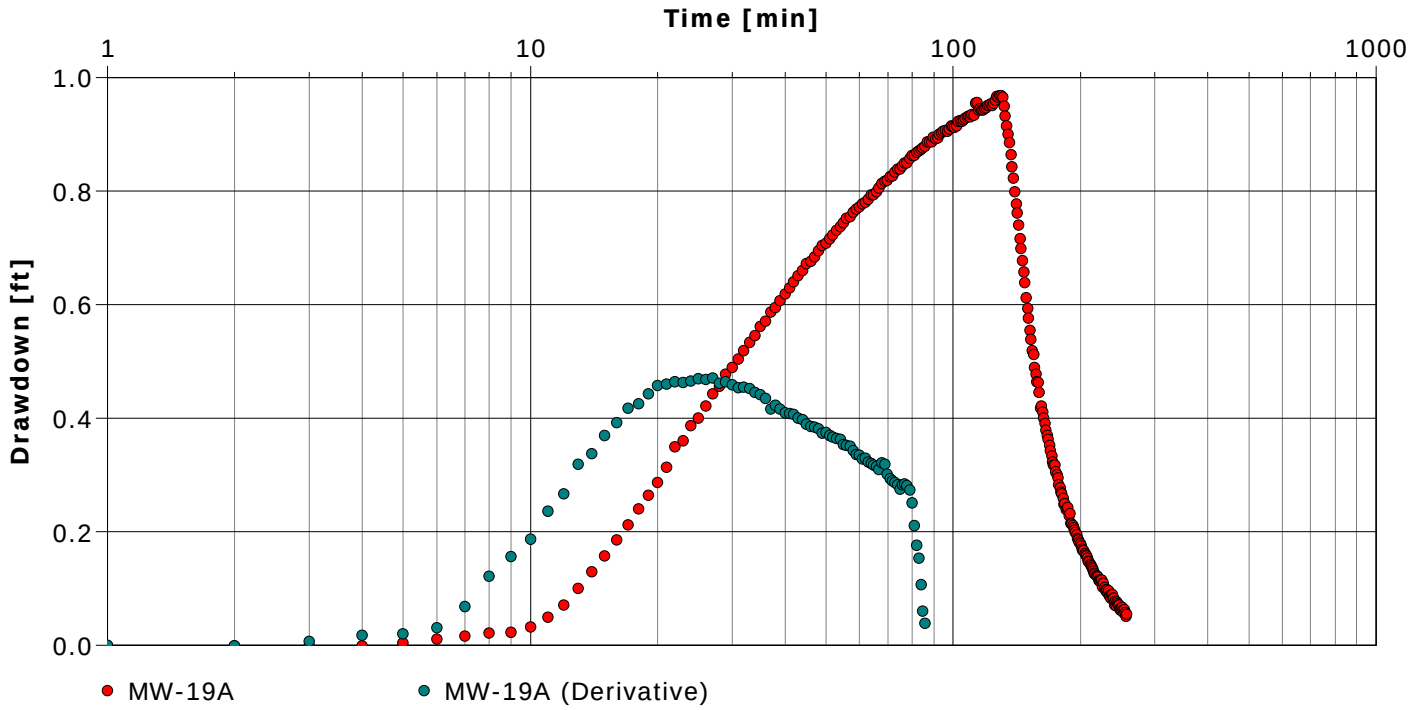
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19A Diagnostic Semi-log	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using Theis

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-19A	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}	4.0	

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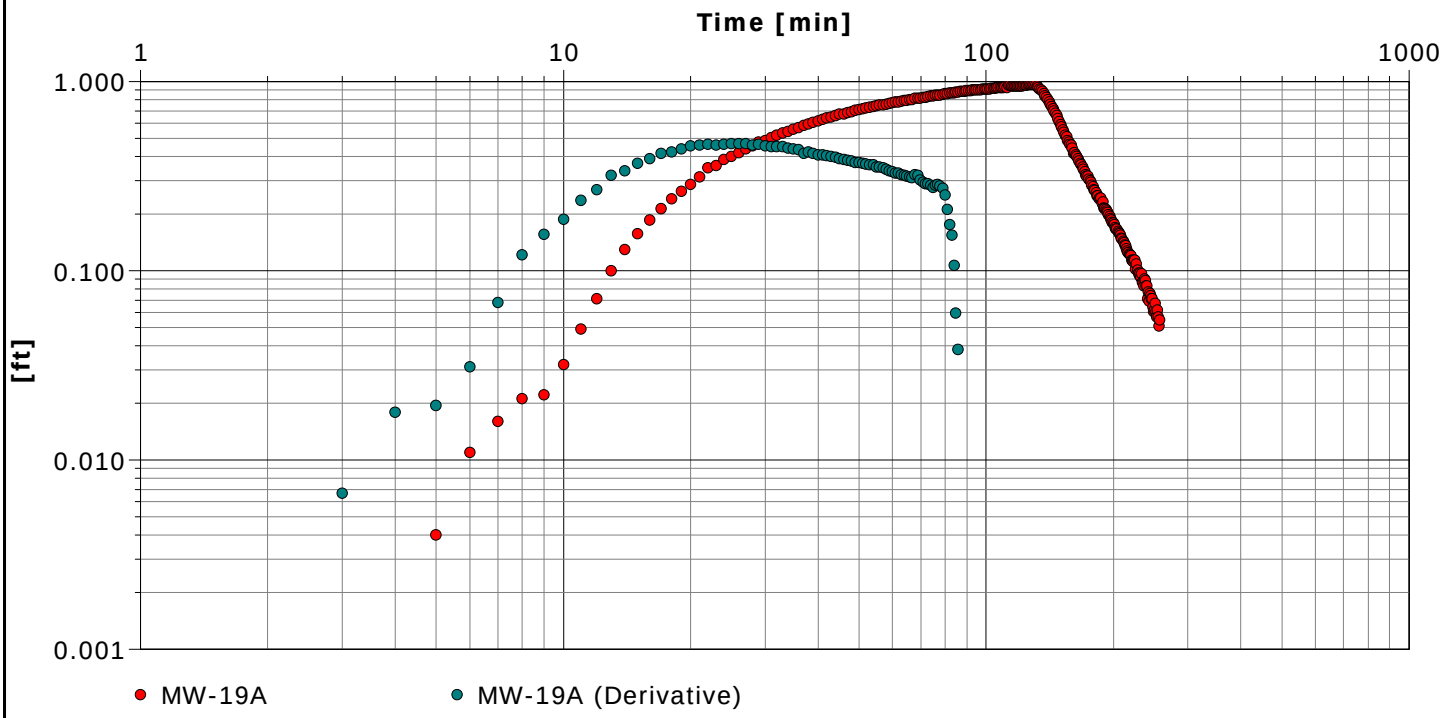
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Analysis Performed by: S Devin	MW-19A Diagnostic Log-log	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	



Calculation using Theis

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-19A	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}	4.0	

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Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-19B Pumped	Pumping Well: MW-19B
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/12/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.68238 [U.S. gal/min]	

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [ft²/d]	K [ft/d]	S
1	MW-19B Theis Recovery	S Devin	6/22/2013	Theis Recovery	MW-19B	1.89×10^{1}	1.89×10^{0}	
2	MW-19A Copper & Jacob I	S Devin	6/24/2013	Cooper & Jacob I	MW-19A	2.26×10^{1}	2.26×10^{0}	2.34×10^{-2}
3	MW-19A Theis Recovery	S Devin	7/3/2013	Theis Recovery	MW-19A	2.20×10^{1}	2.20×10^{0}	
4	MW-19A Hantush Leaky - Derivative	S Devin	7/6/2013	Hantush	MW-19A	5.57×10^{0}	5.57×10^{-1}	2.01×10^{-2}
5	MW-19B Agarwal Recovery	S Devin	6/22/2013	AGARWAL + Agarwal skin	MW-19B	2.82×10^{1}	2.82×10^{0}	1.04×10^{0}
6	MW-19B Diagnostic Semi-log	S Devin	9/23/2013	Theis	MW-19B	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}
7	MW-19B Diagnostic log-log	S Devin	9/23/2013	Theis	MW-19B	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}
8	MW-19A Diagnostic Semi-log	S Devin	9/23/2013	Theis	MW-19A	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}
9	MW-19A Diagnostic Log-log	S Devin	9/23/2013	Theis	MW-19A	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}
					Average	4.24×10^{2}	4.24×10^{1}	1.55×10^{-1}

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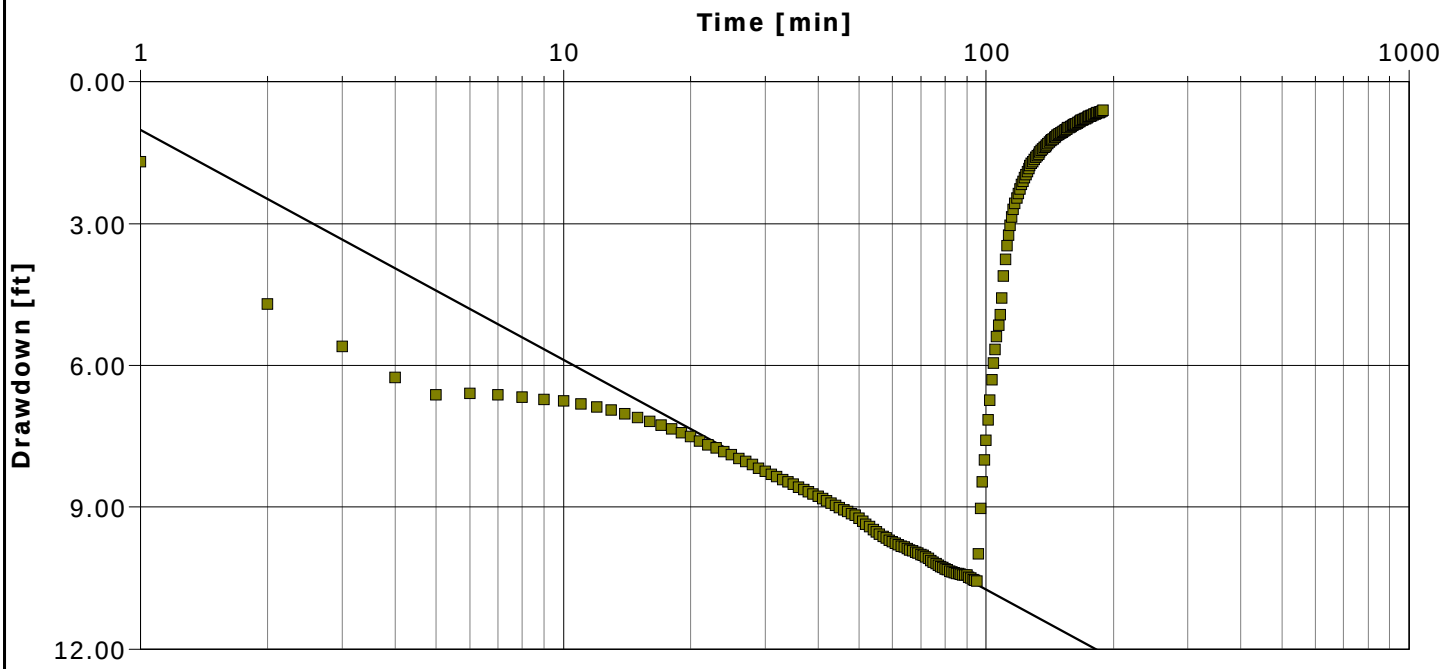
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Cooper & Jacob I	Analysis Date: 6/25/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



Calculation using COOPER & JACOB

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-18B	2.83×10^{0}	2.83×10^{-1}	6.73×10^{-2}	0.2	

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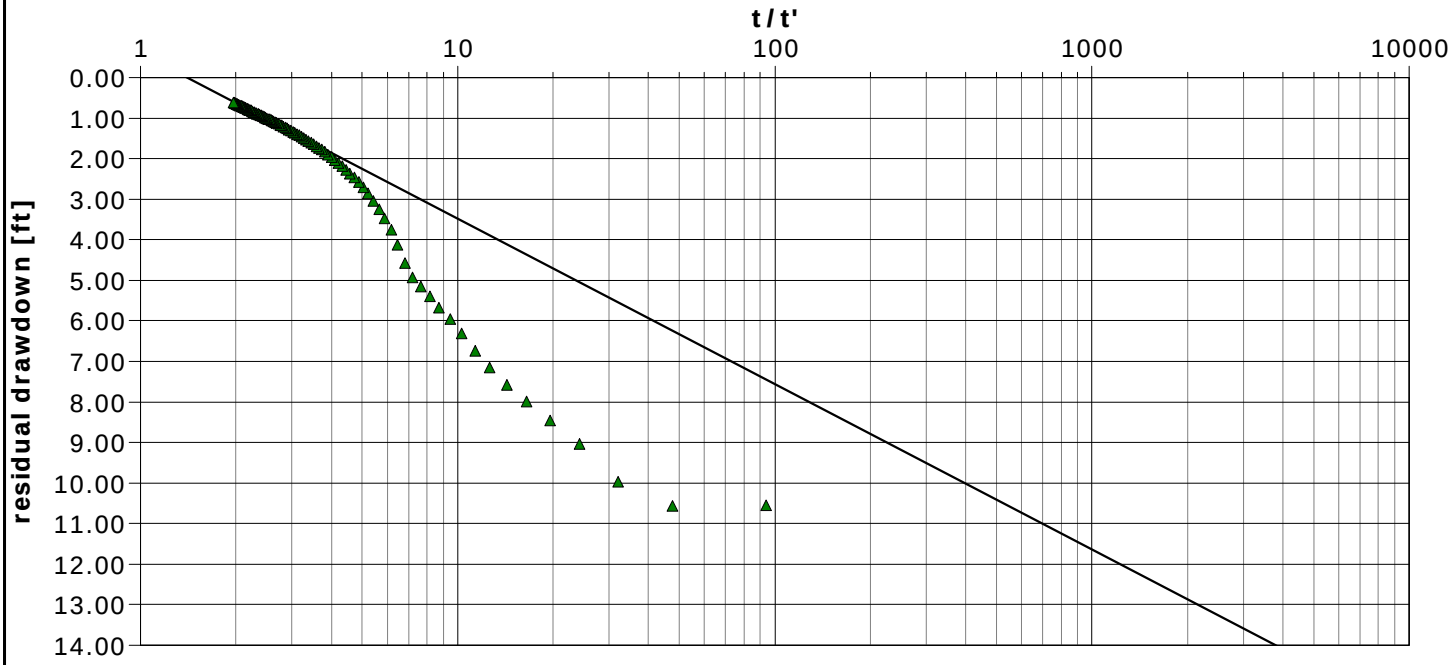
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Theis Recovery	Analysis Date: 7/2/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



Calculation using THEIS & JACOB

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Radial Distance to PW [ft]	
OW-18B	3.37×10^{0}	3.37×10^{-1}		

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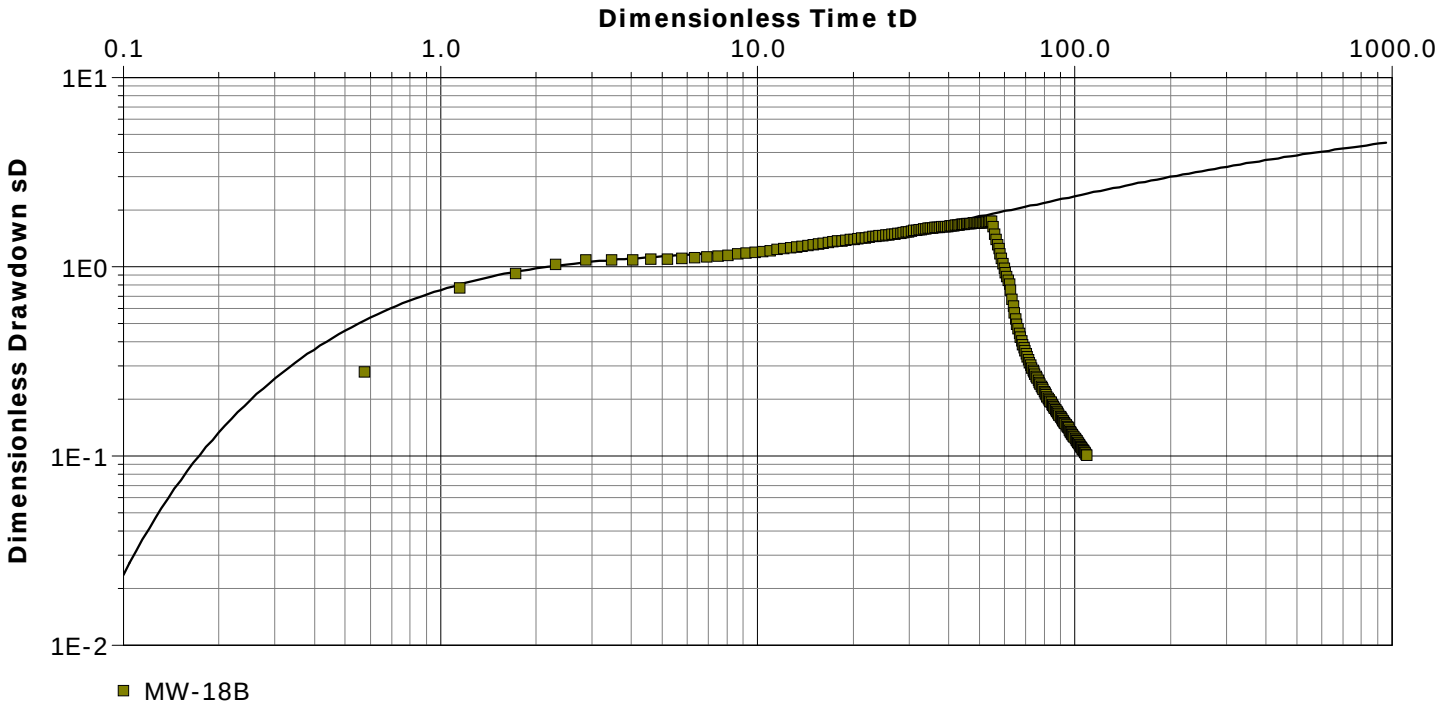
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Unconfined Boulton	Analysis Date: 7/2/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



Calculation using Boulton

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Specific Yield	Drainage factor	Ratio Sy/S	Radial Distance to PW [ft]
MW-18B	9.80×10^{-1}	9.80×10^{-2}	6.60×10^{-1}	3.08×10^{-2}	2.25×10^{1}	0.2

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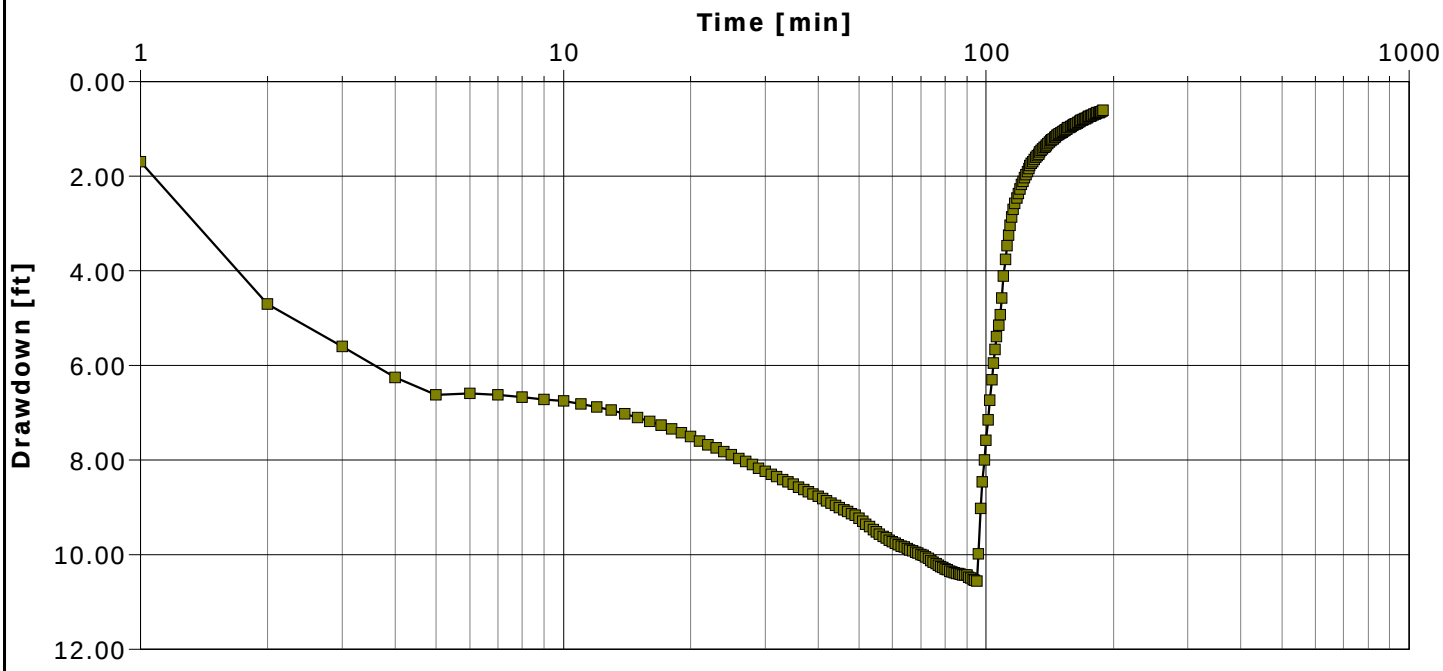
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by:	Time-Drawdown	Analysis Date: 7/6/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



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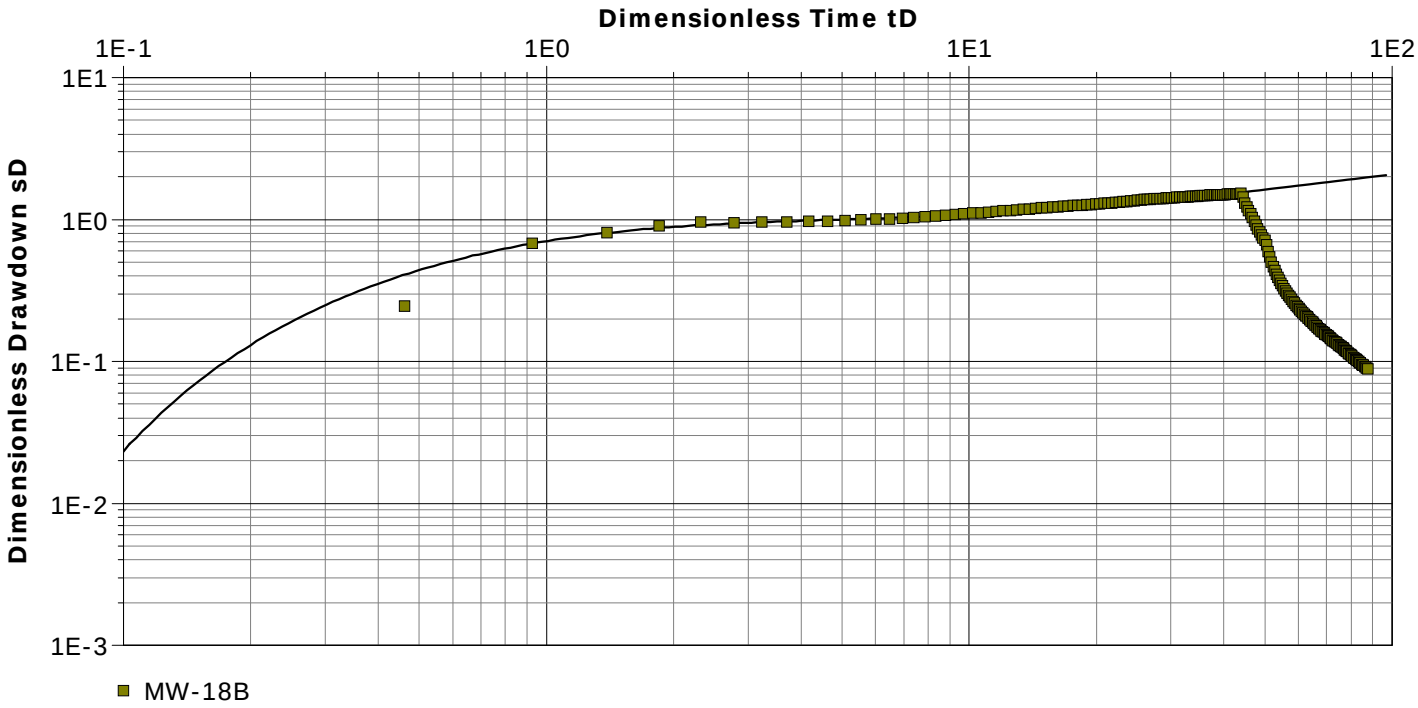
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Double Porosity Model; Log Scale	Analysis Date: 9/16/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



Calculation using Double Porosity

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Sigma	Lambda	Radial Distance to PW [ft]
MW-18B	8.60×10^{-1}	8.60×10^{-2}	3.20×10^{-2}	3.12×10^{1}	8.50×10^{-1}	0.2

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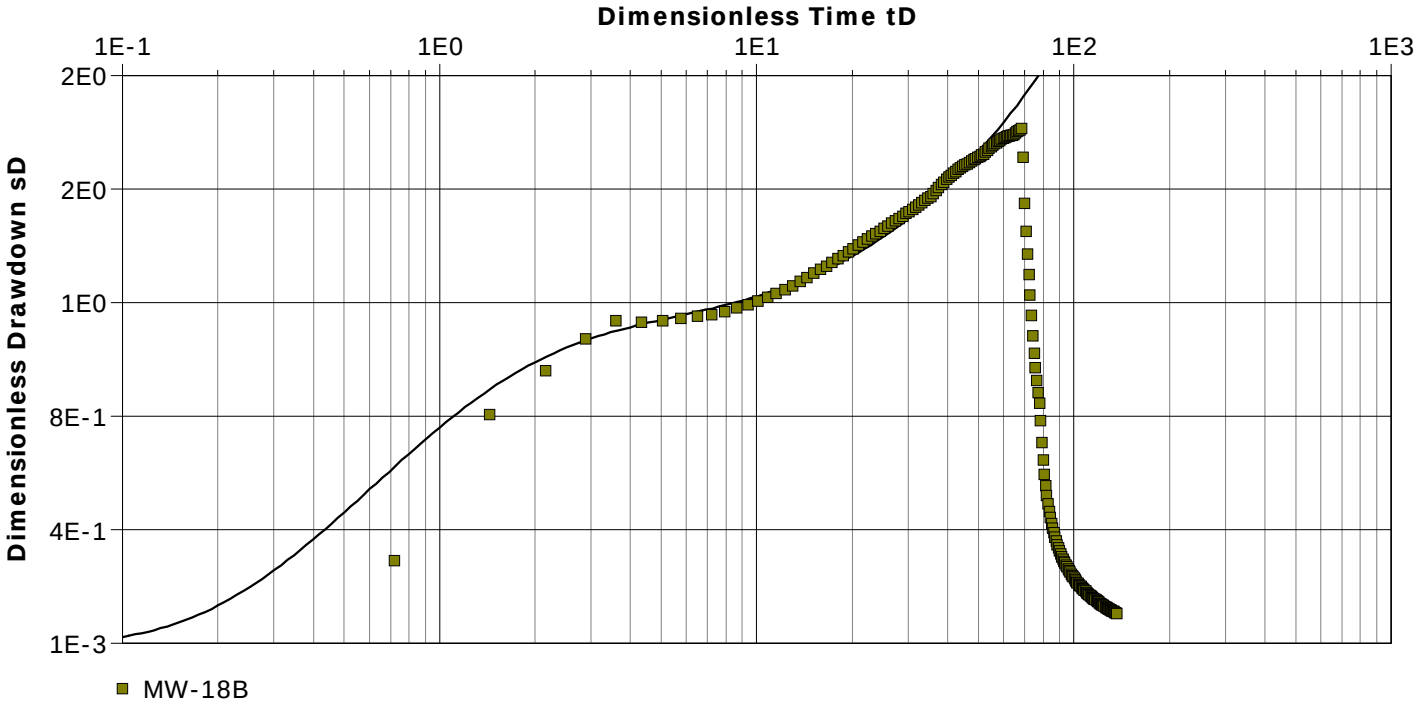
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Double Porosity Model - Semi-Log	Analysis Date: 9/16/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



Calculation using Double Porosity

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Sigma	Lambda	Radial Distance to PW [ft]
MW-18B	1.025×10^{0}	1.025×10^{-1}	2.450×10^{-2}	2.8200×10^{1}	6.7200×10^{-1}	0.2

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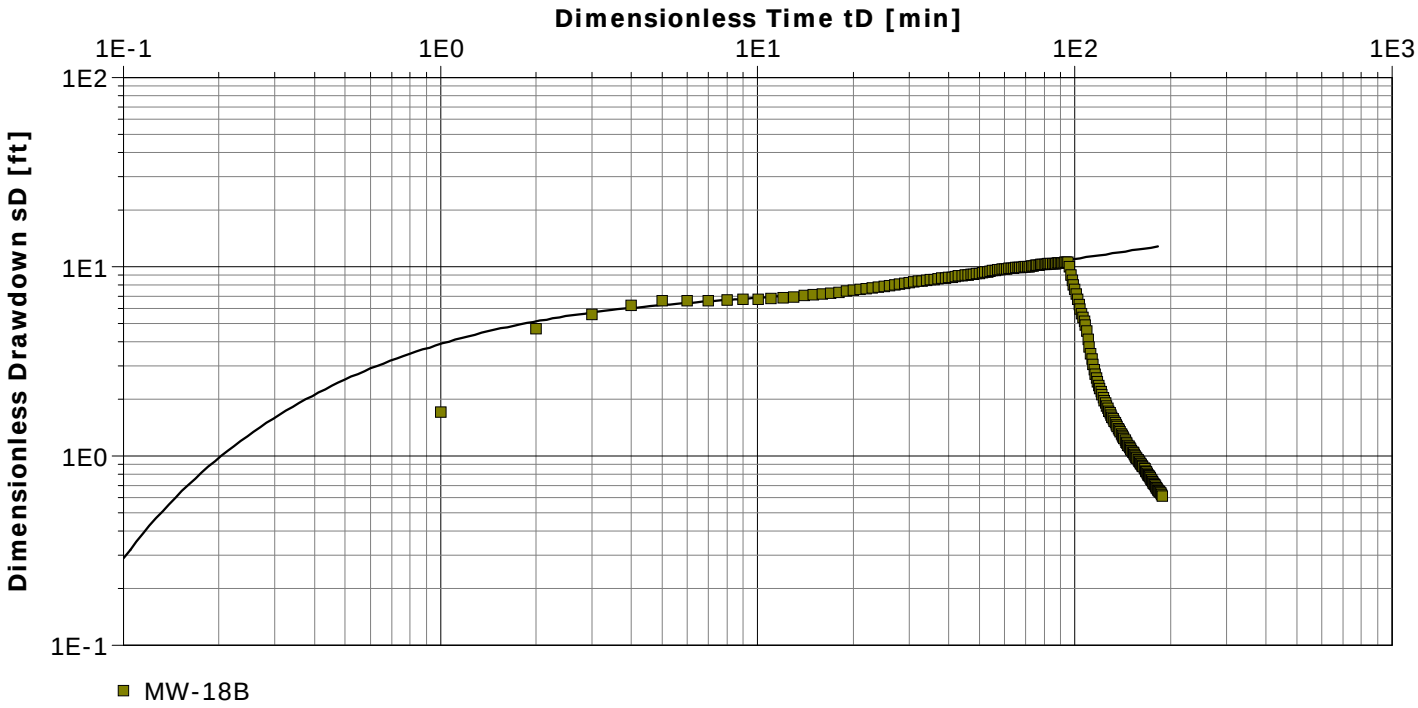
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Boulton Unconfined -fitted	Analysis Date: 9/16/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



Calculation using Boulton

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Specific Yield	Drainage factor	Ratio Sy/S	Radial Distance to PW [ft]
MW-18B	1.92×10^{0}	1.92×10^{-1}	2.04×10^{-1}	1.96×10^{-2}	1.00×10^{1}	0.2

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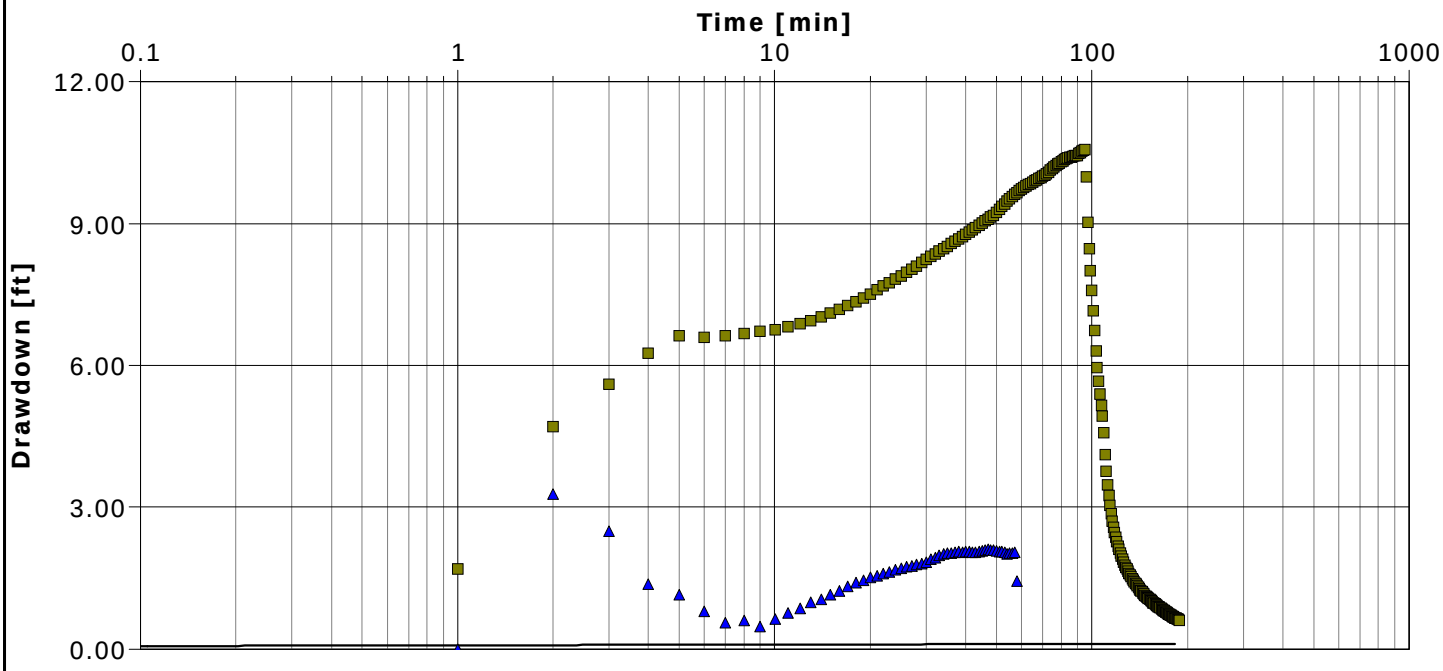
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by:	Diagnostic Semi-log	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



Calculation using Theis

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-18B	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}	0.2	

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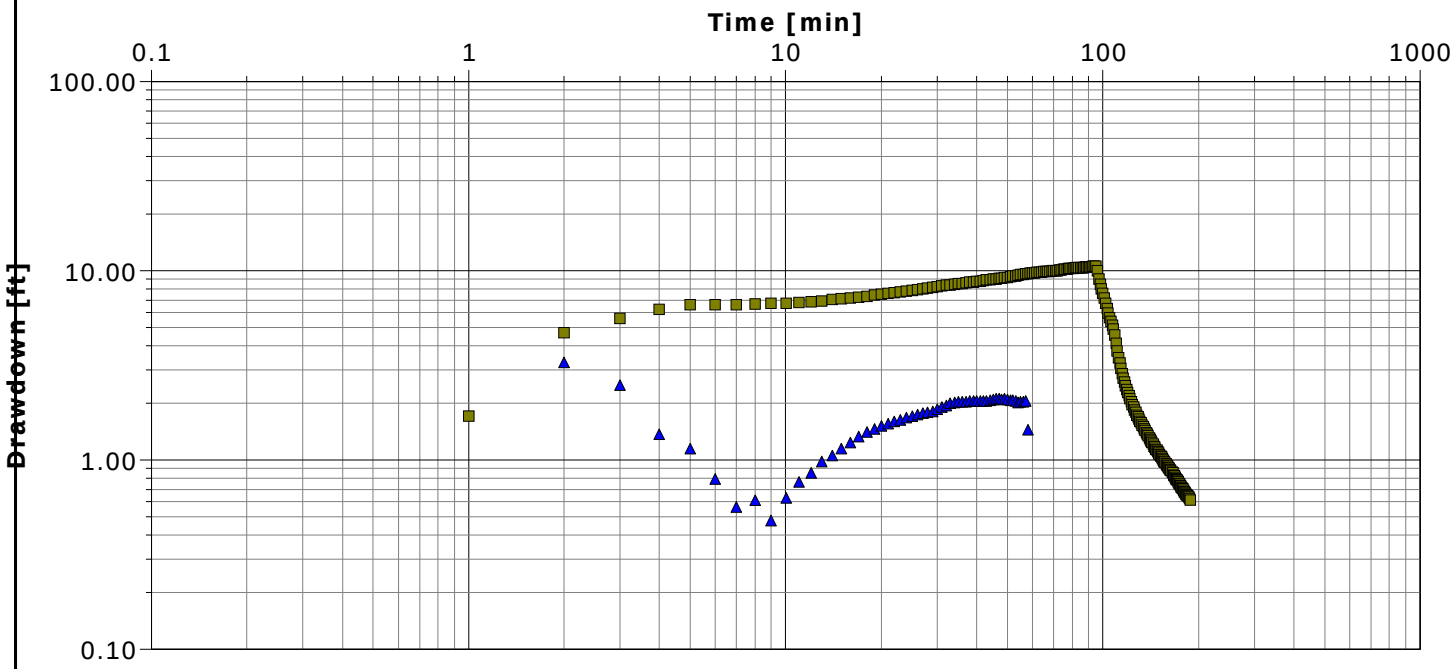
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Analysis Performed by:	Diagnostic Log-log	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	



Calculation using Theis

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-18B	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}	0.2	

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Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-18B Pumped	Pumping Well: MW-18B
Test Conducted by: S Devin		Test Date: 6/12/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.39 [U.S. gal/min]	

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [ft²/d]	K [ft/d]	S
1	Cooper & Jacob I	S Devin	6/25/2013	Cooper & Jacob I	MW-18B	2.83×10^{0}	2.83×10^{-1}	6.73×10^{-2}
2	Theis Recovery	S Devin	7/2/2013	Theis Recovery	OW-18B	3.37×10^{0}	3.37×10^{-1}	
3	Unconfined Boulton	S Devin	7/2/2013	Boulton	MW-18B	9.80×10^{-1}	9.80×10^{-2}	6.60×10^{-1}
4	Double Porosity Model; Log Scale	S Devin	9/16/2013	Double Porosity	MW-18B	8.60×10^{-1}	8.60×10^{-2}	3.20×10^{-2}
5	Double Porosity Model - Semi-Log	S Devin	9/16/2013	Double Porosity	MW-18B	1.02×10^{0}	1.02×10^{-1}	2.45×10^{-2}
6	Boulton Unconfined -fitted	S Devin	9/16/2013	Boulton	MW-18B	1.92×10^{0}	1.92×10^{-1}	2.04×10^{-1}
7	Diagnostic Semi-log		9/23/2013	Theis	MW-18B	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}
8	Diagnostic Log-log		9/23/2013	Theis	MW-18B	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}
					Average	2.34×10^{2}	2.34×10^{1}	1.41×10^{-1}

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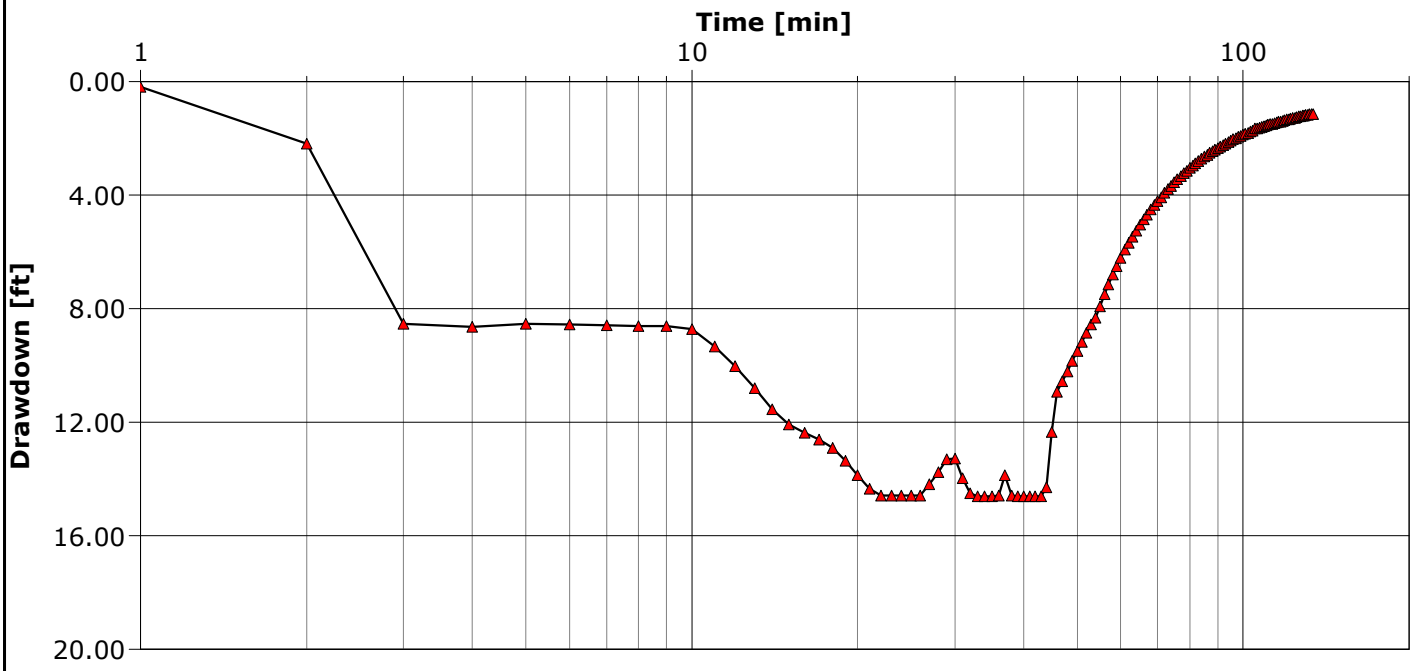
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-2 Pumped	Pumping Well: MW-2
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/20/2013
Analysis Performed by:	Time-Drawdown Curve	Analysis Date: 9/13/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.53659 [U.S. gal/min]	



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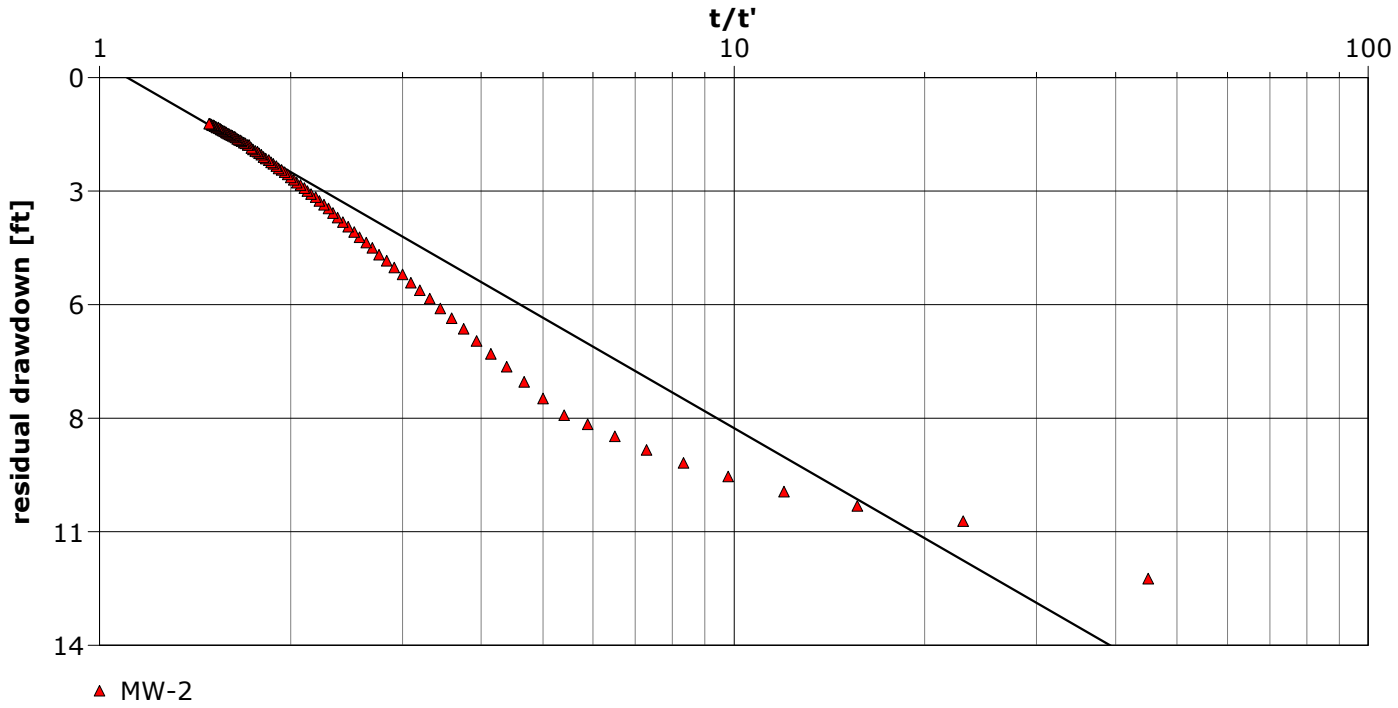
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-2 Pumped	Pumping Well: MW-2
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/20/2013
Analysis Performed by:	Theis Recovery	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.53659 [U.S. gal/min]	



Calculation using THEIS & JACOB

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Radial Distance to PW [ft]	
MW-2	2.09×10^{0}	2.09×10^{-1}	0.2	

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Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-2 Pumped	Pumping Well: MW-2
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/20/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.53659 [U.S. gal/min]	

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [ft²/d]	K [ft/d]	S
1	Theis Recovery		9/23/2013	Theis Recovery	MW-2	2.09×10^{0}	2.09×10^{-1}	

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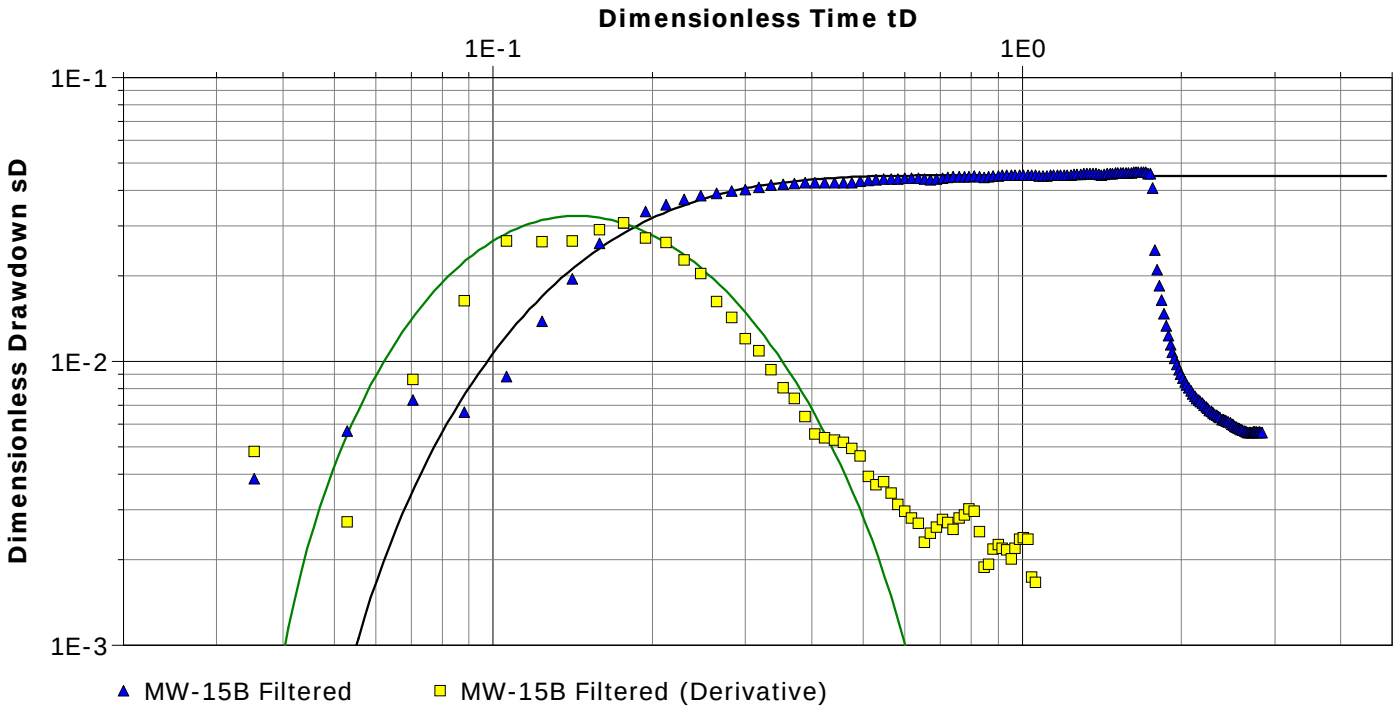
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Hantush	Analysis Date: 7/2/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



Calculation using Hantush

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Hydr. resistance [min]	Leakage factor [ft]	Radial Distance to PW [ft]
MW-15B Filtered	2.71×10^{-2}	2.71×10^{-3}	2.64×10^{-2}	1.88×10^{2}	0.0594415715399329	0.2

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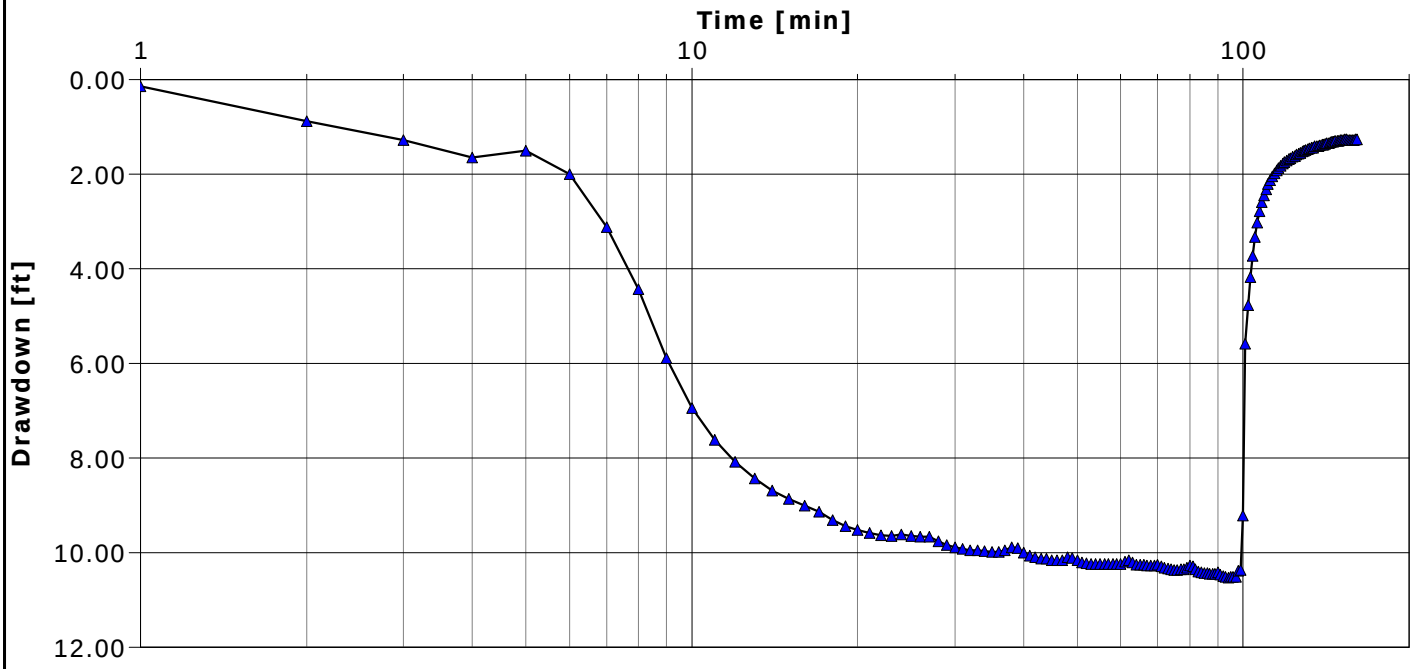
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by:	Time-Drawdown	Analysis Date: 7/6/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



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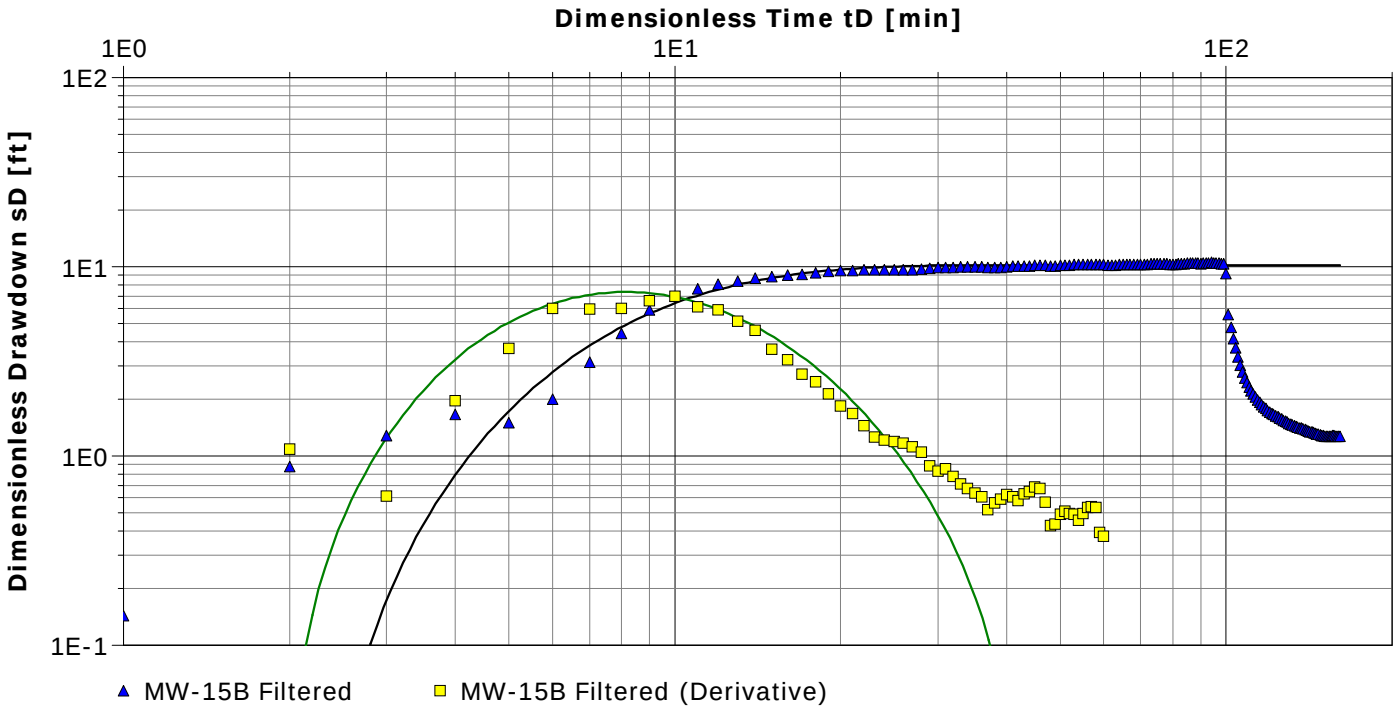
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by:	Hantush with Storage	Analysis Date: 7/6/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



Calculation using Hantush with Storage

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Ratio K(v)/K(h)	Hydr. resistance [min]	Storage coefficient of the aquitard	Leakage factor [ft]	Radial Distance to PW [ft]
MW-15B Filtered	2.71×10^{-2}	2.71×10^{-3}	2.64×10^{-2}	1.47×10^{-1}	1.88×10^{2}	1.29×10^{-6}	0.0594416422998189	0.2

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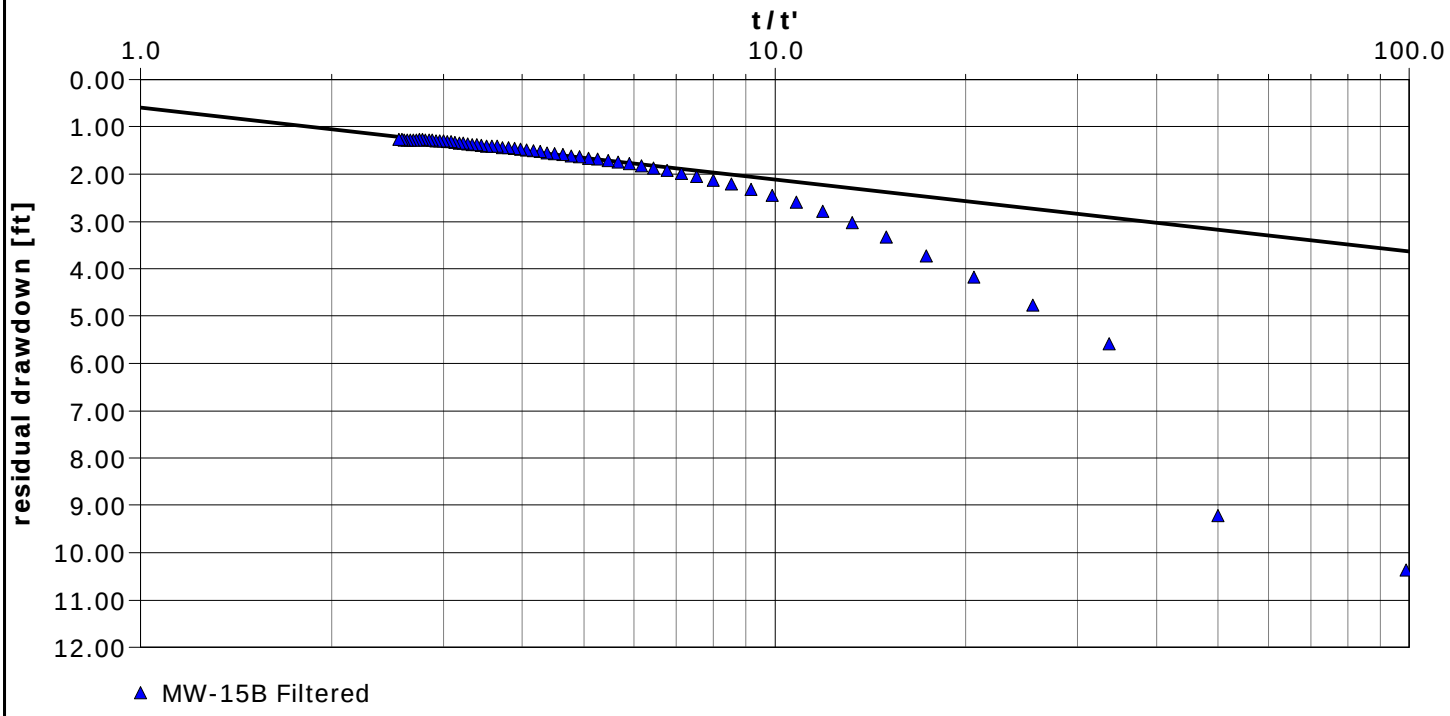
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Theis Recovery	Analysis Date: 9/19/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



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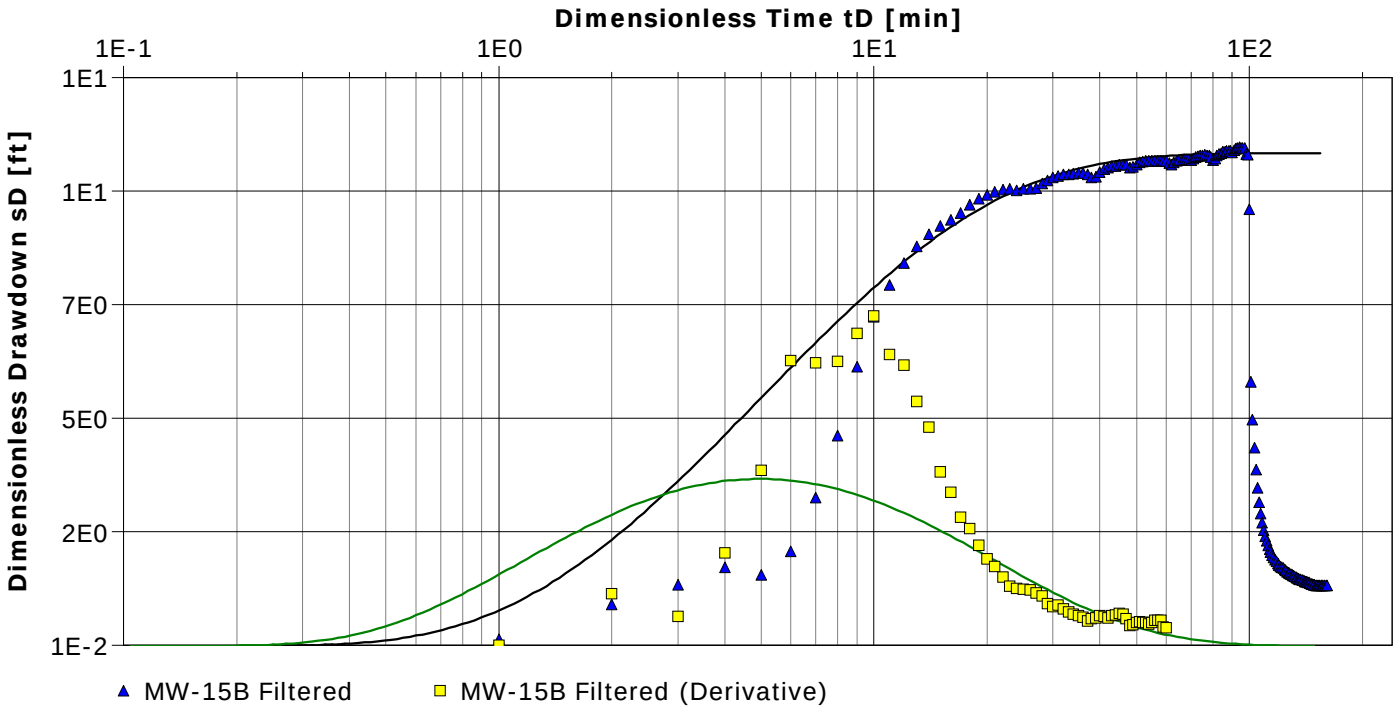
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Hantush - Semi-Log Derv	Analysis Date: 7/2/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



Calculation using Hantush

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Hydr. resistance [min]	Leakage factor [ft]	Radial Distance to PW [ft]
MW-15B Filtered	1.01×10^{0}	1.01×10^{-1}	9.35×10^{-2}	1.95×10^{2}	0.369825409258657	0.2

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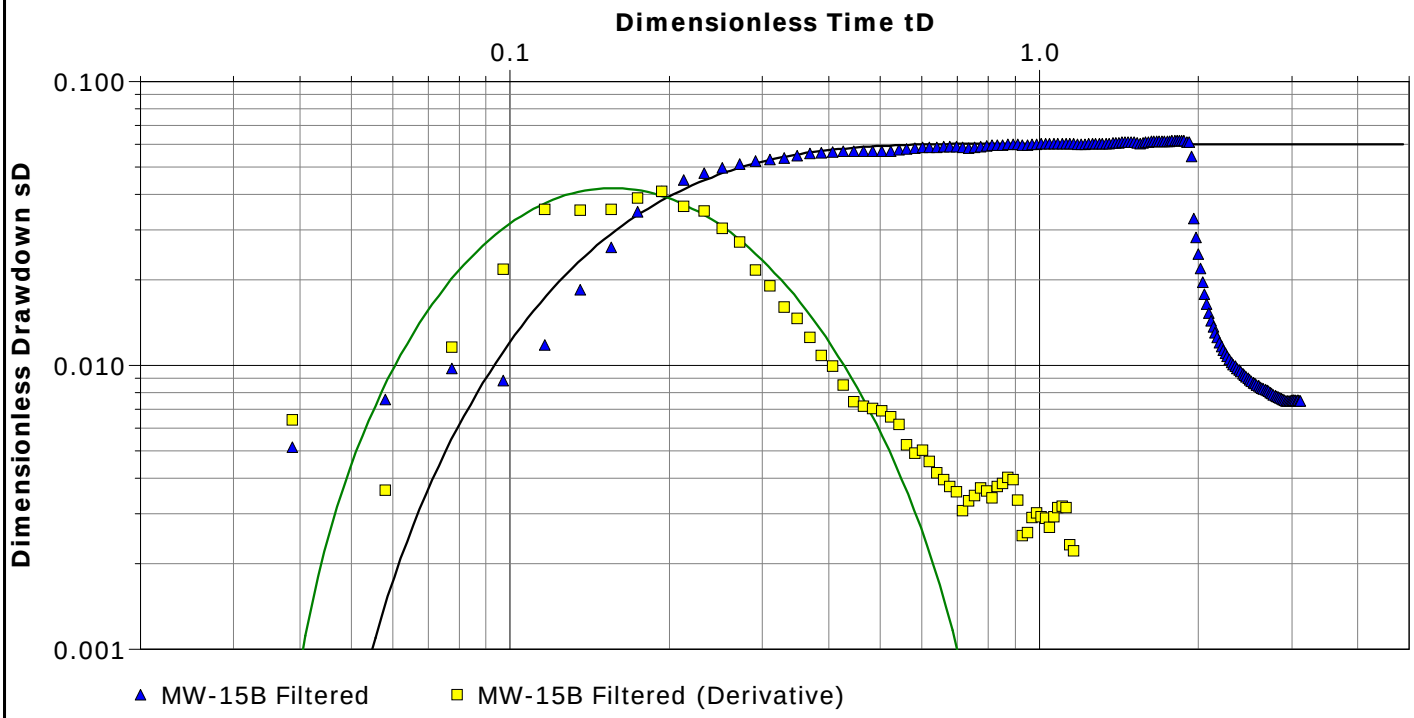
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Hantush - fitted	Analysis Date: 7/2/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



Calculation using Hantush

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Hydr. resistance [min]	Leakage factor [ft]	Radial Distance to PW [ft]
MW-15B Filtered	3.61×10^{-2}	3.61×10^{-3}	3.21×10^{-2}	1.64×10^{2}	0.0642540548103662	0.2

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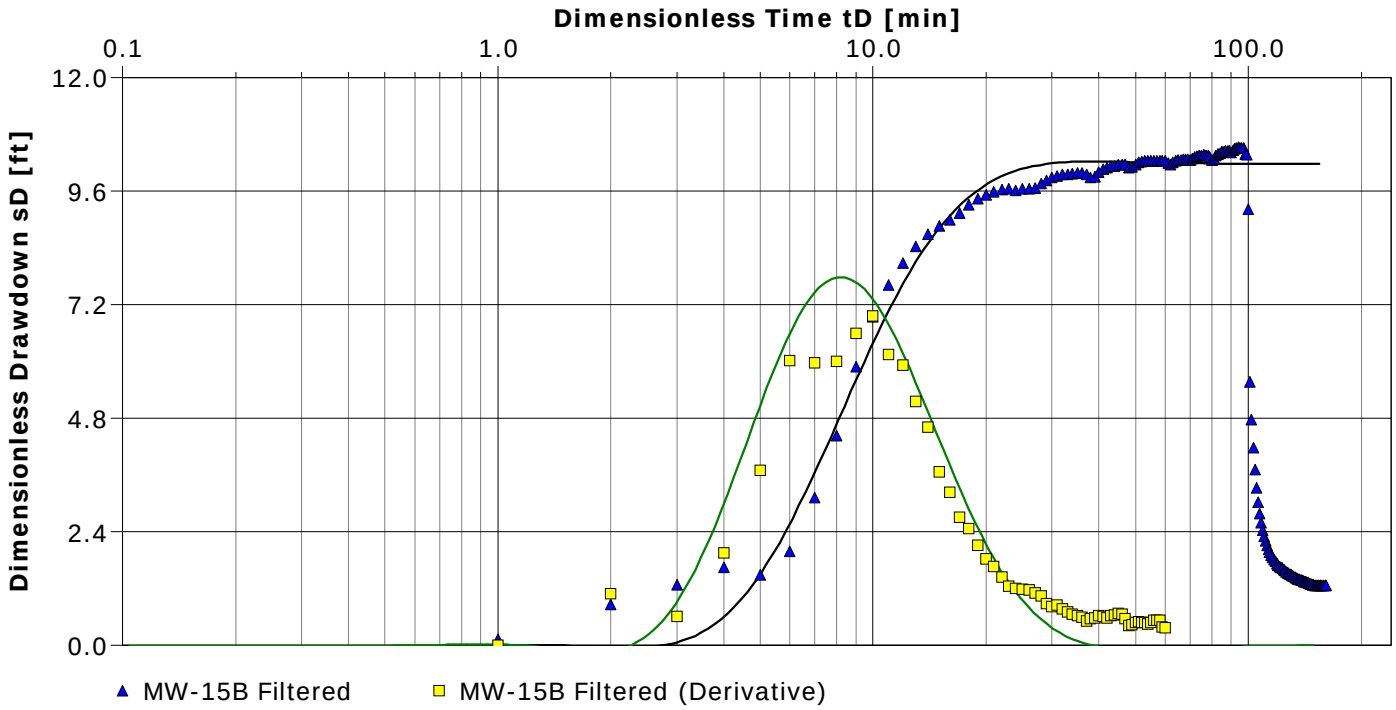
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Hantush - Derv Fit	Analysis Date: 7/2/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



Calculation using Hantush

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Hydr. resistance [min]	Leakage factor [ft]	Radial Distance to PW [ft]
MW-15B Filtered	1.45×10^{-2}	1.45×10^{-3}	1.67×10^{-2}	2.59×10^{2}	0.0510722372886687	0.2

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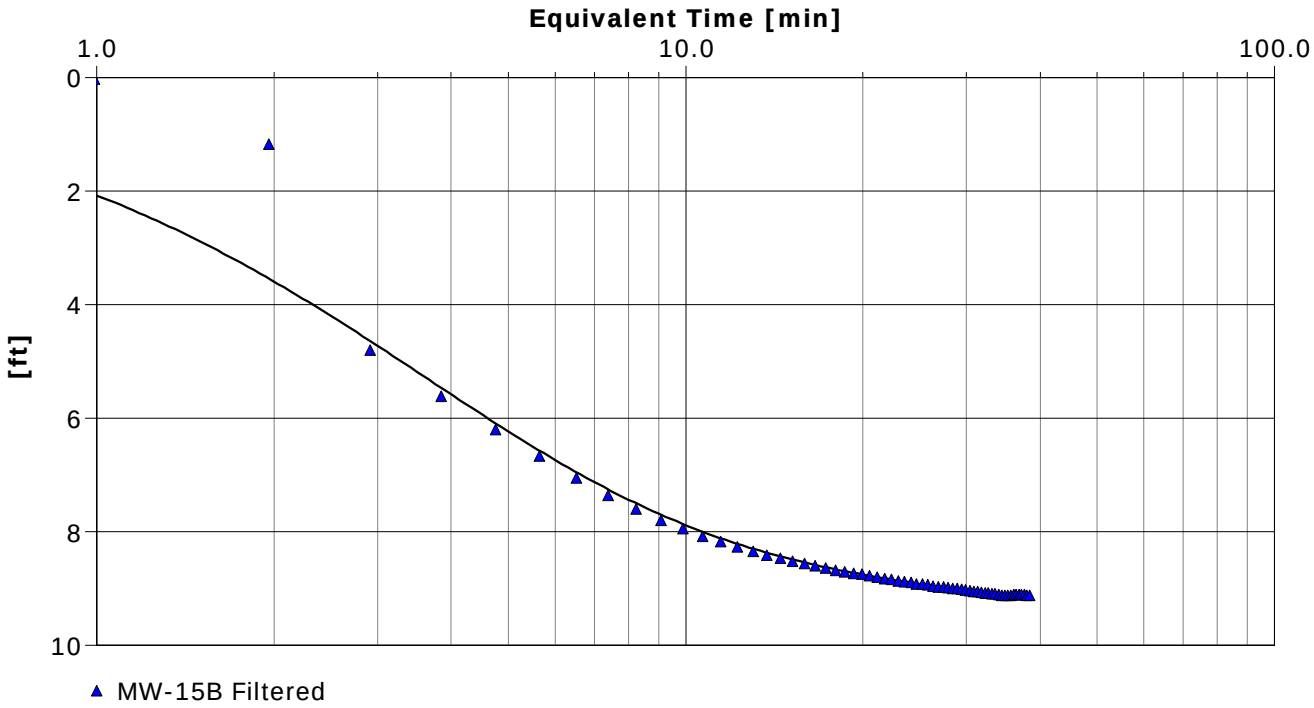
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by: S Devin	Agarwal Recovery	Analysis Date: 9/22/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



Calculation using AGARWAL + Agarwal skin

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Well-bore storage coefficient	Skin factor	Radial Distance to PW [ft]
MW-15B Filtered	1.44×10^{1}	1.44×10^{0}	8.03×10^{-7}	2.34×10^{0}	0.2

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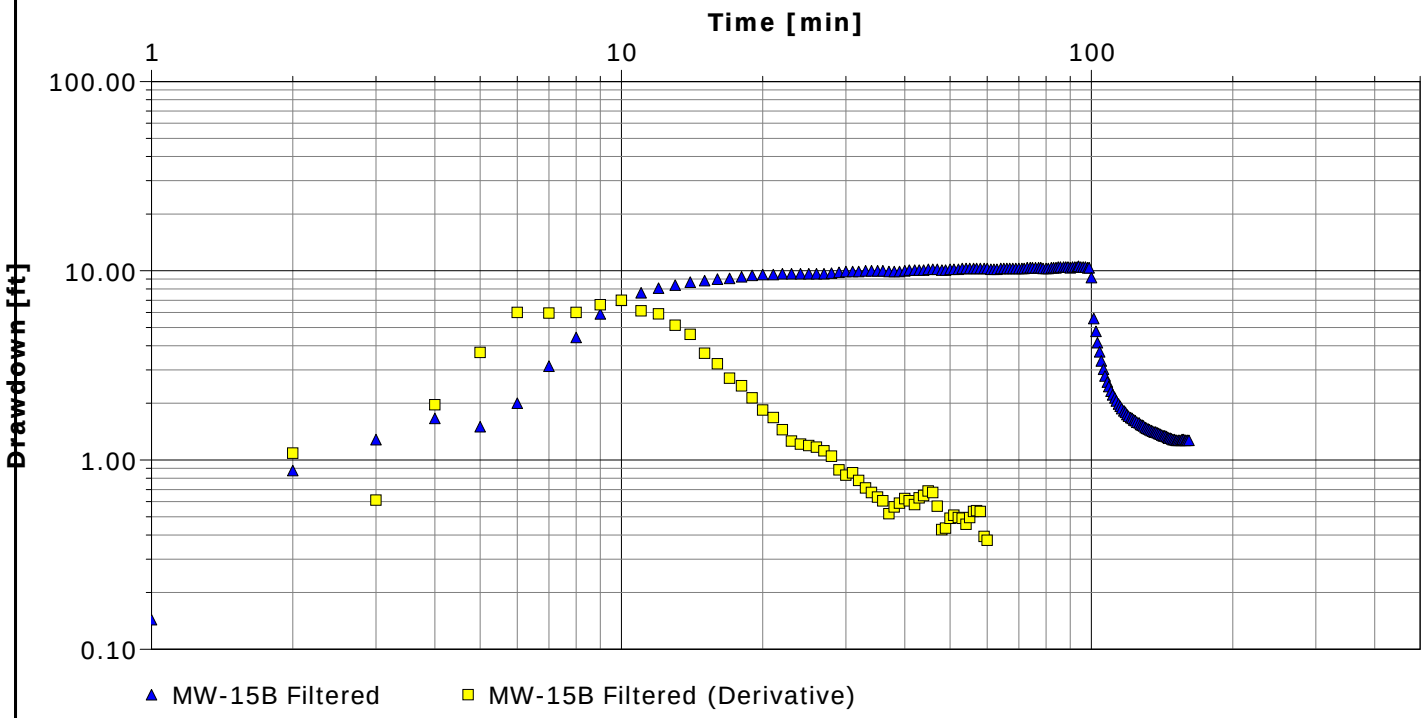
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by:	Diagnostic Log-log	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



Calculation using Theis

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-15B Filtered	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}	0.2	

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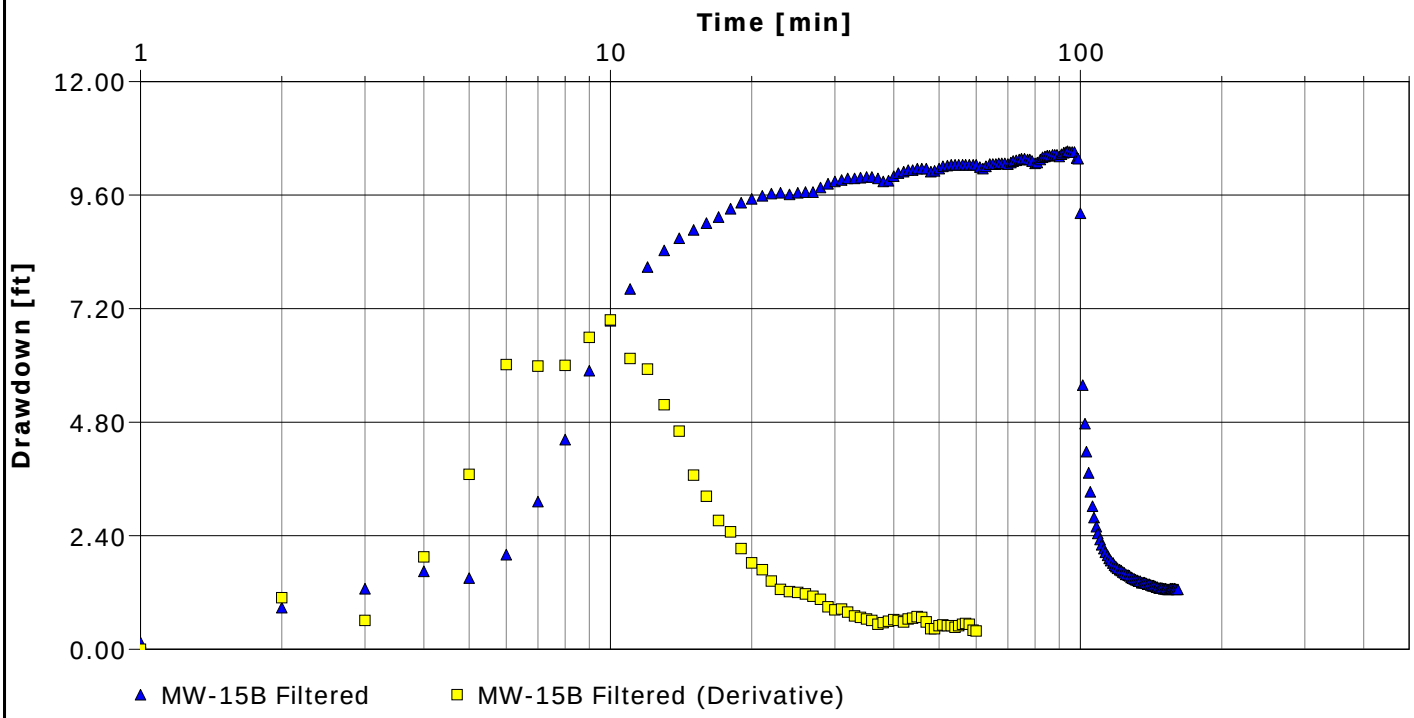
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Analysis Performed by:	Diagnostic Semi-log	Analysis Date: 9/23/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	



Calculation using Theis

Observation Well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial Distance to PW [ft]	
MW-15B Filtered	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}	0.2	

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Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: MW-15B Pumped	Pumping Well: MW-15B Filtered
Test Conducted by: Steve Devin		Test Date: 6/12/2013
Aquifer Thickness: 10.00 ft	Discharge: variable, average rate 0.4 [U.S. gal/min]	

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [ft²/d]	K [ft/d]	S
1	Hantush	S Devin	7/2/2013	Hantush	MW-15B Filtered	2.71×10^{-2}	2.71×10^{-3}	2.64×10^{-2}
2	Hantush with Storage		7/6/2013	Hantush with Storage	MW-15B Filtered	2.71×10^{-2}	2.71×10^{-3}	2.64×10^{-2}
3	Theis Recovery	S Devin	9/19/2013	Theis Recovery	MW-15B Filtered	9.26×10^{0}	9.26×10^{-1}	
4	Hantush - Semi-Log Derv	S Devin	7/2/2013	Hantush	MW-15B Filtered	1.01×10^{0}	1.01×10^{-1}	9.35×10^{-2}
5	Hantush - fitted	S Devin	7/2/2013	Hantush	MW-15B Filtered	3.61×10^{-2}	3.61×10^{-3}	3.21×10^{-2}
6	Hantush - Derv Fit	S Devin	7/2/2013	Hantush	MW-15B Filtered	1.45×10^{-2}	1.45×10^{-3}	1.67×10^{-2}
7	Agarwal Recovery	S Devin	9/22/2013	AGARWAL + Agarwal skin	MW-15B Filtered	1.44×10^{1}	1.44×10^{0}	8.03×10^{-7}
8	Diagnostic Log-log		9/23/2013	Theis	MW-15B Filtered	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}
9	Diagnostic Semi-log		9/23/2013	Theis	MW-15B Filtered	9.30×10^{2}	9.30×10^{1}	1.00×10^{-4}
					Average	2.09×10^{2}	2.09×10^{1}	2.44×10^{-2}

APPENDIX A-6
Stepped Drawdown Tests

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Pumping Test - Discharge Data

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: EW-1 Stepped Drawdown	Pumping Well: EW-1
Test Conducted by: Steve Devin / Chip Porter	Test Date: 6/11/2013	Discharge: variable, average rate 0.82753 [U.S. ga
Observation Well: EW-1		Radial Distance to PW [ft]: -

	Time [min]	Discharge [U.S. gal/min]
1	6.6167	1.10
2	16.7667	1.60
3	21.35	2.24
4	39.7333	0.00
5	45.0333	1.30
6	56.1167	0.52

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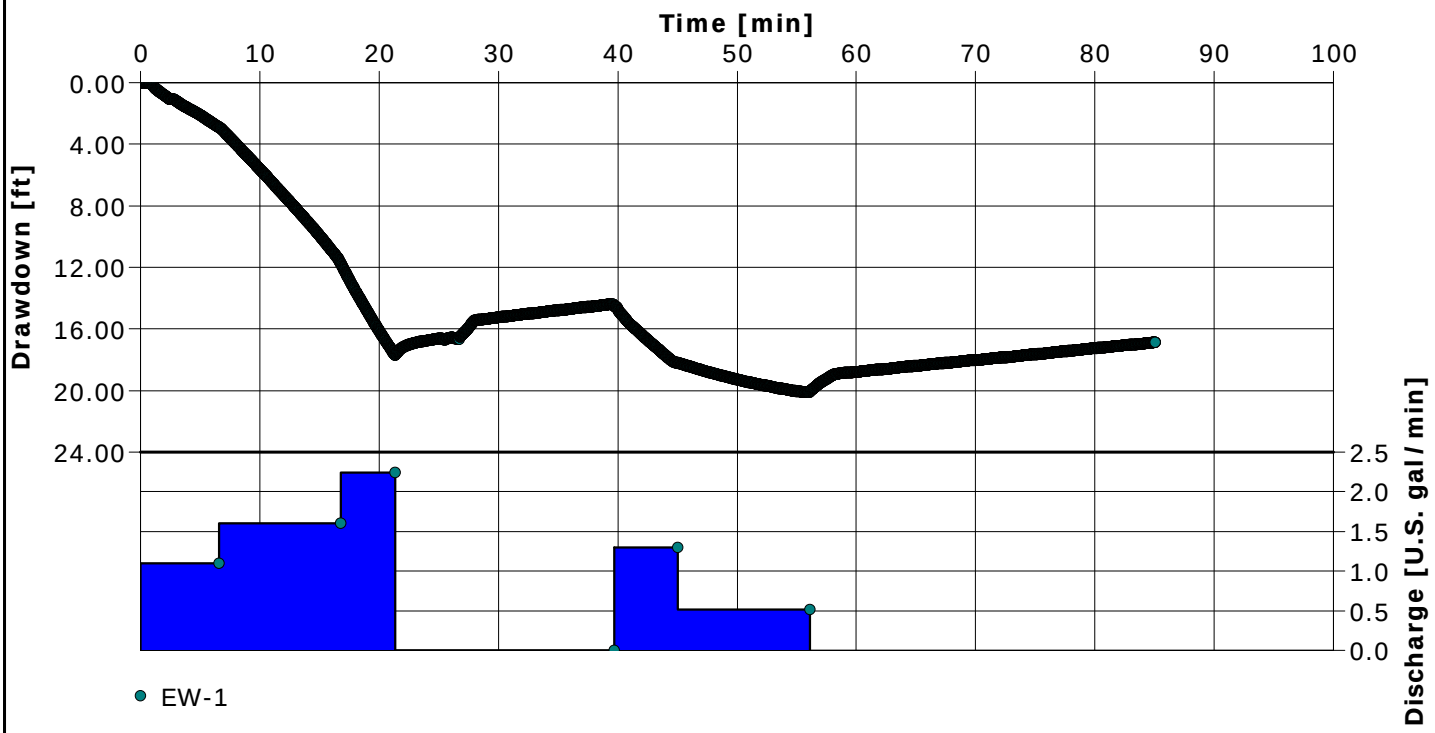
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: EW-1 Stepped Drawdown	Pumping Well: EW-1
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by:	Time-Drawdown	Analysis Date: 6/26/2013
Aquifer Thickness: 20.00 ft	Discharge: variable, average rate 0.82753 [U.S. gal/min]	



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Pumping Test - Discharge Data

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: EW-2 Stepped Drawdown	Pumping Well: EW-2
Test Conducted by: Steve Devin / Chip Porte	Test Date: 6/11/2013	Discharge: variable, average rate 0.84557 [U.S. ga
Observation Well: EW-2		Radial Distance to PW [ft]: -

	Time [min]	Discharge [U.S. gal/min]
1	7.1667	0.95
2	15.9167	0.82
3	36.3333	0.53
4	52.5	1.38
5	66.4167	0.65

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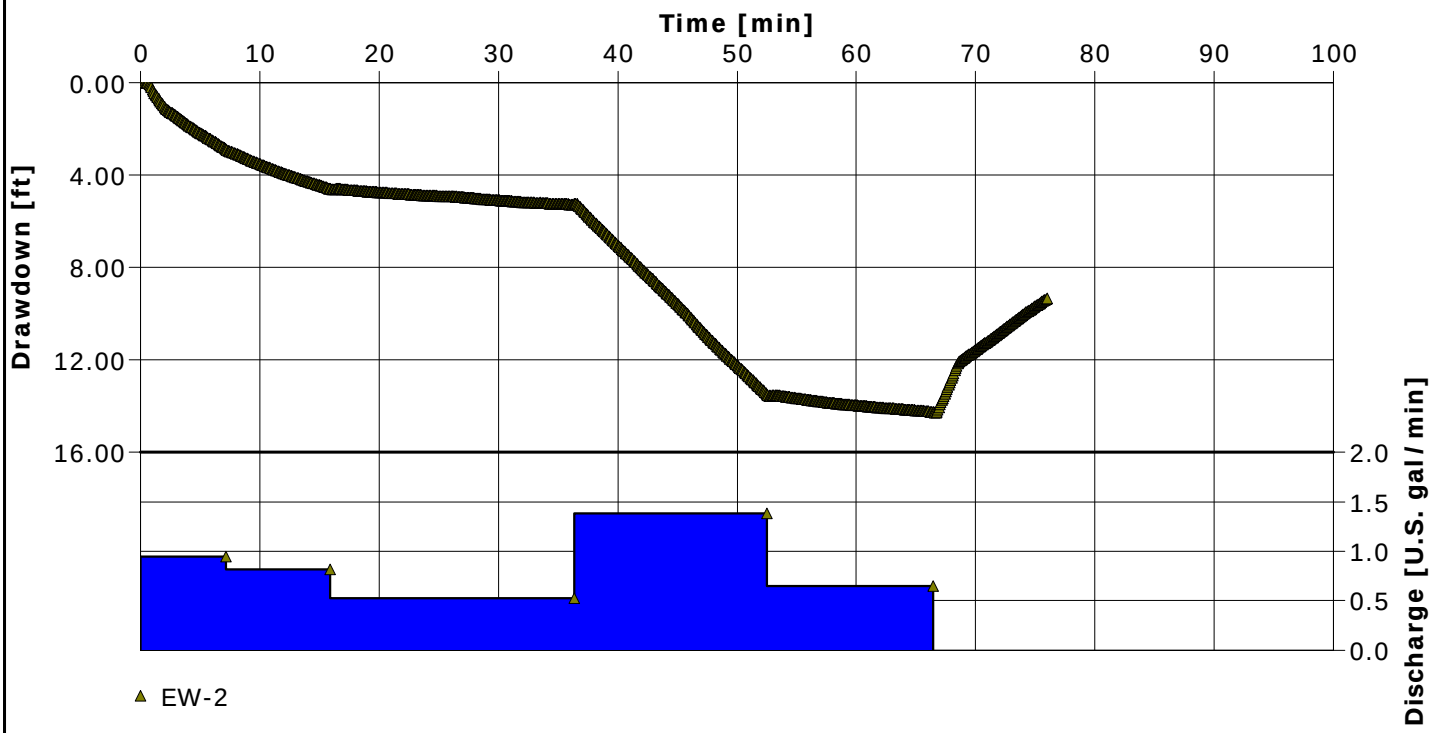
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: EW-2 Stepped Drawdown	Pumping Well: EW-2
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by:	Time-Drawdown	Analysis Date: 6/26/2013
Aquifer Thickness: 20.00 ft	Discharge: variable, average rate 0.84557 [U.S. gal/min]	



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Pumping Test - Discharge Data

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: EW-3 Stepped Drawdown	Pumping Well: EW-3
Test Conducted by: Steve Devin / Chip Porter	Test Date: 6/26/2013	Discharge: variable, average rate 0.56603 [U.S. ga
Observation Well: EW-3		Radial Distance to PW [ft]: -

	Time [min]	Discharge [U.S. gal/min]
1	1.4167	0.00
2	6.75	1.31
3	25.5833	0.61
4	63.25	0.46

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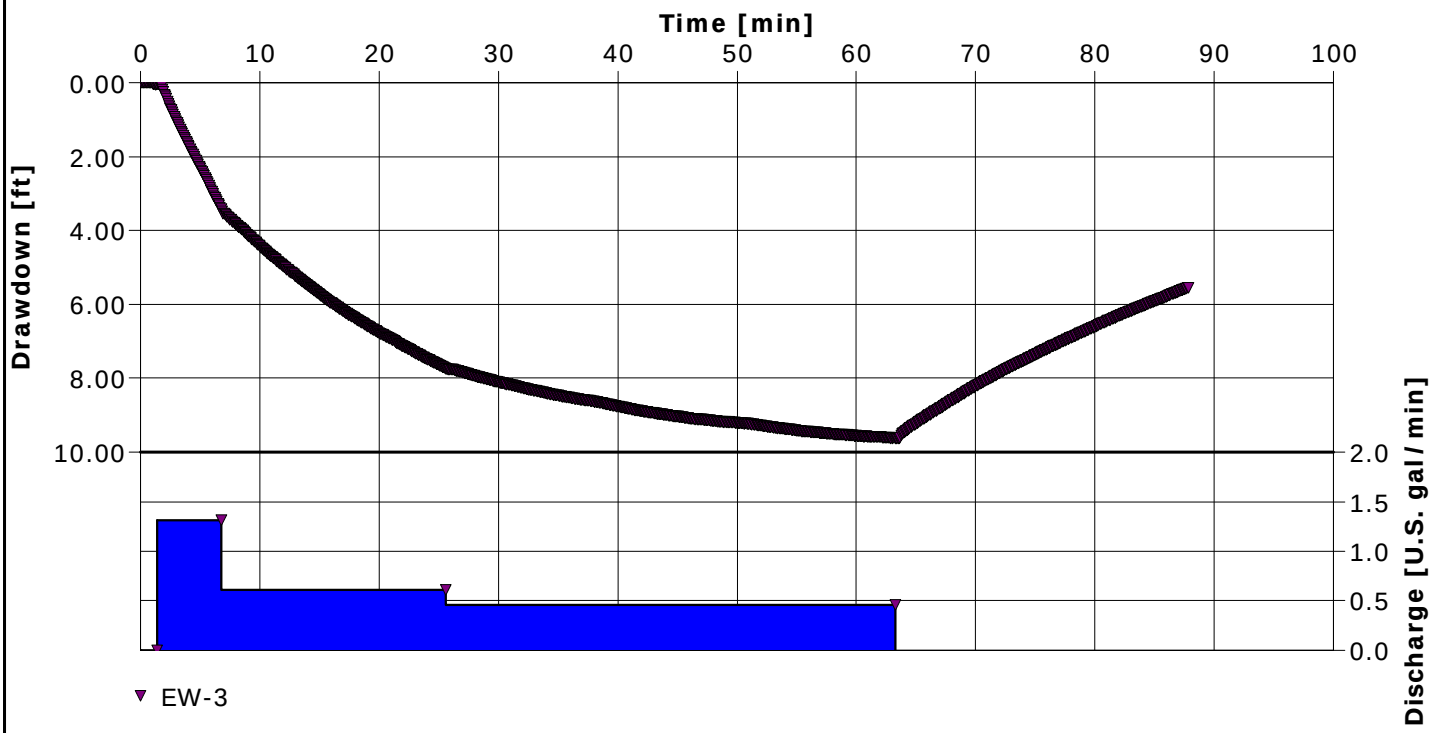
Pumping Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Pumping Test: EW-3 Stepped Drawdown	Pumping Well: EW-3
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/26/2013
Analysis Performed by:	Time-Drawdown	Analysis Date: 6/26/2013
Aquifer Thickness:	Discharge: variable, average rate 0.56603 [U.S. gal/min]	



APPENDIX A-7

Plots of the Slug Test Results

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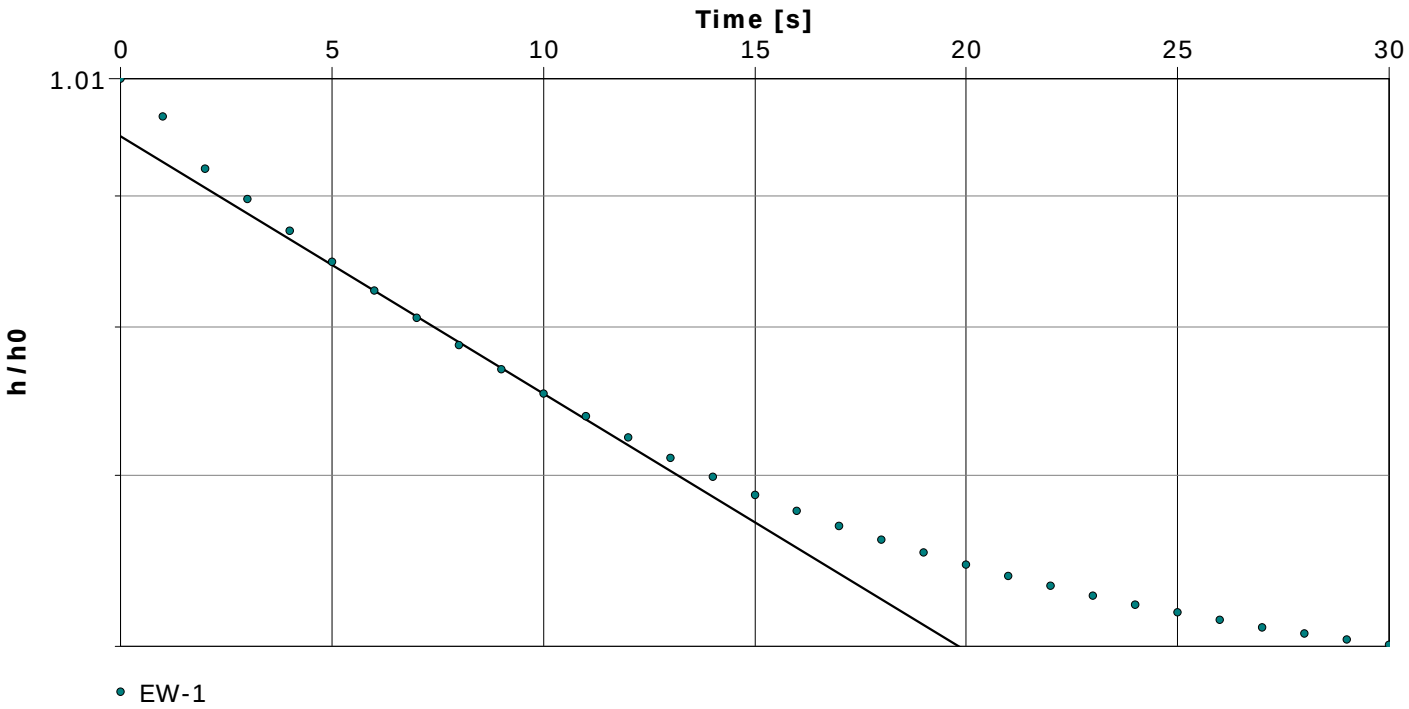
Slug Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Slug Test: EW-1 Slug Test	Test Well: EW-1
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by: S Devin	Hvorslev	Analysis Date: 6/27/2013
Aquifer Thickness: 20.00 ft		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/d]	
EW-1	1.27×10^{1}	

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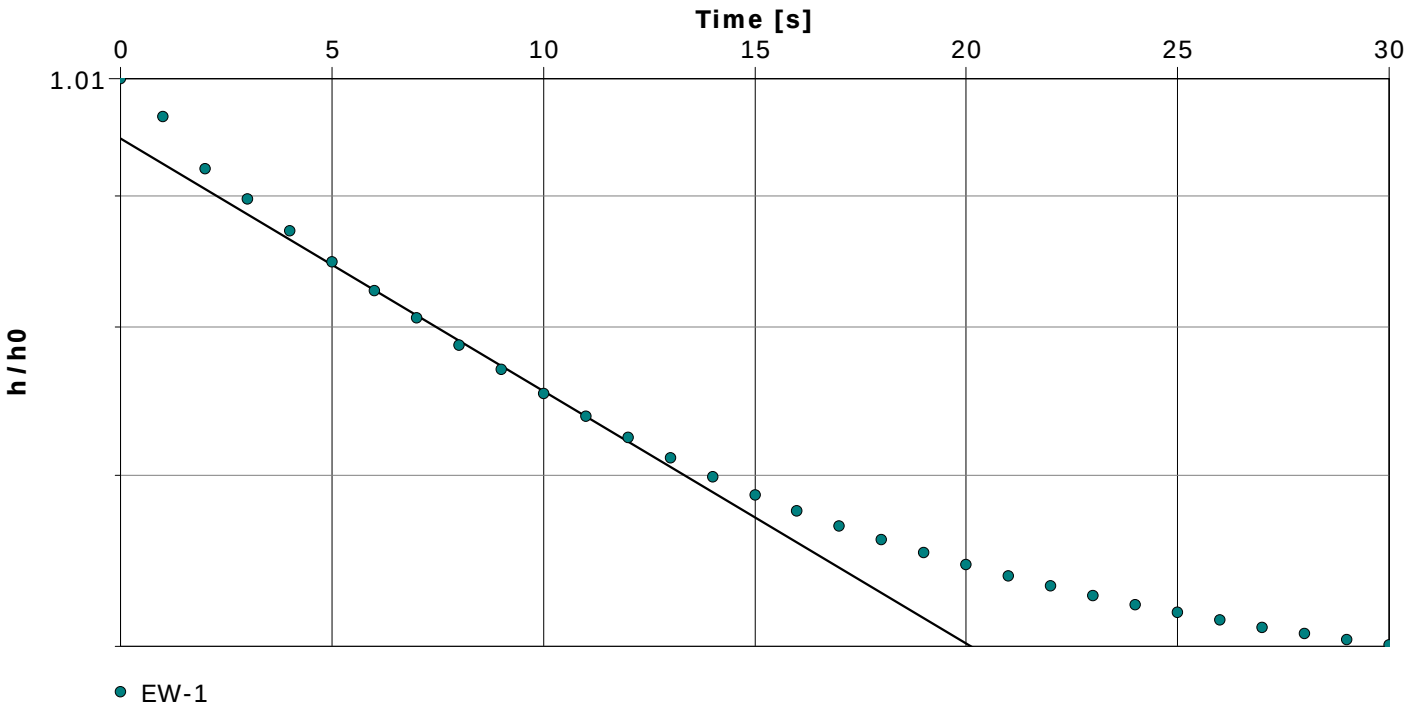
Slug Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Slug Test: EW-1 Slug Test	Test Well: EW-1
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by: S Devin	Bouwer & Rice	Analysis Date: 6/27/2013
Aquifer Thickness: 20.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [ft/d]	
EW-1	9.58×10^{0}	

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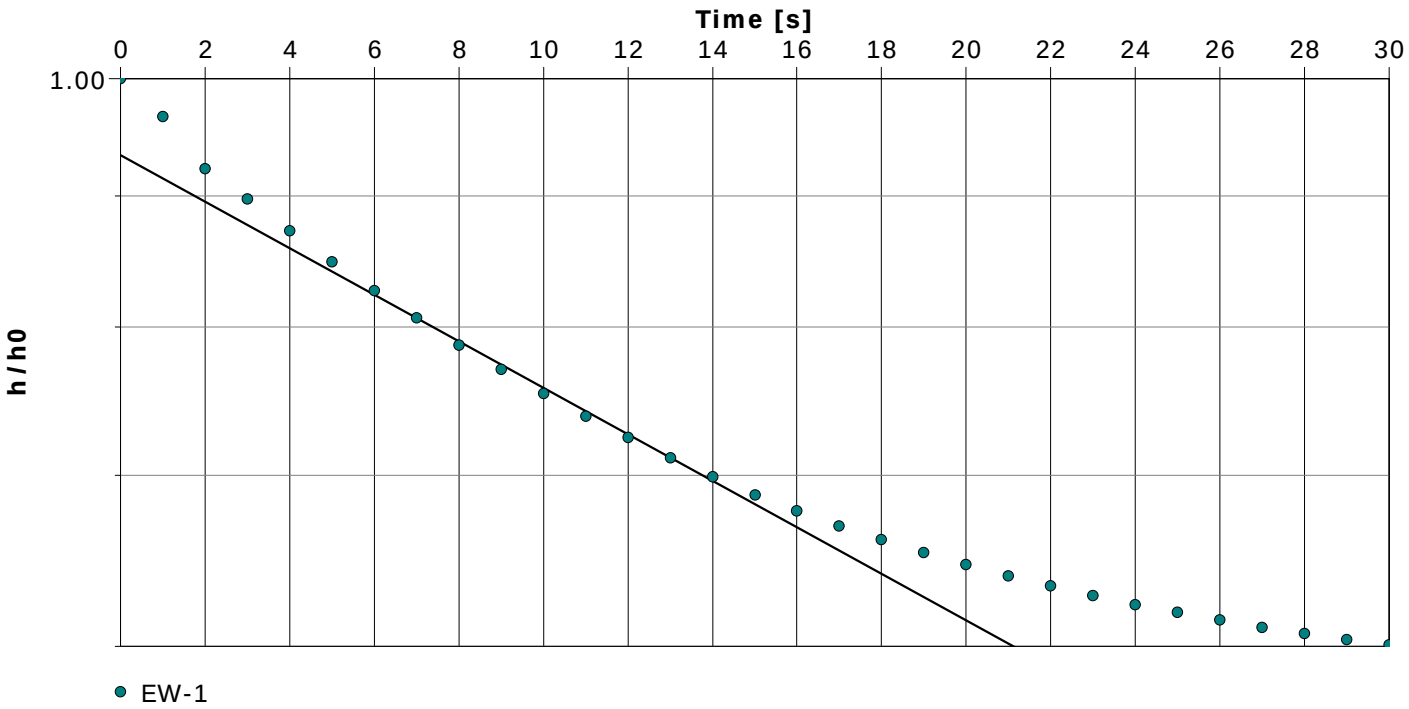
Slug Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Slug Test: EW-1 Slug Test	Test Well: EW-1
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by: S devin	Bouwer-Rice	Analysis Date: 9/21/2013
Aquifer Thickness: 20.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [ft/d]	
EW-1	8.82×10^{0}	

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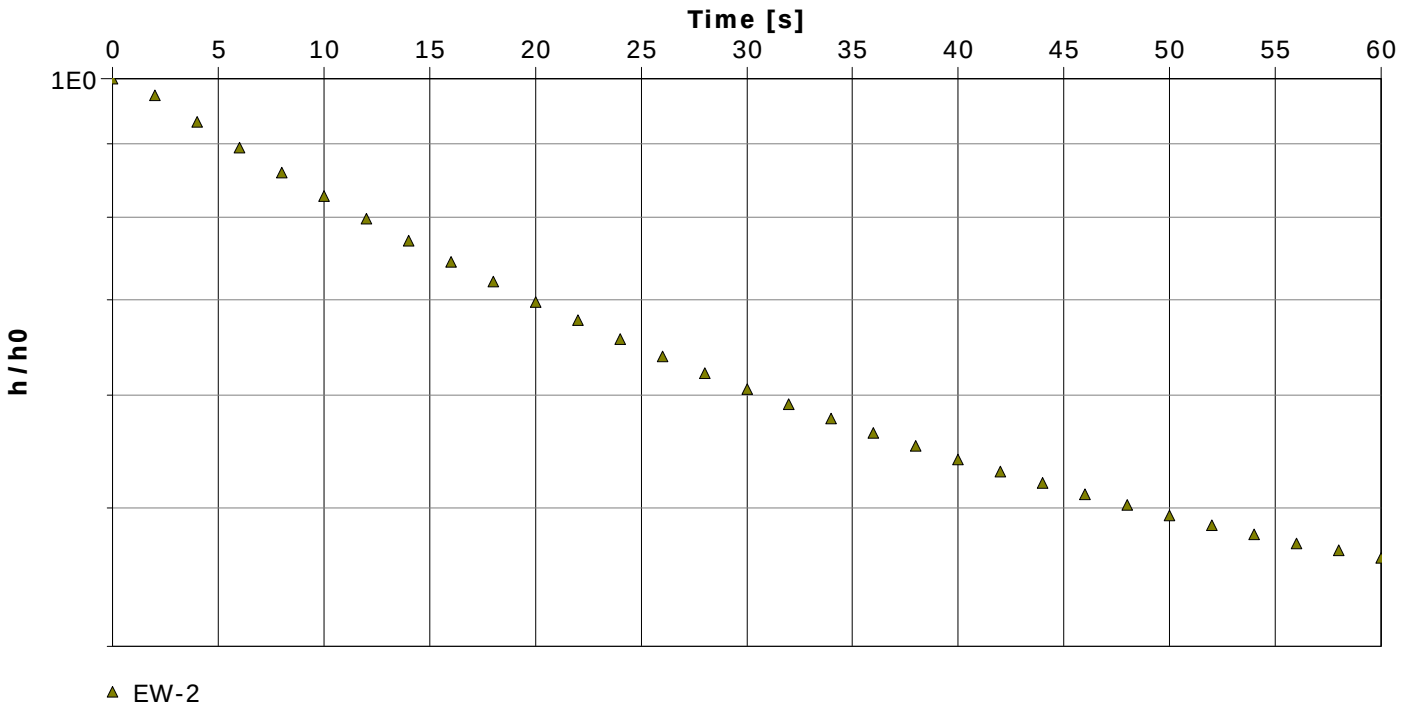
Slug Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Slug Test: EW-2 Slug Test	Test Well: EW-2
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by: S Devin	Hvorslev	Analysis Date: 6/27/2013
Aquifer Thickness: 19.30 ft		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/d]	
EW-2	1.02×10^{1}	

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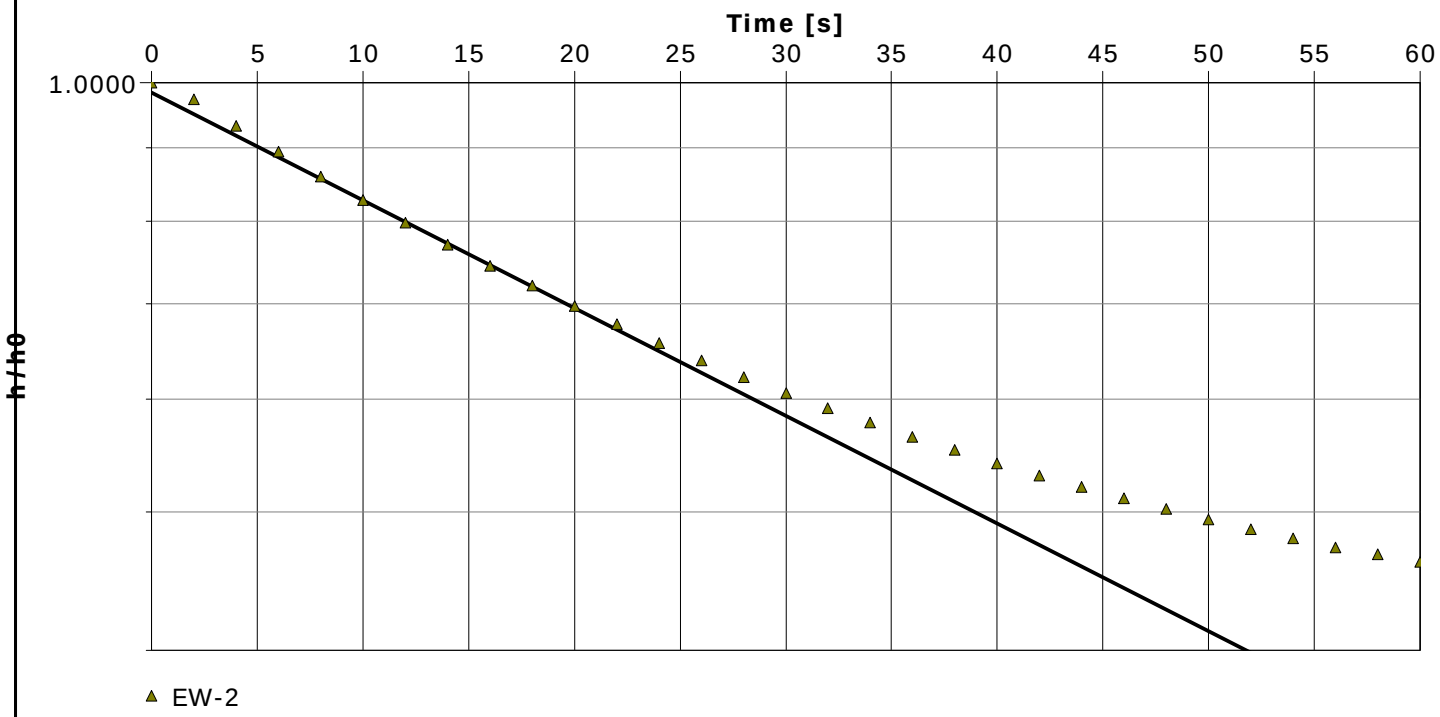
Slug Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Slug Test: EW-2 Slug Test	Test Well: EW-2
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by: S Devin	Bouwer-Rice	Analysis Date: 9/21/2013
Aquifer Thickness: 19.30 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [ft/d]	
EW-2	7.52×10^{0}	

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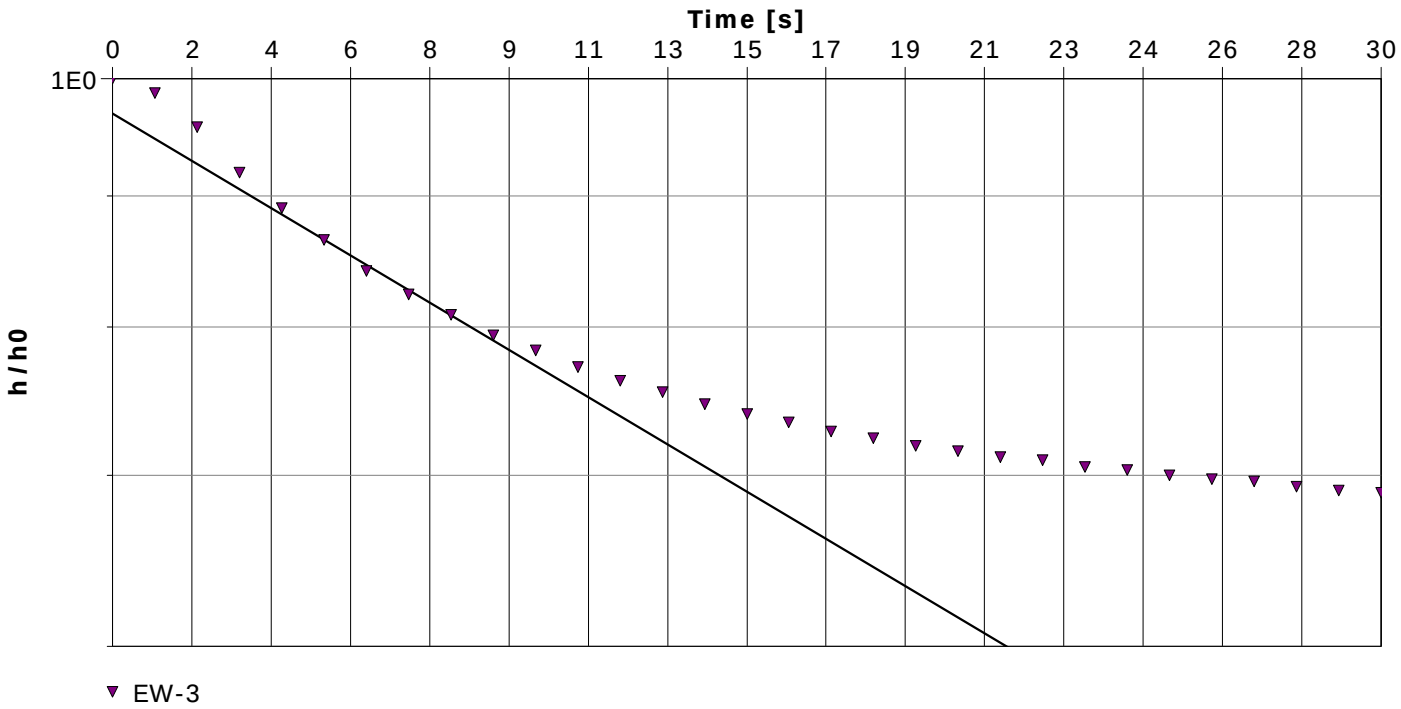
Slug Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Slug Test: EW-3 Slug Test	Test Well: EW-3
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by: S Devin	Hvorslev	Analysis Date: 6/27/2013
Aquifer Thickness: 20.00 ft		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/d]	
EW-3	1.33×10^{1}	

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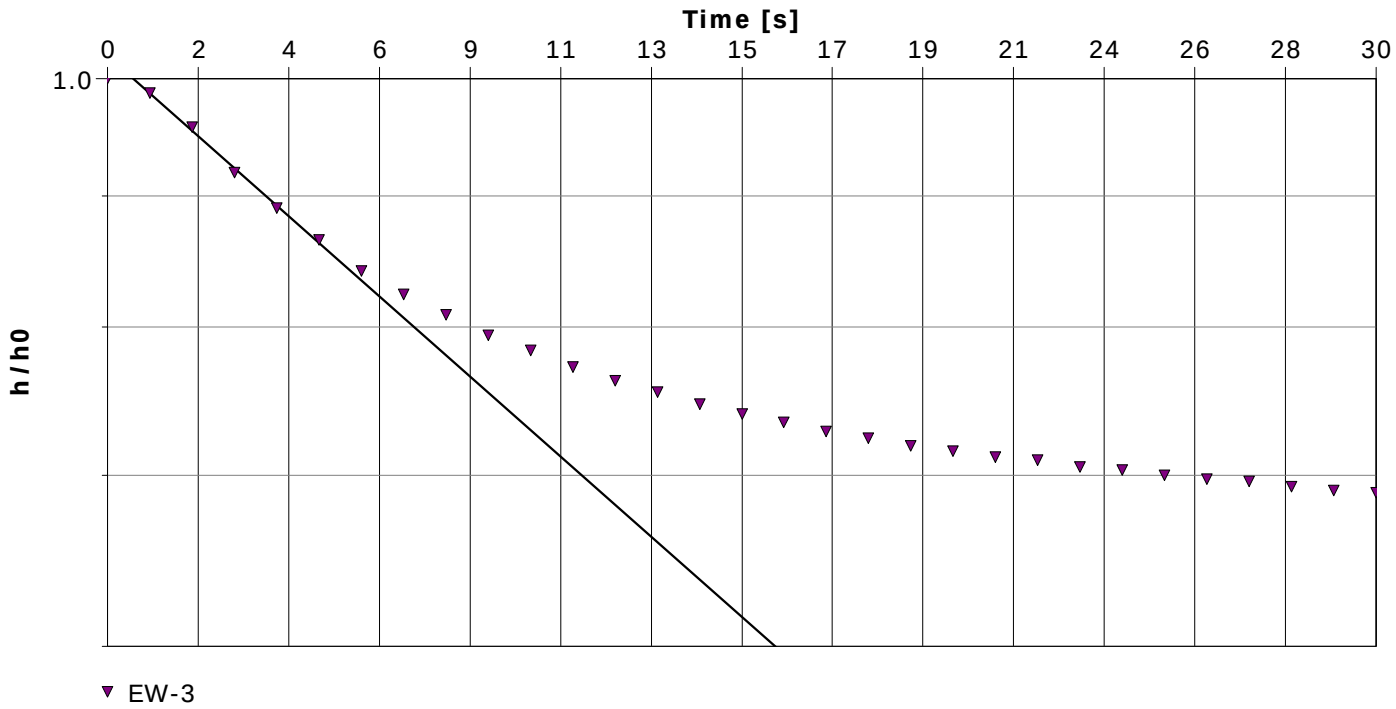
Slug Test Analysis Report

Project: Former Gil's Gas

Number: RWQCB Case No. 250006

Client: Porter Geotechnical

Location: Alturas, CA	Slug Test: EW-3 Slug Test	Test Well: EW-3
Test Conducted by: Steve Devin / Chip Porter		Test Date: 6/11/2013
Analysis Performed by:	Bouwer & Rice	Analysis Date: 7/6/2013
Aquifer Thickness: 20.00 ft		

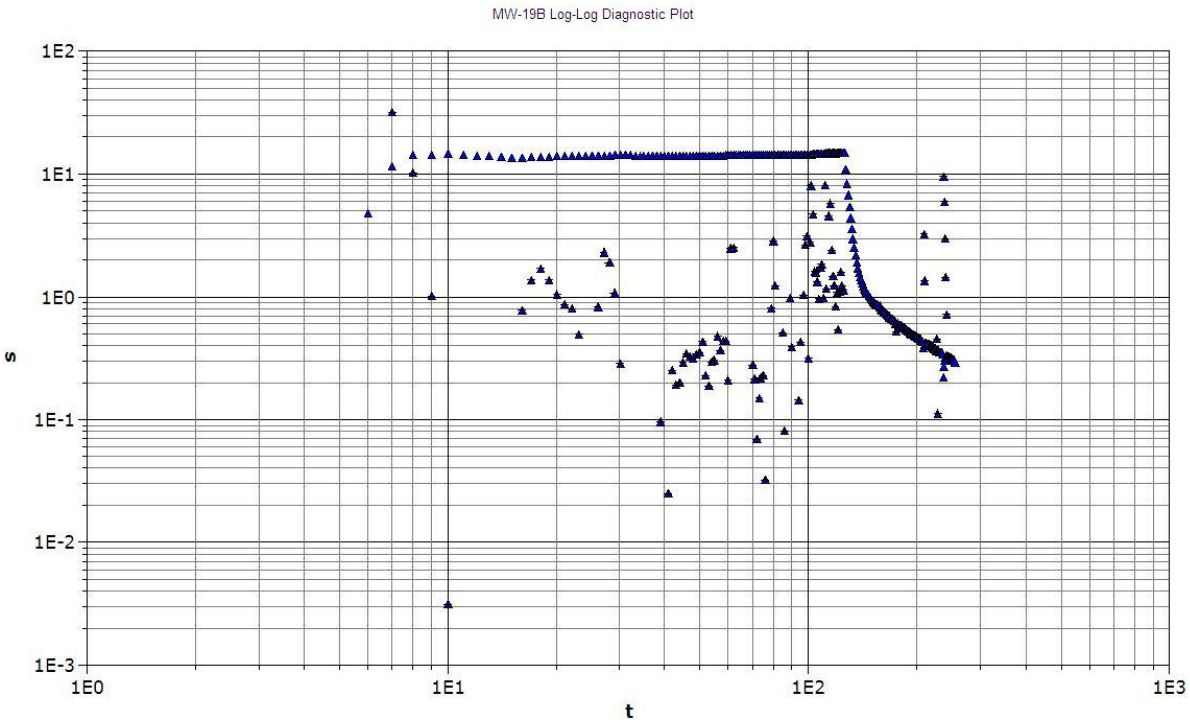


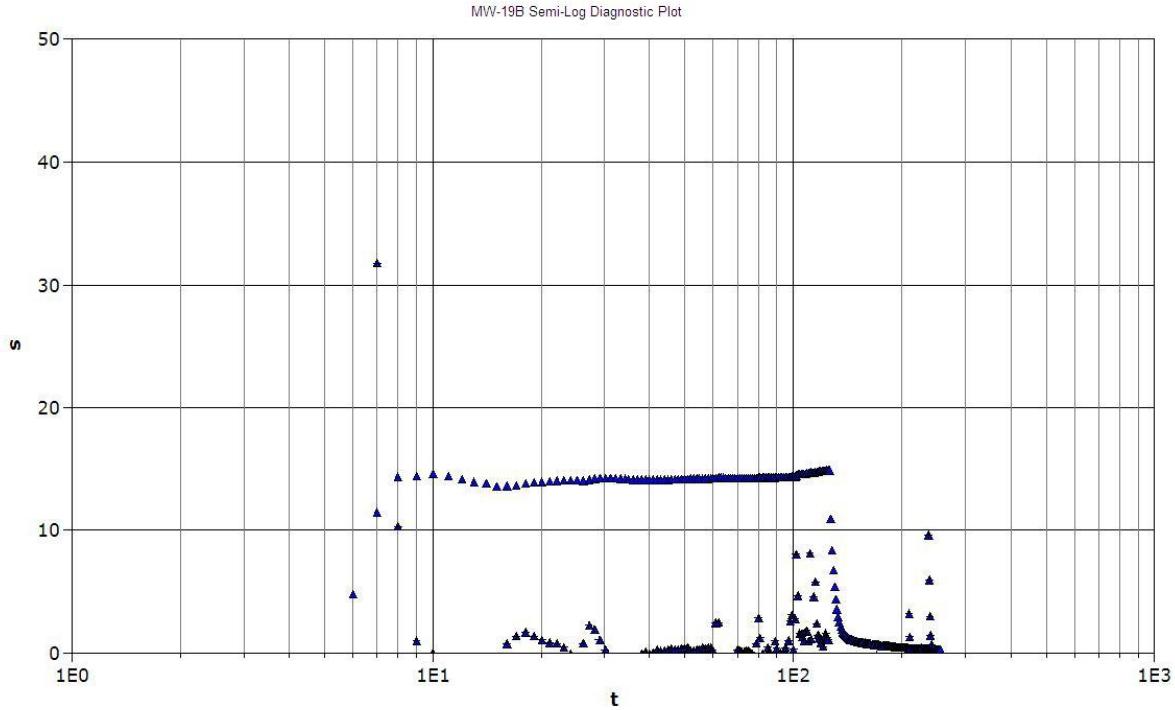
Calculation using Bouwer & Rice

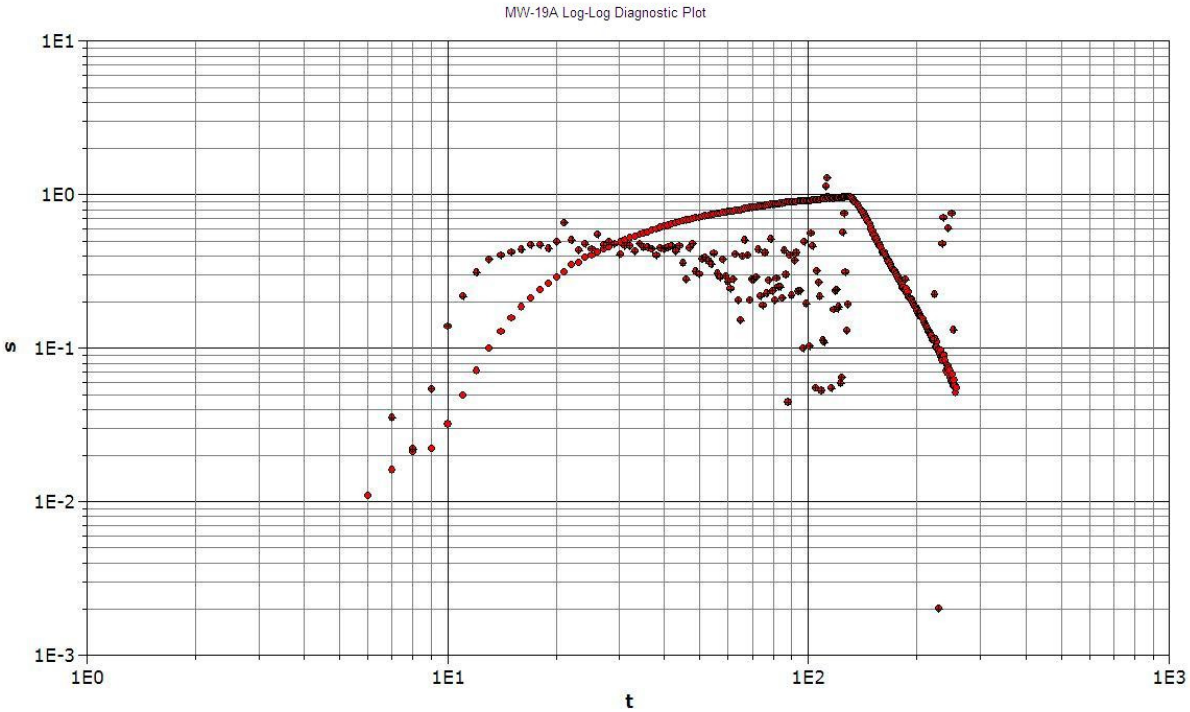
Observation Well	Hydraulic Conductivity [ft/d]	
EW-3	1.51×10^{1}	

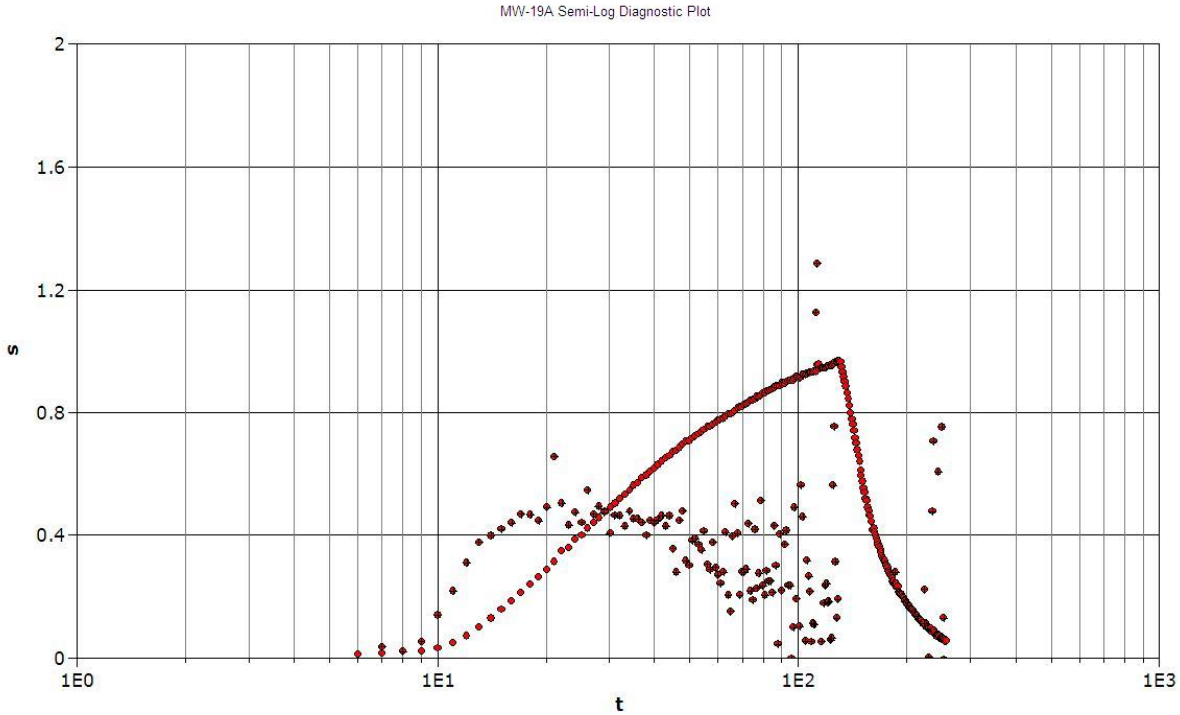
APPENDIX A-8

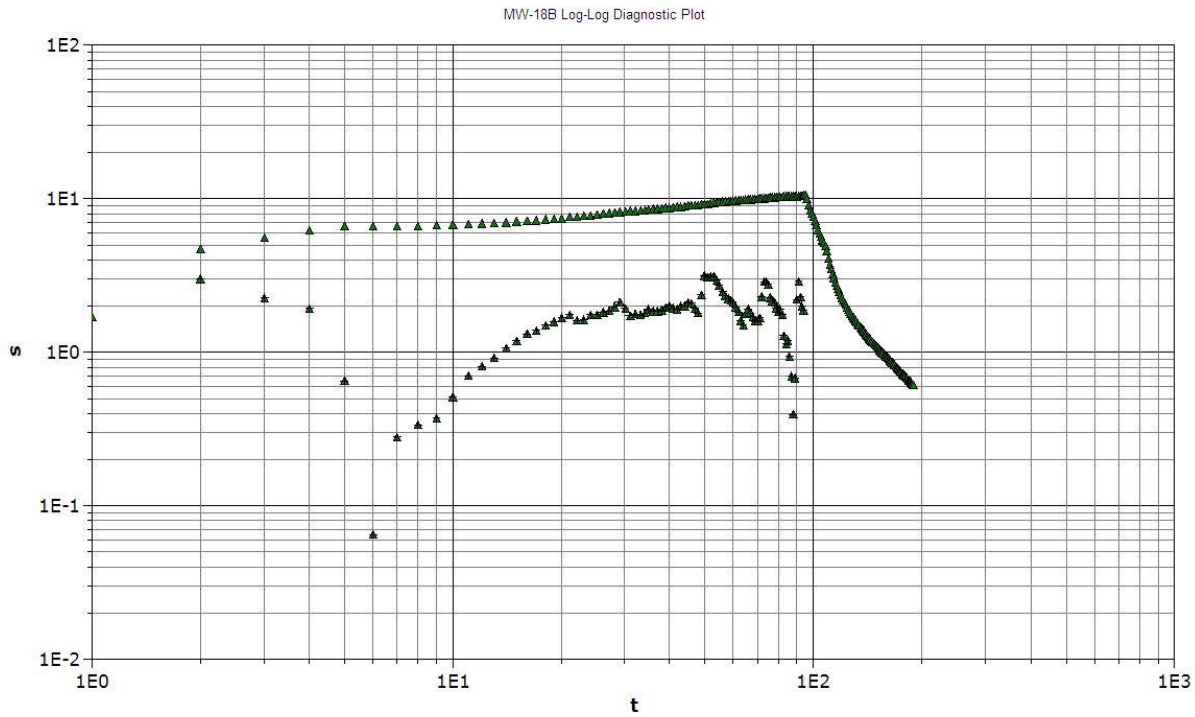
Diagnostic Plots for Monitoring Wells MW-19B, MW-19A, MW-15B and MW-2

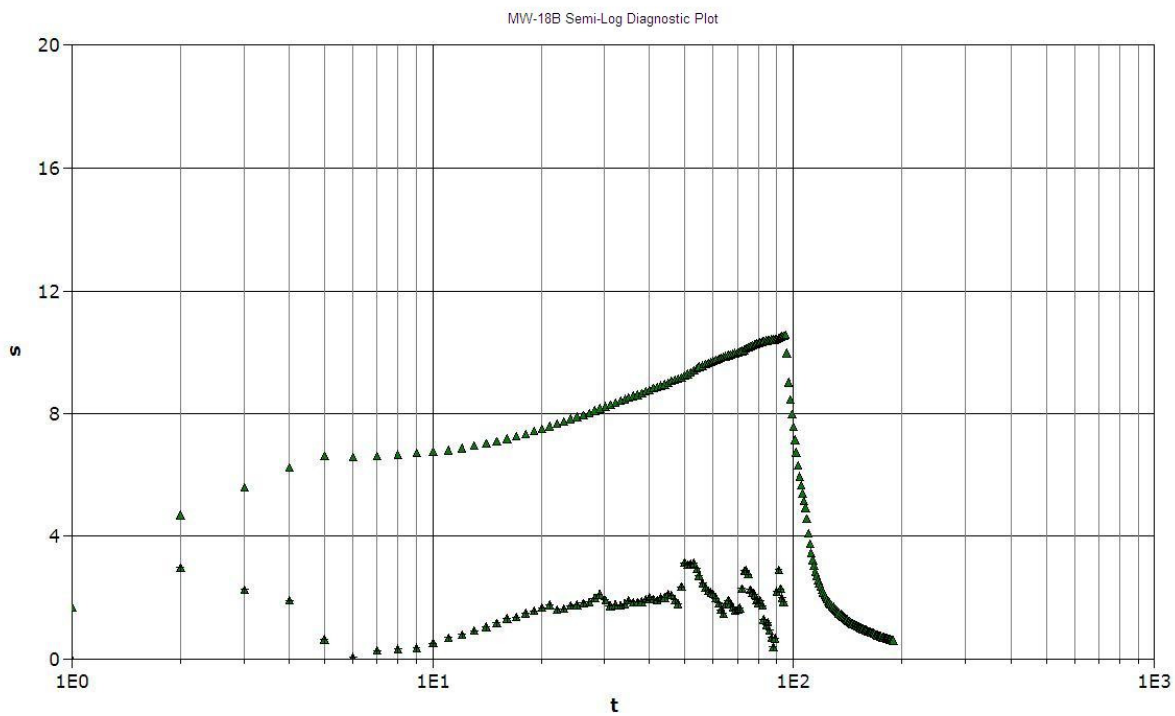

MW-19B Log-Log Diagnostic Plot
1E2
1E1
1E0
1E-1
1E-2
1E-3
s
1E0
1E1
1E2
1E3
t

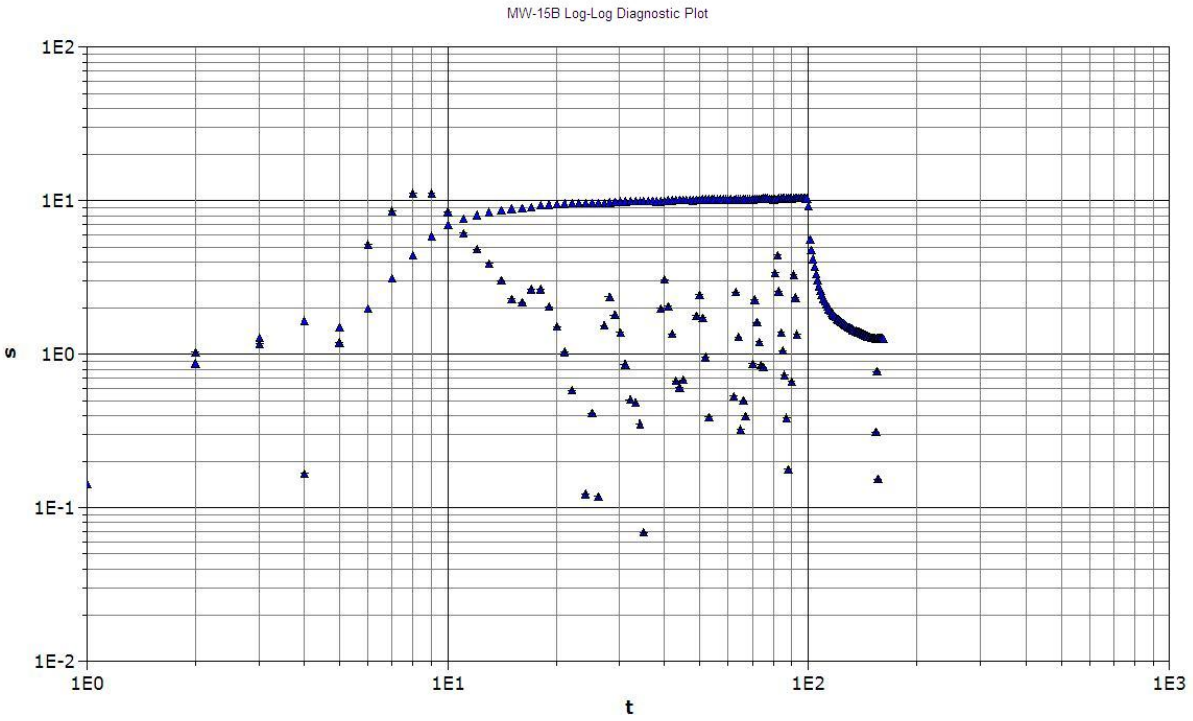

MW-19B Semi-Log Diagnostic Plot
50
40
30
20
10
0
s
1E0
1E1
1E2
1E3
t

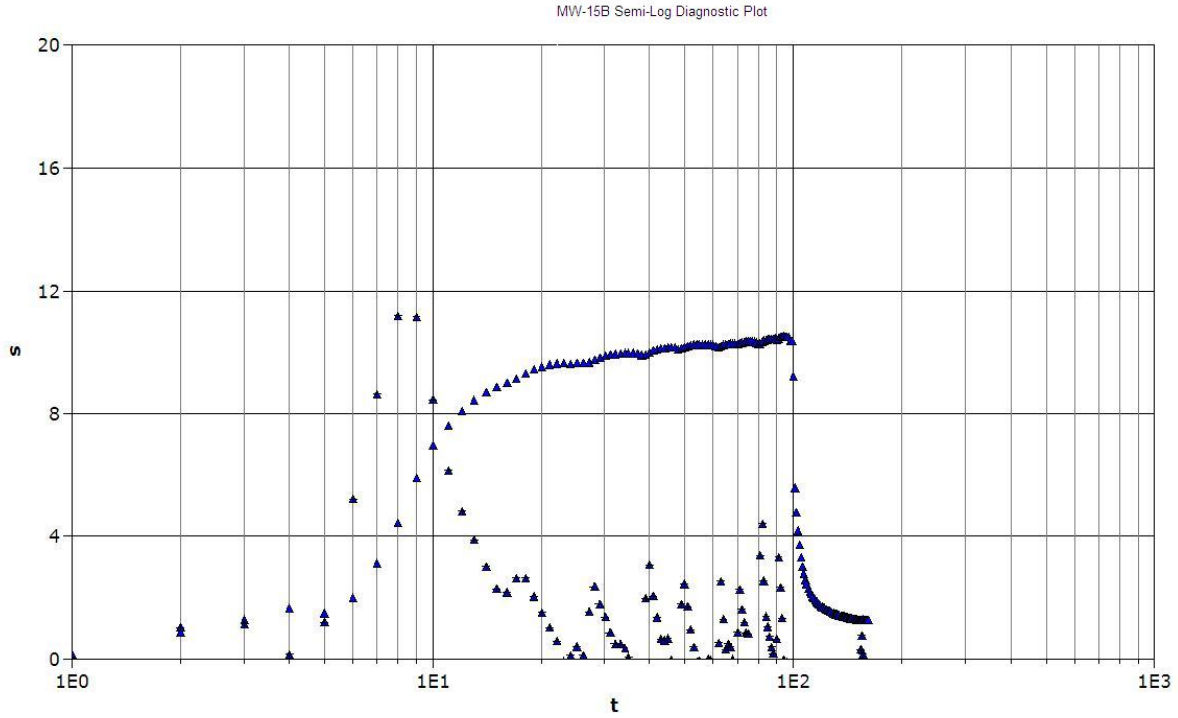

MW-19A Log-Log Diagnostic Plot
1E1
1E0
1E-1
1E-2
1E-3
s
1E0
1E1
1E2
1E3
t

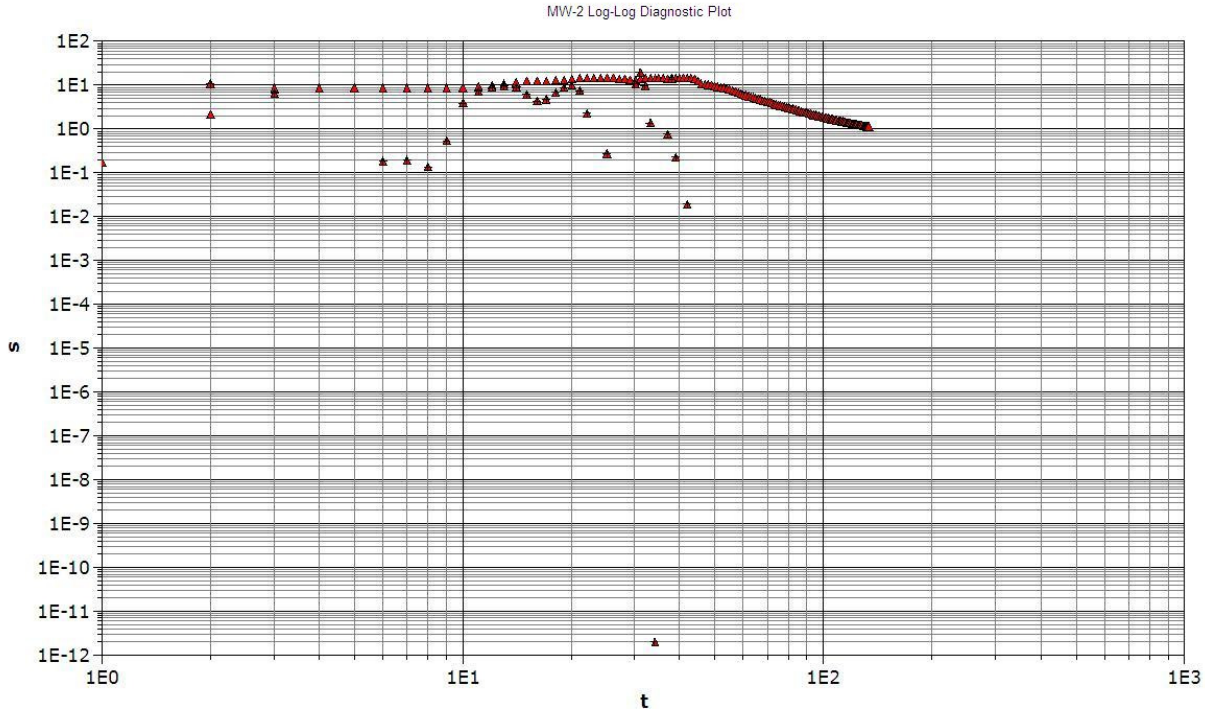

MW-19A Semi-Log Diagnostic Plot
2
1.6
1.2
0.8
0.4
0
s
1E0
1E1
1E2
1E3
t

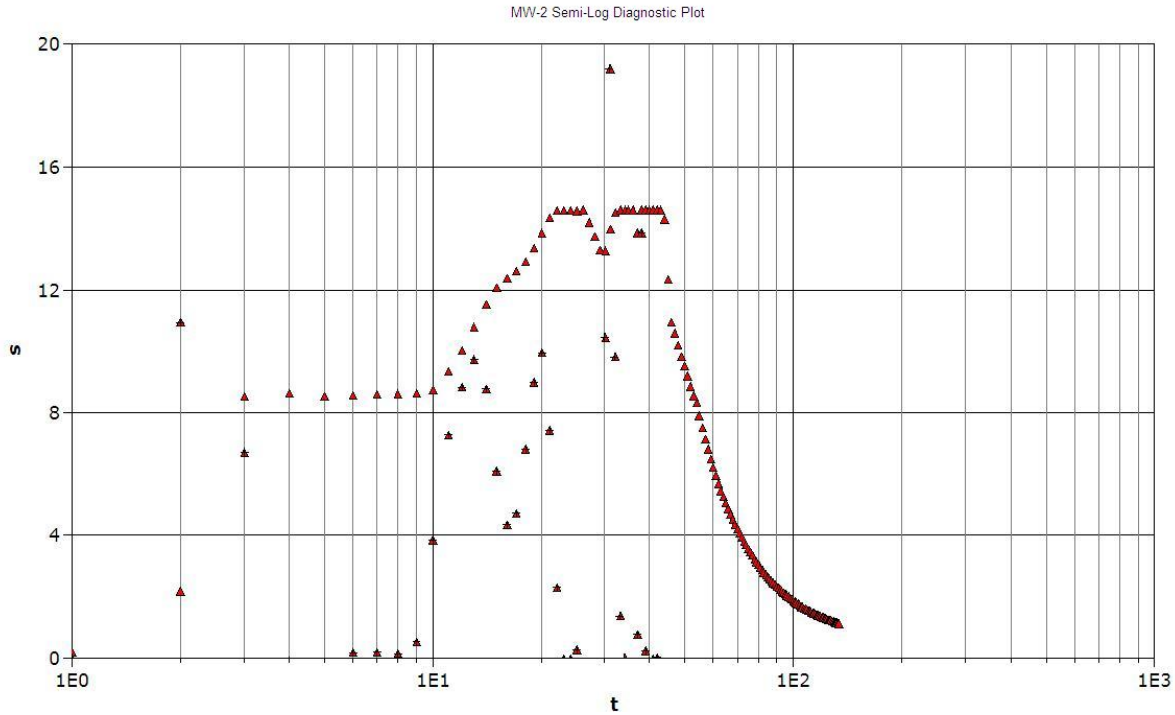

MW-18B Log-Log Diagnostic Plot
1E2
1E1
1E0
1E-1
1E-2
s
1E0
1E1
1E2
1E3
t


MW-18B Semi-Log Diagnostic Plot
20
16
12
8
4
0
s
1E0
1E1
1E2
1E3
t


MW-15B Log-Log Diagnostic Plot
1E2
1E1
1E0
1E-1
1E-2
s
1E0
1E1
1E2
1E3
t


MW-15B Semi-Log Diagnostic Plot
20
16
12
8
4
0
s
1E0
1E1
1E2
1E3
t


MW-2 Log-Log Diagnostic Plot
1E2
1E1
1E0
1E-1
1E-2
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
s
1E0
1E1
1E2
1E3
t


MW-2 Semi-Log Diagnostic Plot
20
16
12
8
4
0
s
1E0
1E1
1E2
1E3
t

APPENDIX A-9

Aquifer Test Validity Checks

Theis Recovery Method - Single Well

Applicability:

1. The aquifer is confined, leaky, or unconfined with specific conditions as noted below;
2. The aquifer has a seemingly infinite areal extent;
3. The aquifer is homogeneous, isotropic, and of uniform thickness over the area influenced by the test;
4. Prior to pumping, the prezometric surface is horizontal (or nearly so) over the area that will be influenced by the test;
5. The aquifer is pumped at a constant discharge rate;
6. The flow into the well is unsteady;
7. The well penetrates the entire thickness of the aquifer and thus receives water by horizontal flow except as noted below;
8. The water removed from storage is discharged instantaneously with decline in head;
9. Well function argument u < 0.01; *i.e.* $t_p > \frac{25 \cdot r^2 \cdot S}{T}$ where $u = \frac{r^2 \cdot S}{4 \cdot T \cdot t}$ and;
10. Well function argument u' < 0.01; *i.e.* $t' > \frac{25 \cdot r^2 \cdot S}{T}$ where $u' = \frac{r^2 \cdot S}{4 \cdot T \cdot t'}$;
11. Well storage effects can be neglected when pumping time $t_p > \frac{25 \cdot r_c^2}{T}$ and recovery time $t' > \frac{25 \cdot r_c^2}{T}$ where r_c= radius of casing;
12. For partially penetrating wells; $t_p > \frac{10 \cdot D^2 \cdot S}{T}$ and $t' > \frac{10 \cdot D^2 \cdot S}{T}$;
13. For determining the skin factor using Jacob's Equation the linear well losses (*i.e.* the skin effect) are appreciable, and the non-linear well losses are negligible.
14. For leaky aquifers, the sum of the pumping and recovery times should be $(t_p + t') \le \frac{L^2 \cdot S}{20 \cdot T}$ or $(t_p + t') \le \frac{c \cdot S}{20}$

    where $L = \sqrt{K \cdot D \cdot c}$ is the leakage factor and $c = \frac{D'}{K'}$ is the hydraulic resistance;
15. For unconfined aquifers only late-time recovery data can be used so u < 0.01 *i.e.*; $t_p > \frac{25 \cdot r_w^2 \cdot S}{T}$

    and u' < 0.01 *i.e.*; $t' > \frac{25 \cdot r_w^2 \cdot S}{T}$

MW-18B Theis Recovery - Single Well

$S := 3.2 \times 10^{-2}$ from double porosity model curve fit

$T := 3.37 \cdot \frac{ft^2}{day}$ from late-time recovery data (Cooper-Jacob modification of Theis)

$Q := 0.39 \cdot gpm$ $\quad Q = 0.0521 \cdot \frac{ft^3}{min}$

$t_p := 93 \cdot min$

$r := 1 \cdot in$

$$Check_Pumping_Time := \begin{cases} \text{"Pumping Time OK"} & \text{if } t_p > \frac{25 \cdot r^2 \cdot S}{T} \\ \text{"Pumping Time Too Short"} & \text{otherwise} \end{cases} = \text{"Pumping Time OK"}$$

Recovery Time; $t'_{min} := \frac{25 \cdot r^2 \cdot S}{T} = 2.37 \cdot min$ $\quad \frac{t_p + t'_{min}}{t'_{min}} = 40.18$

T calculation for straight line recovery valid for $\frac{t_p + t'}{t'} \le 40.176$ on semi-log plot

$$Check_Well_Casing_Storage := \begin{cases} \text{"Ok, Well Storage can be neglected"} & \text{if } t_p > \frac{25 \cdot r^2}{T} \\ \text{"Cannot neglect Well Storage"} & \text{otherwise} \end{cases} = \text{"Ok, Well Storage can be neglected"}$$

MW-18B Skin Factor and Effective Well Radius

$T := 2.34 \times 10^{-3} \cdot \frac{ft^2}{min}$ $\quad r := 0.08333 \cdot ft$

$Q := 0.0521 \cdot \frac{ft^3}{min}$ $\quad r_w := r$

$t/t' := \frac{2.25 \cdot T \cdot t_p}{r_w^2 \cdot S} = 2203.58$

Well drawdown at end of pumping; $s_w := 10.52 \cdot ft$

Well drawdown from extrapolated recovery curve at $t/t' = 2203.58$ $\quad s'_w := 12.8 \cdot ft$

$$skin_factor := \frac{2 \cdot \pi \cdot T}{Q} \cdot \left(s_w - s'_w\right) = -0.64$$

$$\left[\frac{Q}{4\cdot\pi\cdot T}\cdot\ln\left(\frac{2.25\cdot T\cdot t_p}{r_{eff}^{\,2}\cdot S}\right)-\frac{Q}{4\cdot\pi\cdot T}\cdot\ln\left(\frac{2.25\cdot T\cdot t_p}{r_w^{\,2}\cdot S}\right)-(\text{skin_factor})\cdot\frac{Q}{2\cdot\pi\cdot T}\right]\text{solve}\rightarrow\begin{pmatrix}-0.159\cdot ft\\ 0.159\cdot ft\end{pmatrix}$$

Positive root = Effective Well Radius, r_{eff}

MW-19B Theis Recovery - Single Well

$S := 2\times 10^{-2}$ assumed

$T := 18.9\cdot\frac{ft^2}{day}$ from late-time recovery data (Cooper-Jacob modification of Theis)

$Q := 0.65\cdot gpm$ $\quad Q = 0.0869\cdot\frac{ft^3}{min}$

$t_p := 126\cdot min$

$r := 1\cdot in$

$$\text{Check_Pumping_Time} := \begin{cases}\text{"Pumping Time OK"} & \text{if } t_p > \frac{25\cdot r^2\cdot S}{T}\\ \text{"Pumping Time Too Short"} & \text{otherwise}\end{cases} = \text{"Pumping Time OK"}$$

Recovery Time; $t'_{min} := \frac{25\cdot r^2\cdot S}{T} = 0.26\cdot min$ $\quad \frac{t_p + t'_{min}}{t'_{min}} = 477.28$

T calculation for straight line recovery valid for $\frac{t_p + t'}{t'} \le 477.28$ on semi-log plot

$$\text{Check_Well_Casing_Storage} := \begin{cases}\text{"Ok, Well Storage can be neglected"} & \text{if } t_p > \frac{25\cdot r^2}{T}\\ \text{"Cannot neglect Well Storage"} & \text{otherwise}\end{cases} = \text{"Ok, Well Storage can be neglected"}$$

MW-19B Skin Factor and Effective Well Radius

$T := 1.3125 \times 10^{-2} \cdot \frac{ft^2}{min}$ $\quad r := 0.08333 \cdot ft$

$Q := 0.0869 \cdot \frac{ft^3}{min}$ $\quad r_w := r$

Well drawdown at end of pumping; $s_w := 14.88 \cdot ft$

$t/t' := \frac{2.25 \cdot T \cdot t_p}{r_w^2 \cdot S} = 2.6793 \times 10^4$

Well drawdown from extrapolated recovery curve at $t/t' = 26792.89$ $\quad s'_w := 5.6 \cdot ft$

$skin_factor := \frac{2 \cdot \pi \cdot T}{Q} \cdot (s_w - s'_w) = 8.81$

$$\left[\frac{Q}{4 \cdot \pi \cdot T} \cdot \ln\left(\frac{2.25 \cdot T \cdot t_p}{r_{eff}^2 \cdot S}\right) - \frac{Q}{4 \cdot \pi \cdot T} \cdot \ln\left(\frac{2.25 \cdot T \cdot t_p}{r_w^2 \cdot S}\right) - (skin_factor) \cdot \frac{Q}{2 \cdot \pi \cdot T}\right] \text{solve} \rightarrow \begin{pmatrix} -1.248 \times 10^{-5} \cdot ft \\ 1.248 \times 10^{-5} \cdot ft \end{pmatrix}$$

Positive root = Effective Well Radius, r_{eff}

MW-19A Theis Recovery - Single Well

$S := 2 \times 10^{-2}$ assumed

$T := 18.9 \cdot \frac{ft^2}{day}$ from late-time recovery data (Cooper-Jacob modification of Theis)

$Q := 0.65 \cdot gpm$ $\quad Q = 0.0869 \cdot \frac{ft^3}{min}$

$t_p := 126 \cdot min$

$r := 3.5 \cdot ft$

$$Check_Pumping_Time := \begin{cases} \text{"Pumping Time OK"} & \text{if } t_p > \frac{25 \cdot r^2 \cdot S}{T} \\ \text{"Pumping Time Too Short"} & \text{otherwise} \end{cases} = \text{"Pumping Time Too Short"}$$

Recovery Time; $t'_{min} := \frac{25 \cdot r^2 \cdot S}{T} = 466.67 \cdot min$ $\quad \frac{t_p + t'_{min}}{t'_{min}} = 1.27$

T calculation for straight line recovery valid for $\frac{t_p + t'}{t'} \le 477.28$ on semi-log plot

$$\text{Check_Well_Casing_Storage} := \begin{cases} \text{"Ok, Well Storage can be neglected"} & \text{if } t_p > \dfrac{25 \cdot r^2}{T} \\ \text{"Cannot neglect Well Storage"} & \text{otherwise} \end{cases} = \text{"Cannot neglect Well Storage"}$$

MW-19A Skin Factor and Effective Well Radius

$T := 1.3125 \times 10^{-2} \cdot \dfrac{ft^2}{min}$ $\quad r := 3.5 \cdot ft$

$Q := 0.0869 \cdot \dfrac{ft^3}{min}$ $\quad r_w := r$

Well drawdown at end of pumping; $s_w := 14.88 \cdot ft$

$t/t' := \dfrac{2.25 \cdot T \cdot t_p}{r_w^{\,2} \cdot S} = 15.1875$

Well drawdown from extrapolated recovery curve at $t/t' = 15.19$ $\quad s'_w := 5.6 \cdot ft$

$$\text{skin_factor} := \frac{2 \cdot \pi \cdot T}{Q} \cdot \left(s_w - s'_w\right) = 8.81$$

$$\left[\frac{Q}{4 \cdot \pi \cdot T} \cdot \ln\left(\frac{2.25 \cdot T \cdot t_p}{r_{eff}^{\,2} \cdot S}\right) - \frac{Q}{4 \cdot \pi \cdot T} \cdot \ln\left(\frac{2.25 \cdot T \cdot t_p}{r_w^{\,2} \cdot S}\right) - (\text{skin_factor}) \cdot \frac{Q}{2 \cdot \pi \cdot T}\right] \text{solve} \rightarrow \begin{pmatrix} -5.241 \times 10^{-4} \cdot ft \\ 5.241 \times 10^{-4} \cdot ft \end{pmatrix}$$

Positive root = Effective Well Radius, r_{eff}

MW-15B Theis Recovery - Single Well

$S := 3.32 \times 10^{-2}$ assumed

$T := 6.07 \cdot \dfrac{ft^2}{day}$ from late-time recovery data (Cooper-Jacob modification of Theis)

$Q := 0.40 \cdot gpm$ $\quad Q = 0.0535 \cdot \dfrac{ft^3}{min}$

$t_p := 98 \cdot min$

$r := 1 \cdot in$

$$\text{Check_Pumping_Time} := \begin{cases} \text{"Pumping Time OK"} & \text{if } t_p > \dfrac{25 \cdot r^2 \cdot S}{T} \\ \text{"Pumping Time Too Short"} & \text{otherwise} \end{cases} = \text{"Pumping Time OK"}$$

Recovery Time; $t'_{min} := \frac{25 \cdot r^2 \cdot S}{T} = 1.37 \cdot min$

$\frac{t_p + t'_{min}}{t'_{min}} = 72.67$

T calculation for straight line recovery valid for $\frac{t_p + t'}{t'} \le 477.28$ on semi-log plot

Check_Well_Casing_Storage := "Ok, Well Storage can be neglected" if $t_p > \frac{25 \cdot r^2}{T}$ = "Ok, Well Storage can be neglected"

"Cannot neglect Well Storage" otherwise

MW-15B Skin Factor and Effective Well Radius

$T := 1.3125 \times 10^{-2} \cdot \frac{ft^2}{min}$ $\quad r := 0.08333 \cdot ft$

$Q := 0.0535 \cdot \frac{ft^3}{min}$ $\quad r_w := r$

Well drawdown at end of pumping; $s_w := 10.39 \cdot ft$

$t/t' := \frac{2.25 \cdot T \cdot t_p}{r_w^2 \cdot S} = 1.614 \times 10^4$

Well drawdown from extrapolated recovery curve at $t/t' = 16140.30$ $\quad s'_w := 9.7 \cdot ft$

$skin_factor := \frac{2 \cdot \pi \cdot T}{Q} \cdot (s_w - s'_w) = 1.06$

$$\left[\frac{Q}{4 \cdot \pi \cdot T} \cdot \ln\left(\frac{2.25 \cdot T \cdot t_p}{r_{eff}^2 \cdot S}\right) - \frac{Q}{4 \cdot \pi \cdot T} \cdot \ln\left(\frac{2.25 \cdot T \cdot t_p}{r_w^2 \cdot S}\right) - (skin_factor) \cdot \frac{Q}{2 \cdot \pi \cdot T}\right] \text{solve} \rightarrow \begin{pmatrix} -2.877 \times 10^{-2} \cdot ft \\ 2.877 \times 10^{-2} \cdot ft \end{pmatrix}$$

Positive root = Effective Well Radius, r_{eff}

References

Batu, V., 1998. Aquifer Hydraulics. John Wiley & Sons, New York.

Dawson, K.J. and Istok, J.D., 1992. Aquifer Testing. CRC Press, Boca Raton, FL.

Driscoll, F.G., 1986. Groundwater and Wells, 2nd Ed., Johnson Filtration Systems, Inc., St. Paul, Minnesota.

Kruseman, G.P. and de Ridder, N.A., 1991. Analysis and Evaluation of Pumping Test Data, 2nd Ed., Int'l Inst for Land Reclamation and Improvement, ILRI Publication 47, The Netherlands.

Poehls, D.J. and Smith, G.J., Eds. 2009. Encyclopedic Dictionary of Hydrogeology. Boston (MA). Academic Press.

APPENDIX A-10

Driller's Logs of the Two Nearest Municipal Wells

REGION 5
COUNTY Modoc
NEAR Alturas

DIVISION OF WATER RESOURCES
DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

WELL LOG

#3
BASIN South Fork Pit River
DWR No. ____ : ____ B & M
OTHER Nos. Alturas well #5
42N/12E-12L1

LOCATION SE cor. of Athletic grounds on east 8th St. Alturas

OWNER City of Alturas ADDRESS

CONFIDENTIAL LOG
Water Code Sec. 13752

DRILLED BY Hartley & Kirkpatrick ADDRESS

DRILLING METHOD Cable GRAVEL PACKED DATE COMPLETED 1951

SIZE OF CASING DEPTH 12" 415' STRUCK WATER AT 21'

PERFORATIONS SIZE No.

WATER LEVEL BEFORE PERFORATING AFTER

TEST DATA: DISCHARGE G. P. M. DRAWDOWN FT. HOURS RUN

OTHER DATA AVAILABLE: WATER LEVEL RECORD ANALYSIS

SURFACE ELEV. DATUM SOURCE OF INFORMATION City of Alturas

DEPTH	ELEV. OF BOTTOM OF STRATUM	MATERIAL	THICKNESS	SP. YIELD %	
0-		Gravel	21	25	525
21'		First Water			
			54	3	162
75-85		Gravel	10	25	250
		100	15	3	45
			42	3	126
142-152		Gravel	10	25	250
		200	46	3	138
210-226		Gravel	0-100		982
			100-200		574
240-250		Gravel			
					1496
					7.5 av
275-285		Gravel			
295-300.		Water Gravel.			

FOR FIELD COPIES USE ALTERNATE LINES

LOG OBTAINED BY Hill DATE 11/21 SHEET 1 OF

FORM 263. 47655 7-81 5M ③ SPO

#2

ORIGINAL
File with DWR

CONFIDENTIAL LOG
Water Code Sec. 13752

WATER WELL DRILLERS REPORT

(Sections 7079, 7080, 7081, 7082, Water Code)

THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

42N/12E ~ 11

Do Not Fill In

Nº 18353

State Well No.

Other Well No.

(1) OWNER:

Name City of Alturas

Address Alturas, Ca.

(2) LOCATION OF WELL:

County Modoc Owner's number, if any 7

Township, Range, and Section Lots 11 & 12, Block 4, Broadmoor

Distance from cities, roads, railroads, etc. Park Addition. Lots face East A Street between 12th and 13th Sts.

(3) TYPE OF WORK *(check)*:

New Well [X] Deepening [ ] Reconditioning [ ] Destroying [ ]

If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE *(check)*:

Domestic [ ] Industrial [ ] Municipal [X]
Irrigation [ ] Test Well [ ] Other [ ]

(5) EQUIPMENT:

Rotary [X]
Cable [ ]
Other [ ]

(6) CASING INSTALLED:

STEEL: OTHER:
SINGLE [X] DOUBLE [ ]

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
0	670	16"	¼"	32"	0	74
				24"	75 5	670

If gravel packed

Size of shoe or well ring:

Size of gravel: ¼" X 3/8"

Describe joint Welded

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen Factory milled

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
350	450	4	38	1/8" X 2½"
535	670	"	"	" " "

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes [X] No [ ] To what depth 74' ft.

Were any strata sealed against pollution? Yes [ ] No [X] If yes, note depth of strata

From ft. to ft.

From ft. to ft.

Method of sealing

(9) WATER LEVELS:

Depth at which water was first found, if known ft.

Standing level before perforating, if known ft.

Standing level after perforating and developing ft.

(10) WELL TESTS:

Was pump test made? Yes [X] No [ ] If yes, by whom? Conner's Drill

Yield: gal./min. with ft. drawdown after hrs.

Temperature of water Was a chemical analysis made? Yes [ ] No [ ]

Was electric log made of well? Yes [ ] No [X] If yes, attach copy

(11) WELL LOG:

Total depth 670 ft. Depth of completed well 670 ft.

CONFIDENTIAL LOG
Water Code Sec. 13752

Formation: *Describe by color, character, size of material, and structure*

ft. to	
0' - 3'	Soil and rock
3' - 20'	Yellow sand, stone and clay
20' - 31'	Sandstone - soft (Yellow)
31' - 52'	Blue gritty clay
52' - 62'	Blue sands
62' - 86'	Blue sandy clays
86' - 109'	Brown sandy clays
109' - 124'	Brown sands (100SE)
124' - 161'	Brown sandy clay
161' - 187'	Red sandy clay
187' - 290'	Brown sandy clays
290' - 310'	Blue sands and clays
310' - 321'	Whiteish grey clays (sandy)
321' - 340'	Brown sandy clays
340' - 375'	Hard rock (Basalt)
375' - 425'	" " "
425' - 445'	" " "
445' - 504'	Reddish brown and consolidated sands and clays
504' - 522'	Gravel and brown clays
522' - 540'	Blue sands coarse-loose
540' - 585'	White sands coarse (100se)
585' - 652'	White sands some clays showing
652' - 790'	Reddish brown sandy clays
790' - 805'	Brown sandy clay
805' - 828'	Blue-grey gravelly clays

CONFIDENTIAL LOG
Water Code Sec. 13752

Work started 7/15 19 70, Completed 8/27 19 70

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME C & N Pump and Well Co.
(Person, firm, or corporation) *(Typed or printed)*

Address 1745 Walsh Ave.
Santa Clara, Ca. 95050

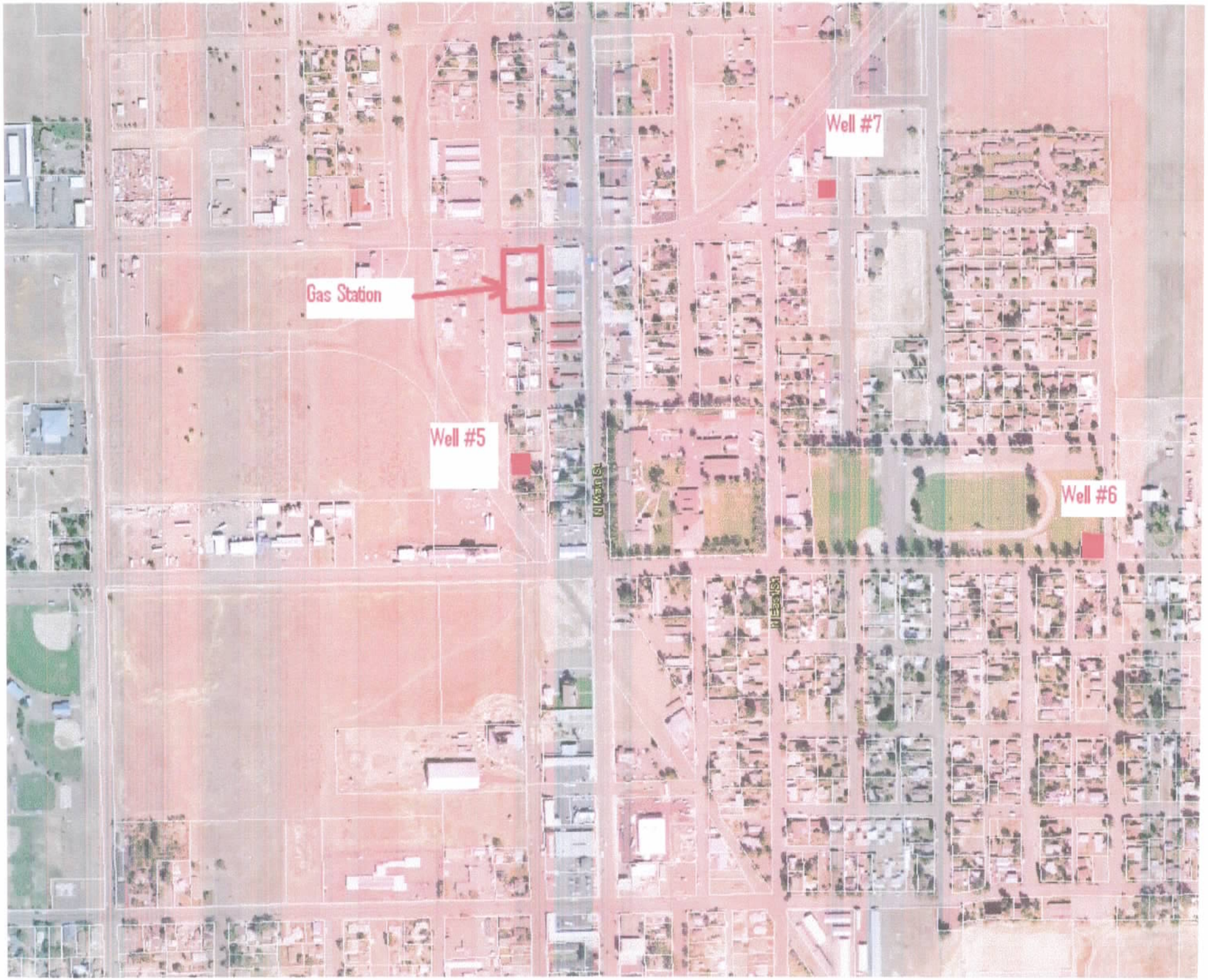
[SIGNED] [signature]
(Well Driller)

License No. 68648 Dated 9/23, 1970

SKETCH LOCATION OF WELL ON REVERSE SIDE

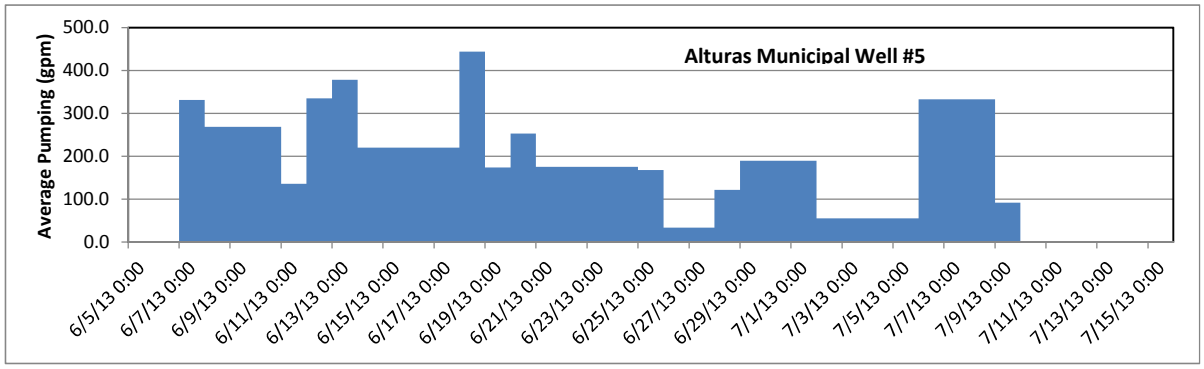
DWR 188 (REV. 9-65)

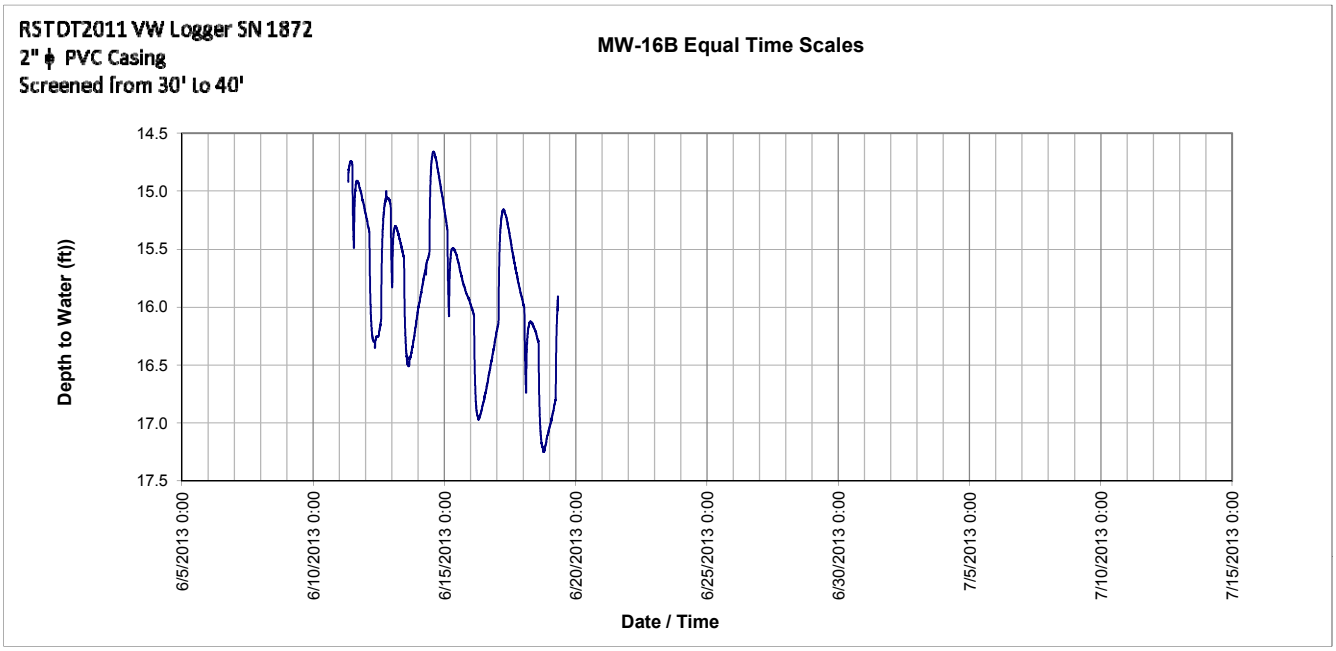
56391-950 10-65 BOM TRIP ① △ OSP

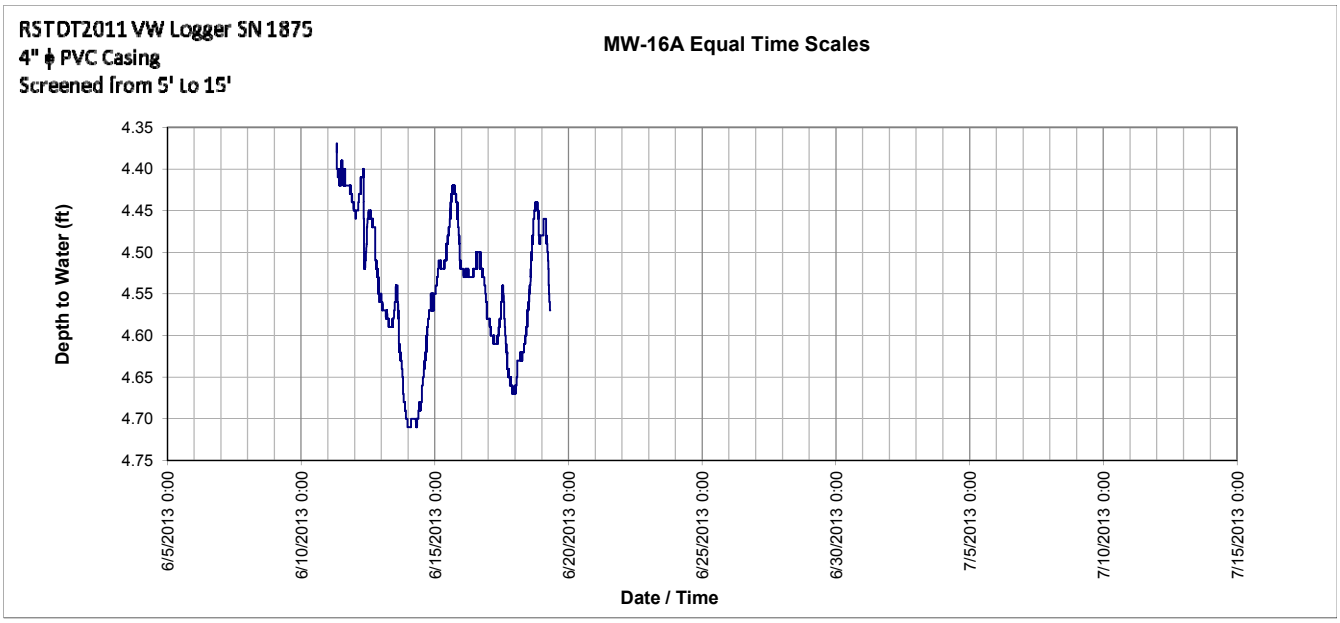

Well #7
Gas Station
Well #5
Well #6
W Main St
W Elm St

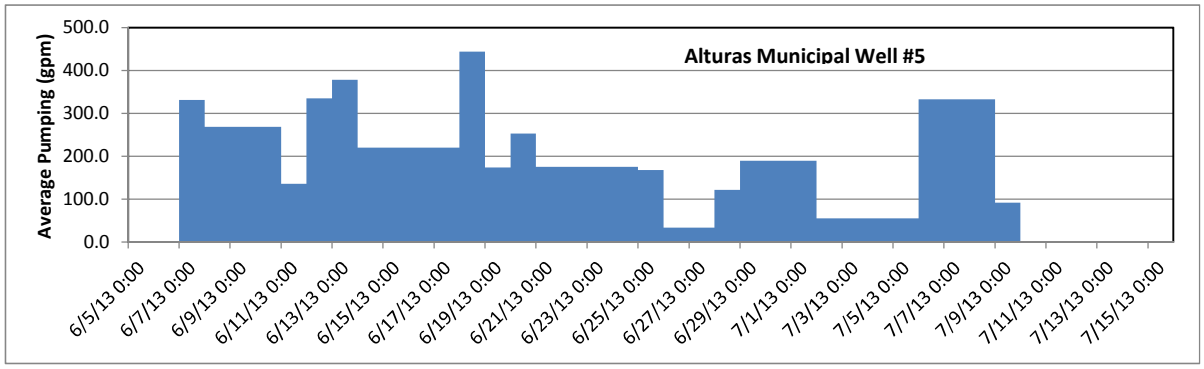
APPENDIX A-11

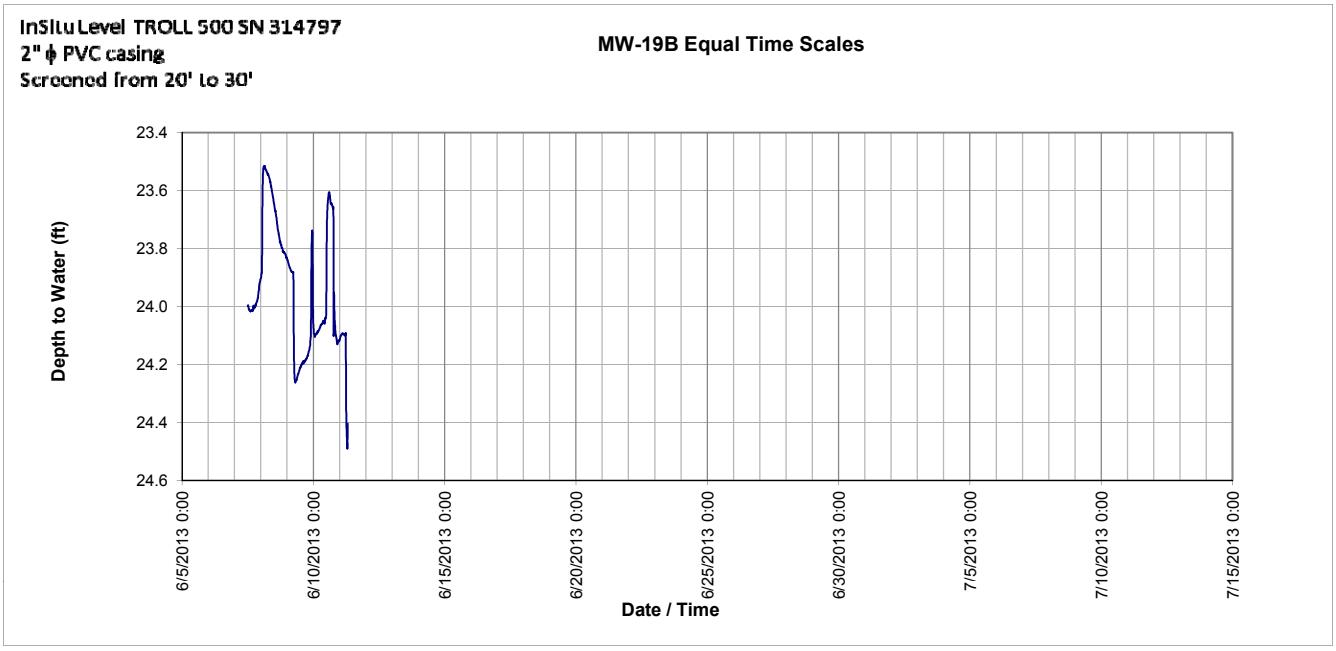
Histogram of Pumping Data

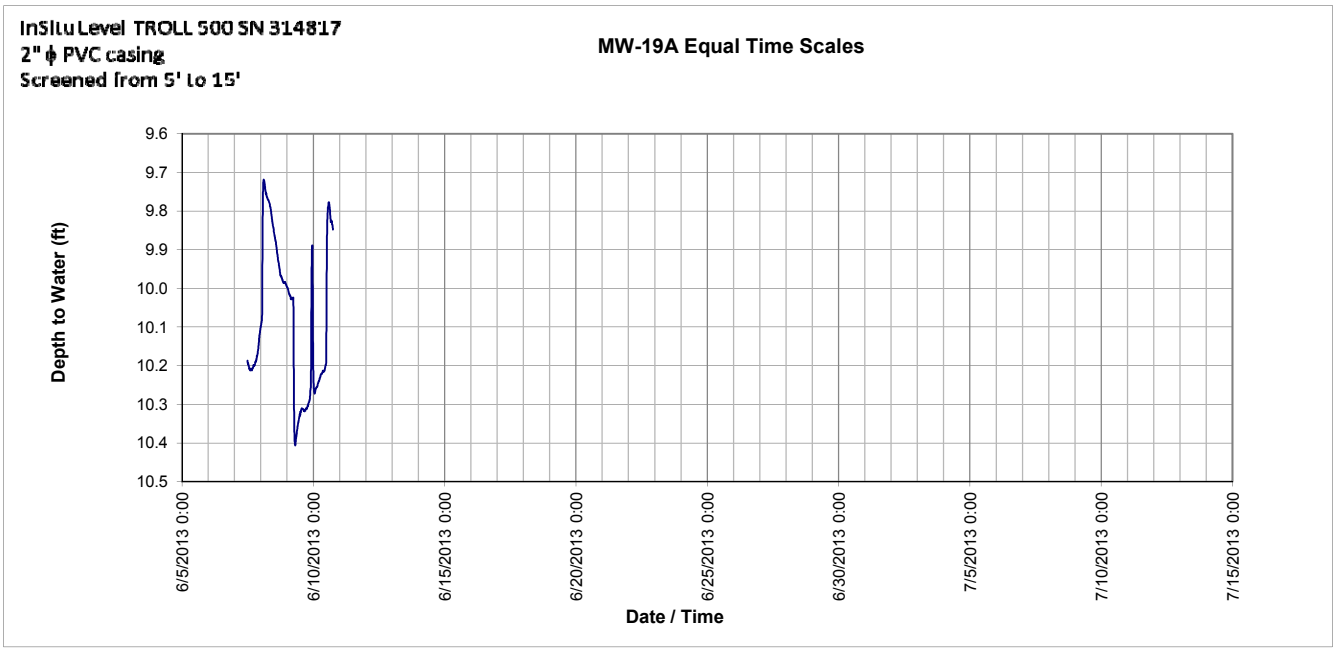

Alturas Municipal Well #5
Average Pumping (gpm)
500.0
400.0
300.0
200.0
100.0
0.0
6/5/13 0:00
6/7/13 0:00
6/9/13 0:00
6/11/13 0:00
6/13/13 0:00
6/15/13 0:00
6/17/13 0:00
6/19/13 0:00
6/21/13 0:00
6/23/13 0:00
6/25/13 0:00
6/27/13 0:00
6/29/13 0:00
7/1/13 0:00
7/3/13 0:00
7/5/13 0:00
7/7/13 0:00
7/9/13 0:00
7/11/13 0:00
7/13/13 0:00
7/15/13 0:00

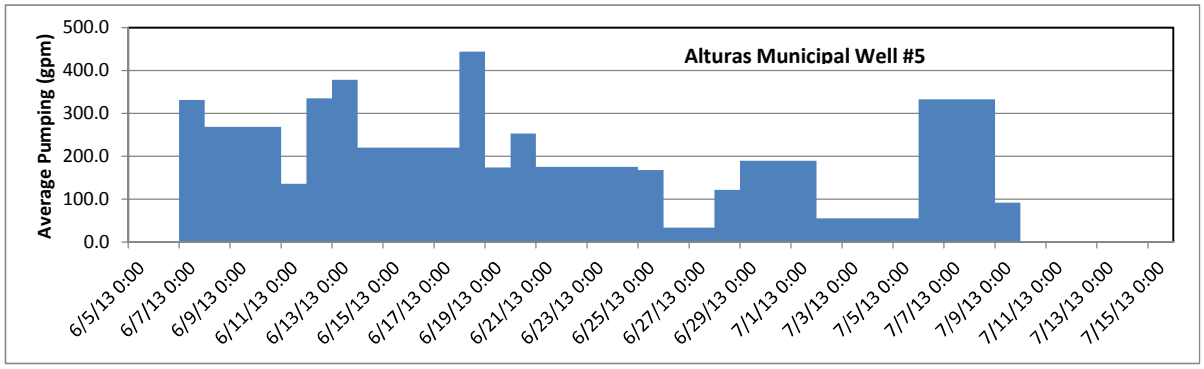

RSTDT2011 VW Logger SN 1872
2" ϕ PVC Casing
Screened from 30' to 40'
MW-16B Equal Time Scales
Depth to Water (ft))
14.5
15.0
15.5
16.0
16.5
17.0
17.5
6/5/2013 0:00
6/10/2013 0:00
6/15/2013 0:00
6/20/2013 0:00
6/25/2013 0:00
6/30/2013 0:00
7/5/2013 0:00
7/10/2013 0:00
7/15/2013 0:00
Date / Time

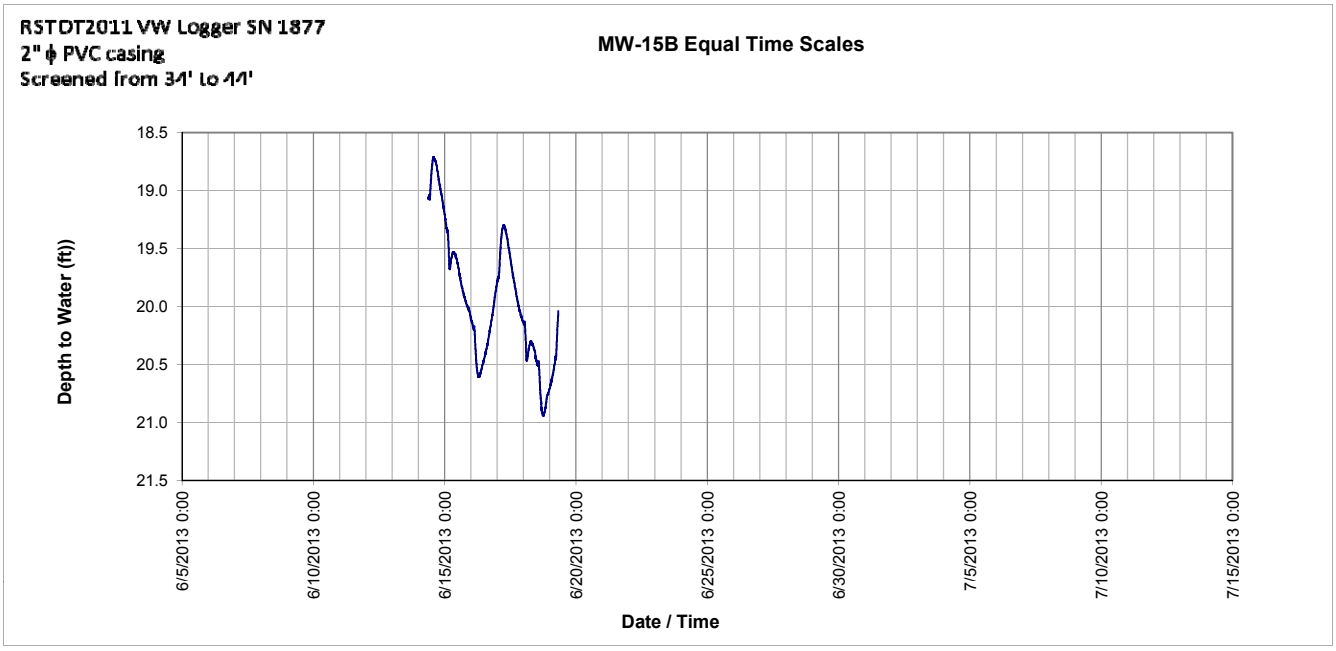

RSTDT2011 VW Logger SN 1875
4" ϕ PVC Casing
Screened from 5' to 15'
MW-16A Equal Time Scales
Depth to Water (ft)
4.35
4.40
4.45
4.50
4.55
4.60
4.65
4.70
4.75
6/5/2013 0:00
6/10/2013 0:00
6/15/2013 0:00
6/20/2013 0:00
6/25/2013 0:00
6/30/2013 0:00
7/5/2013 0:00
7/10/2013 0:00
7/15/2013 0:00
Date / Time

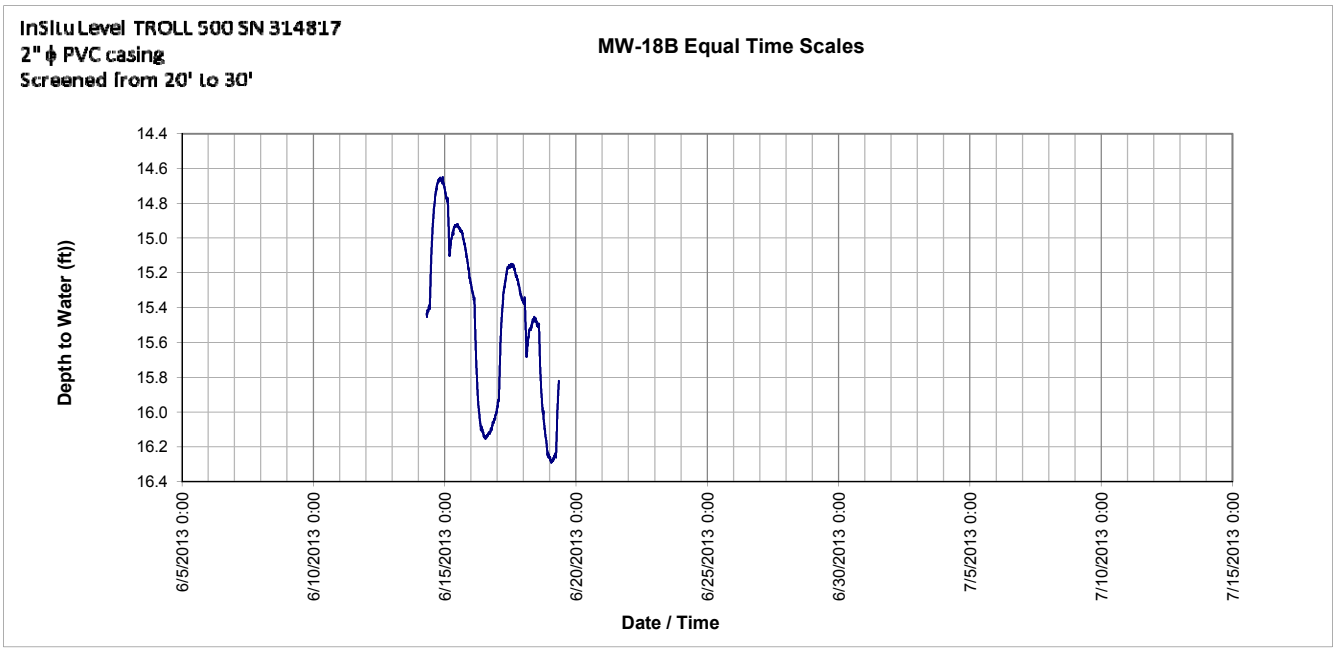

Alturas Municipal Well #5
Average Pumping (gpm)
500.0
400.0
300.0
200.0
100.0
0.0
6/5/13 0:00
6/7/13 0:00
6/9/13 0:00
6/11/13 0:00
6/13/13 0:00
6/15/13 0:00
6/17/13 0:00
6/19/13 0:00
6/21/13 0:00
6/23/13 0:00
6/25/13 0:00
6/27/13 0:00
6/29/13 0:00
7/1/13 0:00
7/3/13 0:00
7/5/13 0:00
7/7/13 0:00
7/9/13 0:00
7/11/13 0:00
7/13/13 0:00
7/15/13 0:00

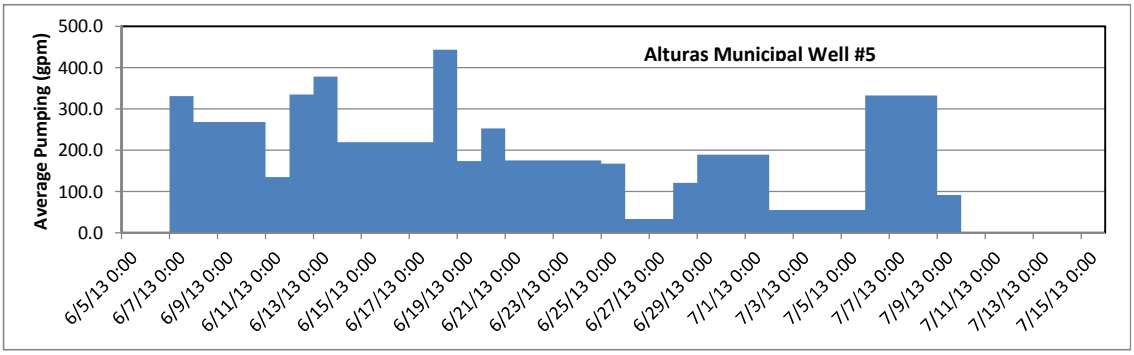

InSitu Level TROLL 500 SN 314797
2" ϕ PVC casing
Screened from 20' to 30'
MW-19B Equal Time Scales
Depth to Water (ft)
23.4
23.6
23.8
24.0
24.2
24.4
24.6
6/5/2013 0:00
6/10/2013 0:00
6/15/2013 0:00
6/20/2013 0:00
6/25/2013 0:00
6/30/2013 0:00
7/5/2013 0:00
7/10/2013 0:00
7/15/2013 0:00
Date / Time

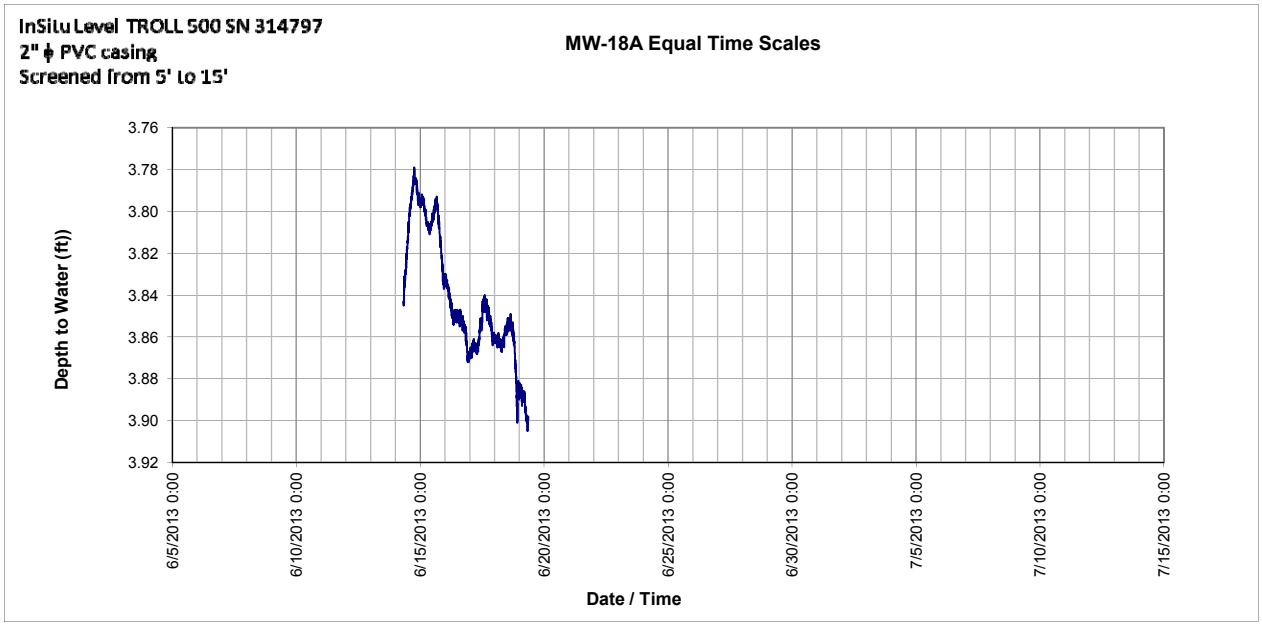

InSitu Level TROLL 500 SN 314817
2" ϕ PVC casing
Screened from 5' to 15'
MW-19A Equal Time Scales
Depth to Water (ft)
9.6
9.7
9.8
9.9
10.0
10.1
10.2
10.3
10.4
10.5
6/5/2013 0:00
6/10/2013 0:00
6/15/2013 0:00
6/20/2013 0:00
6/25/2013 0:00
6/30/2013 0:00
7/5/2013 0:00
7/10/2013 0:00
7/15/2013 0:00
Date / Time

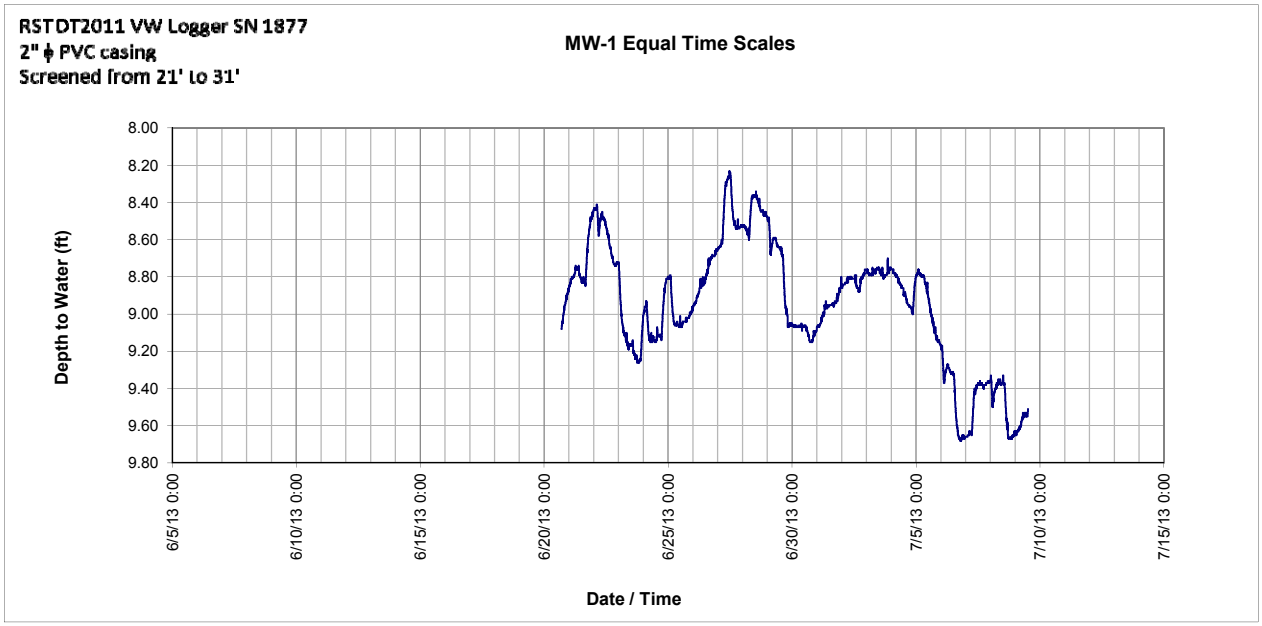

Alturas Municipal Well #5
Average Pumping (gpm)
500.0
400.0
300.0
200.0
100.0
0.0
6/5/13 0:00
6/7/13 0:00
6/9/13 0:00
6/11/13 0:00
6/13/13 0:00
6/15/13 0:00
6/17/13 0:00
6/19/13 0:00
6/21/13 0:00
6/23/13 0:00
6/25/13 0:00
6/27/13 0:00
6/29/13 0:00
7/1/13 0:00
7/3/13 0:00
7/5/13 0:00
7/7/13 0:00
7/9/13 0:00
7/11/13 0:00
7/13/13 0:00
7/15/13 0:00

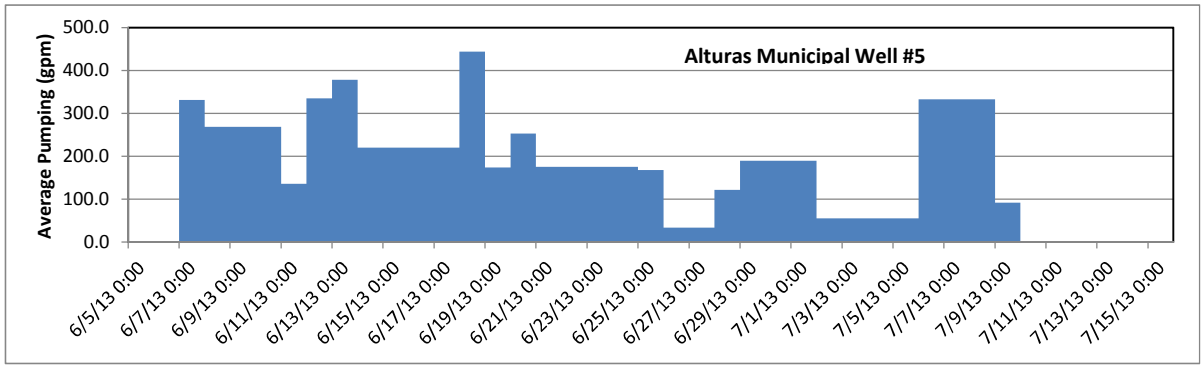

RSTDT2011 VW Logger SN 1877
2" ϕ PVC casing
Screened from 34' to 44'
MW-15B Equal Time Scales
Depth to Water (ft))
18.5
19.0
19.5
20.0
20.5
21.0
21.5
6/5/2013 0:00
6/10/2013 0:00
6/15/2013 0:00
6/20/2013 0:00
6/25/2013 0:00
6/30/2013 0:00
7/5/2013 0:00
7/10/2013 0:00
7/15/2013 0:00
Date / Time

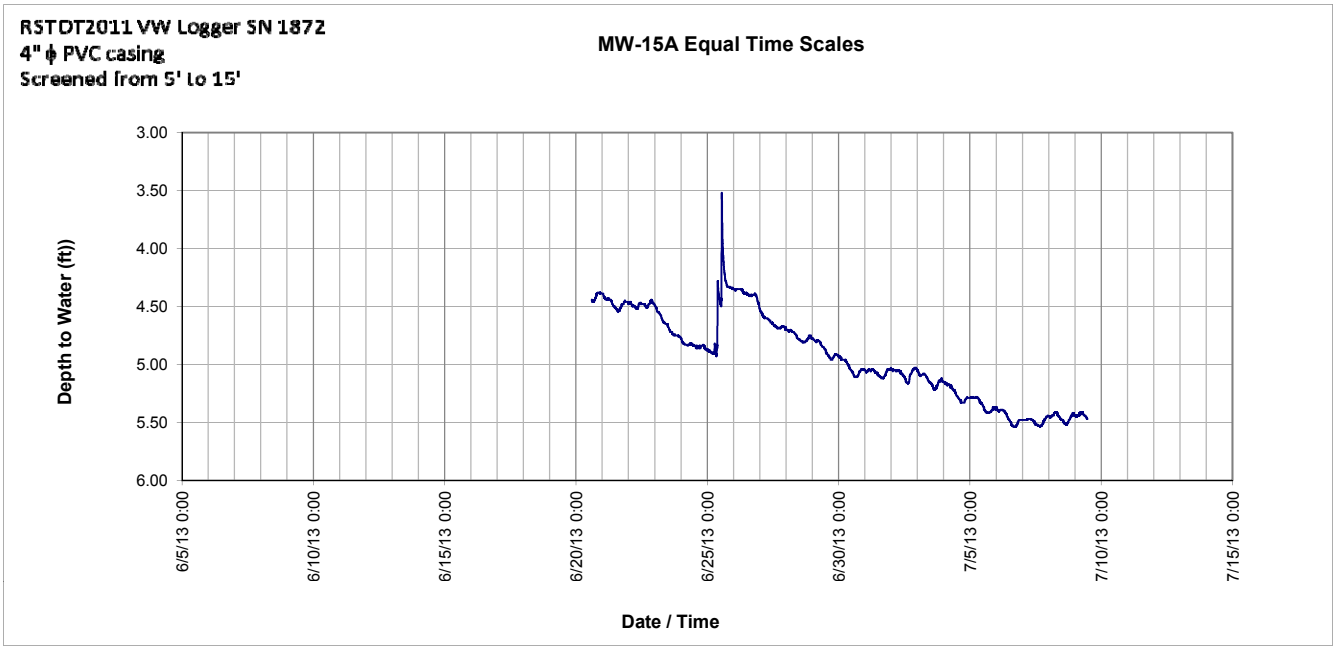

InSitu Level TROLL 500 SN 314817
2" ϕ PVC casing
Screened from 20' to 30'
MW-18B Equal Time Scales
Depth to Water (ft))
14.4
14.6
14.8
15.0
15.2
15.4
15.6
15.8
16.0
16.2
16.4
6/5/2013 0:00
6/10/2013 0:00
6/15/2013 0:00
6/20/2013 0:00
6/25/2013 0:00
6/30/2013 0:00
7/5/2013 0:00
7/10/2013 0:00
7/15/2013 0:00
Date / Time

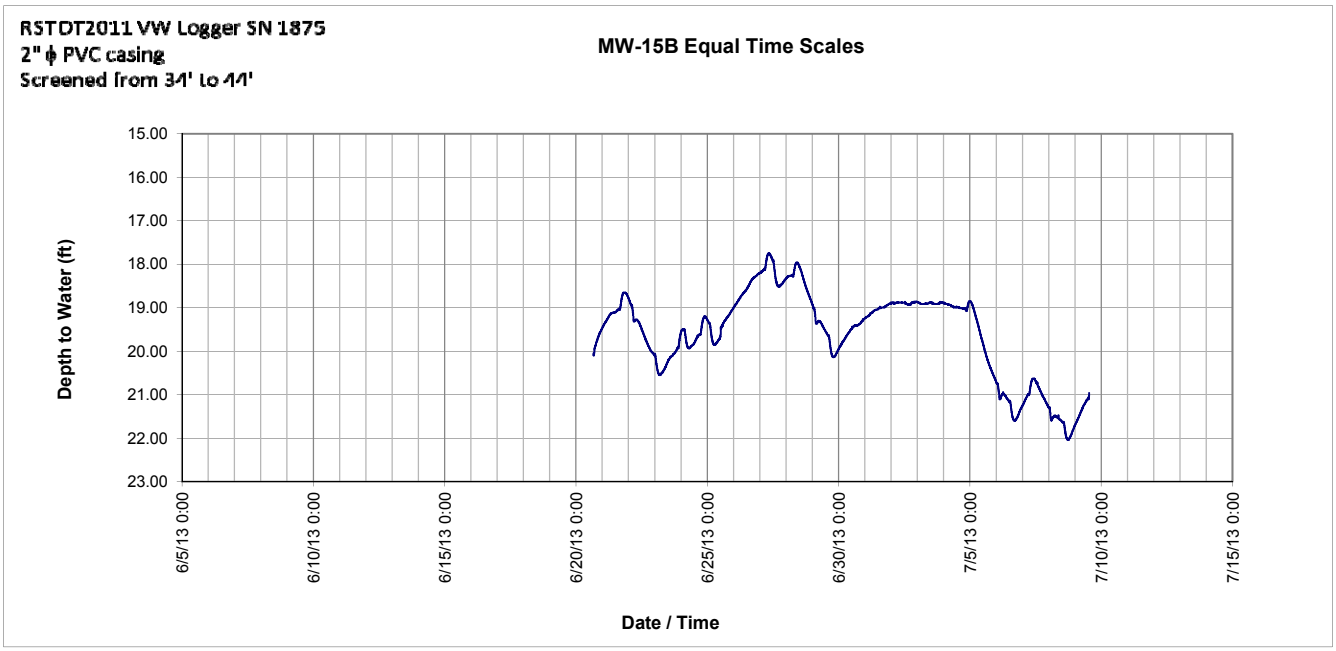

Alturas Municipal Well #5
Average Pumping (gpm)
500.0
400.0
300.0
200.0
100.0
0.0
6/5/13 0:00
6/7/13 0:00
6/9/13 0:00
6/11/13 0:00
6/13/13 0:00
6/15/13 0:00
6/17/13 0:00
6/19/13 0:00
6/21/13 0:00
6/23/13 0:00
6/25/13 0:00
6/27/13 0:00
6/29/13 0:00
7/1/13 0:00
7/3/13 0:00
7/5/13 0:00
7/7/13 0:00
7/9/13 0:00
7/11/13 0:00
7/13/13 0:00
7/15/13 0:00

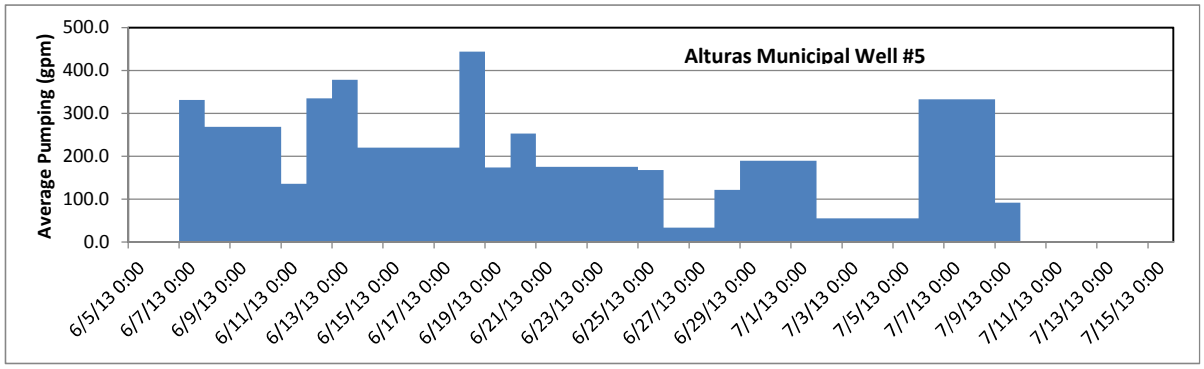

InSitu Level TROLL 500 SN 314797
2" ϕ PVC casing
Screened from 5' to 15'
MW-18A Equal Time Scales
Depth to Water (ft))
3.76
3.78
3.80
3.82
3.84
3.86
3.88
3.90
3.92
6/5/2013 0:00
6/10/2013 0:00
6/15/2013 0:00
6/20/2013 0:00
6/25/2013 0:00
6/30/2013 0:00
7/5/2013 0:00
7/10/2013 0:00
7/15/2013 0:00
Date / Time

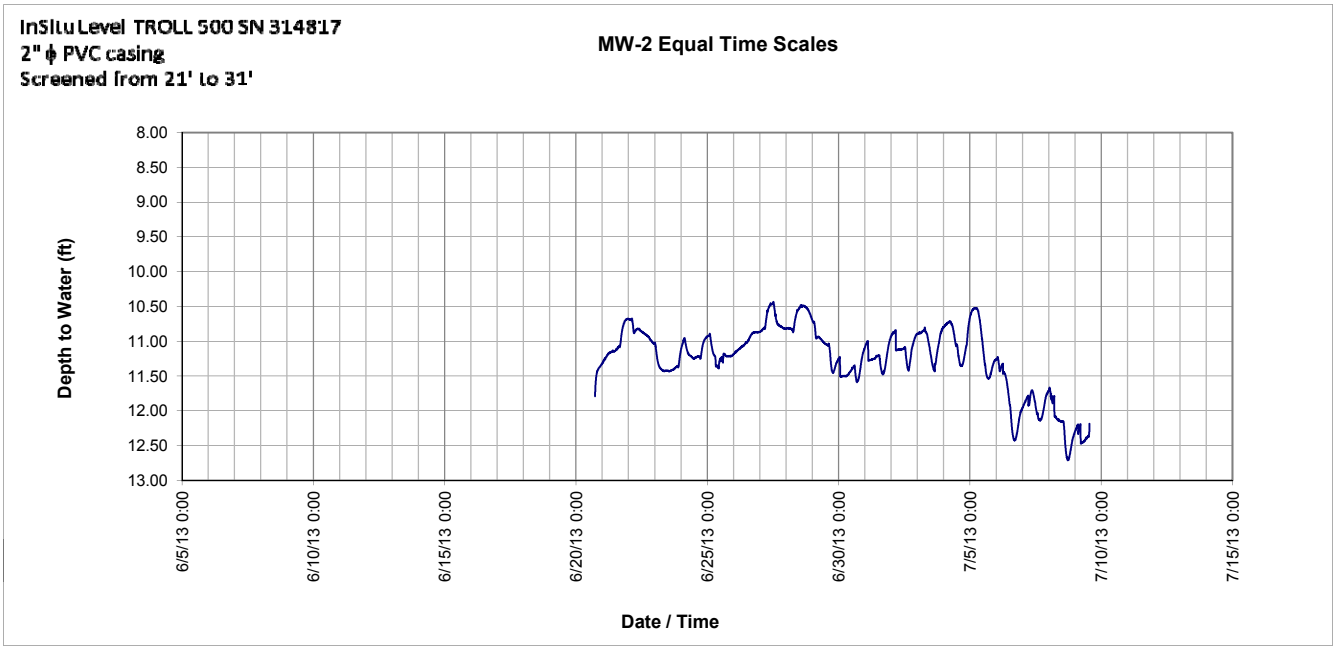

RSTDT2011 VW Logger SN 1877
2" ϕ PVC casing
Screened from 21' to 31'
MW-1 Equal Time Scales
Depth to Water (ft)
8.00
8.20
8.40
8.60
8.80
9.00
9.20
9.40
9.60
9.80
6/5/13 0:00
6/10/13 0:00
6/15/13 0:00
6/20/13 0:00
6/25/13 0:00
6/30/13 0:00
7/5/13 0:00
7/10/13 0:00
7/15/13 0:00
Date / Time

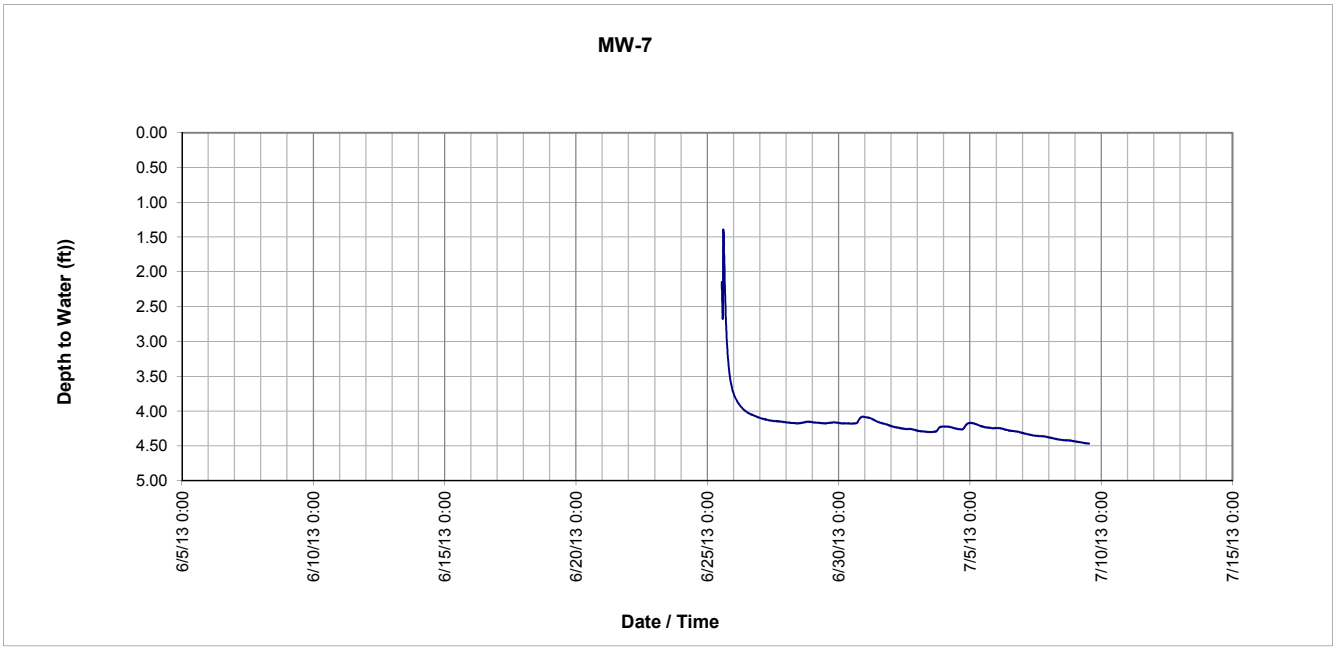

Alturas Municipal Well #5
Average Pumping (gpm)
500.0
400.0
300.0
200.0
100.0
0.0
6/5/13 0:00
6/7/13 0:00
6/9/13 0:00
6/11/13 0:00
6/13/13 0:00
6/15/13 0:00
6/17/13 0:00
6/19/13 0:00
6/21/13 0:00
6/23/13 0:00
6/25/13 0:00
6/27/13 0:00
6/29/13 0:00
7/1/13 0:00
7/3/13 0:00
7/5/13 0:00
7/7/13 0:00
7/9/13 0:00
7/11/13 0:00
7/13/13 0:00
7/15/13 0:00


RSTDT2011 VW Logger SN 1872
4" ϕ PVC casing
Screened from 5' to 15'
MW-15A Equal Time Scales
Depth to Water (ft))
3.00
3.50
4.00
4.50
5.00
5.50
6.00
6/5/13 0:00
6/10/13 0:00
6/15/13 0:00
6/20/13 0:00
6/25/13 0:00
6/30/13 0:00
7/5/13 0:00
7/10/13 0:00
7/15/13 0:00
Date / Time


RSTDT2011 VW Logger SN 1875
2" ϕ PVC casing
Screened from 34' to 44'
MW-15B Equal Time Scales
Depth to Water (ft)
15.00
16.00
17.00
18.00
19.00
20.00
21.00
22.00
23.00
6/5/13 0:00
6/10/13 0:00
6/15/13 0:00
6/20/13 0:00
6/25/13 0:00
6/30/13 0:00
7/5/13 0:00
7/10/13 0:00
7/15/13 0:00
Date / Time


Alturas Municipal Well #5
Average Pumping (gpm)
500.0
400.0
300.0
200.0
100.0
0.0
6/5/13 0:00
6/7/13 0:00
6/9/13 0:00
6/11/13 0:00
6/13/13 0:00
6/15/13 0:00
6/17/13 0:00
6/19/13 0:00
6/21/13 0:00
6/23/13 0:00
6/25/13 0:00
6/27/13 0:00
6/29/13 0:00
7/1/13 0:00
7/3/13 0:00
7/5/13 0:00
7/7/13 0:00
7/9/13 0:00
7/11/13 0:00
7/13/13 0:00
7/15/13 0:00


InSitu Level TROLL 500 SN 314817
2" ϕ PVC casing
Screened from 21' to 31'
MW-2 Equal Time Scales
Depth to Water (ft)
8.00
8.50
9.00
9.50
10.00
10.50
11.00
11.50
12.00
12.50
13.00
6/5/13 0:00
6/10/13 0:00
6/15/13 0:00
6/20/13 0:00
6/25/13 0:00
6/30/13 0:00
7/5/13 0:00
7/10/13 0:00
7/15/13 0:00
Date / Time


MW-7
Depth to Water (ft))
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
6/5/13 0:00
6/10/13 0:00
6/15/13 0:00
6/20/13 0:00
6/25/13 0:00
6/30/13 0:00
7/5/13 0:00
7/10/13 0:00
7/15/13 0:00
Date / Time

APPENDIX A-12

Laboratory Analytical Reports

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Porter Geotechnical, Inc
5560 Wildwood Dr.
Reno, NV 89511

Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/07/13

Job: 2145.1/Gils Shell

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B
Volatile Organic Compounds (VOCs) EPA Method SW8260B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**MW-18A@6.5-7.5**					
Lab ID :	POR13061023-01A	TPH-E (DRO)	ND	5.0 mg/Kg	06/12/13	06/12/13
Date Sampled	06/03/13 00:00	TPH-P (GRO)	ND	1.0 mg/Kg	06/11/13	06/12/13
		Tertiary Butyl Alcohol (TBA)	ND	500 µg/Kg	06/11/13	06/12/13
		Methyl tert-butyl ether (MTBE)	ND	5.0 µg/Kg	06/11/13	06/12/13
		Di-isopropyl Ether (DIPE)	ND	20 µg/Kg	06/11/13	06/12/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	20 µg/Kg	06/11/13	06/12/13
		Benzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Tertiary Amyl Methyl Ether (TAME)	ND	20 µg/Kg	06/11/13	06/12/13
		Toluene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Ethylbenzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Xylenes, Total	ND	5.0 µg/Kg	06/11/13	06/12/13
Client ID :	**EW-1@10-10.5**					
Lab ID :	POR13061023-02A	TPH-E (DRO)	ND	5.0 mg/Kg	06/12/13	06/12/13
Date Sampled	06/05/13 00:00	TPH-P (GRO)	8.8	1.0 mg/Kg	06/11/13	06/12/13
		Tertiary Butyl Alcohol (TBA)	ND	500 µg/Kg	06/11/13	06/12/13
		Methyl tert-butyl ether (MTBE)	5.8	5.0 µg/Kg	06/11/13	06/12/13
		Di-isopropyl Ether (DIPE)	ND	20 µg/Kg	06/11/13	06/12/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	20 µg/Kg	06/11/13	06/12/13
		Benzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Tertiary Amyl Methyl Ether (TAME)	ND	20 µg/Kg	06/11/13	06/12/13
		Toluene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Ethylbenzene	56	5.0 µg/Kg	06/11/13	06/12/13
		Xylenes, Total	140	5.0 µg/Kg	06/11/13	06/12/13
Client ID :	**EW-1@15-15.5ft**					
Lab ID :	POR13061023-03A	TPH-E (DRO)	ND	5.0 mg/Kg	06/12/13	06/12/13
Date Sampled	06/05/13 00:00	TPH-P (GRO)	ND	1.0 mg/Kg	06/11/13	06/12/13
		Tertiary Butyl Alcohol (TBA)	ND	500 µg/Kg	06/11/13	06/12/13
		Methyl tert-butyl ether (MTBE)	ND	5.0 µg/Kg	06/11/13	06/12/13
		Di-isopropyl Ether (DIPE)	ND	20 µg/Kg	06/11/13	06/12/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	20 µg/Kg	06/11/13	06/12/13
		Benzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Tertiary Amyl Methyl Ether (TAME)	ND	20 µg/Kg	06/11/13	06/12/13
		Toluene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Ethylbenzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Xylenes, Total	5.5	5.0 µg/Kg	06/11/13	06/12/13

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Client ID :	**EW-2@5ft**					
Lab ID :	POR13061023-04A	TPH-E (DRO)	47	5.0 mg/Kg	06/12/13	06/12/13
Date Sampled	06/06/13 00:00	TPH-P (GRO)	ND	1.0 mg/Kg	06/11/13	06/14/13
		Tertiary Butyl Alcohol (TBA)	ND	500 µg/Kg	06/11/13	06/14/13
		Methyl tert-butyl ether (MTBE)	110	5.0 µg/Kg	06/11/13	06/14/13
		Di-isopropyl Ether (DIPE)	ND	20 µg/Kg	06/11/13	06/14/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	20 µg/Kg	06/11/13	06/14/13
		Benzene	ND	5.0 µg/Kg	06/11/13	06/14/13
		Tertiary Amyl Methyl Ether (TAME)	ND	20 µg/Kg	06/11/13	06/14/13
		Toluene	ND	5.0 µg/Kg	06/11/13	06/14/13
		Ethylbenzene	ND	5.0 µg/Kg	06/11/13	06/14/13
		Xylenes, Total	11	5.0 µg/Kg	06/11/13	06/14/13
Client ID :	**EW-2@15-15 1/2ft**					
Lab ID :	POR13061023-05A	TPH-E (DRO)	ND	5.0 mg/Kg	06/12/13	06/12/13
Date Sampled	06/06/13 00:00	TPH-P (GRO)	ND	1.0 mg/Kg	06/11/13	06/12/13
		Tertiary Butyl Alcohol (TBA)	ND	500 µg/Kg	06/11/13	06/12/13
		Methyl tert-butyl ether (MTBE)	670	5.0 µg/Kg	06/11/13	06/12/13
		Di-isopropyl Ether (DIPE)	ND	20 µg/Kg	06/11/13	06/12/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	20 µg/Kg	06/11/13	06/12/13
		Benzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Tertiary Amyl Methyl Ether (TAME)	ND	20 µg/Kg	06/11/13	06/12/13
		Toluene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Ethylbenzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Xylenes, Total	ND	5.0 µg/Kg	06/11/13	06/12/13
Client ID :	**EW-3@5.5ft**					
Lab ID :	POR13061023-06A	TPH-E (DRO)	ND	5.0 mg/Kg	06/12/13	06/12/13
Date Sampled	06/06/13 00:00	TPH-P (GRO)	ND	1.0 mg/Kg	06/11/13	06/12/13
		Tertiary Butyl Alcohol (TBA)	ND	500 µg/Kg	06/11/13	06/12/13
		Methyl tert-butyl ether (MTBE)	ND	5.0 µg/Kg	06/11/13	06/12/13
		Di-isopropyl Ether (DIPE)	ND	20 µg/Kg	06/11/13	06/12/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	20 µg/Kg	06/11/13	06/12/13
		Benzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Tertiary Amyl Methyl Ether (TAME)	ND	20 µg/Kg	06/11/13	06/12/13
		Toluene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Ethylbenzene	ND	5.0 µg/Kg	06/11/13	06/12/13
		Xylenes, Total	ND	5.0 µg/Kg	06/11/13	06/12/13

Diesel Range Organics (DRO) C13-C22

Gasoline Range Organics (GRO) C4-C13

Sample results were calculated on a wet weight basis.
ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

6/21/13

Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *17-Jun-13*

QC Summary Report

Work Order: 13061023

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A06081366.D** Batch ID: **31089** Analysis Date: **06/12/2013 10:55**

Sample ID: **MBLK-31059** Units : **mg/Kg** Run ID: **FID_2_130612A** Prep Date: **06/12/2013 10:05**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	5								
Surr: Nonane	5.79		6		96	65	160			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A06081368.D** Batch ID: **31089** Analysis Date: **06/12/2013 11:47**

Sample ID: **LCS-31059** Units : **mg/Kg** Run ID: **FID_2_130612A** Prep Date: **06/12/2013 10:05**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	86.3	5	100		86	70	130			
Surr: Nonane	6.24		6		104	65	160			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A06081375.D** Batch ID: **31089** Analysis Date: **06/12/2013 14:51**

Sample ID: **13060342-06AMS** Units : **mg/Kg** Run ID: **FID_2_130612A** Prep Date: **06/12/2013 10:05**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	239	5	100	123.9	115	46	150			
Surr: Nonane	7.1		6		118	65	160			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8015B/C Ext**

File ID: **2A06081376.D** Batch ID: **31089** Analysis Date: **06/12/2013 15:18**

Sample ID: **13060342-06AMSD** Units : **mg/Kg** Run ID: **FID_2_130612A** Prep Date: **06/12/2013 10:05**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	138	5	100	123.9	14	46	150	238.8	53.7(42)	M2 R58
Surr: Nonane	5.54		6		92	65	160			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

M2 = Matrix spike recovery was low, the method control sample recovery was acceptable.

R58 = MS/MSD RPD exceeded the laboratory control limit.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *17-Jun-13*

QC Summary Report

Work Order: 13061023

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**
File ID: **13061229.D** Batch ID: **MS08S1084B** Analysis Date: **06/12/2013 21:17**
Sample ID: **MBLK MS08S1084B** Units : **mg/Kg** Run ID: **MSD_08_130612A** Prep Date: **06/12/2013 21:17**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	1								
Surr: 1,2-Dichloroethane-d4	0.199		0.2		99	70	130			
Surr: Toluene-d8	0.208		0.2		104	70	130			
Surr: 4-Bromofluorobenzene	0.182		0.2		91	70	130			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**
File ID: **13061240.D** Batch ID: **MS08S1084B** Analysis Date: **06/13/2013 01:46**
Sample ID: **GLCS MS08S1084B** Units : **mg/Kg** Run ID: **MSD_08_130612A** Prep Date: **06/13/2013 01:46**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	18	2	16		112	63	149			
Surr: 1,2-Dichloroethane-d4	0.413		0.4		103	70	130			
Surr: Toluene-d8	0.384		0.4		96	70	130			
Surr: 4-Bromofluorobenzene	0.4		0.4		100	70	130			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW8015B/C / SW8260B**
File ID: **13061241.D** Batch ID: **MS08S1084B** Analysis Date: **06/13/2013 02:10**
Sample ID: **13061023-06AGS** Units : **mg/Kg** Run ID: **MSD_08_130612A** Prep Date: **06/13/2013 02:10**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	16.7	2	16	0	104	36	164			
Surr: 1,2-Dichloroethane-d4	0.387		0.4		97	70	130			
Surr: Toluene-d8	0.383		0.4		96	70	130			
Surr: 4-Bromofluorobenzene	0.406		0.4		102	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8015B/C / SW8260B**
File ID: **13061242.D** Batch ID: **MS08S1084B** Analysis Date: **06/13/2013 02:35**
Sample ID: **13061023-06AGSD** Units : **mg/Kg** Run ID: **MSD_08_130612A** Prep Date: **06/13/2013 02:35**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	17.6	2	16	0	110	36	164	16.67	5.3(40)	
Surr: 1,2-Dichloroethane-d4	0.401		0.4		100	70	130			
Surr: Toluene-d8	0.384		0.4		96	70	130			
Surr: 4-Bromofluorobenzene	0.41		0.4		103	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

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Date: *17-Jun-13*

QC Summary Report

Work Order: 13061023

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8260B**

File ID: **13061229.D** Batch ID: **MS08S1084A** Analysis Date: **06/12/2013 21:17**

Sample ID: **MBLK MS08S1084A** Units : **µg/Kg** Run ID: **MSD_08_130612A** Prep Date: **06/12/2013 21:17**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Tertiary Butyl Alcohol (TBA)	ND	500								
Methyl tert-butyl ether (MTBE)	ND	5								
Di-isopropyl Ether (DIPE)	ND	20								
Ethyl Tertiary Butyl Ether (ETBE)	ND	20								
Benzene	ND	5								
Tertiary Amyl Methyl Ether (TAME)	ND	20								
Toluene	ND	5								
Ethylbenzene	ND	5								
Xylenes, Total	ND	5								
Surr: 1,2-Dichloroethane-d4	199		200		99	70	130			
Surr: Toluene-d8	208		200		104	70	130			
Surr: 4-Bromofluorobenzene	182		200		91	70	130			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8260B**

File ID: **13061237.D** Batch ID: **MS08S1084A** Analysis Date: **06/13/2013 00:33**

Sample ID: **LCS MS08S1084A** Units : **µg/Kg** Run ID: **MSD_08_130612A** Prep Date: **06/13/2013 00:33**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	457	10	400		114	65	145			
Benzene	472	10	400		118	70	137			
Toluene	482	10	400		120	70	139			
Ethylbenzene	492	10	400		123	70	137			
Xylenes, Total	954	10	800		119	70	145			
Surr: 1,2-Dichloroethane-d4	418		400		104	70	130			
Surr: Toluene-d8	395		400		99	70	130			
Surr: 4-Bromofluorobenzene	402		400		100	70	130			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW8260B**

File ID: **13061238.D** Batch ID: **MS08S1084A** Analysis Date: **06/13/2013 00:57**

Sample ID: **13061023-06AMS** Units : **µg/Kg** Run ID: **MSD_08_130612A** Prep Date: **06/13/2013 00:57**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	385	10	400	0	96	45	155			
Benzene	407	10	400	0	102	52	151			
Toluene	412	10	400	0	103	47	154			
Ethylbenzene	431	10	400	0	108	52	154			
Xylenes, Total	840	10	800	0	105	51	162			
Surr: 1,2-Dichloroethane-d4	386		400		96	70	130			
Surr: Toluene-d8	396		400		99	70	130			
Surr: 4-Bromofluorobenzene	407		400		102	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8260B**

File ID: **13061239.D** Batch ID: **MS08S1084A** Analysis Date: **06/13/2013 01:21**

Sample ID: **13061023-06AMSD** Units : **µg/Kg** Run ID: **MSD_08_130612A** Prep Date: **06/13/2013 01:21**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	506	10	400	0	127	45	155	384.5	27.3(32)	
Benzene	525	10	400	0	131	52	151	406.6	25.3(30)	
Toluene	560	10	400	0	140	47	154	412.3	30.3(28)	R5
Ethylbenzene	585	10	400	0	146	52	154	430.7	30.4(37)	
Xylenes, Total	1140	10	800	0	142	51	162	840	30.0(34)	
Surr: 1,2-Dichloroethane-d4	426		400		106	70	130			
Surr: Toluene-d8	400		400		99.9	70	130			
Surr: 4-Bromofluorobenzene	407		400		102	70	130			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *17-Jun-13*

QC Summary Report

Work Order: 13061023

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

R5 = MS/MSD RPD exceeded the laboratory control limit. Recovery met acceptance criteria.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13061023

Report Due By : 5:00 PM On : 24-Jun-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Chip Porter

PO :

Client's COC # : 13155 Job : 2145.1/Gils Shell

Cooler Temp	Samples Received	Date Printed
6 °C	07-Jun-13	10-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_S	TPH/P_S	VOC_S						Sample Remarks
							Requested Tests								
POR13061023-01A	MW-18A@6.5-7.5	SO	06/03/13 00:00	1	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061023-02A	EW-1@10-10.5	SO	06/05/13 00:00	1	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061023-03A	EW-1@15-15.5ft	SO	06/05/13 00:00	1	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061023-04A	EW-2@5ft	SO	06/06/13 00:00	1	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061023-05A	EW-2@15-15 1/2ft	SO	06/06/13 00:00	1	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061023-06A	EW-3@5.5ft	SO	06/06/13 00:00	1	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						

Comments: Samples brought in by client on 6/7/13, kept cold and secure until login on 6/10/13. Frozen ice. Samples received after 16:00 cut off time, therefore one day added to TAT. Total Xylenes. No sampling times provided. :

	Signature	Print Name	Company	Date/Time
Logged in by:	K. Murray	K Murray	Alpha Analytical, Inc.	6/10/13 1005

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:

Company: Porter Geotechnical
Attn: Chip Porter
Address: 5560 Wildwood Dr
City, State, Zip: Reno NV 89511
Phone Number: 849-0668 Fax: 849-0895

Alpha Analytical, Inc.

Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 Phone: 775-355-1044
Fax: 775-355-0406

Satellite Service Centers:

Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 Phone: 702-281-4848
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 Phone: 714-386-2901

13155

Page # 1 of

Consultant/ Client Info:

Company: Porter Geotechnical
Address:
City, State, Zip:

Job and Purchase Order Info:

Job #: 21451
Job Name: Gils Shell
P.O. #: 123 West St Alturas CA

Report Attention/Project Manager:

Name: Chip Porter
Email Address: Nochip@portergeotechnical.com
Phone #: 849-0668
Cell #: 233-6691

QC Deliverable Info:

EDD Required? Yes / No
EDF Required? Yes / No
Global ID:
Data Validation Level: III or IV

Samples Collected from which State? (circle one) AZ CA NV WA ID OR DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	Field Filtered?	# Containers** (See Key Below)	TPHg	TPHd	BTXE	5OXYS								Remarks
	6-3	S	POR13061023-01	MW-18A @ 6.5-7.5	STD		1 T												
	6-5	S	02	EW-1 @ 10-10.5			1 T												
	6-5	S	03	EW-1 @ 15-15.5'			1 T												
	6-6	S	04	EW-2 @ 5'			1 T												
	6-6	S	05	EW-2 @ 15-15½'			1 T												
	6-6	S	06	EW-3 @ 5.5'			1 T												

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By: Chip Porter

Relinquished by: (Signature/Affiliation)	Date:	Time:	Received by: (Signature/Affiliation)	Date:	Time:
Chip Porter	6-7-13	4:20 PM	KM Alpha	6/7/13	16:20
Relinquished by: (Signature/Affiliation)	Date:	Time:	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature/Affiliation)	Date:	Time:	Received by: (Signature/Affiliation)	Date:	Time:

* Key: AQ - Aqueous WA - Waste OT - Other **: L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Porter Geotechnical, Inc
5560 Wildwood Dr.
Reno, NV 89511

Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/19/13

Job: 2145.1/Former Gil's, Alturas

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B
Volatile Organic Compounds (VOCs) EPA Method SW8260B

		Parameter	Concentration		Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**MW-1**						
Lab ID :	POR13061928-01A	TPH-E (DRO)	ND		0.050 mg/L	06/20/13	06/20/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	0.82		0.40 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	200		40 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	1,300		2.0 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	V	4.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	V	4.0 µg/L	06/27/13	06/27/13
		Benzene	ND	V	2.0 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND	V	4.0 µg/L	06/27/13	06/27/13
		Toluene	ND	V	2.0 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND	V	2.0 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND	V	2.0 µg/L	06/27/13	06/27/13
Client ID :	**MW-2**						
Lab ID :	POR13061928-02A	TPH-E (DRO)	0.12	L	0.050 mg/L	06/20/13	06/20/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	0.77		0.30 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	260		30 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	1,200		1.5 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	V	3.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	V	3.0 µg/L	06/27/13	06/27/13
		Benzene	ND	V	1.5 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	4.2		3.0 µg/L	06/27/13	06/27/13
		Toluene	ND	V	1.5 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND	V	1.5 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND	V	1.5 µg/L	06/27/13	06/27/13
Client ID :	**MW-3**						
Lab ID :	POR13061928-03A	TPH-E (DRO)	0.14	Z	0.050 mg/L	06/20/13	06/20/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	0.74		0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	18		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	2.4		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	ND		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	1.2		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	0.62		0.50 µg/L	06/27/13	06/27/13

Alpha Analytical, Inc.
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Client ID :	**MW-4**						
Lab ID :	POR13061928-04A	TPH-E (DRO)	0.41	Z	0.050 mg/L	06/20/13	06/20/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	0.91		0.30 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND	V	30 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	1,100		1.5 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	V	3.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	V	3.0 µg/L	06/27/13	06/27/13
		Benzene	8.9		1.5 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	5.5		3.0 µg/L	06/27/13	06/27/13
		Toluene	ND	V	1.5 µg/L	06/27/13	06/27/13
		Ethylbenzene	1.6		1.5 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND	V	1.5 µg/L	06/27/13	06/27/13
Client ID :	**MW-5**						
Lab ID :	POR13061928-05A	TPH-E (DRO)	0.071	Z	0.050 mg/L	06/20/13	06/20/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	1.2		0.10 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	ND		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	3.3		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	3.0		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	29		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	66		0.50 µg/L	06/27/13	06/27/13
Client ID :	**MW-7**						
Lab ID :	POR13061928-06A	TPH-E (DRO)	0.17	Z	0.050 mg/L	06/20/13	06/20/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	0.71		0.10 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	ND		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	5.6		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	4.1		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	2.1		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	15		0.50 µg/L	06/27/13	06/27/13
Client ID :	**MW-8**						
Lab ID :	POR13061928-07A	TPH-E (DRO)	0.38	Z	0.050 mg/L	06/20/13	06/20/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	1.2		0.10 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	ND		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	13		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	1.4		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	4.9		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	24		0.50 µg/L	06/27/13	06/27/13

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Client ID :	**MW-14A**						
Lab ID :	POR13061928-08A	TPH-E (DRO)	ND		0.050 mg/L	06/20/13	06/20/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	ND		0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	ND		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	ND		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	ND		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND		0.50 µg/L	06/27/13	06/27/13
Client ID :	**MW-14B**						
Lab ID :	POR13061928-09A	TPH-E (DRO)	ND		0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	ND		0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	0.72		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	ND		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	ND		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND		0.50 µg/L	06/27/13	06/27/13
Client ID :	**EW-1**						
Lab ID :	POR13061928-10A	TPH-E (DRO)	0.14	K	0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	33		5.0 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND	V	500 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	35		25 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	V	50 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	V	50 µg/L	06/27/13	06/27/13
		Benzene	38		25 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND	V	50 µg/L	06/27/13	06/27/13
		Toluene	43		25 µg/L	06/27/13	06/27/13
		Ethylbenzene	1,100		25 µg/L	06/27/13	06/27/13
		Xylenes, Total	5,600		25 µg/L	06/27/13	06/27/13
Client ID :	**EW-2**						
Lab ID :	POR13061928-11A	TPH-E (DRO)	0.43	K	0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	2.0		0.40 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND	V	40 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	1,900		2.0 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	V	4.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	V	4.0 µg/L	06/27/13	06/27/13
		Benzene	21		2.0 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	11		4.0 µg/L	06/27/13	06/27/13
		Toluene	ND	V	2.0 µg/L	06/27/13	06/27/13
		Ethylbenzene	8.1		2.0 µg/L	06/27/13	06/27/13
		Xylenes, Total	35		2.0 µg/L	06/27/13	06/27/13

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Client ID :	**EW-3**						
Lab ID :	POR13061928-12A	TPH-E (DRO)	0.13	K	0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	2.3		0.50 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	600		50 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	2,800		2.5 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	V	5.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	V	5.0 µg/L	06/27/13	06/27/13
		Benzene	5.9		2.5 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	14		5.0 µg/L	06/27/13	06/27/13
		Toluene	ND	V	2.5 µg/L	06/27/13	06/27/13
		Ethylbenzene	5.5		2.5 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND	V	2.5 µg/L	06/27/13	06/27/13
Client ID :	**MW-15A**						
Lab ID :	POR13061928-15A	TPH-E (DRO)	ND		0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/19/13 00:00	TPH-P (GRO)	ND		0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	ND		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	ND		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	ND		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND		0.50 µg/L	06/27/13	06/27/13
Client ID :	**MW-15B**						
Lab ID :	POR13061928-16A	TPH-E (DRO)	ND		0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/19/13 00:00	TPH-P (GRO)	ND		0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	56		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	ND		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	ND		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND		0.50 µg/L	06/27/13	06/27/13
Client ID :	**MW-16A**						
Lab ID :	POR13061928-17A	TPH-E (DRO)	ND		0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/19/13 00:00	TPH-P (GRO)	ND		0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND		10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	ND		0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	06/27/13	06/27/13
		Benzene	ND		0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	06/27/13	06/27/13
		Toluene	ND		0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND		0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND		0.50 µg/L	06/27/13	06/27/13

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Client ID :	**MW-16B**					
Lab ID :	POR13061928-18A	TPH-E (DRO)	ND	0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/19/13 00:00	TPH-P (GRO)	ND	0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND	10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0 µg/L	06/27/13	06/27/13
		Benzene	ND	0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND	1.0 µg/L	06/27/13	06/27/13
		Toluene	ND	0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND	0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND	0.50 µg/L	06/27/13	06/27/13
Client ID :	**MW-18A**					
Lab ID :	POR13061928-19A	TPH-E (DRO)	ND	0.050 mg/L	06/19/13	06/20/13
Date Sampled	06/19/13 00:00	TPH-P (GRO)	ND	0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND	10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0 µg/L	06/27/13	06/27/13
		Benzene	ND	0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND	1.0 µg/L	06/27/13	06/27/13
		Toluene	ND	0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND	0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND	0.50 µg/L	06/27/13	06/27/13
Client ID :	**MW-18B**					
Lab ID :	POR13061928-20A	TPH-E (DRO)	ND	0.050 mg/L	06/19/13	06/20/13
Date Sampled	06/19/13 00:00	TPH-P (GRO)	ND	0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND	10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	1.9	0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0 µg/L	06/27/13	06/27/13
		Benzene	ND	0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND	1.0 µg/L	06/27/13	06/27/13
		Toluene	ND	0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND	0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND	0.50 µg/L	06/27/13	06/27/13
Client ID :	**ACSW**					
Lab ID :	POR13061928-21A	TPH-E (DRO)	ND	0.050 mg/L	06/19/13	06/20/13
Date Sampled	06/19/13 00:00	TPH-P (GRO)	ND	0.050 mg/L	06/27/13	06/27/13
		Tertiary Butyl Alcohol (TBA)	ND	10 µg/L	06/27/13	06/27/13
		Methyl tert-butyl ether (MTBE)	0.69	0.50 µg/L	06/27/13	06/27/13
		Di-isopropyl Ether (DIPE)	ND	1.0 µg/L	06/27/13	06/27/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0 µg/L	06/27/13	06/27/13
		Benzene	ND	0.50 µg/L	06/27/13	06/27/13
		Tertiary Amyl Methyl Ether (TAME)	ND	1.0 µg/L	06/27/13	06/27/13
		Toluene	ND	0.50 µg/L	06/27/13	06/27/13
		Ethylbenzene	ND	0.50 µg/L	06/27/13	06/27/13
		Xylenes, Total	ND	0.50 µg/L	06/27/13	06/27/13

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Diesel Range Organics (DRO) C13-C22

Gasoline Range Organics (GRO) C4-C13

K = DRO concentration may include contributions from lighter-end hydrocarbons that elute in the DRO range.

L = DRO concentration may include contributions from heavier-end hydrocarbons that elute in the DRO range.

V = Reporting Limits were increased due to high concentrations of target analytes.

Z = DRO concentration may include contributions from lighter-end and heavier-end hydrocarbons that elute in the DRO range.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

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Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

7/3/13

Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Porter Geotechnical, Inc
5560 Wildwood Dr.
Reno, NV 89511

Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/19/13

Job: 2145.1/Former Gil's, Alturas

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B
Volatile Organic Compounds (VOCs) EPA Method SW8260B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**MW-19A**					
Lab ID :	POR13061928-13A	TPH-E (DRO)	ND	0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	ND	0.050 mg/L	06/24/13	06/24/13
		Tertiary Butyl Alcohol (TBA)	ND	10 µg/L	06/24/13	06/24/13
		Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	06/24/13	06/24/13
		Di-isopropyl Ether (DIPE)	ND	1.0 µg/L	06/24/13	06/24/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0 µg/L	06/24/13	06/24/13
		Benzene	ND	0.50 µg/L	06/24/13	06/24/13
		Tertiary Amyl Methyl Ether (TAME)	ND	1.0 µg/L	06/24/13	06/24/13
		Toluene	ND	0.50 µg/L	06/24/13	06/24/13
		Ethylbenzene	ND	0.50 µg/L	06/24/13	06/24/13
		Xylenes, Total	ND	0.50 µg/L	06/24/13	06/24/13
Client ID :	**MW-19B**					
Lab ID :	POR13061928-14A	TPH-E (DRO)	ND	0.050 mg/L	06/20/13	06/21/13
Date Sampled	06/18/13 00:00	TPH-P (GRO)	ND	0.050 mg/L	06/24/13	06/24/13
		Tertiary Butyl Alcohol (TBA)	ND	10 µg/L	06/24/13	06/24/13
		Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	06/24/13	06/24/13
		Di-isopropyl Ether (DIPE)	ND	1.0 µg/L	06/24/13	06/24/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	1.0 µg/L	06/24/13	06/24/13
		Benzene	ND	0.50 µg/L	06/24/13	06/24/13
		Tertiary Amyl Methyl Ether (TAME)	ND	1.0 µg/L	06/24/13	06/24/13
		Toluene	ND	0.50 µg/L	06/24/13	06/24/13
		Ethylbenzene	ND	0.50 µg/L	06/24/13	06/24/13
		Xylenes, Total	ND	0.50 µg/L	06/24/13	06/24/13

Diesel Range Organics (DRO) C13-C22

Gasoline Range Organics (GRO) C4-C13

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

ACLASS ACCREDITED DoD ELAP

NELAP ACCREDITED TNI LABORATORY

6/24/13
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: POR13061928 **Job:** 2145.1/Former Gil's, Alturas

Alpha's Sample ID	Client's Sample ID	Matrix	pH
13061928-01A	MW-1	Aqueous	2
13061928-02A	MW-2	Aqueous	2
13061928-03A	MW-3	Aqueous	2
13061928-04A	MW-4	Aqueous	2
13061928-05A	MW-5	Aqueous	2
13061928-06A	MW-7	Aqueous	6
13061928-07A	MW-8	Aqueous	6
13061928-08A	MW-14A	Aqueous	2
13061928-09A	MW-14B	Aqueous	2
13061928-10A	EW-1	Aqueous	2
13061928-11A	EW-2	Aqueous	2
13061928-12A	EW-3	Aqueous	2
13061928-15A	MW-15A	Aqueous	2
13061928-16A	MW-15B	Aqueous	2
13061928-17A	MW-16A	Aqueous	2
13061928-18A	MW-16B	Aqueous	2
13061928-19A	MW-18A	Aqueous	2
13061928-20A	MW-18B	Aqueous	2
13061928-21A	ACSW	Aqueous	2

7/3/13
Report Date

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VOC Sample Preservation Report

Work Order: POR13061928 **Job:** 2145.1/Former Gil's, Alturas

Alpha's Sample ID	Client's Sample ID	Matrix	pH
13061928-13A	MW-19A	Aqueous	2
13061928-14A	MW-19B	Aqueous	2

6/24/13
Report Date

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Date: *01-Jul-13*

QC Summary Report

Work Order: 13061928

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**
File ID: **2A06171361.D** Batch ID: **31133** Analysis Date: **06/19/2013 17:44**
Sample ID: **MBLK-31133** Units : **mg/L** Run ID: **FID_2_130619A** Prep Date: **06/19/2013 12:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
Surr: Nonane	0.152		0.15		101	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**
File ID: **2A06171360.D** Batch ID: **31133** Analysis Date: **06/19/2013 17:18**
Sample ID: **LCS-31133** Units : **mg/L** Run ID: **FID_2_130619A** Prep Date: **06/19/2013 12:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.41	0.05	2.5		97	70	130			
Surr: Nonane	0.158		0.15		105	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**
File ID: **2A06171364.D** Batch ID: **31133** Analysis Date: **06/19/2013 19:02**
Sample ID: **13061820-01AMS** Units : **mg/L** Run ID: **FID_2_130619A** Prep Date: **06/19/2013 12:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.68	0.05	2.5	0	107	51	151			
Surr: Nonane	0.146		0.15		97	53	145			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**
File ID: **2A06171365.D** Batch ID: **31133** Analysis Date: **06/19/2013 19:28**
Sample ID: **13061820-01AMSD** Units : **mg/L** Run ID: **FID_2_130619A** Prep Date: **06/19/2013 12:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.66	0.05	2.5	0	106	51	151	2.675	0.6(40)	
Surr: Nonane	0.13		0.15		87	53	145			

Comments:

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Date: *01-Jul-13*

QC Summary Report

Work Order: 13061928

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C Ext**
File ID: **2A06201312.D** Batch ID: **31139** Analysis Date: **06/20/2013 16:45**
Sample ID: **MBLK-31139** Units : **mg/L** Run ID: **FID_2_130620A** Prep Date: **06/20/2013 13:01**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	ND	0.05								
Surr: Nonane	0.144		0.15		96	53	145			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C Ext**
File ID: **2A06201313.D** Batch ID: **31139** Analysis Date: **06/20/2013 17:11**
Sample ID: **LCS-31139** Units : **mg/L** Run ID: **FID_2_130620A** Prep Date: **06/20/2013 13:01**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.38	0.05	2.5		95	70	130			
Surr: Nonane	0.151		0.15		101	53	145			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C Ext**
File ID: **2A06201316.D** Batch ID: **31139** Analysis Date: **06/20/2013 18:29**
Sample ID: **13061926-02AMS** Units : **mg/L** Run ID: **FID_2_130620A** Prep Date: **06/20/2013 13:01**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.25	0.05	2.5	0	90	51	151			
Surr: Nonane	0.141		0.15		94	53	145			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C Ext**
File ID: **2A06201317.D** Batch ID: **31139** Analysis Date: **06/20/2013 18:55**
Sample ID: **13061926-02AMSD** Units : **mg/L** Run ID: **FID_2_130620A** Prep Date: **06/20/2013 13:01**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.44	0.05	2.5	0	97	51	151	2.249	8.0(40)	
Surr: Nonane	0.112		0.15		75	53	145			

Comments:

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Date: *01-Jul-13*

QC Summary Report

Work Order: 13061928

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062404.D** Batch ID: **MS12W0624B** Analysis Date: **06/24/2013 11:25**

Sample ID: **MBLK MS12W0624B** Units : **mg/L** Run ID: **MSD_12_130624B** Prep Date: **06/24/2013 11:25**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0116		0.01		116	70	130			
Surr: Toluene-d8	0.0116		0.01		116	70	130			
Surr: 4-Bromofluorobenzene	0.00882		0.01		88	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062402.D** Batch ID: **MS12W0624B** Analysis Date: **06/24/2013 10:22**

Sample ID: **GLCS MS12W0624B** Units : **mg/L** Run ID: **MSD_12_130624B** Prep Date: **06/24/2013 10:22**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.427	0.05	0.4		107	70	130			
Surr: 1,2-Dichloroethane-d4	0.0112		0.01		112	70	130			
Surr: Toluene-d8	0.0101		0.01		101	70	130			
Surr: 4-Bromofluorobenzene	0.00966		0.01		97	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062418.D** Batch ID: **MS12W0624B** Analysis Date: **06/24/2013 16:30**

Sample ID: **13062121-01AGS** Units : **mg/L** Run ID: **MSD_12_130624B** Prep Date: **06/24/2013 16:30**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	2.59	0.25	2	0	130	54	143			
Surr: 1,2-Dichloroethane-d4	0.0603		0.05		121	70	130			
Surr: Toluene-d8	0.0489		0.05		98	70	130			
Surr: 4-Bromofluorobenzene	0.0434		0.05		87	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062510.D** Batch ID: **MS12W0624B** Analysis Date: **06/25/2013 14:14**

Sample ID: **13062121-01AGSD** Units : **mg/L** Run ID: **MSD_12_130624B** Prep Date: **06/25/2013 14:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	2.15	0.25	2	0	107	54	143	2.593	18.8(23)	
Surr: 1,2-Dichloroethane-d4	0.055		0.05		110	70	130			
Surr: Toluene-d8	0.0498		0.05		99.5	70	130			
Surr: 4-Bromofluorobenzene	0.0466		0.05		93	70	130			

Comments:

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Date: *01-Jul-13*

QC Summary Report

Work Order: 13061928

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062704.D** Batch ID: **MS15W0627B** Analysis Date: **06/27/2013 10:50**

Sample ID: **MBLK MS15W0627B** Units : **mg/L** Run ID: **MSD_15_130627A** Prep Date: **06/27/2013 10:50**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.00884		0.01		88	70	130			
Surr: Toluene-d8	0.0115		0.01		115	70	130			
Surr: 4-Bromofluorobenzene	0.0103		0.01		103	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062703.D** Batch ID: **MS15W0627B** Analysis Date: **06/27/2013 10:28**

Sample ID: **GLCS MS15W0627B** Units : **mg/L** Run ID: **MSD_15_130627A** Prep Date: **06/27/2013 10:28**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.369	0.05	0.4		92	70	130			
Surr: 1,2-Dichloroethane-d4	0.00879		0.01		88	70	130			
Surr: Toluene-d8	0.0111		0.01		111	70	130			
Surr: 4-Bromofluorobenzene	0.00981		0.01		98	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062727.D** Batch ID: **MS15W0627B** Analysis Date: **06/27/2013 19:11**

Sample ID: **13061928-08AGS** Units : **mg/L** Run ID: **MSD_15_130627A** Prep Date: **06/27/2013 19:11**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.38	0.25	2	0	69	54	143			
Surr: 1,2-Dichloroethane-d4	0.043		0.05		86	70	130			
Surr: Toluene-d8	0.0564		0.05		113	70	130			
Surr: 4-Bromofluorobenzene	0.0493		0.05		99	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062728.D** Batch ID: **MS15W0627B** Analysis Date: **06/27/2013 19:33**

Sample ID: **13061928-08AGSD** Units : **mg/L** Run ID: **MSD_15_130627A** Prep Date: **06/27/2013 19:33**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.47	0.25	2	0	73	54	143	1.38	6.0(23)	
Surr: 1,2-Dichloroethane-d4	0.0427		0.05		85	70	130			
Surr: Toluene-d8	0.0557		0.05		111	70	130			
Surr: 4-Bromofluorobenzene	0.0505		0.05		101	70	130			

Comments:

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Date: *01-Jul-13*

QC Summary Report

Work Order: 13061928

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **13062404.D** Batch ID: **MS12W0624A** Analysis Date: **06/24/2013 11:25**

Sample ID: **MBLK MS12W0624A** Units : **µg/L** Run ID: **MSD_12_130624B** Prep Date: **06/24/2013 11:25**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Tertiary Butyl Alcohol (TBA)	ND	10								
Methyl tert-butyl ether (MTBE)	ND	0.5								
Di-isopropyl Ether (DIPE)	ND	1								
Ethyl Tertiary Butyl Ether (ETBE)	ND	1								
Benzene	ND	0.5								
Tertiary Amyl Methyl Ether (TAME)	ND	1								
Toluene	ND	0.5								
Ethylbenzene	ND	0.5								
Xylenes, Total	ND	0.5								
Surr: 1,2-Dichloroethane-d4	11.6		10		116	70	130			
Surr: Toluene-d8	11.6		10		116	70	130			
Surr: 4-Bromofluorobenzene	8.82		10		88	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **13062403.D** Batch ID: **MS12W0624A** Analysis Date: **06/24/2013 10:44**

Sample ID: **LCS MS12W0624A** Units : **µg/L** Run ID: **MSD_12_130624B** Prep Date: **06/24/2013 10:44**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	11.9	0.5	10		119	63	137			
Benzene	10.5	0.5	10		105	70	130			
Toluene	8.89	0.5	10		89	80	120			
Ethylbenzene	8.18	0.5	10		82	80	120			
Xylenes, Total	16.7	0.5	20		83	70	130			
Surr: 1,2-Dichloroethane-d4	12.4		10		124	70	130			
Surr: Toluene-d8	9.56		10		96	70	130			
Surr: 4-Bromofluorobenzene	8.82		10		88	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **13062416.D** Batch ID: **MS12W0624A** Analysis Date: **06/24/2013 15:46**

Sample ID: **13062121-01AMS** Units : **µg/L** Run ID: **MSD_12_130624B** Prep Date: **06/24/2013 15:46**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	65.5	1.3	50	0	131	56	140			
Benzene	56.4	1.3	50	0	113	67	134			
Toluene	46.2	1.3	50	0	92	38	130			
Ethylbenzene	42.2	1.3	50	0	84	70	130			
Xylenes, Total	85.9	1.3	100	0	86	70	130			
Surr: 1,2-Dichloroethane-d4	41.5		50		83	70	130			
Surr: Toluene-d8	45.9		50		92	70	130			
Surr: 4-Bromofluorobenzene	42.1		50		84	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **13062509.D** Batch ID: **MS12W0624A** Analysis Date: **06/25/2013 13:53**

Sample ID: **13062121-01AMSD** Units : **µg/L** Run ID: **MSD_12_130624B** Prep Date: **06/25/2013 13:53**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	51.5	1.3	50	0	103	56	140	65.51	23.9(40)	
Benzene	58.2	1.3	50	0	116	67	134	56.41	3.1(21)	
Toluene	51.7	1.3	50	0	103	38	130	46.24	11.1(20)	
Ethylbenzene	47.3	1.3	50	0	95	70	130	42.24	11.3(20)	
Xylenes, Total	96.4	1.3	100	0	96	70	130	85.91	11.5(22)	
Surr: 1,2-Dichloroethane-d4	58.9		50		118	70	130			
Surr: Toluene-d8	48.3		50		97	70	130			
Surr: 4-Bromofluorobenzene	43.3		50		87	70	130			

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Date: *01-Jul-13*

QC Summary Report

Work Order: 13061928

Comments:

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Date: *01-Jul-13*

QC Summary Report

Work Order: 13061928

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **13062704.D** Batch ID: **MS15W0627A** Analysis Date: **06/27/2013 10:50**

Sample ID: **MBLK MS15W0627A** Units : **µg/L** Run ID: **MSD_15_130627A** Prep Date: **06/27/2013 10:50**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Tertiary Butyl Alcohol (TBA)	ND	10								
Methyl tert-butyl ether (MTBE)	ND	0.5								
Di-isopropyl Ether (DIPE)	ND	1								
Ethyl Tertiary Butyl Ether (ETBE)	ND	1								
Benzene	ND	0.5								
Tertiary Amyl Methyl Ether (TAME)	ND	1								
Toluene	ND	0.5								
Ethylbenzene	ND	0.5								
Xylenes, Total	ND	0.5								
Surr: 1,2-Dichloroethane-d4	8.84		10		88	70	130			
Surr: Toluene-d8	11.5		10		115	70	130			
Surr: 4-Bromofluorobenzene	10.3		10		103	70	130			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **13062702.D** Batch ID: **MS15W0627A** Analysis Date: **06/27/2013 10:07**

Sample ID: **LCS MS15W0627A** Units : **µg/L** Run ID: **MSD_15_130627A** Prep Date: **06/27/2013 10:07**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	8.19	0.5	10		82	63	137			
Benzene	10.6	0.5	10		106	70	130			
Toluene	10.3	0.5	10		103	80	120			
Ethylbenzene	10.7	0.5	10		107	80	120			
Xylenes, Total	21.4	0.5	20		107	70	130			
Surr: 1,2-Dichloroethane-d4	9.5		10		95	70	130			
Surr: Toluene-d8	11		10		110	70	130			
Surr: 4-Bromofluorobenzene	9.82		10		98	70	130			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **13062725.D** Batch ID: **MS15W0627A** Analysis Date: **06/27/2013 18:27**

Sample ID: **13061928-03AMS** Units : **µg/L** Run ID: **MSD_15_130627A** Prep Date: **06/27/2013 18:27**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	67.5	1.3	50	17.79	99	56	140			
Benzene	48.1	1.3	50	2.35	91	67	134			
Toluene	45.5	1.3	50	0	91	38	130			
Ethylbenzene	45.8	1.3	50	1.16	89	70	130			
Xylenes, Total	91.7	1.3	100	0.62	91	70	130			
Surr: 1,2-Dichloroethane-d4	48.1		50		96	70	130			
Surr: Toluene-d8	57.2		50		114	70	130			
Surr: 4-Bromofluorobenzene	49.7		50		99	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **13062726.D** Batch ID: **MS15W0627A** Analysis Date: **06/27/2013 18:49**

Sample ID: **13061928-03AMSD** Units : **µg/L** Run ID: **MSD_15_130627A** Prep Date: **06/27/2013 18:49**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	71.3	1.3	50	17.79	107	56	140	67.5	5.5(40)	
Benzene	51.9	1.3	50	2.35	99	67	134	48.08	7.6(21)	
Toluene	49.8	1.3	50	0	99.5	38	130	45.53	8.9(20)	
Ethylbenzene	51	1.3	50	1.16	99.6	70	130	45.82	10.6(20)	
Xylenes, Total	101	1.3	100	0.62	101	70	130	91.68	10.1(22)	
Surr: 1,2-Dichloroethane-d4	47.2		50		94	70	130			
Surr: Toluene-d8	56.8		50		114	70	130			
Surr: 4-Bromofluorobenzene	49.8		50		99.6	70	130			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *01-Jul-13*

QC Summary Report

Work Order: 13061928

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

AMENDED

CA RUSH

Billing Information :

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13061928

Report Due By : 5:00 PM On : 05-Jul-13

13A+14A due 6-24-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Dianne Phelps

PO :

Client's COC # : 13158, 13159 Job : 2145.1/Former Gil's, Alturas

Cooler Temp	Samples Received	Date Printed
5 °C	19-Jun-13	21-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	TPH/P_W	VOC_W						Sample Remarks
POR13061928-01A	MW-1	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-02A	MW-2	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-03A	MW-3	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-04A	MW-4	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-05A	MW-5	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-06A	MW-7	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-07A	MW-8	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-08A	MW-14A	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-09A	MW-14B	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-10A	EW-1	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						

Comments: Samples brought in by client after 16:00 cut off time, therefore one day added to TAT. Frozen ice. Sampling times listed as AM. TPH-D on first page of client chain logged in as TPH-G, per second page of client chain. Total Xylenes. : Amended 6/21/13 13:30 to place 13A and 14A on 72 HR TAT, per Chip. Due 6/24/13.KM

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	6/21/13 1330

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

AMENDED

CARUSH

Billing Information :

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13061928

Report Due By : 5:00 PM On : 05-Jul-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Dianne Phelps

PO :

Client's COC # : 13158, 13159 Job : 2145.1/Former Gil's, Alturas

Cooler Temp	Samples Received	Date Printed
5 °C	19-Jun-13	21-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	TPH/P_W	VOC_W						Sample Remarks
POR13061928-11A	EW-2	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-12A	EW-3	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-13A	MW-19A	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-14A	MW-19B	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-15A	MW-15A	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-16A	MW-15B	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-17A	MW-16A	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-18A	MW-16B	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-19A	MW-18A	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-20A	MW-18B	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						

Comments: Samples brought in by client after 16:00 cut off time, therefore one day added to TAT. Frozen ice. Sampling times listed as AM. TPH-D on first page of client chain logged in as TPH-G, per second page of client chain. Total Xylenes. : Amended 6/21/13 13:30 to place 13A and 14A on 72 HR TAT, per Chip. Due 6/24/13.KM

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	6/21/13 1330

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Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

AMENDED
CARUSH

Billing Information :

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13061928

Report Due By : 5:00 PM On : 05-Jul-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Dianne Phelps

PO :

Client's COC # : 13158, 13159 Job : 2145.1/Former Gil's, Alturas

Cooler Temp	Samples Received	Date Printed
5 °C	19-Jun-13	21-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	TPH/P_W	VOC_W						Sample Remarks
							Requested Tests								
POR13061928-21A	ACSW	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						Voas labeled CSW, logged in per client chain.

Comments: Samples brought in by client after 16:00 cut off time, therefore one day added to TAT. Frozen ice. Sampling times listed as AM. TPH-D on first page of client chain logged in as TPH-G, per second page of client chain. Total Xylenes. : Amended 6/21/13 13:30 to place 13A and 14A on 72 HR TAT, per Chip. Due 6/24/13.KM

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	6/21/13 1330

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
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Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13061928

Report Due By : 5:00 PM On : 05-Jul-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Dianne Phelps

PO :

Client's COC # : 13158, 13159 Job : 2145.1/Former Gil's, Alturas

Cooler Temp	Samples Received	Date Printed
5 °C	19-Jun-13	19-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	TPH/P_W	VOC_W						Sample Remarks
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POR13061928-02A	MW-2	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-03A	MW-3	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-04A	MW-4	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-05A	MW-5	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-06A	MW-7	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-07A	MW-8	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-08A	MW-14A	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-09A	MW-14B	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-10A	EW-1	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						

Comments: Samples brought in by client after 16:00 cut off time, therefore one day added to TAT. Frozen ice. Sampling times listed as AM. TPH-D on first page of client chain logged in as TPH-G, per second page of client chain. Total Xylenes. :

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	6/19/13 1630

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Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13061928

Report Due By : 5:00 PM On : 05-Jul-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Dianne Phelps

PO :

Client's COC # : 13158, 13159 Job : 2145.1/Former Gil's, Alturas

Cooler Temp	Samples Received	Date Printed
5 °C	19-Jun-13	19-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	TPH/P_W	VOC_W						Sample Remarks
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POR13061928-12A	EW-3	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-13A	MW-19A	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-14A	MW-19B	AQ	06/18/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-15A	MW-15A	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-16A	MW-15B	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-17A	MW-16A	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-18A	MW-16B	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
POR13061928-19A	MW-18A	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						
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	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	6/19/13 1630

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Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13061928

Report Due By : 5:00 PM On : 05-Jul-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Dianne Phelps

PO :

Client's COC # : 13158, 13159 Job : 2145.1/Former Gil's, Alturas

Cooler Temp	Samples Received	Date Printed
5 °C	19-Jun-13	19-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	TPH/P_W	VOC_W						Sample Remarks
POR13061928-21A	ACSW	AQ	06/19/13 00:00	3	0	10	TPH/E_C	GAS-C	BTEX/OXY_C						Voas labeled CSW, logged in per client chain.

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	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	6/19/13 1630

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Billing Information:

Company: Porter Geotechnical
Attn:
Address: 5560 Wildwood Dr
City, State, Zip: Reno, NV 89511
Phone Number: 849-0668 Fax: 849-0895

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 Phone: 775-355-1044 Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 Phone: 702-281-4848
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 Phone: 714-386-2901

13158

Page # 1 of 2

Consultant/ Client Info:
Company: Porter Geotechnical
Address:
City, State, Zip:

Job and Purchase Order Info:
Job #: 2145.1
Job Name: Former 66's, Altures
P.O. #:

Report Attention/Project Manager:
Name: Chip Porter
Email Address: nvchip@portergeotechnical.com
Phone #: 849-0668
Cell #: 233-6691

QC Deliverable Info:
EDD Required? Yes / No
EDF Required? Yes / No
Global ID:
Data Validation Level: III or IV

Samples Collected from which State? (circle one) AZ CA NV WA ID OR DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	Field Filtered?	# Containers** (See Key Below)	TPH-D	TPH-D	BTEX	5 OXYS								Remarks
AM	6/18/13	AQ	POR1306 1928-01	MW-1	STD	NO	3V												
			02	MW-2															
			03	MW-3															
			04	MW-4															
			05	MW-5															
			06	MW-7															
			07	MW-8															
			08	MW-14A															
			09	MW-14B															
			10	EW-1															
			11	EW-2															
			12	EW-3															

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By: [signature]

Relinquished by: (Signature/Affiliation)	Date:	Time:	Received by: (Signature/Affiliation)	Date:	Time:
[signature]	6/19/13	4:08p	K Murray/AAI	6/19/13	1608

* Key: AQ - Aqueous WA - Waste OT - Other **: L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Billing Information:

Company: Porter Geotechnical
Attn:
Address:
City, State, Zip:
Phone Number: Fax:

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 Phone: 775-355-1044 Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089
Southern NV: 6255 McLeod Ave, Suite 24, Las Vegas, NV 89120 Phone: 702-281-4848
Southern CA: 1007 E. Dominguez St., Suite O, Carson, CA 90746 Phone: 714-386-2901

13159

Page # 2 of 2

Consultant/ Client Info:
Company: Porter Geotechnical
Address:
City, State, Zip:

Job and Purchase Order Info:
Job # 2145.1
Job Name: Former Gil's, Altoids
P.O. #:

Report Attention/Project Manager:
Name:
Email Address:
Phone #:
Cell #:

QC Deliverable Info:
EDD Required? Yes No EDF Required? Yes No
Global ID:
Data Validation Level: III or IV

Samples Collected from which State? (circle one) AZ CA NV WA ID OR DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	Field Filtered?	# Containers** (See Key Below)	TPH-D	TPH-G	BTEX	5 OXYS								Remarks
AM	6/18/13	AQ	PORI306192B-13	MW-19A	STD	NO	3V												
			14	MW-19B															
AM	6/19/13	AQ	15	MW-15A															
			16	MW-15B															
			17	MW-16A															
			18	MW-16B															
			19	MW-18A															
			20	MW-18B															
			21	ACSW															

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By: Alanna Rhy

Relinquished by: (Signature/Affiliation)	Date:	Time:	Received by: (Signature/Affiliation)	Date:	Time:
Alanna Rhy	6/19/13	4:08	K Murray/AA	6/19/13	1608
Relinquished by: (Signature/Affiliation):	Date:	Time:	Received by: (Signature/Affiliation):	Date:	Time:
Relinquished by: (Signature/Affiliation):	Date:	Time:	Received by: (Signature/Affiliation):	Date:	Time:

* Key: AQ - Aqueous WA - Waste OT - Other **: L - Liter V - VOA S-Soil Jar O - Orbo T - Tedlar B - Brass P - Plastic OT - Other

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Porter Geotechnical, Inc
5560 Wildwood Dr.
Reno, NV 89511

Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/21/13

Job: 2145.1/Former Gil's Shell

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B / SW8260B
Volatile Organic Compounds (VOCs) EPA Method SW8260B

		Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**EW-1 Pilot Test Exhaust**					
Lab ID :	POR13062126-01A	TPH-P (GRO)	1,800	130 mg/m³	06/21/13 16:00	06/25/13
Date Sampled	06/19/13 08:08	Tertiary Butyl Alcohol (TBA)	ND	63 mg/m³	06/21/13 16:00	06/25/13
		Methyl tert-butyl ether (MTBE)	ND	1.3 mg/m³	06/21/13 16:00	06/25/13
		Di-isopropyl Ether (DIPE)	ND	2.5 mg/m³	06/21/13 16:00	06/25/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	2.5 mg/m³	06/21/13 16:00	06/25/13
		Benzene	ND	1.3 mg/m³	06/21/13 16:00	06/25/13
		Tertiary Amyl Methyl Ether (TAME)	ND	2.5 mg/m³	06/21/13 16:00	06/25/13
		Toluene	ND	1.3 mg/m³	06/21/13 16:00	06/25/13
		Ethylbenzene	11	1.3 mg/m³	06/21/13 16:00	06/25/13
		Xylenes, Total	19	1.3 mg/m³	06/21/13 16:00	06/25/13
Client ID :	**EW-2 Pilot Test Exhaust**					
Lab ID :	POR13062126-02A	TPH-P (GRO)	84	25 mg/m³	06/21/13 16:00	06/25/13
Date Sampled	06/20/13 09:58	Tertiary Butyl Alcohol (TBA)	ND	13 mg/m³	06/21/13 16:00	06/25/13
		Methyl tert-butyl ether (MTBE)	0.77	0.25 mg/m³	06/21/13 16:00	06/25/13
		Di-isopropyl Ether (DIPE)	ND	0.50 mg/m³	06/21/13 16:00	06/25/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	0.50 mg/m³	06/21/13 16:00	06/25/13
		Benzene	ND	0.25 mg/m³	06/21/13 16:00	06/25/13
		Tertiary Amyl Methyl Ether (TAME)	ND	0.50 mg/m³	06/21/13 16:00	06/25/13
		Toluene	ND	0.25 mg/m³	06/21/13 16:00	06/25/13
		Ethylbenzene	2.2	0.25 mg/m³	06/21/13 16:00	06/25/13
		Xylenes, Total	4.3	0.25 mg/m³	06/21/13 16:00	06/25/13
Client ID :	**EW-3 Pilot Test Exhaust**					
Lab ID :	POR13062126-03A	TPH-P (GRO)	160	20 mg/m³	06/21/13 16:00	06/25/13
Date Sampled	06/20/13 15:45	Tertiary Butyl Alcohol (TBA)	ND	10 mg/m³	06/21/13 16:00	06/25/13
		Methyl tert-butyl ether (MTBE)	2.9	0.20 mg/m³	06/21/13 16:00	06/25/13
		Di-isopropyl Ether (DIPE)	ND	0.40 mg/m³	06/21/13 16:00	06/25/13
		Ethyl Tertiary Butyl Ether (ETBE)	ND	0.40 mg/m³	06/21/13 16:00	06/25/13
		Benzene	ND	0.20 mg/m³	06/21/13 16:00	06/25/13
		Tertiary Amyl Methyl Ether (TAME)	ND	0.40 mg/m³	06/21/13 16:00	06/25/13
		Toluene	ND	0.20 mg/m³	06/21/13 16:00	06/25/13
		Ethylbenzene	ND	0.20 mg/m³	06/21/13 16:00	06/25/13
		Xylenes, Total	ND	0.20 mg/m³	06/21/13 16:00	06/25/13

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Gasoline Range Organics (GRO) C4-C13

Note: Concentrations of air in Tedlar Bags are at 26 degrees Celsius and 25.55 inches of mercury.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

7/5/13

Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *27-Jun-13*

QC Summary Report

Work Order: 13062126

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062508.D** Batch ID: **MS08A0625B** Analysis Date: **06/25/2013 12:39**

Sample ID: **MBLK MS08A0625B** Units : **mg/m³** Run ID: **MSD_08_130625B** Prep Date: **06/25/2013 12:39**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	10								
Surr: 1,2-Dichloroethane-d4	2.15		2		108	70	130			
Surr: Toluene-d8	2.06		2		103	70	130			
Surr: 4-Bromofluorobenzene	1.97		2		99	70	130			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8015B/C / SW8260B**

File ID: **13062506.D** Batch ID: **MS08A0625B** Analysis Date: **06/25/2013 11:48**

Sample ID: **GLCS MS08A0625B** Units : **mg/m³** Run ID: **MSD_08_130625B** Prep Date: **06/25/2013 11:48**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	419	10	400		105	70	130			
Surr: 1,2-Dichloroethane-d4	11.2		10		112	70	130			
Surr: Toluene-d8	8.72		10		87	70	130			
Surr: 4-Bromofluorobenzene	11.2		10		112	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *27-Jun-13*

QC Summary Report

Work Order: 13062126

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8260B**

File ID: **13062508.D** Batch ID: **MS08A0625A** Analysis Date: **06/25/2013 12:39**

Sample ID: **MBLK MS08A0625A** Units : **mg/m³** Run ID: **MSD_08_130625B** Prep Date: **06/25/2013 12:39**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Tertiary Butyl Alcohol (TBA)	ND	5								
Methyl tert-butyl ether (MTBE)	ND	0.1								
Di-isopropyl Ether (DIPE)	ND	0.2								
Ethyl Tertiary Butyl Ether (ETBE)	ND	0.2								
Benzene	ND	0.1								
Tertiary Amyl Methyl Ether (TAME)	ND	0.2								
Toluene	ND	0.1								
Ethylbenzene	ND	0.1								
Xylenes, Total	ND	0.1								
Surr: 1,2-Dichloroethane-d4	2.15		2		108	70	130			
Surr: Toluene-d8	2.06		2		103	70	130			
Surr: 4-Bromofluorobenzene	1.97		2		99	70	130			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8260B**

File ID: **13062505.D** Batch ID: **MS08A0625A** Analysis Date: **06/25/2013 11:24**

Sample ID: **LCS MS08A0625A** Units : **mg/m³** Run ID: **MSD_08_130625B** Prep Date: **06/25/2013 11:24**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	8.5	0.1	10		85	63	137			
Benzene	8.55	0.1	10		86	70	130			
Toluene	8.47	0.1	10		85	80	120			
Ethylbenzene	9.25	0.1	10		93	80	120			
Xylenes, Total	17.5	0.1	20		87	70	130			
Surr: 1,2-Dichloroethane-d4	11.3		10		113	70	130			
Surr: Toluene-d8	9.31		10		93	70	130			
Surr: 4-Bromofluorobenzene	10.4		10		104	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13062126

Report Due By : 5:00 PM On : 08-Jul-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Chip Porter

PO :

Client's COC # : 33282 Job : 2145.1/Former Gil's Shell

Cooler Temp	Samples Received	Date Printed
N/A °C	21-Jun-13	21-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/P_A	VOC_A							Sample Remarks
							Requested Tests								
POR13062126-01A	EW-1 Pilot Test Exhaust	AR	06/19/13 08:08	1	0	10	GAS-N/C	BTEX/OXY							Tedlar
POR13062126-02A	EW-2 Pilot Test Exhaust	AR	06/20/13 09:58	1	0	10	GAS-N/C	BTEX/OXY							Tedlar
POR13062126-03A	EW-3 Pilot Test Exhaust	AR	06/20/13 15:45	1	0	10	GAS-N/C	BTEX/OXY							Tedlar

Comments: Samples brought in by client. Ice N/A. Total Xylenes. :

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	6/21/13 1530

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

33282

Billing Information:
Company Name: Porter Geotechnical
Attn: Chip Porter
Address: 5580 Wildwood Dr
City, State, Zip: Reno NV 89511
Phone Number: 849-0668 Fax: 849-0895

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State?
AZ ____ CA ✓ NV ____ WA ____ DOD Site ____
ID ____ OR ____ OTHER ____ Page # 1 of 1

Consultant / Client Name: Porter Geotechnical
Address: For Roger Reddy
City, State, Zip: Alturas, CA

Job #: 2145.1
Job Name: Former Gil's Shell

Report Attention / Project Manager
Name: Chip Porter
Email: Nuchip@portergeotechnical.com
Phone: 849-0668 Mobile: 233-6691

Data Validation Level: III or IV
EDD / EDF? YES ✓ NO ____
Global ID #: ____

Time Sampled	Date Sampled	Matrix* See Key Below	P.O. # / Lab ID Number (Office Use Only)	Sample Description	TAT	Field Filtered	# Containers**	TPHG	BTXE	5 OXYS					REMARKS
8:08	6/19/13	AR	POR1306 2126-01	EW-1 Pilot Test Exhaust	STD		1 T	✓	✓	✓					
9:58	6/20/13	AR	02	EW-2 Pilot Test Exhaust	✓		1 T	✓	✓	✓					
3:45 pm	6/20/13	AR	03	EW-3 Pilot Test Exhaust	✓		1 T	✓	✓	✓					

FOR LAB USE ONLY

ADDITIONAL INSTRUCTIONS:

I, (field sampler), attest to the validity and authenticity of this sample. I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action (NAC 445.0636 (c) (2)). Sampled By: Chip Porter

Relinquished by: (Signature/Affiliation)	Received by: (Signature/Affiliation)	Date:	Time:
Chip Porter	K Murray/AAI	6/21/13	3:15 pm
Relinquished by: (Signature/Affiliation)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature/Affiliation)	Received by: (Signature/Affiliation)	Date:	Time:

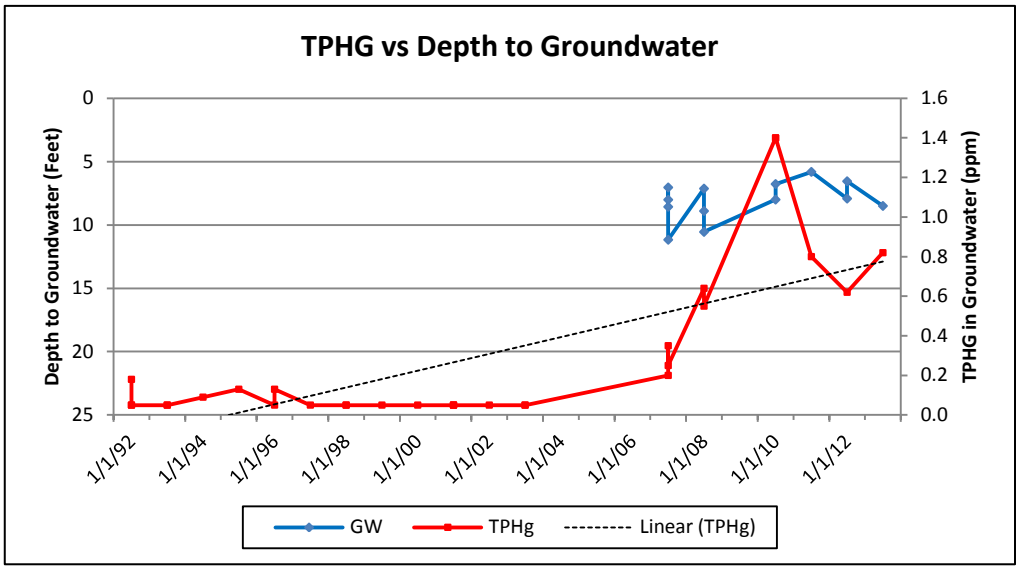
*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

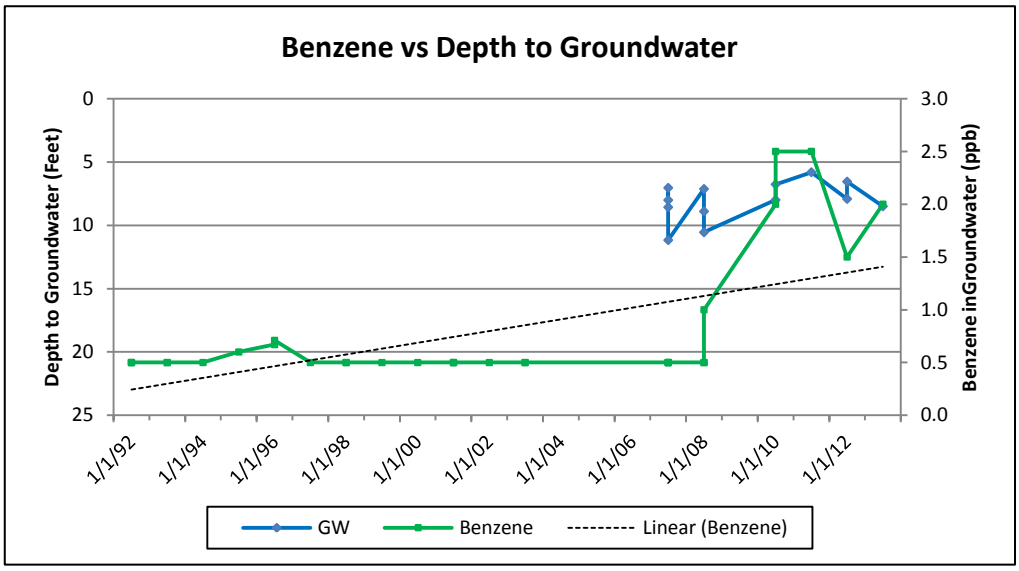
NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

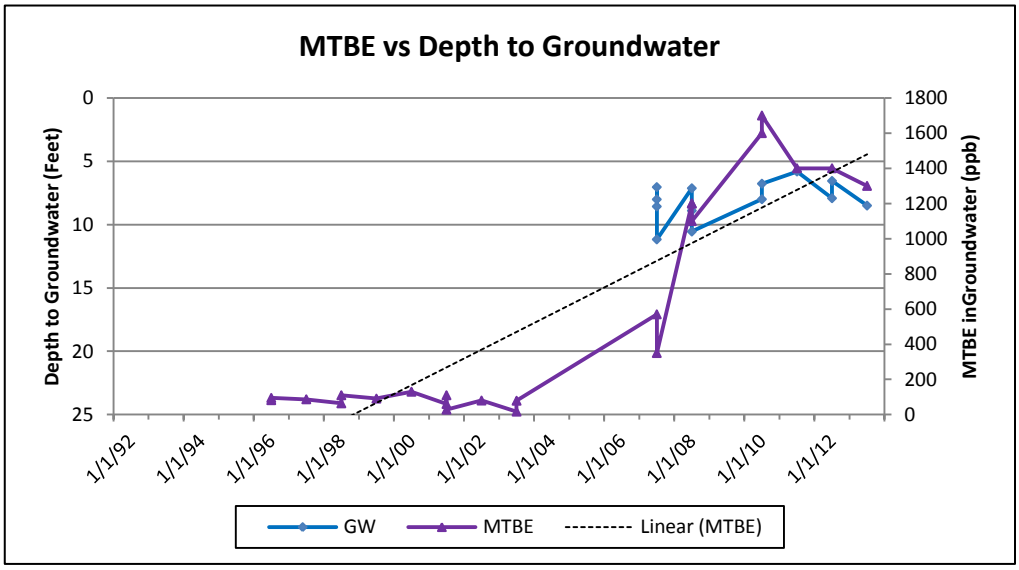
APPENDIX A-13

Time Series Graphs for Gasoline, Diesel, Benzene and MTBE in Groundwater

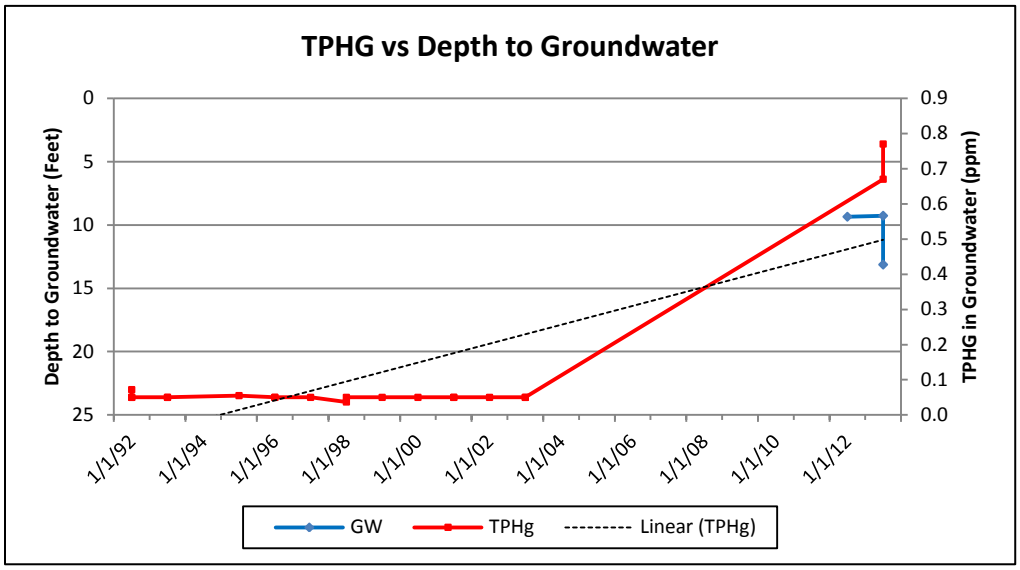
MW-1: Time Series Graphs - Former Gil's Shell, Alturas, CA

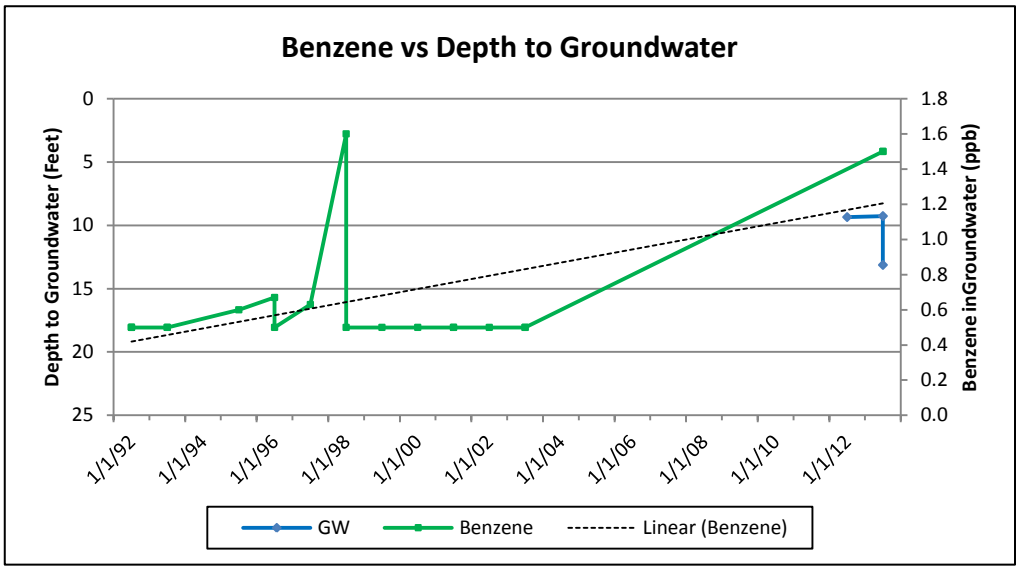


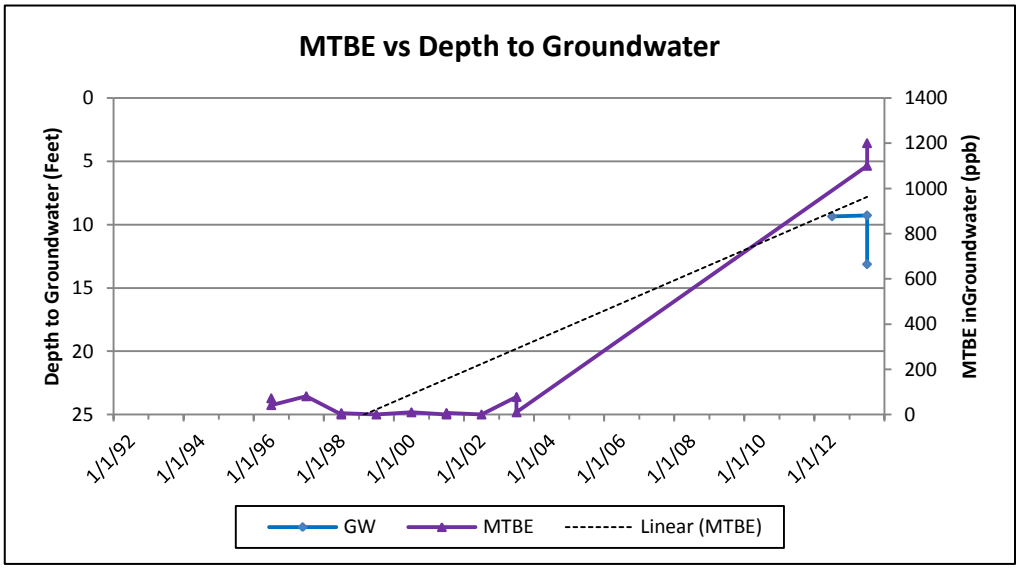




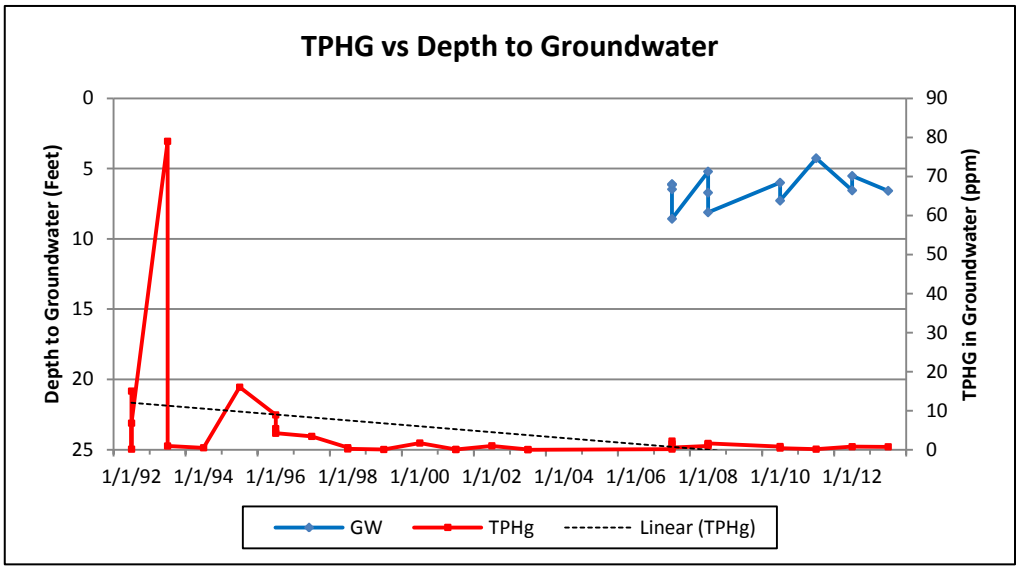
MW-2: Time Series Graphs - Former Gil's Shell, Alturas, CA

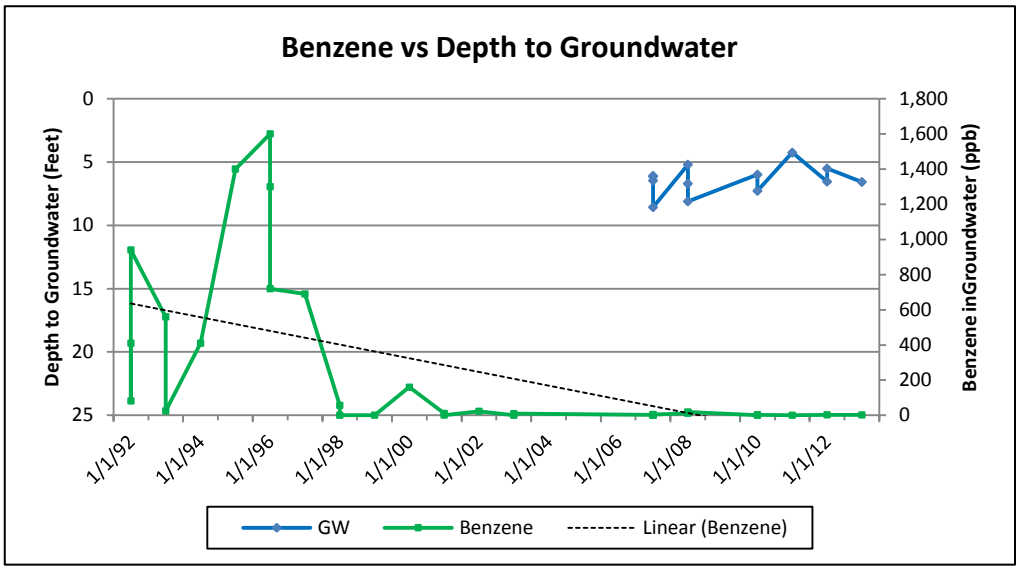


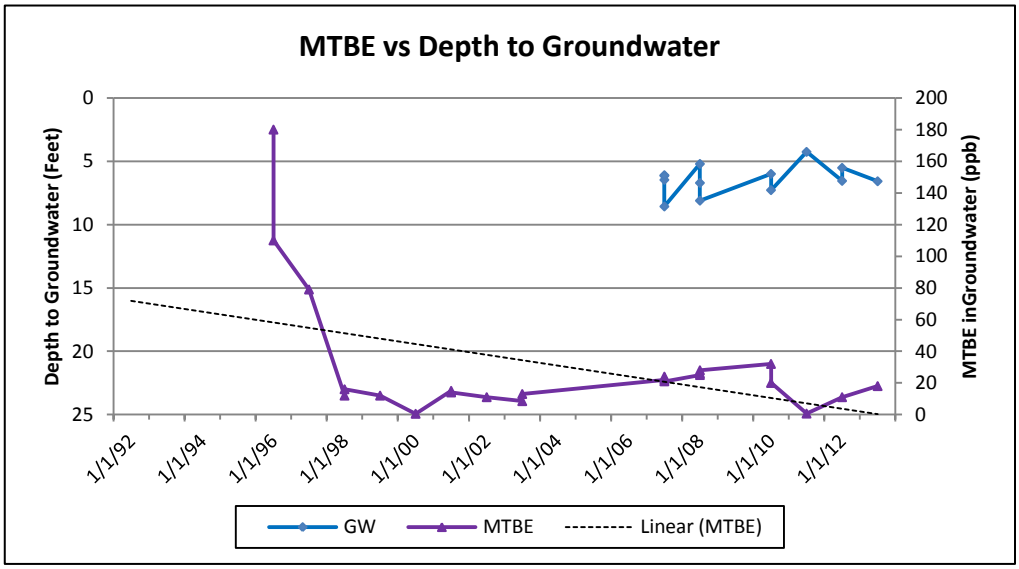




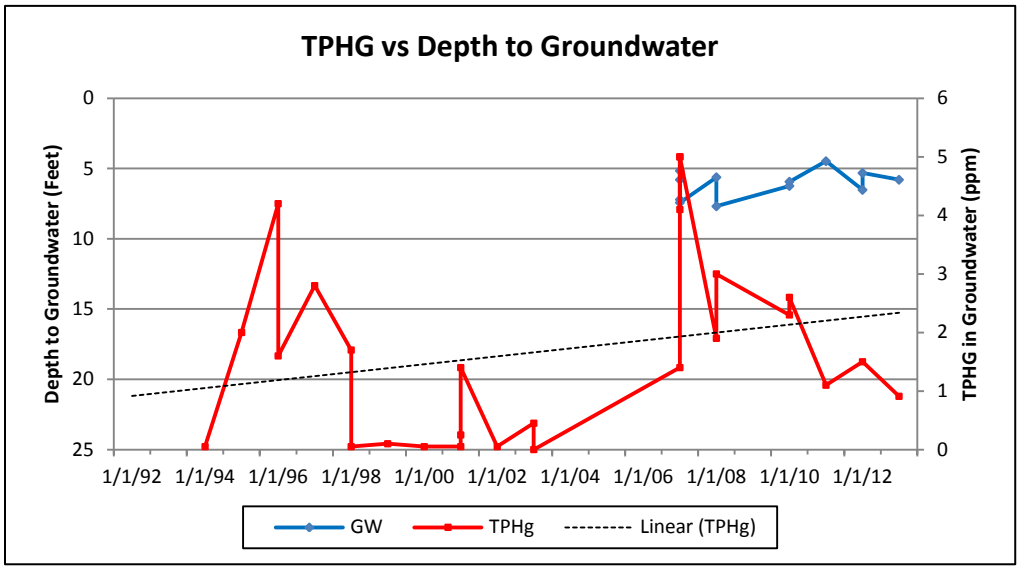
MW-3: Time Series Graphs - Former Gil's Shell, Alturas, CA

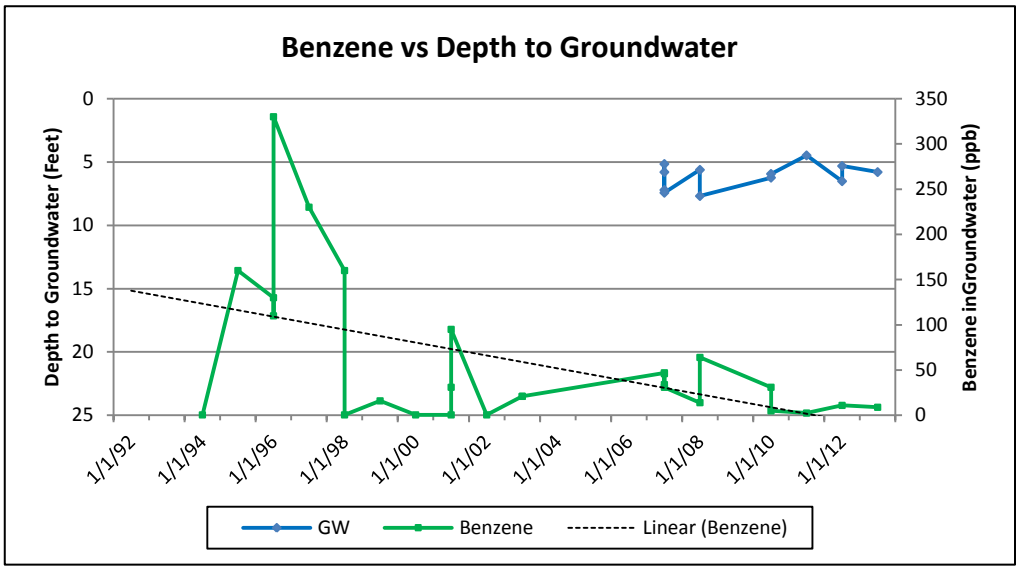


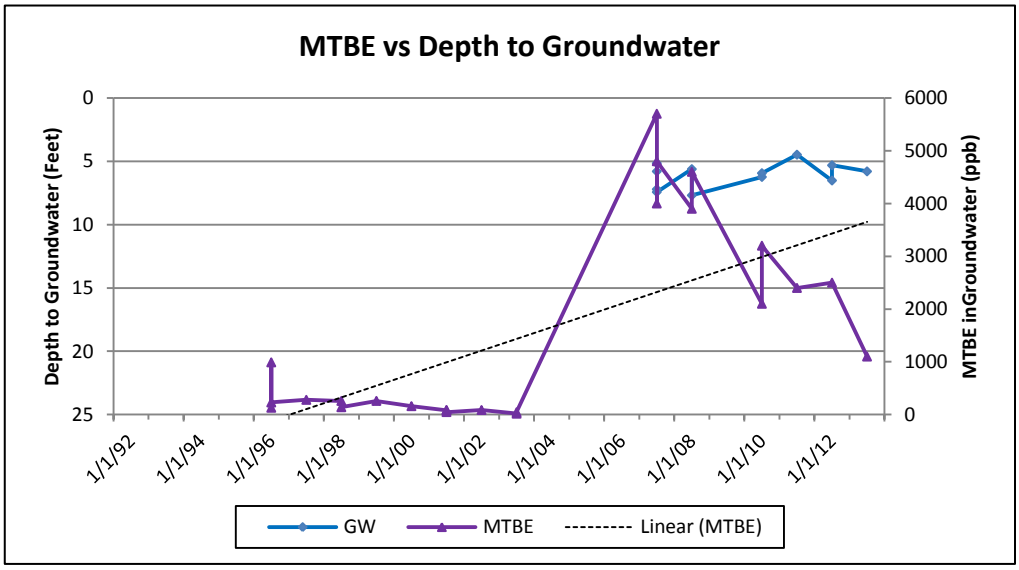




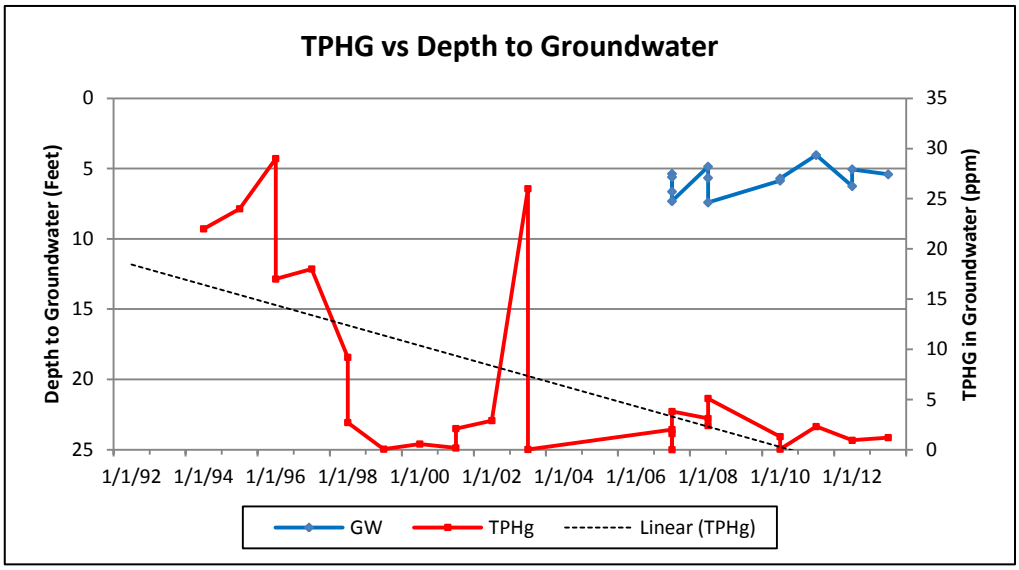
MW-4: Time Series Graphs - Former Gil's Shell, Alturas, CA

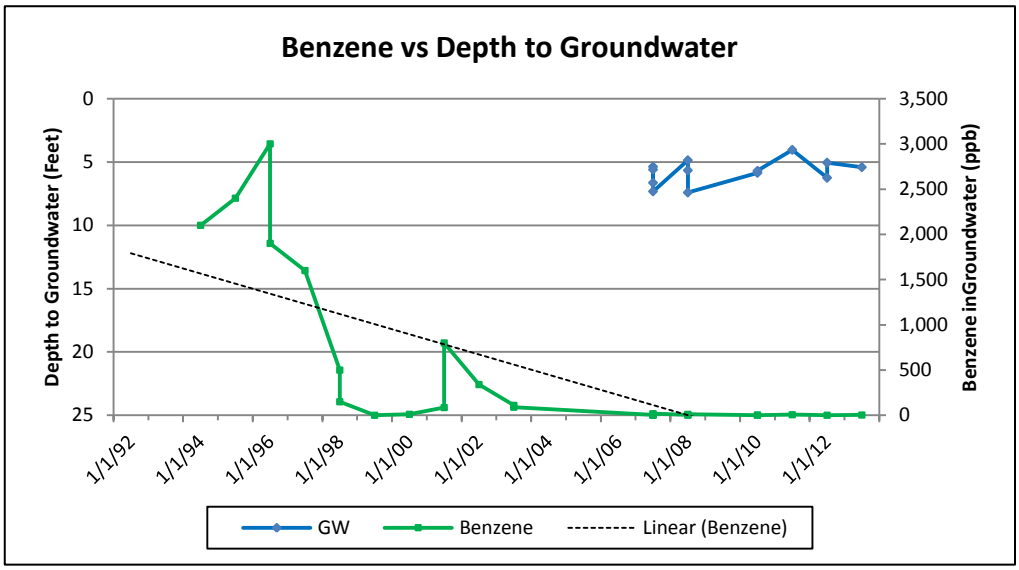


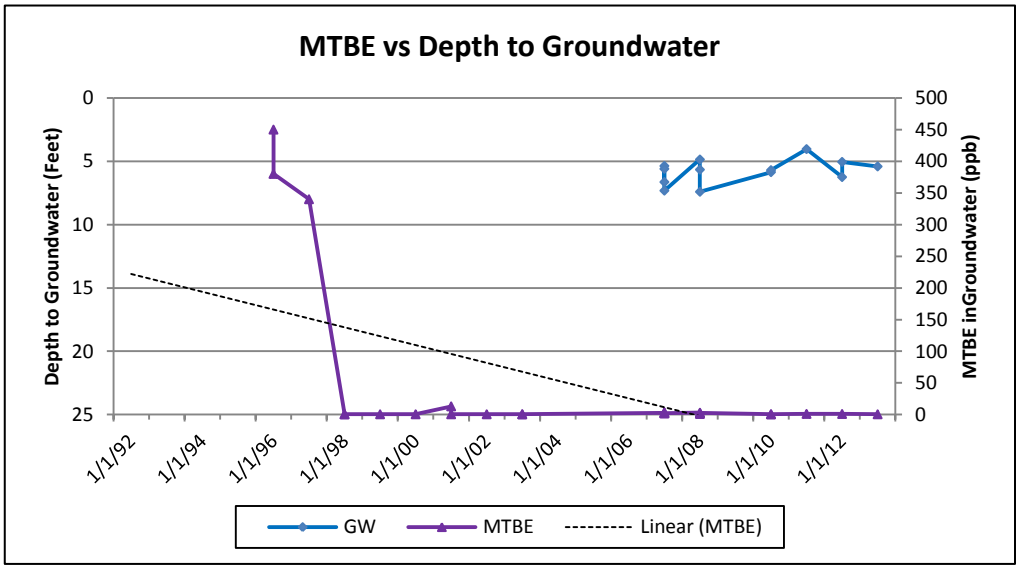




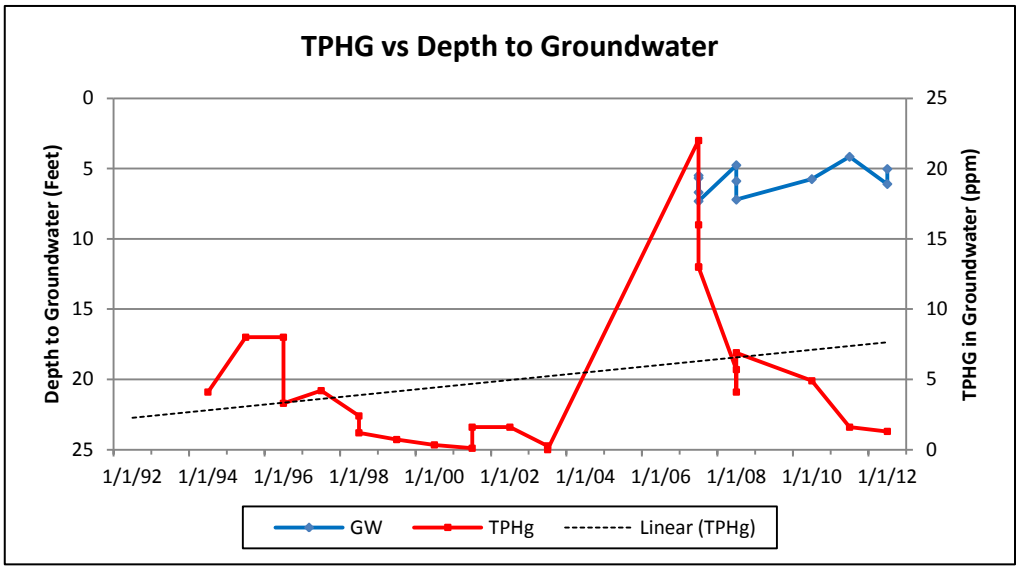
MW-5: Time Series Graphs - Former Gil's Shell, Alturas, CA

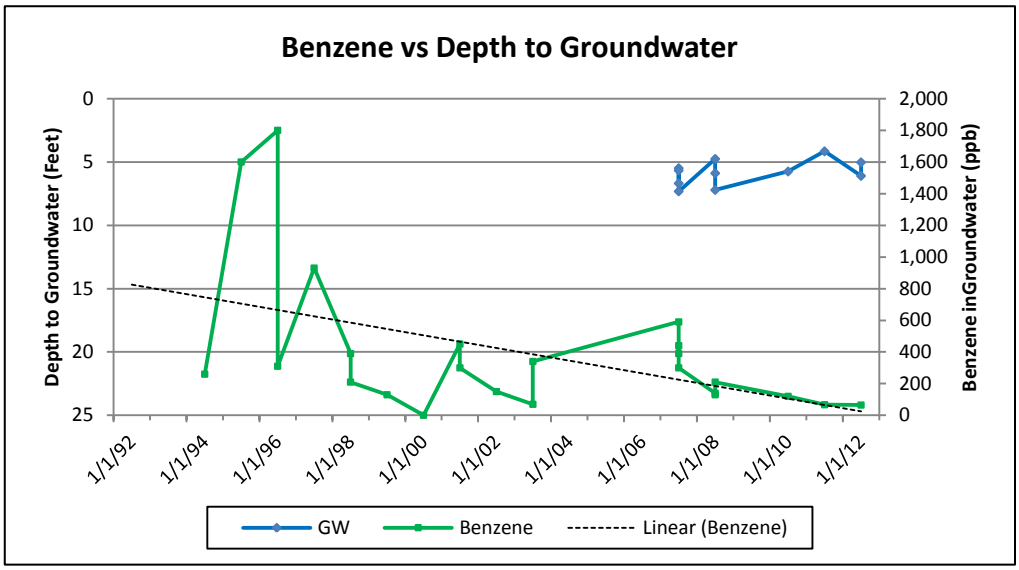


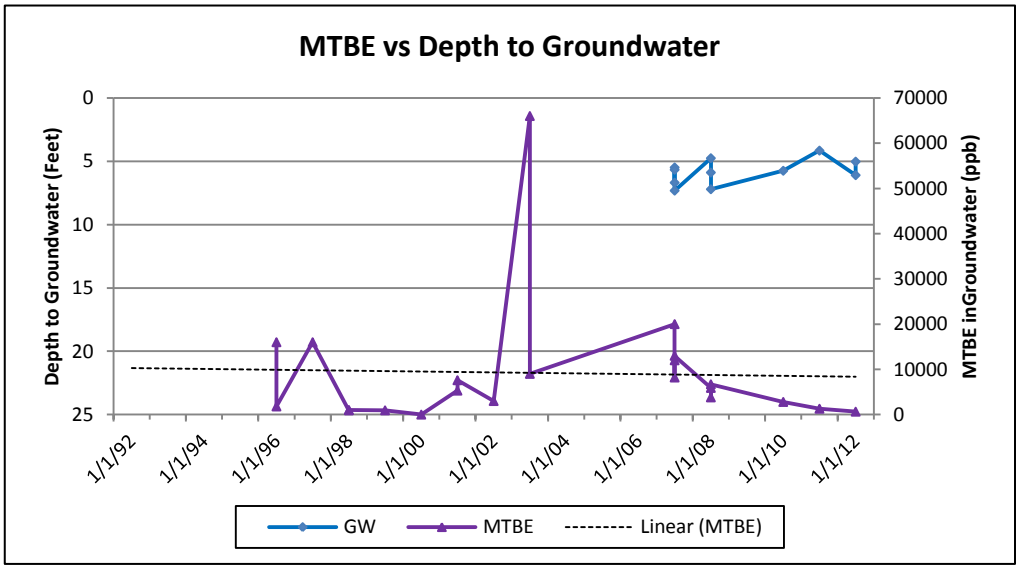




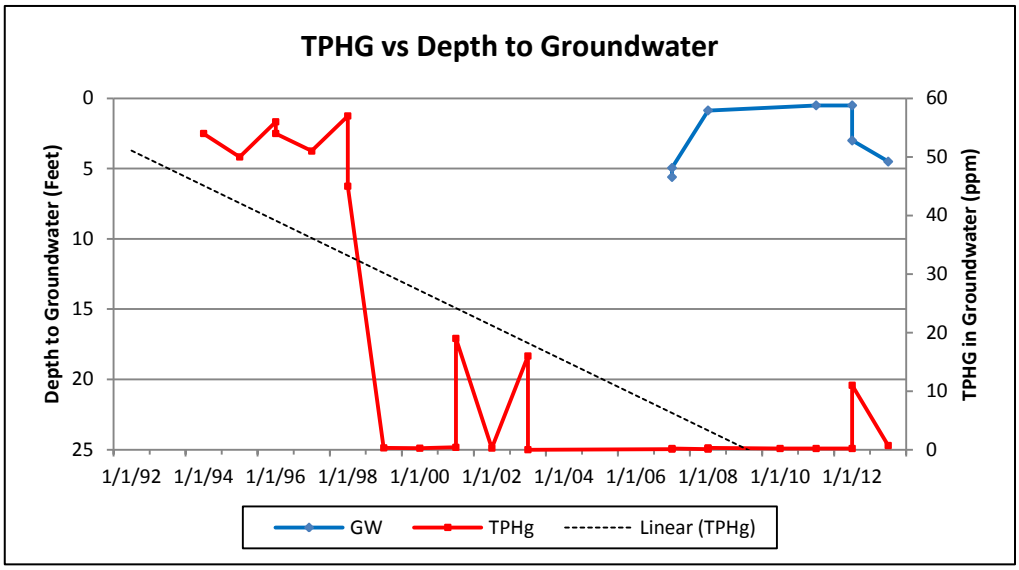
MW-6: Time Series Graphs - Former Gil's Shell, Alturas, CA

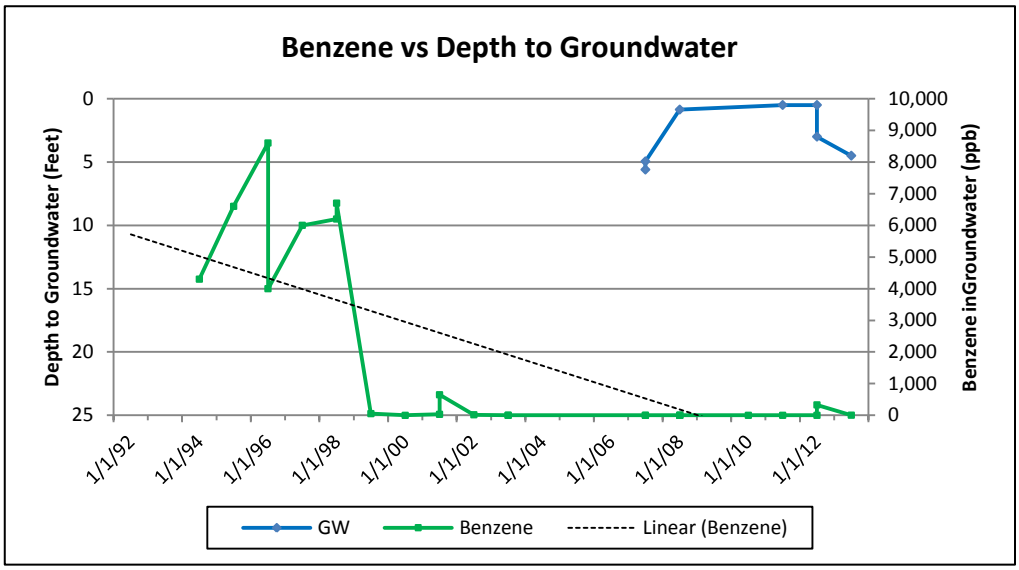


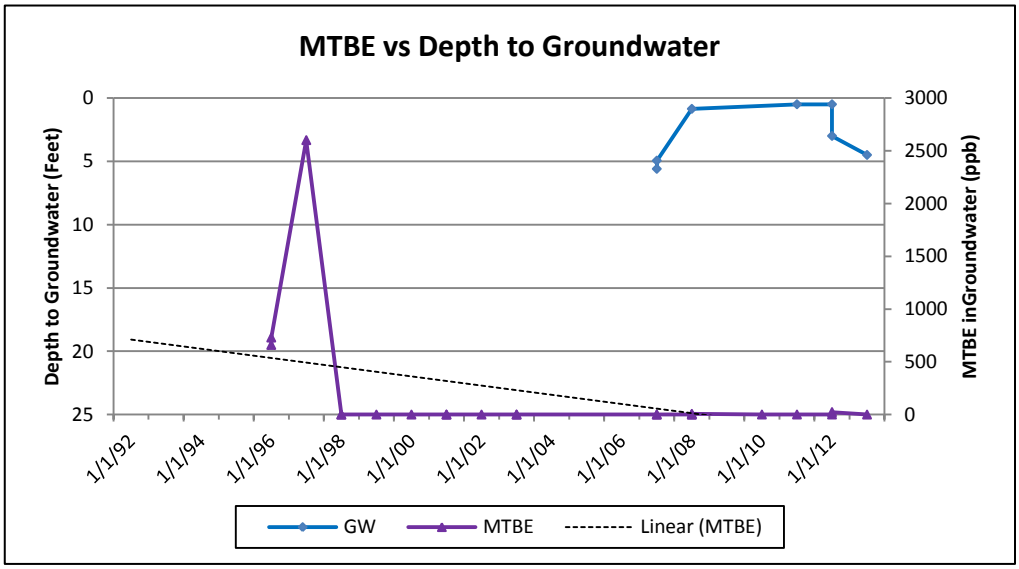




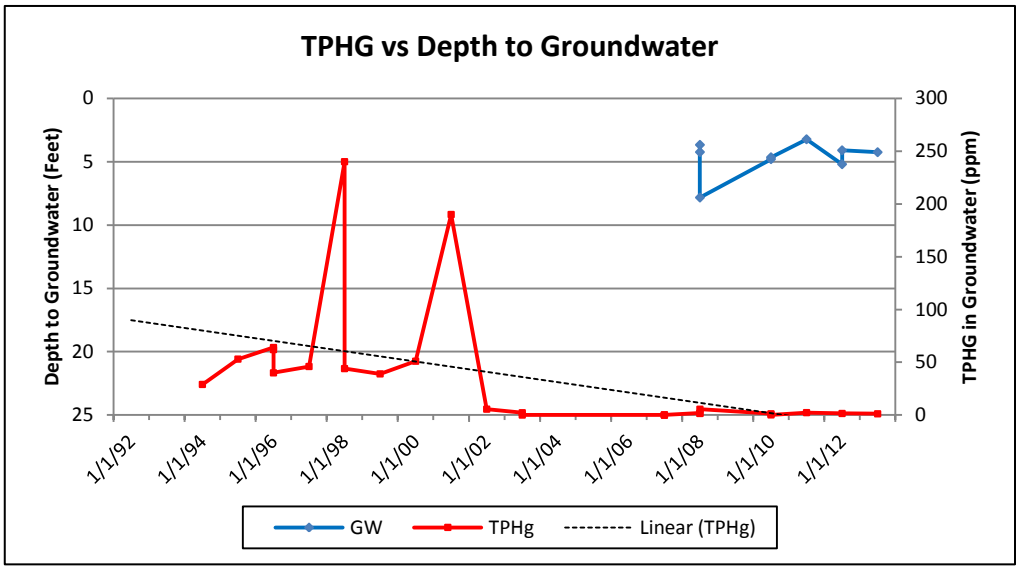
MW-7: Time Series Graphs - Former Gil's Shell, Alturas, CA

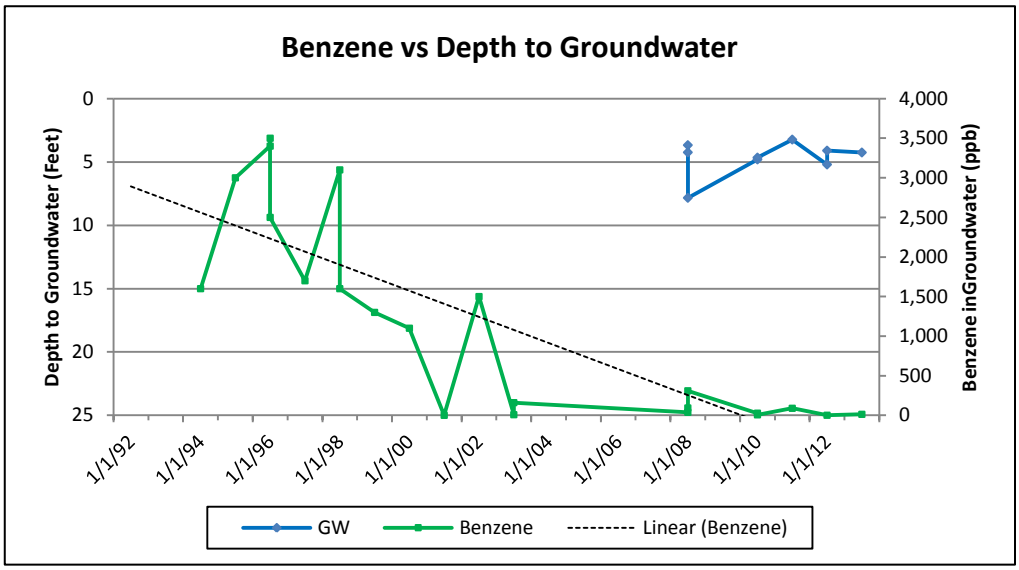


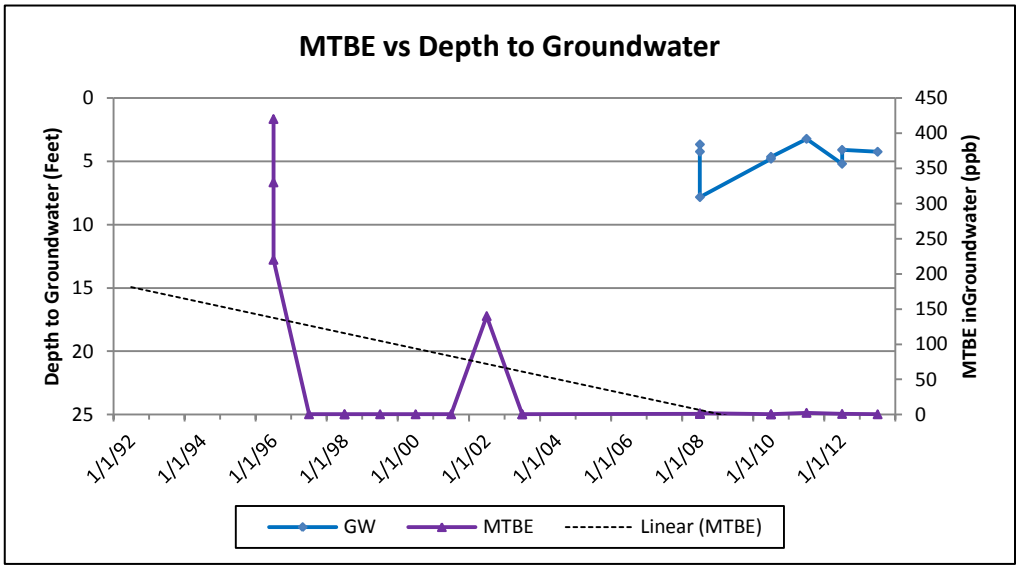




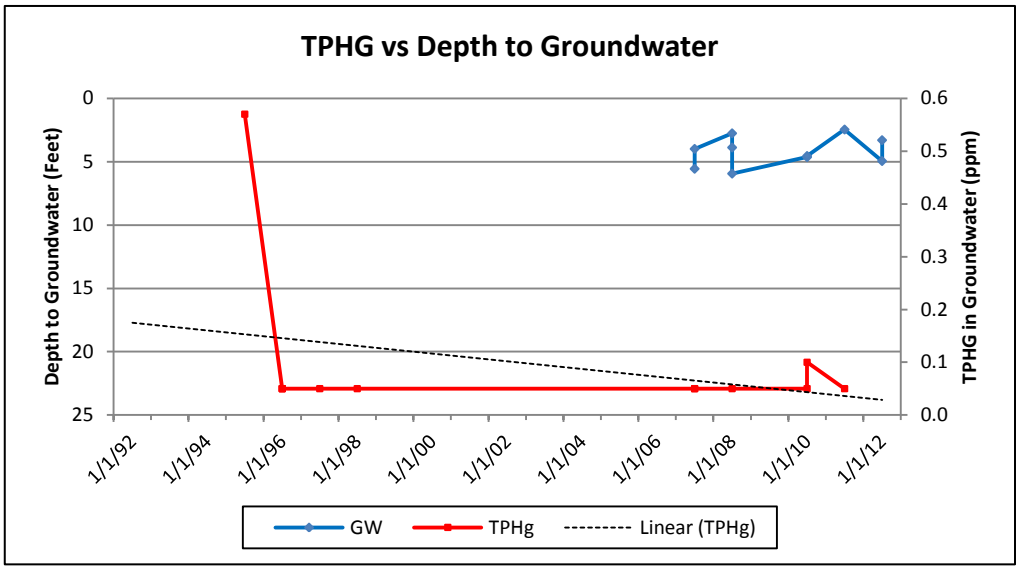
MW-8: Time Series Graphs - Former Gil's Shell, Alturas, CA

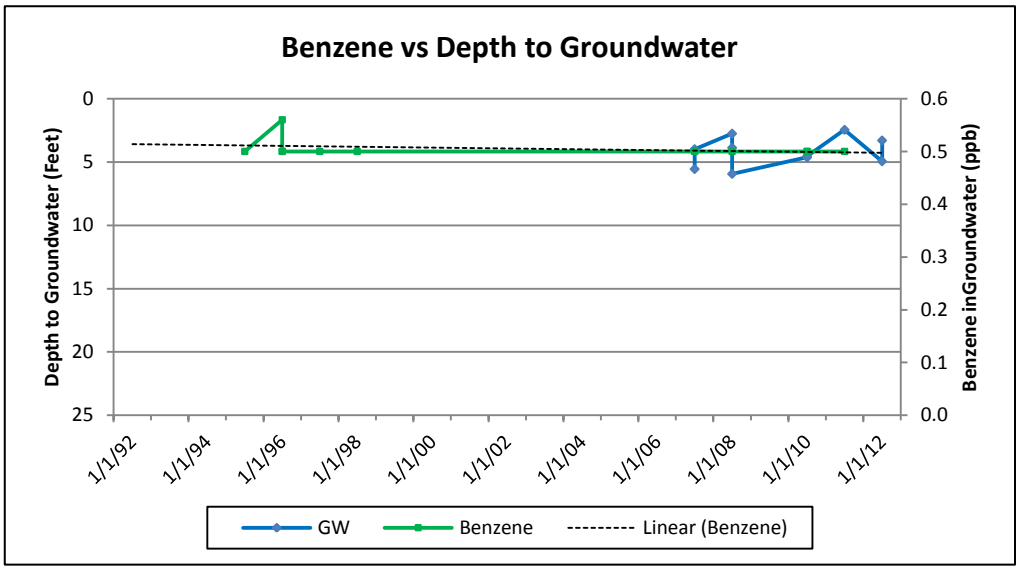


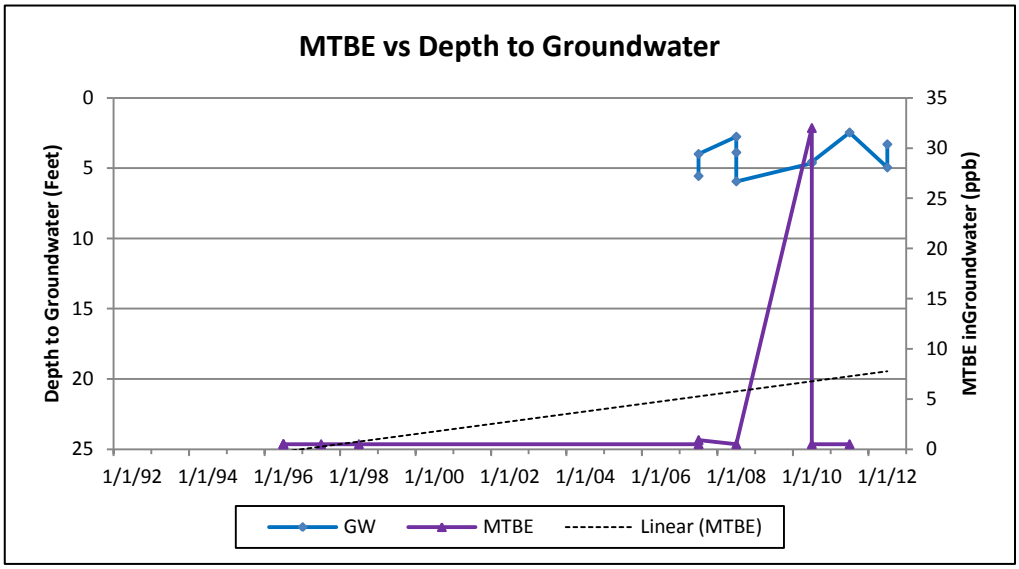




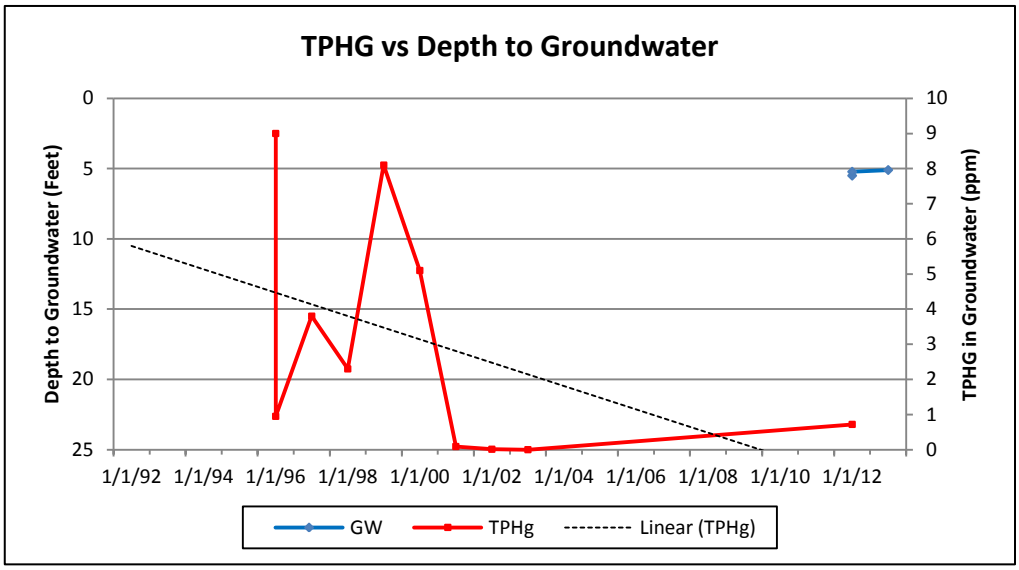
MW-11A: Time Series Graphs - Former Gil's Shell, Alturas, CA

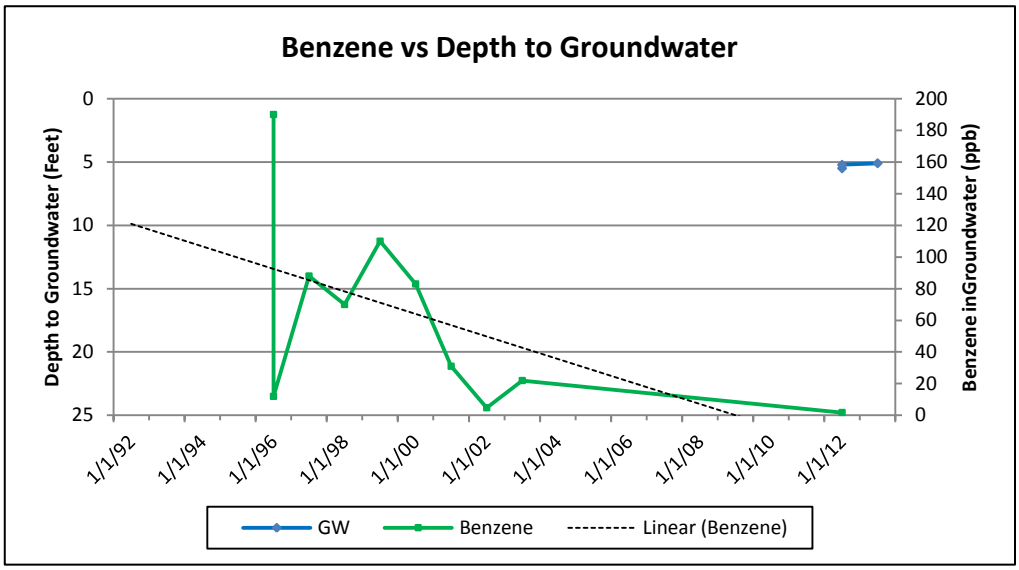


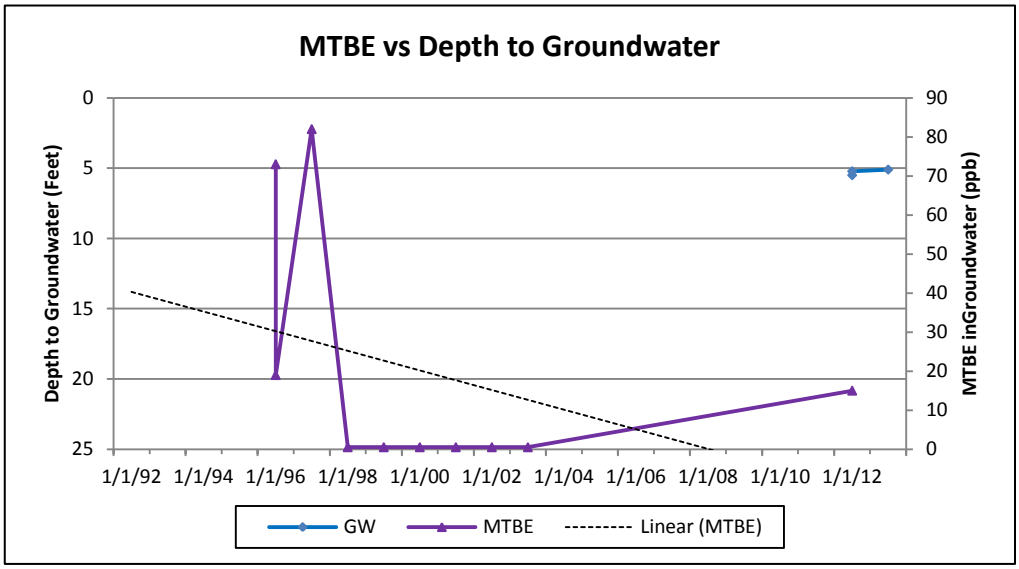




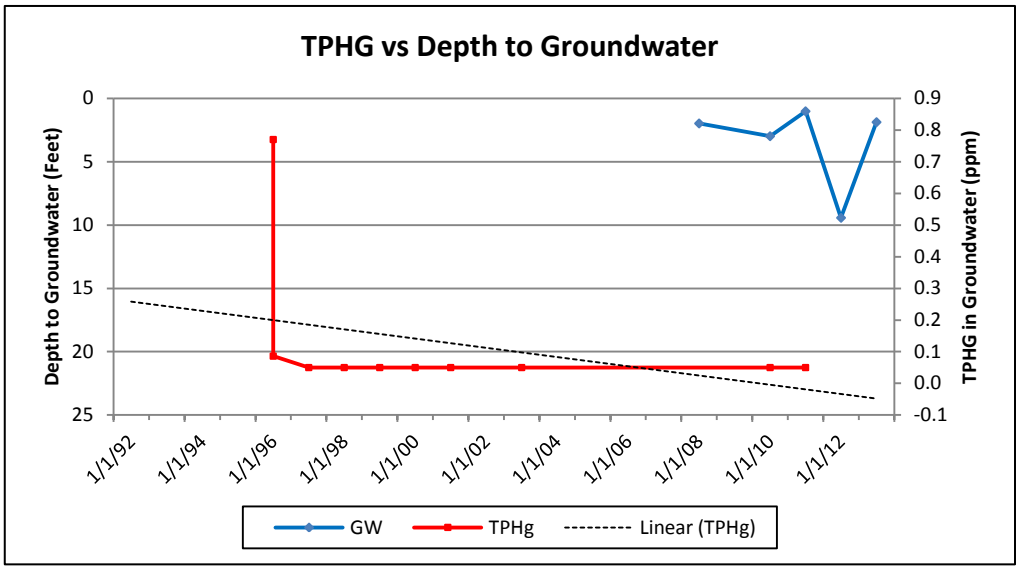
MW-13A: Time Series Graphs - Former Gil's Shell, Alturas, CA

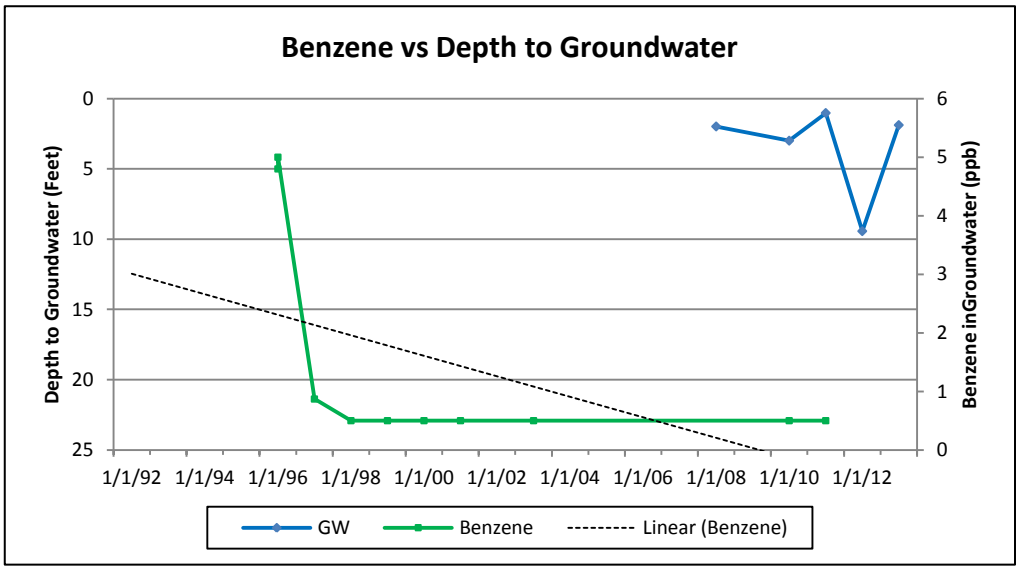


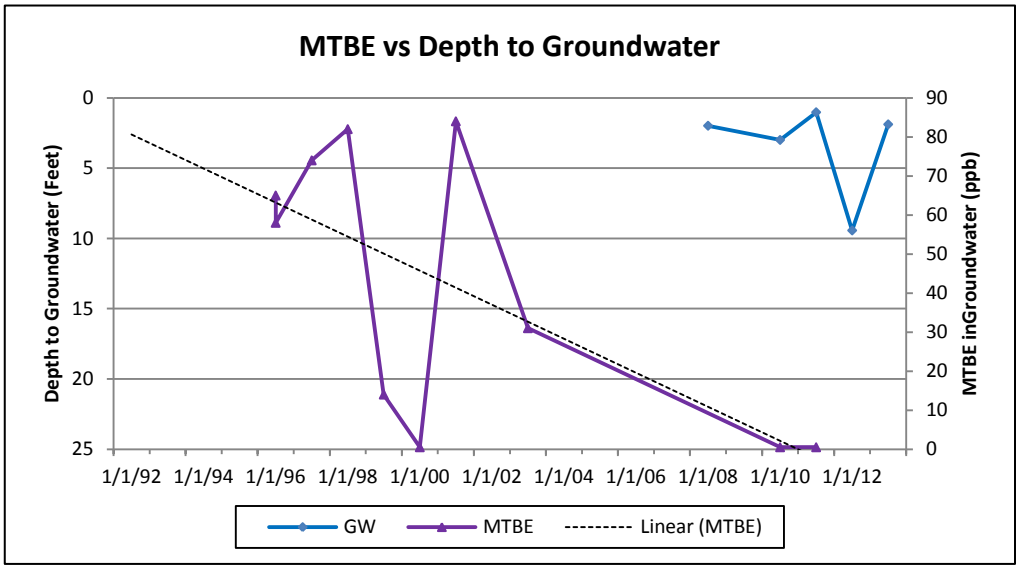




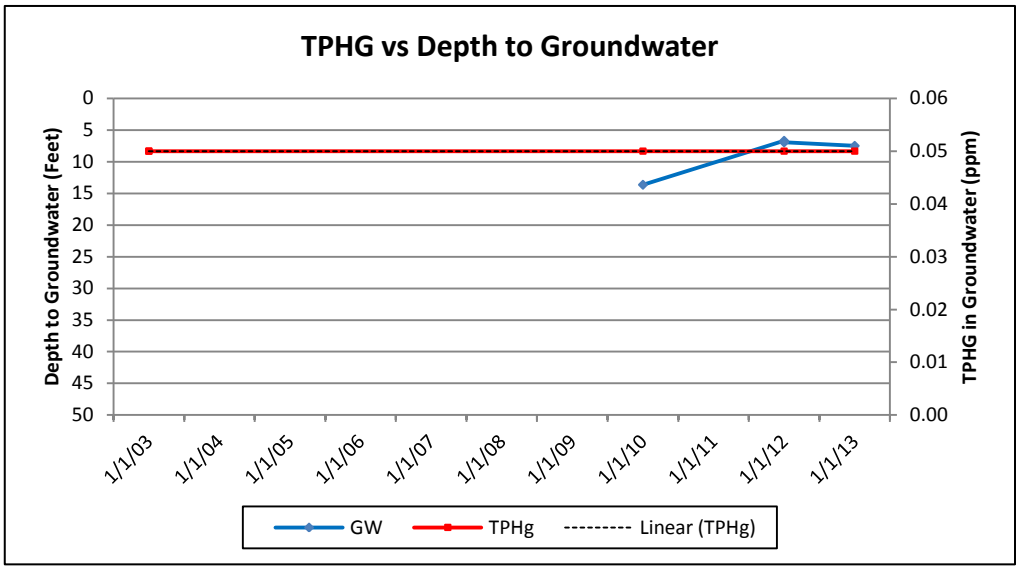
MW-13B: Time Series Graphs - Former Gil's Shell, Alturas, CA

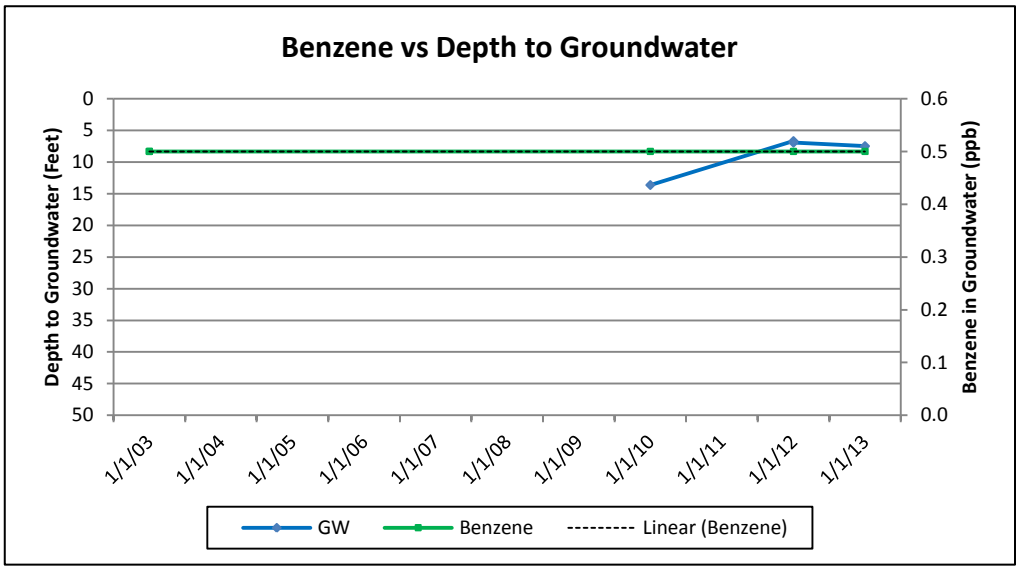


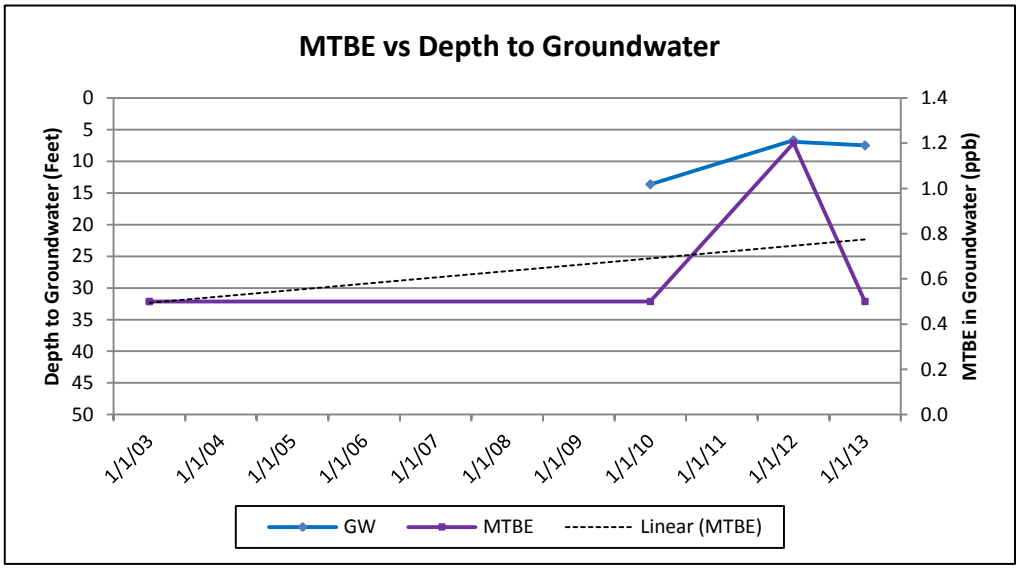




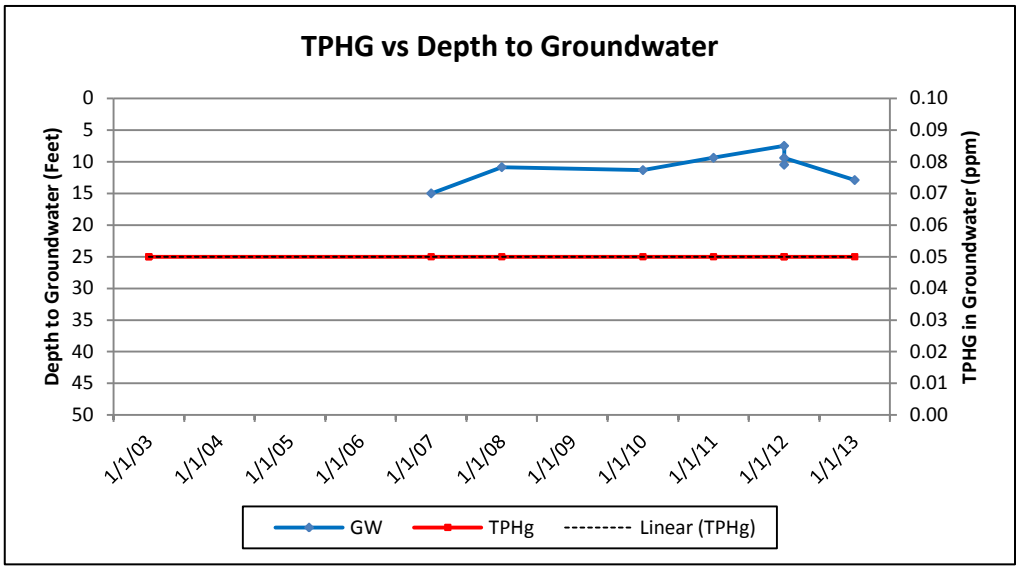
MW-14A: Time Series Graphs - Former Gil's Shell, Alturas, CA

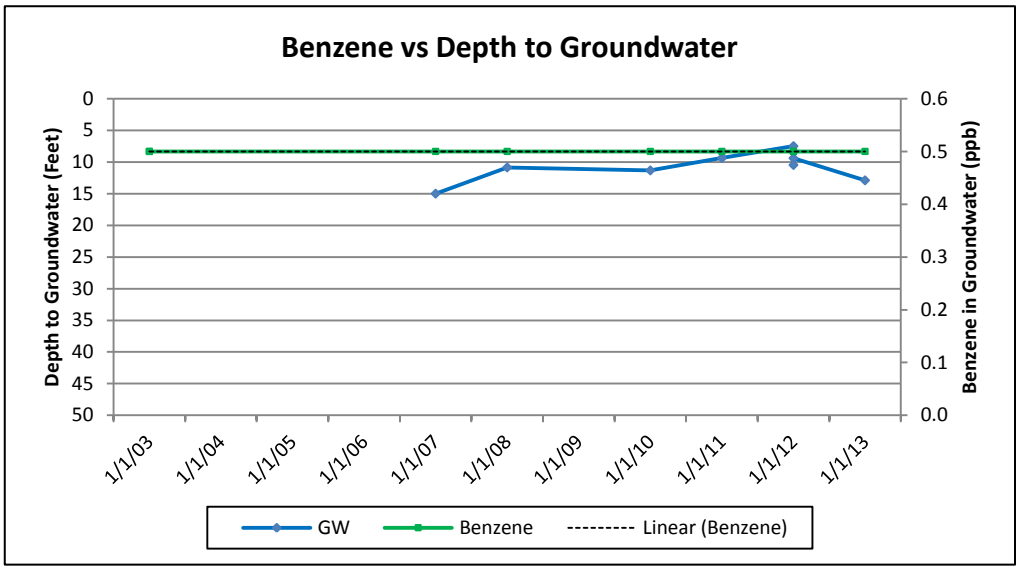


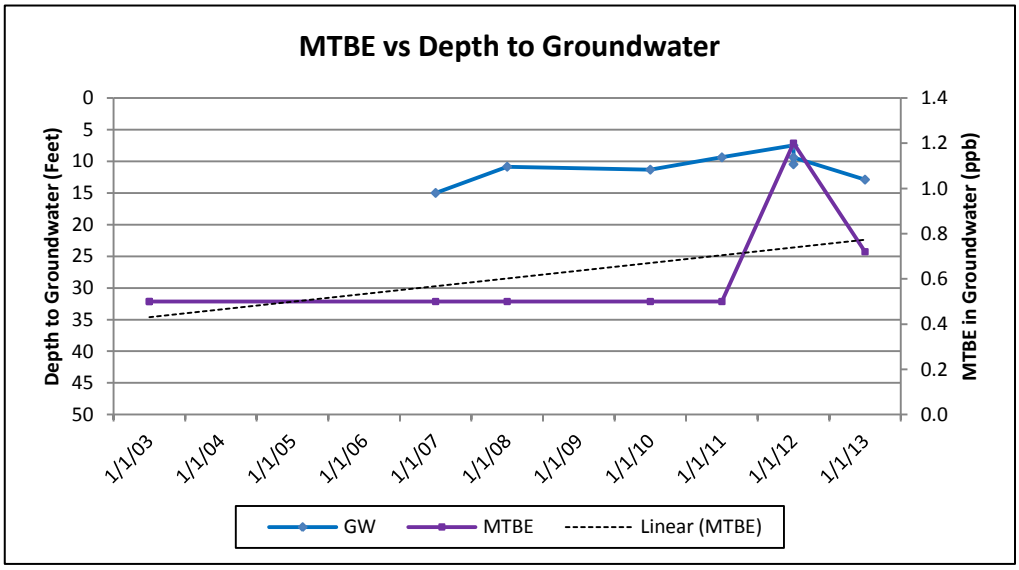




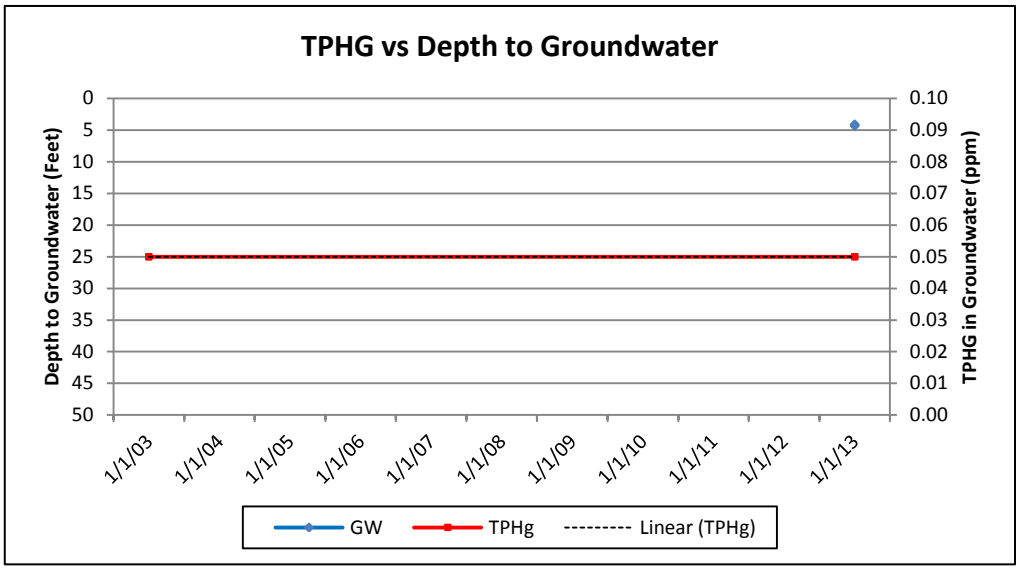
MW-14B: Time Series Graphs - Former Gil's Shell, Alturas, CA

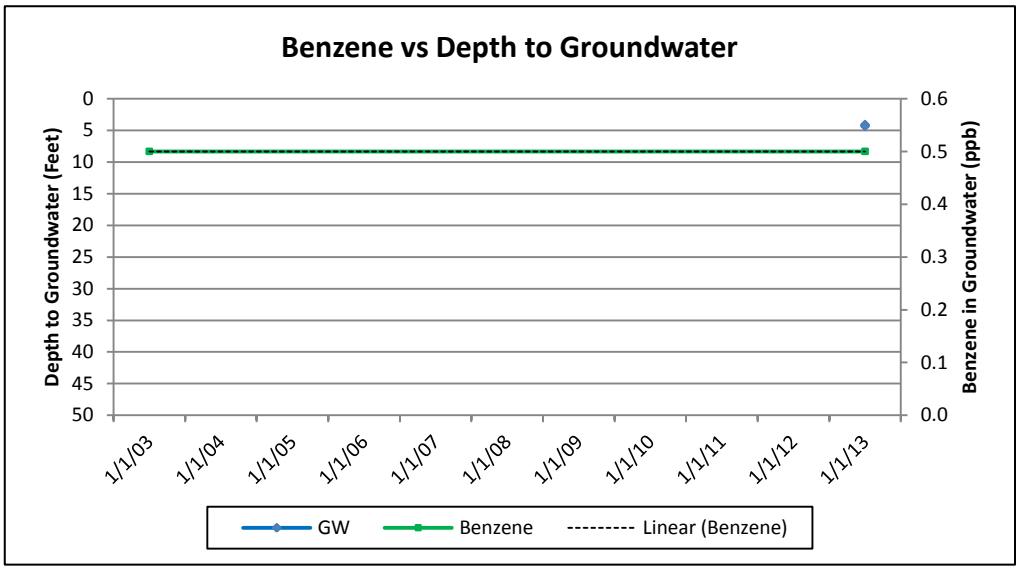


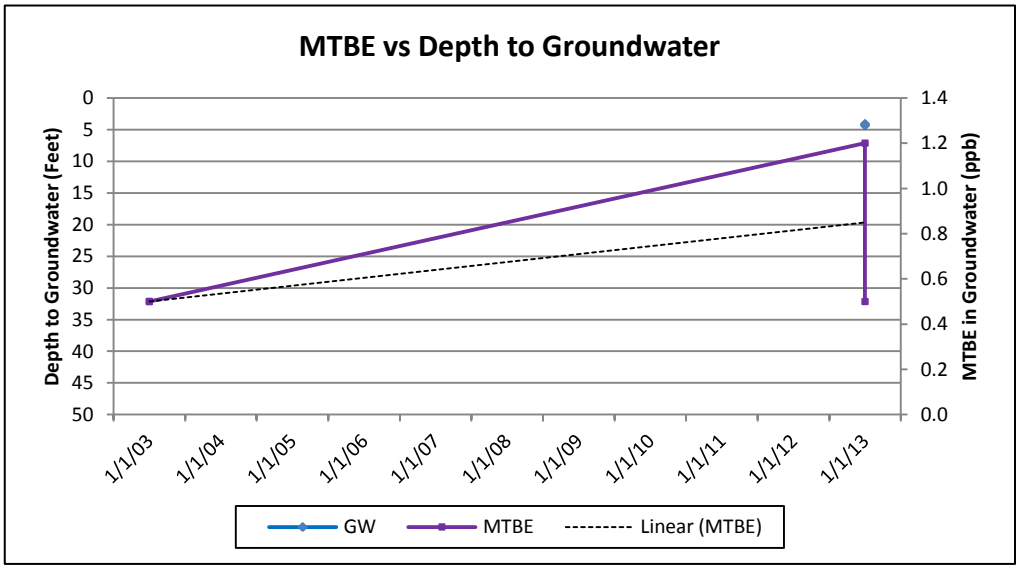




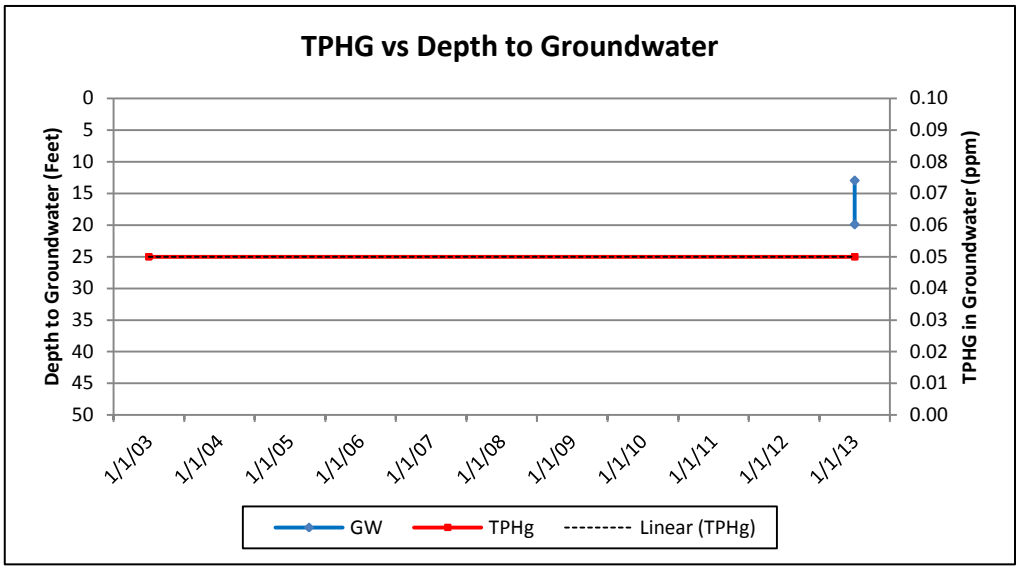
MW-15A: Time Series Graphs - Former Gil's Shell, Alturas, CA

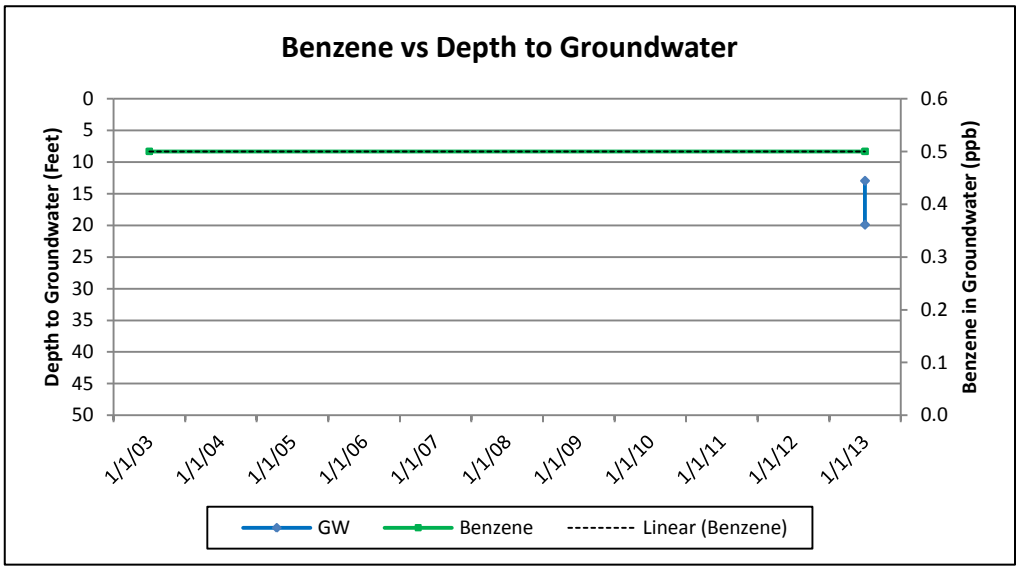


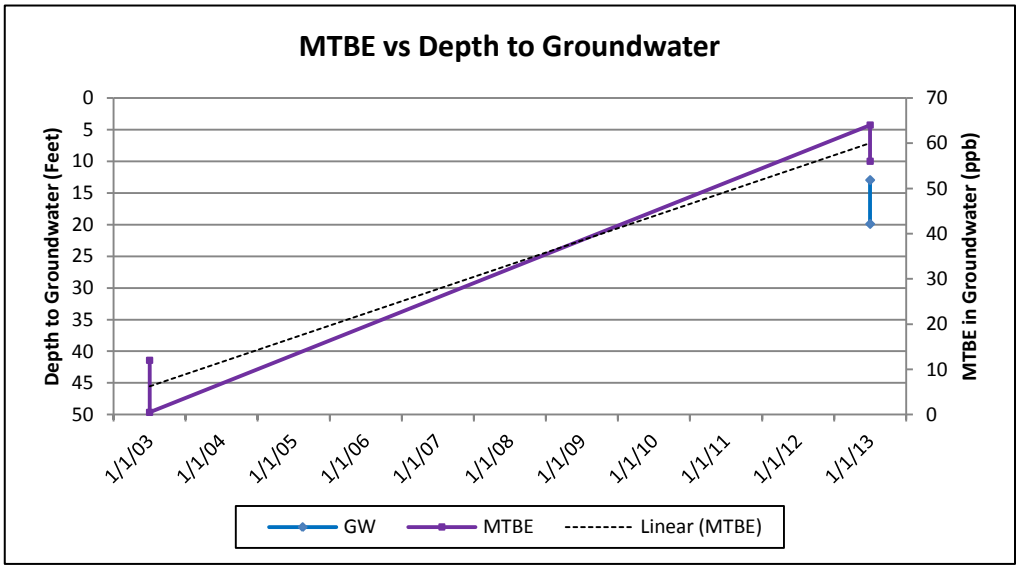




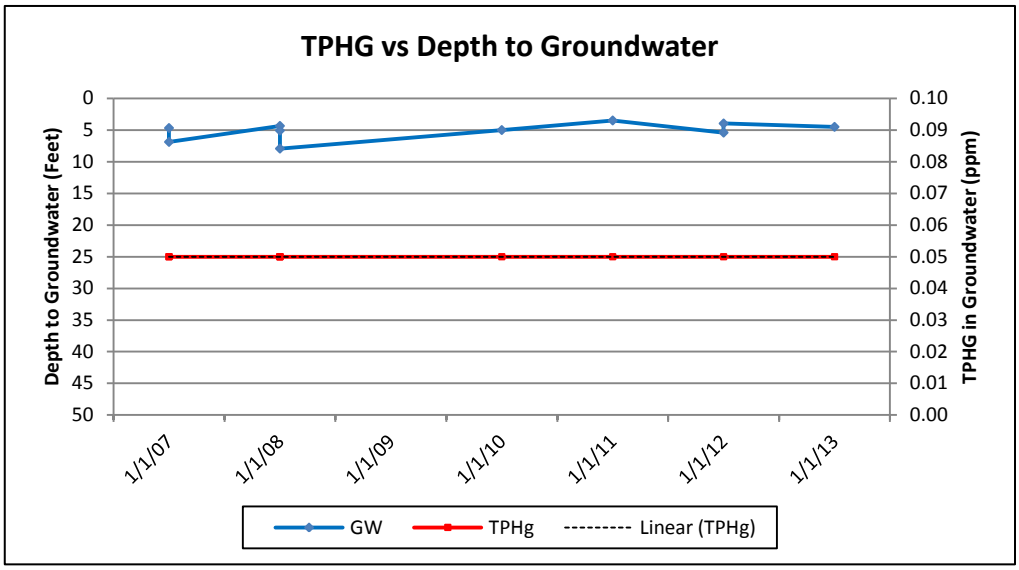
MW-15B: Time Series Graphs - Former Gil's Shell, Alturas, CA

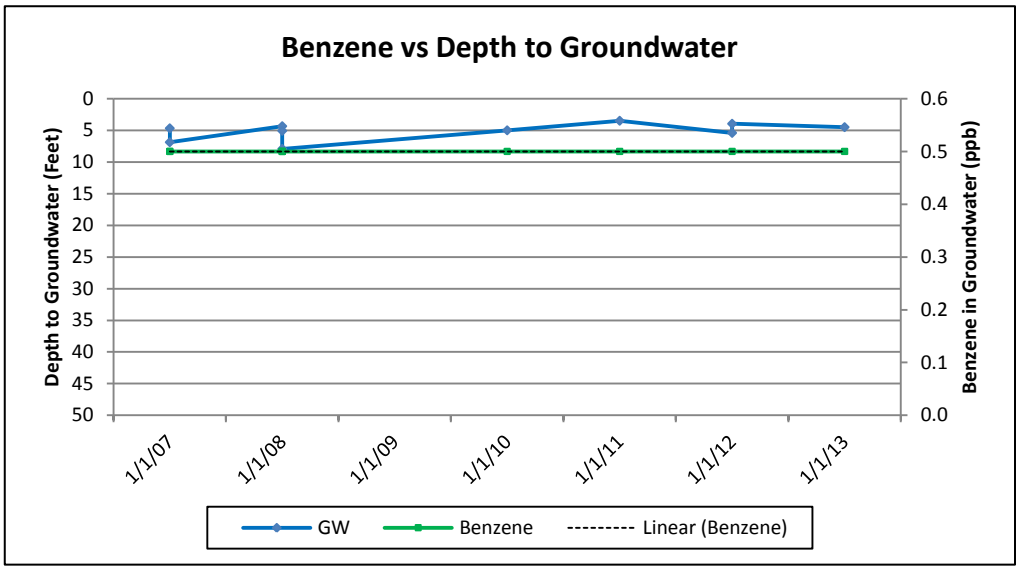


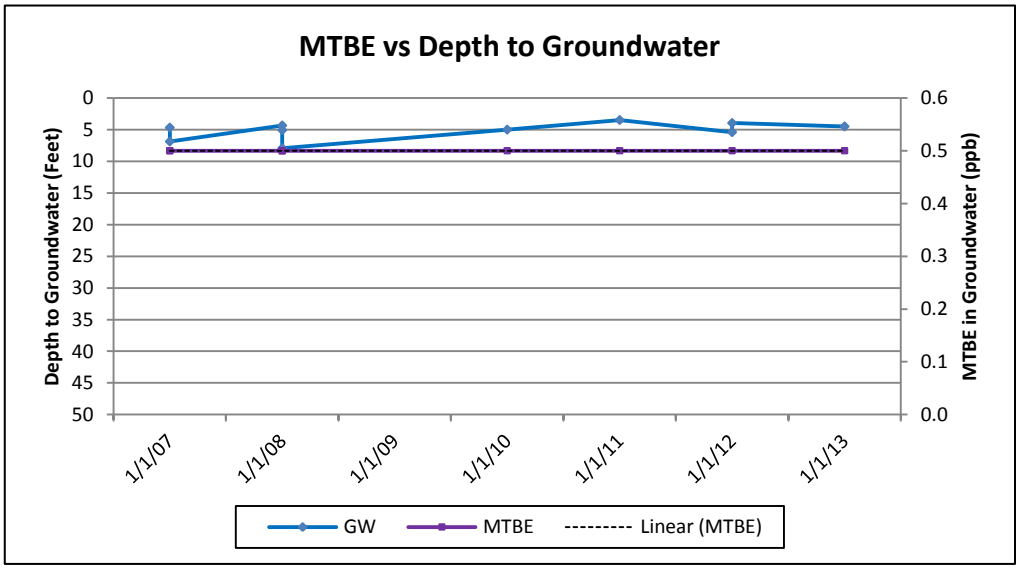




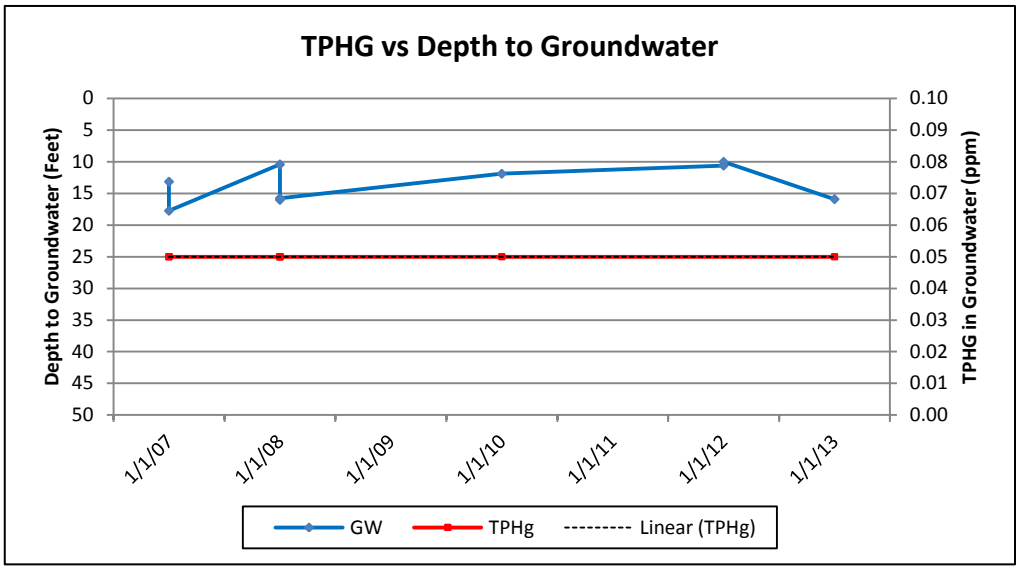
MW-16A: Time Series Graphs - Former Gil's Shell, Alturas, CA

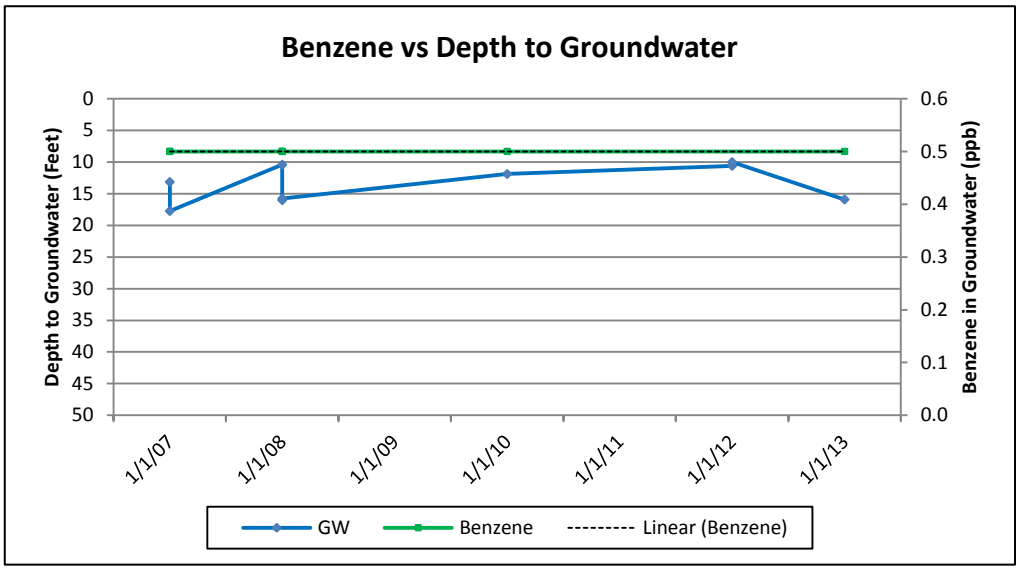


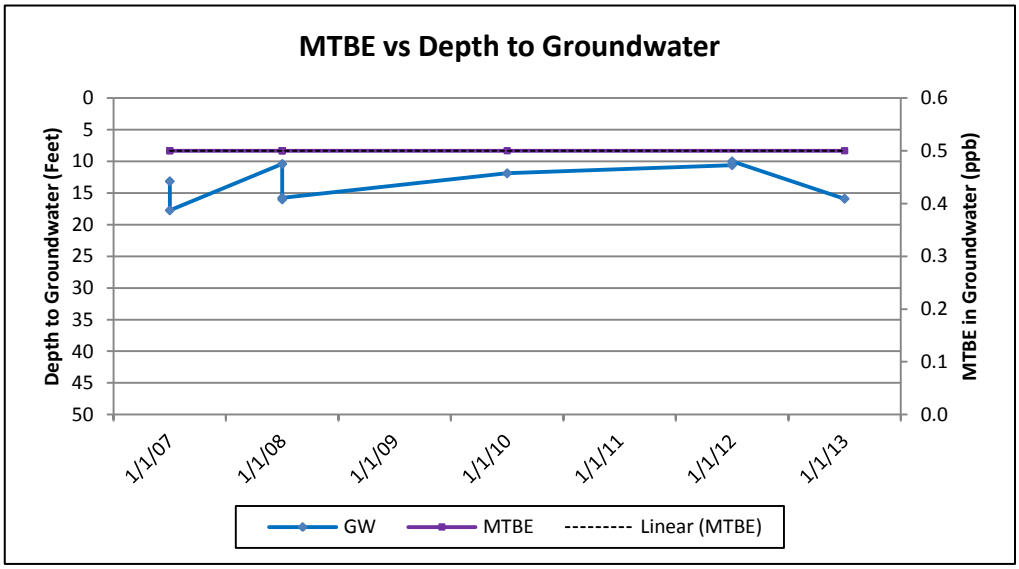




MW-16B: Time Series Graphs - Former Gil's Shell, Alturas, CA







APPENDIX A-14

Inorganic Chemical Test Results on Groundwater

DATE: 08/20/13
REPORT: R-040/1-3

STATE OF CALIFORNIA
DRINKING WATER PROGRAM

DRINKING WATER ANALYSES RESULTS REPORT
LAST SAMPLE FOR SELECTED CHAPTER 15 GROUPS - ALL RESULTS
REPORT OF COUNTY: 25 MODOC

SYSTEM NO: 2510001 NAME: CITY OF ALTURAS COUNTY: MODOC
SOURCE NO: 002 NAME: WELL 05 PSCODE: 2510001-002 CLASS: CLGP STATUS: AU

GROUP IDENTIFICATION / CONSTITUENT IDENTIFICATION	SAMPLE DATE	RESULT *	MCL	DLR	TRIGGER	UNIT
GP SECONDARY/GP						
82383 AGGRSSIVE INDEX (CORROSIVITY)	09/01/2011	12.4000 *	----------	----------	----------	
00440 BICARBONATE ALKALINITY	09/01/2011	223.0000 *	----------	----------	----------	MG/L
00916 CALCIUM	09/01/2011	49.3000 *	----------	----------	----------	MG/L
00445 CARBONATE ALKALINITY	09/01/2011	.0000 *	----------	----------	----------	MG/L
00940 CHLORIDE	09/01/2011	16.4000	600.0000	----------	500.0000	MG/L
00081 COLOR	04/12/2007	[illegible].0000	15.0000	----------	15.0000	UNITS
01042 COPPER	04/12/2007	[illegible].0000	1,000.0000	50.0000	1,000.0000	UG/L
38260 FOAMING AGENTS (MBAS)	09/01/2011	.0000	.5000	----------	.5000	MG/L
00900 HARDNESS (TOTAL) AS CACO3	09/01/2011	182.0000 *	----------	----------	----------	MG/L
71830 HYDROXIDE ALKALINITY	09/01/2011	.0000 *	----------	----------	----------	MG/L
01045 IRON	09/01/2011	.0000	300.0000	100.0000	300.0000	UG/L
00927 MAGNESIUM	09/01/2011	14.5000 *	----------	----------	----------	MG/L
01055 MANGANESE	09/01/2011	.0000	50.0000	20.0000	50.0000	UG/L
00086 ODOR THRESHOLD @ 60 C	04/12/2007	.0000	3.0000	1.0000	3.0000	TON
00403 PH, LABORATORY	09/01/2011	8.0100 *	----------	----------	----------	
01077 SILVER	09/01/2011	.0000	100.0000	10.0000	100.0000	UG/L
00929 SODIUM	09/01/2011	23.1000 *	----------	----------	----------	MG/L
00095 SPECIFIC CONDUCTANCE	09/01/2011	462.0000	2,200.0000	----------	1,600.0000	US
00945 SULFATE	09/01/2011	24.2000	600.0000	500.0000	600.0000	MG/L
70300 TOTAL DISSOLVED SOLIDS	09/01/2011	341.0000	1,500.0000	----------	1,000.0000	MG/L
82079 TURBIDITY, LABORATORY	04/12/2007	.2000	5.0000	----------	5.0000	NTU
01092 ZINC	09/01/2011	.0000	5,000.0000	50.0000	5,000.0000	UG/L

NOTE1: * = RESULT IS EQUAL TO OR GREATER THAN TRIGGER
NOTE2: .000 = RESULT WAS REPORTED AS NON-DETECTED EXCEPT FOR RAD

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Porter Geotechnical, Inc
5560 Wildwood Dr.
Reno, NV 89511

Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/26/13

Job: 2145.1/Former Gils

Anions by IC
EPA Method 300.0

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-19B**					
Lab ID : POR13062623-01A	Fluoride	0.29	0.25 mg/L	06/27/13 10:16	06/27/13 12:09
Date Sampled 06/25/13 13:30	Chloride	43	0.50 mg/L	06/27/13 10:16	06/27/13 12:09
	Nitrate (NO3) - N	3.9	0.25 mg/L	06/27/13 10:16	06/27/13 12:09
	Sulfate (SO4)	59	0.50 mg/L	06/27/13 10:16	06/27/13 12:09

ACLASS ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.

NELAP ACCREDITED TNI LABORATORY

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

7/10/13
Report Date

Alpha Analytical, Inc.

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Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/26/13

Job: 2145.1/Former Gils

Alkalinity
SM2320B

Parameter		Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-19B**					
Lab ID : POR13062623-01A	Alkalinity, Bicarbonate (As CaCO3)	340	20 mg/L	07/01/13	07/01/13
Date Sampled 06/25/13 13:30	Alkalinity, Carbonate (As CaCO3)	ND	20 mg/L	07/01/13	07/01/13
	Alkalinity, Total (As CaCO3 at pH 4.5)	340	20 mg/L	07/01/13	07/01/13

This replaces the report originally signed 7/10/13, due to a change in the analyte list, per client request.

ND = Not Detected

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8/20/13
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Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/26/13

Job: 2145.1/Former Gils

Specific Conductance at 25°C
EPA Method 120.1

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-19B**					
Lab ID : POR13062623-01A	Specific Conductance (at 25°C)	800	10 µS/cm	07/10/13	07/10/13
Date Sampled 06/25/13 13:30					

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7/11/13
Report Date

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ANALYTICAL REPORT

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Reno, NV 89511

Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/26/13

Job: 2145.1/Former Gils

Hardness
SM2340B

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-19B**				
Lab ID : POR13062623-01A Hardness, Total (calc as CaCO3)	290	2.5 mg/L	06/28/13	06/29/13
Date Sampled 06/25/13 13:30				

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NELAP ACCREDITED TNI LABORATORY

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7/10/13
Report Date

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ANALYTICAL REPORT

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Reno, NV 89511

Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/26/13

Job: 2145.1/Former Gils

Metals by ICPMS
EPA Method SW6020 / SW6020A

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-19B**					
Lab ID : POR13062623-01A	Sodium (Na)	34	0.50 mg/L	06/28/13	06/29/13
Date Sampled 06/25/13 13:30	Magnesium (Mg)	32	0.50 mg/L	06/28/13	06/29/13
	Potassium (K)	8.5	0.50 mg/L	06/28/13	06/29/13
	Calcium (Ca)	65	0.50 mg/L	06/28/13	06/29/13

This replaces the report originally signed 7/10/13, due to a change in the analyte list, per client request.

ACLASS ACCREDITED DoD ELAP

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8/20/13
Report Date

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Fax: (775) 849-0895
Date Received : 06/26/13

Job: 2145.1/Former Gils

pH (Range 1.7 to 12.4)
EPA Method 150.1 / SM4500HB / SW9040C

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-19B**					
Lab ID : POR13062623-01A	pH	7.3	1.7 pH Units	06/27/13 16:42	06/27/13 16:42
Date Sampled 06/25/13 13:30	pH - Temperature	21	1.0 °C	06/27/13 16:42	06/27/13 16:42

The EPA has established an analytical holding time of 15 minutes for pH as documented in the Methods Update Rule, Federal Register, Vol 72, No 47, March 2007. This holding time will often be exceeded, unless samples are analyzed in the field.

ACLASS ACCREDITED DoD ELAP

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

NELAP ACCREDITED TNI LABORATORY

7/11/13
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Porter Geotechnical, Inc
5560 Wildwood Dr.
Reno, NV 89511

Attn: Chip Porter
Phone: (775) 849-0668
Fax: (775) 849-0895
Date Received : 06/26/13

Job: 2145.1/Former Gils

Total Dissolved Solids (TDS)
SM2540C

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-19B**				
Lab ID : POR13062623-01A Solids, Total Dissolved (TDS)	490	10 mg/L	07/03/13	07/03/13
Date Sampled 06/25/13 13:30				

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
Alpha Analytical, Inc. certifies that the test results meet all requirements of NELAC unless footnoted otherwise.
Statement of Data Authenticity : Alpha Analytical, Inc. attests that the data reported has not been altered an any way.
Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

7/10/13
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *09-Jul-13*

QC Summary Report

Work Order: 13062623

Method Blank

Type: **MBLK** Test Code: **EPA Method 300.0**
File ID: **26** Batch ID: **31162** Analysis Date: **06/27/2013 11:02**
Sample ID: **MB-31162** Units : **mg/L** Run ID: **IC_1_130627B** Prep Date: **06/27/2013 10:16**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Fluoride	ND	0.25								
Chloride	ND	0.5								
Nitrate (NO3) - N	ND	0.25								
Sulfate (SO4)	ND	0.5								

Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 300.0**
File ID: **27** Batch ID: **31162** Analysis Date: **06/27/2013 11:20**
Sample ID: **LFB-31162** Units : **mg/L** Run ID: **IC_1_130627B** Prep Date: **06/27/2013 10:16**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Fluoride	5.21	0.25	5		104	90	110			
Chloride	52.2	0.5	50		104	90	110			
Nitrate (NO3) - N	5.45	0.25	5		109	90	110			
Sulfate (SO4)	99.7	0.5	100		99.7	90	110			

Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 300.0**
File ID: **31** Batch ID: **31162** Analysis Date: **06/27/2013 12:46**
Sample ID: **13062705-11ALFM** Units : **mg/L** Run ID: **IC_1_130627B** Prep Date: **06/27/2013 10:16**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Fluoride	26.2	0.63	25	0	105	80	120			
Chloride	299	1.3	250	52.64	99	80	120			
Nitrate (NO3) - N	27.1	0.63	25	0	108	80	120			
Sulfate (SO4)	687	1.3	500	256.7	86	80	120			

Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 300.0**
File ID: **32** Batch ID: **31162** Analysis Date: **06/27/2013 13:04**
Sample ID: **13062705-11ALFMD** Units : **mg/L** Run ID: **IC_1_130627B** Prep Date: **06/27/2013 10:16**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Fluoride	26.3	0.63	25	0	105	80	120	26.18	0.5(15)	
Chloride	299	1.3	250	52.64	98	80	120	299.1	0.1(15)	
Nitrate (NO3) - N	27.1	0.63	25	0	108	80	120	27.08	0.0(15)	
Sulfate (SO4)	684	1.3	500	256.7	86	80	120	686.6	0.3(15)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *19-Aug-13*

QC Summary Report

Work Order: 13062623

Laboratory Control Spike Type **LCS** Test Code: **SM2320B**

File ID: Batch ID: **W0701AL** Analysis Date: **07/01/2013 10:12**

Sample ID: **LCS-W0701AL** Units : **mg/L** Run ID: **WETLAB_130701A** Prep Date: **07/01/2013 10:12**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Alkalinity, Bicarbonate (As CaCO3)	230.2	10	250		92	80	120			
Alkalinity, Carbonate (As CaCO3)	230.2	10	250		92	80	120			
Alkalinity, Total (As CaCO3 at pH 4.5)	230	10	250		92	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

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Date: *11-Jul-13*

QC Summary Report

Work Order: 13062623

Method Blank

Type **MBLK** Test Code: **EPA Method 120.1 / SM2510B / SW9050A**

File ID:

Batch ID: **W0710CN** Analysis Date: **07/10/2013 15:27**

Sample ID: **MBLK-W0710CN** Units : **µS/cm** Run ID: **WETLAB_130710A** Prep Date: **07/10/2013 15:27**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Specific Conductance (at 25°C)	ND	10								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 120.1 / SM2510B / SW9050A**

File ID:

Batch ID: **W0710CN** Analysis Date: **07/10/2013 15:24**

Sample ID: **LCS-W0710CN** Units : **µS/cm** Run ID: **WETLAB_130710A** Prep Date: **07/10/2013 15:24**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Specific Conductance (at 25°C)	1390	10	1410		98	98	102			

Comments:

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Alpha Analytical, Inc.

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Date: *15-Jul-13*

QC Summary Report

Work Order: 13062623

Method Blank

Type **MBLK** Test Code: **SM2340B**

File ID: **119_** Batch ID: **31182H** Analysis Date: **06/28/2013 23:39**

Sample ID: **MB-31182** Units : **mg/L** Run ID: **ICP/MS_130628D** Prep Date: **06/28/2013 16:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Hardness, Total (calc as CaCO3)	ND	2.5								

Laboratory Control Spike

Type **LCS** Test Code: **SM2340B**

File ID: **121_** Batch ID: **31182H** Analysis Date: **06/28/2013 23:45**

Sample ID: **LCS-31182** Units : **mg/L** Run ID: **ICP/MS_130628D** Prep Date: **06/28/2013 16:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Hardness, Total (calc as CaCO3)	336	25	331		102	80	120			

Sample Matrix Spike

Type **MS** Test Code: **SM2340B**

File ID: **123_** Batch ID: **31182H** Analysis Date: **06/28/2013 23:51**

Sample ID: **13062441-03AMS** Units : **mg/L** Run ID: **ICP/MS_130628D** Prep Date: **06/28/2013 16:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Hardness, Total (calc as CaCO3)	503	25	331	175.8	99	75	125			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **SM2340B**

File ID: **124_** Batch ID: **31182H** Analysis Date: **06/28/2013 23:54**

Sample ID: **13062441-03AMSD** Units : **mg/L** Run ID: **ICP/MS_130628D** Prep Date: **06/28/2013 16:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Hardness, Total (calc as CaCO3)	495	25	331	175.8	97	75	125	502.6	1.5(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *20-Aug-13*

QC Summary Report

Work Order: 13062623

Method Blank

Type **MBLK** Test Code: **EPA Method SW6020 / SW6020A**

File ID: **119_** Batch ID: **31182** Analysis Date: **06/28/2013 23:39**

Sample ID: **MB-31182** Units : **mg/L** Run ID: **ICP/MS_130628C** Prep Date: **06/28/2013 16:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	ND	0.5								
Magnesium (Mg)	ND	0.5								
Potassium (K)	ND	0.5								
Calcium (Ca)	ND	0.5								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW6020 / SW6020A**

File ID: **121_** Batch ID: **31182** Analysis Date: **06/28/2013 23:45**

Sample ID: **LCS-31182** Units : **mg/L** Run ID: **ICP/MS_130628C** Prep Date: **06/28/2013 16:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	49.7	0.5	50		99	80	120			
Magnesium (Mg)	50.3	0.5	50		101	80	120			
Potassium (K)	51.4	0.5	50		103	80	120			
Calcium (Ca)	51.7	0.5	50		103	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW6020 / SW6020A**

File ID: **123_** Batch ID: **31182** Analysis Date: **06/28/2013 23:51**

Sample ID: **13062441-03AMS** Units : **mg/L** Run ID: **ICP/MS_130628C** Prep Date: **06/28/2013 16:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	82	0.5	50	33.44	97	75	125			
Magnesium (Mg)	67.3	0.5	50	18.4	98	75	125			
Potassium (K)	57.5	0.5	50	5.447	104	75	125			
Calcium (Ca)	90.3	0.5	50	40.04	101	75	125			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW6020 / SW6020A**

File ID: **124_** Batch ID: **31182** Analysis Date: **06/28/2013 23:54**

Sample ID: **13062441-03AMSD** Units : **mg/L** Run ID: **ICP/MS_130628C** Prep Date: **06/28/2013 16:14**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	79.3	0.5	50	33.44	92	75	125	81.99	3.4(20)	
Magnesium (Mg)	66.9	0.5	50	18.4	97	75	125	67.27	0.5(20)	
Potassium (K)	57.2	0.5	50	5.447	103	75	125	57.48	0.6(20)	
Calcium (Ca)	88	0.5	50	40.04	96	75	125	90.34	2.6(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

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Date: *11-Jul-13*

QC Summary Report

Work Order: 13062623

Laboratory Control Spike Type **LCS** Test Code: **EPA Method 150.1 / SM4500HB / SW9040C**

File ID: Batch ID: **W0626PH** Analysis Date: **06/26/2013 16:00**

Sample ID: **LCS-W0626PH** Units : **pH Units** Run ID: **WETLAB_130626E** Prep Date: **06/26/2013 16:00**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
pH	4.99	1.7	5		99.8	90	110			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *09-Jul-13*

QC Summary Report

Work Order: 13062623

Method Blank

Type: **MBLK** Test Code: **SM2540C**

File ID: Batch ID: **W0626DS** Analysis Date: **06/28/2013 00:00**

Sample ID: **MBLK-W0626DS** Units : **mg/L** Run ID: **WETLAB_130626G** Prep Date: **06/28/2013 00:00**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	ND	10								

Laboratory Control Spike

Type: **LCS** Test Code: **SM2540C**

File ID: Batch ID: **W0626DS** Analysis Date: **06/28/2013 00:00**

Sample ID: **LCS-W0626DS** Units : **mg/L** Run ID: **WETLAB_130626G** Prep Date: **06/28/2013 00:00**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	101	10	100		101	73	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

AMENDED

CA

Billing Information :

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13062623

Report Due By : 5:00 PM On : 11-Jul-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Chip Porter

PO :

Client's COC # : 33284 Job : 2145.1/Former Gils

Cooler Temp	Samples Received	Date Printed
4 °C	26-Jun-13	20-Aug-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	300_0_W	ALKALINITY_W	CONDUCTIVITY	HARDNESS_W	METALS_AQ	PH_W	TDS_W		Sample Remarks
POR13062623-01A	MW-19B	AQ	06/25/13 13:30	4	0	10	CA	CA	CA	CA	CA	CA	CA		

Comments: Samples brought in by client. Frozen ice. Amended 8/20/13 13:20 to add Alk Bicarbonate, Carbonate, Mg and Ca per Reyna's conversation with Chip.KM :

	Signature	Print Name	Company	Date/Time
Logged in by:	K Murray	K Murray	Alpha Analytical, Inc.	8/20/13 1320

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : POR13062623

Report Due By : 5:00 PM On : 11-Jul-13

Client:
Porter Geotechnical, Inc
5560 Wildwood Dr.

Reno, NV 89511

Report Attention	Phone Number	EMail Address
Chip Porter	(775) 849-0668 x	nvchip@portergeotechnical.com
Dianne Phelps	(775) 849-0668 x	diannep@portergeotechnical.com

EDD Required : **Yes**

Sampled by : Chip Porter

PO :

Client's COC # : 33284 Job : 2145.1/Former Gils

Cooler Temp	Samples Received	Date Printed
4 °C	26-Jun-13	26-Jun-13

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	300_0_W	ALKALINITY_W	CONDUCTIVITY	HARDNESS_W	METALS_AQ	PH_W	TDS_W		Sample Remarks
							Requested Tests								
POR13062623-01A	MW-19B	AQ	06/25/13 13:30	4	0	10	CA	CA	CA	CA	CA	CA	CA		

Comments: Samples brought in by client. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Kmurray	K Murray	Alpha Analytical, Inc.	6/26/13 1525

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

33284

Billing Information:
Company Name: Porter Geotechnical
Attn:
Address: 5560 Wildwood Dr
City, State, Zip: Reno NV 89511
Phone Number: 849-0668 Fax: 849-0895

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State?
AZ ____ CA ✓ NV ____ WA ____ DOD Site ____
ID ____ OR ____ OTHER ____ Page # 1 of 1

~~Consultant~~ / Client Name: Roger Reddy
Address:
City, State, Zip: Alturas CA
Job #: 2145.1
Job Name: Former Gils
Report Attention / Project Manager
Name: Chip Porter
Email: Nochip@portergeotechnical.com
Phone: 849-0668 Mobile: 233-6691

Data Validation Level: III or IV
EDD / EDF? YES ____ NO ____
Global ID #

Time Sampled	Date Sampled	Matrix* See Key Below	P.O. # / Lab ID Number (Office Use Only)	Sample Description	TAT	Field Filtered	# Containers**	General Mineral							REMARKS
1:30 pm	6-25	AQ		MW-19B	STD	No	4	✓							

FOR LAB USE ONLY

ADDITIONAL INSTRUCTIONS: * Anion - Cation (Trilinear Calc.) will be done by us.

I, (field sampler), attest to the validity and authenticity of this sample. I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action (NAC 445.0636 (c) (2)). Sampled By: Chip Porter

Relinquished by: (Signature/Affiliation)	Received by: (Signature/Affiliation)	Date:	Time:
Dianne Rhy	K Murray / AAI	6/26/13	3:05 pm
Relinquished by: (Signature/Affiliation)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature/Affiliation)	Received by: (Signature/Affiliation)	Date:	Time:

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

APPENDIX A-15

Pollution Migration Analyses

Former Gil's Gas Alturas
Plume Migration Analysis towards Alturas City Well No. 5

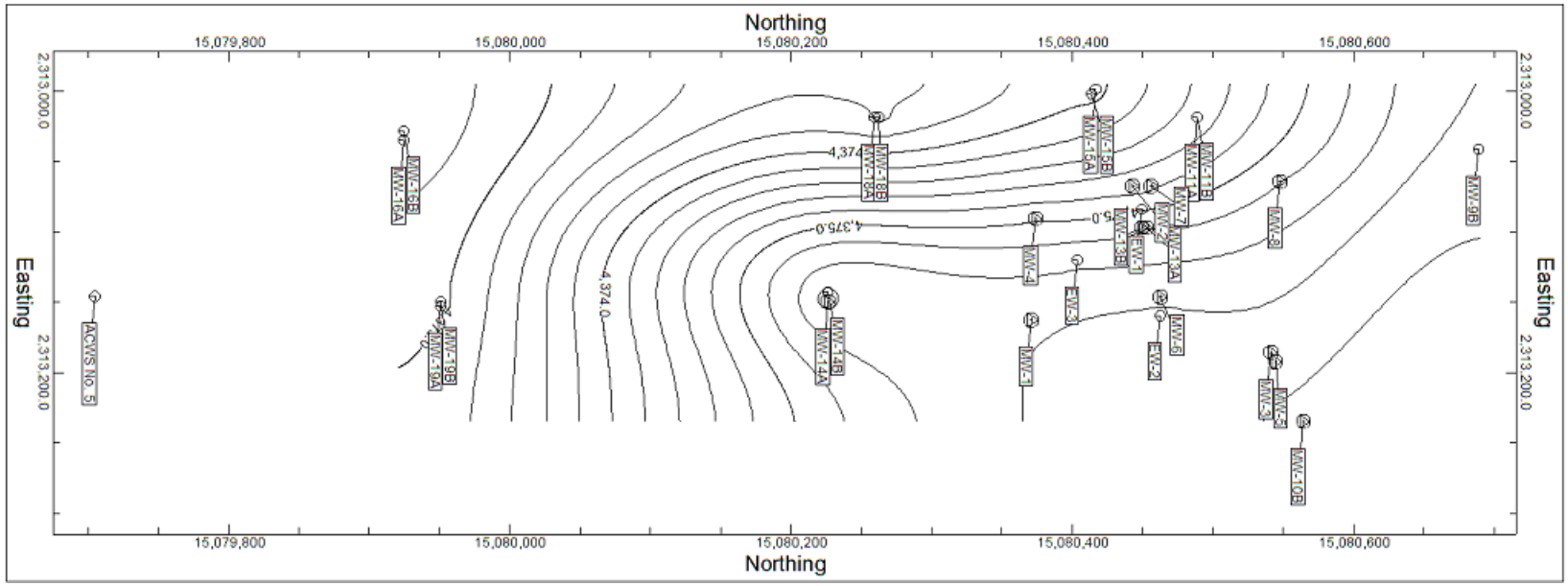
Hydrostratigraphy

Unit 1: Shallow Unconfined Aquifer
(Sand and Gravel)
Unit 2: Upper Aquitard
(Welded Tuff, Sandy Silt with Gravel)
Unit 3: Shallow Confined Aquifer
(Interbedded Silty fine Sand and poorly graded Sand)
Unit 4: Middle Aquitard
(Interbedded Sandy Silt and Silty fine Sand)
Unit 5: Lower Leaky Aquifer
(Silty Sand and poorly graded Sand, some Gravel)

Summary of Field and Laboratory Hydraulic Conductivity Testing

Well ID	Hydro Unit	Depth (ft)	Field K_h (cm/s)	Lab K_v (cm/s)	Lab Porosity, n
MW-19B	Unit 2 - Upper Aquitard	6.5	---	1.13×10^{-6}	0.53
MW-18A	Unit 2 - Upper Aquitard	9.0	---	7.81×10^{-7}	0.56
MW-19B	Unit 4 - Middle Aquitard	20.0	---	3.33×10^{-7}	0.56
EW-2	Unit 4 - Middle Aquitard	21.3	---	6.09×10^{-6}	0.52
MW-19B	Unit 4 - Middle Aquitard	25.0	---	8.47×10^{-7}	0.52
MW-2	Unit 4 - Middle Aquitard	20 - 30	4.76×10^{-5}	---	---
EW-2	Unit 5 - Lower Leaky Aquifer	24.0	---	5.86×10^{-5}	0.57
MW-18B	Unit 5 - Lower Leaky Aquifer	20 - 30	1.31×10^{-4}	---	---
MW-19B	Unit 5 - Lower Leaky Aquifer	20 - 30	6.67×10^{-4}	---	---
MW-15B	Unit 5 - Lower Leaky Aquifer	34 - 44	2.14×10^{-4}	---	---

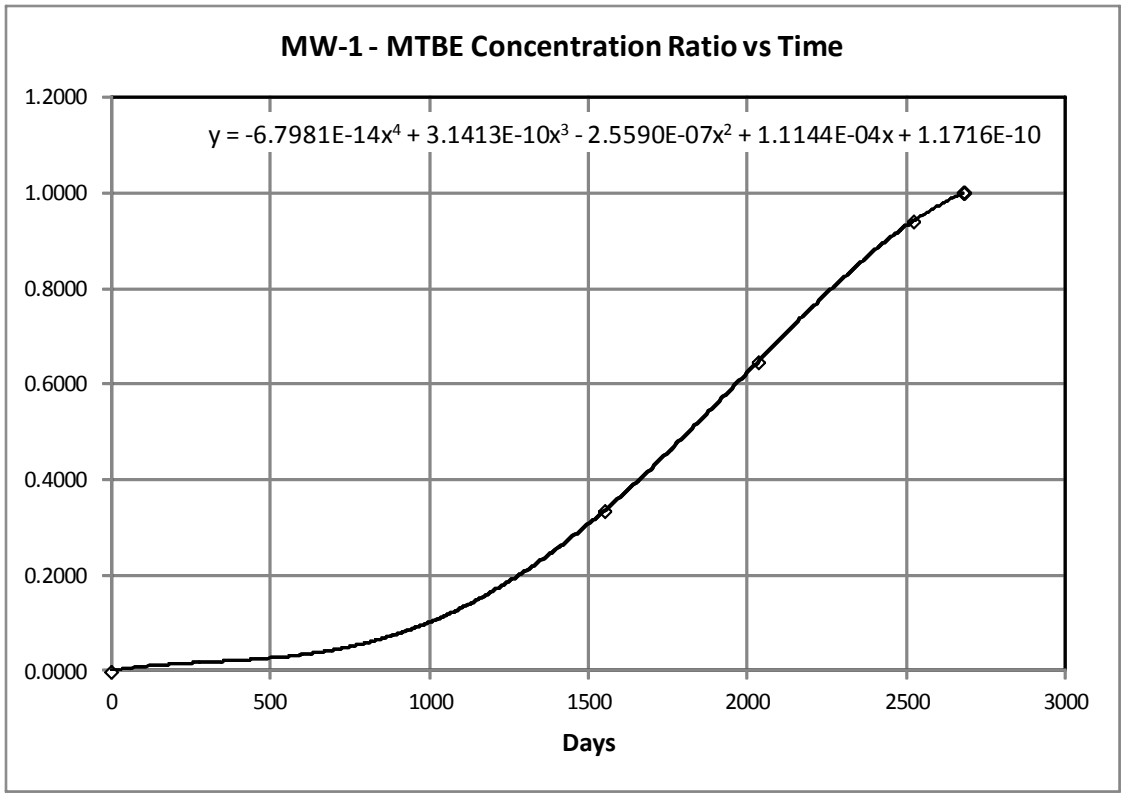
Topographic Site Plan with Well Locations



Estimate the longitudinal dispersion coefficient using MTBE concentration vs. time data from MW-1

Date	days	MTBE concentration (ppb)			
6/16/1995	0	0	0.0000	C_{max} =	1700
4/25/1996	309	82	0.0482		
12/18/1996	542	95	0.0559		
3/22/1997	636	87	0.0512		
3/5/1998	979	64	0.0376		
8/12/1998	1136	110	0.0647		
1/25/1999	1299	91	0.0535		
3/18/2000	1712	130	0.0765		
3/19/2001	2073	60	0.0353		
7/6/2001	2180	110	0.0647		
11/15/2001	2309	28	0.0165		
3/27/2002	2441	80	0.0471		
2/11/2003	0	0	0.0000		
6/28/2003	137				
5/31/2007	1550	570	0.3353		
08/28/07	1637				
10/04/08	2033	1100	0.6471		
02/11/10	2520	1600	0.9412		
07/20/10	2679	1700	1.0000		
05/07/11	2966	1400	0.8235		
06/18/13	3727	1300	0.7647		

Weeded data shaded in green was used to approximate a cumulative normal distribution for the the longitudinal spread of the concentration of MTBE about the advective front which passes MW-1 at a concentration ratio of 0.50 in the graph below. Assuming a normal distribution, the times representing a spread of twice the standard deviation can be evaluated for concentration ratios of 0.16 and 0.84.



$$y(x) := \left(-6.798 \times 1 \times 10^{-14}\right) \cdot x^4 + \left(3.1413 \times 10^{-10}\right) \cdot x^3 - \left(2.559 \times 10^{-7}\right) \cdot x^2 + 0.00011144 \cdot x + \left(11716 \times 10^{-10}\right)$$

$y(2679) = 1.0002$

$y(1181) = 0.1599$ 1181 days for the mean minus one standard deviation to pass MW-1 $t_{16} := 1181\text{day}$

$y(1815) = 0.50$ 1815 days for the mean (i.e. the location of the advective front) to pass MW-1

$y(2330) = 0.84$ 2330 days for the mean plus one standard deviation to pass MW-1 $t_{84} := 2330 \cdot \text{day}$

The standard deviation is therefore:

$$\sigma_t := \frac{\left(t_{84} - t_{16}\right)}{2} = 574.50 \cdot day$$

Flow from mid-screen of MW-6 to mid-screen of MW-1:

$\Delta x := 93.3 \cdot ft$ $\Delta z := 22.3 \cdot ft$ Head differential $\Delta h_{MW6_MW1} := 3.12 \cdot ft$

Based upon pumping tests in MW-2, MW-15B, MW-18B, and MW-19B, as well as laboratory vertical hydraulic conductivity tests, assume the following K values:

$K_{h1} := 7 \times 10^{-04} \cdot \frac{cm}{s}$ $K_{v1} := 9.6 \times 10^{-06} \cdot \frac{cm}{s}$ $K._s$= resultant hydraulic conductivity

NOTE: Initially assumed K values were adjusted such that the computed advective travel time between MW-6 and MW-1 matched the t_{50} determined from the analysis above (*i.e.* 1815 days).

Angle from the horizontal in a vertical plane between the mid-point of each well screen:

$$\theta_1 := \operatorname{atan}\left(\frac{\Delta z}{\Delta x}\right) = 13.44 \cdot °$$

$$K_s := \left(\frac{\cos\left(\theta_1\right)^2}{K_{h1}} + \frac{\sin\left(\theta_1\right)^2}{K_{v1}}\right)^{-1} = 1.4325 \times 10^{-4} \cdot \frac{cm}{s}$$

assuming $n := 0.35$

$n_e := 0.25$

$$v_s := \frac{K_s}{n_e} \cdot \left[\frac{\Delta h_{MW6_MW1}}{\sqrt{(\Delta x)^2 + (\Delta z)^2}}\right] = 1.8637 \times 10^{-5} \cdot \frac{cm}{s}$$

$v_s = 5.2829 \times 10^{-2} \cdot \frac{ft}{day}$ advective velocity

Advective travel time from MW-6 to MW-1:

$$t_{6_1} := \frac{\sqrt{(\Delta x)^2 + (\Delta z)^2}}{v_s} = 1815.80 \cdot day$$

Longitudinal Dispersion Coefficient:

$$D_x(t) := \frac{v_s^2 \cdot \sigma_t^2}{2 \cdot t}$$

Longitudinal Dispersivity:

$$\alpha_x := \frac{D_x(t)}{v_s} \qquad t := 1816 \cdot day \qquad D_x(t) = 0.2536 \cdot \frac{ft^2}{day} \qquad \alpha_x = 4.80\,ft$$

Assume transverse and vertical dispersitivities are as follows:

$\alpha_y := 0.1 \cdot \alpha_x$ Transverse horizontal dispersivity $\alpha_y = 0.48\,ft$

$\alpha_z := 0.05 \cdot \alpha_x$ Transverse vertical dispersivity $\alpha_z = 0.24\,ft$

Check computed dispersivity between MW-6 and MW-1 against regression equation (Xu and Eckstein (1995)):

Apparent dispersivity:

$$\alpha_m(L_s) := (0.83 \cdot m) \cdot \left(\log\left(\frac{L_s}{m}\right)\right)^{2.414}$$

where L_s = distance from source to the front edge of the plume

$$\alpha_m(96.2 \cdot ft) = 6.87\,ft$$

Consider advective, dispersive, retarded transport of MTBE southward from tank cavity near MW-6 and EW-2

Cross sectional dimension of rectangular tank cavity:

Width: $Y := 45 \cdot ft$ Depth: $Z := 20 \cdot ft$

Properties of MTBE: $K_{oc} := 11.5 \cdot \frac{mL}{g}$ Organic carbon and water partition coefficient (Poehls and Smith, 2009)

for lacustrine silt: $f_{oc} := 0.00108$ Weight fraction of organic carbon (Spitz and Moreno, 1996)

for fine sand, glacio lacustrine: $f_{oc} = 0.00102$ (Spitz and Moreno, 1996)

Partition coefficient: $K_d := f_{oc} \cdot K_{oc} = 0.012420 \cdot \frac{mL}{g}$ Distribution coefficient of linear Freundlich isotherm

Density of solids:

$\rho_s := 2.65 \cdot \frac{g}{cm^3}$ assumed

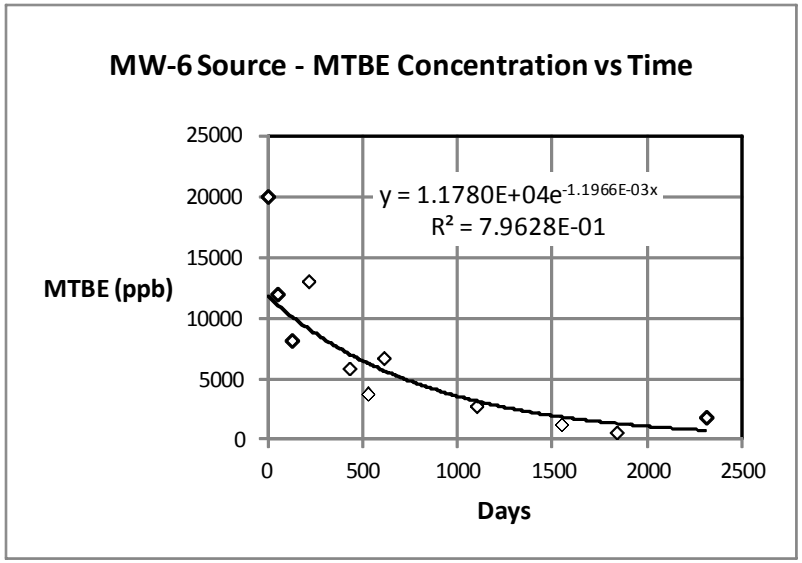
Retardance factor: $R_f := \left[1 + \left(\frac{1-n}{n}\right) \cdot \rho_s \cdot K_d\right] = 1.0611$ accounts for sorption of dissolved solute onto surfaces of solids

Evaluate "lumped" apparent decay rate of MTBE in the tank cavity using MTBE concentrations from MW-6 as shown below. Data has been smoothed to obtain a nearly perfect fit of exponential decay curve. Un smoothed and smoothed curves are both shown.

First order decay rate constant:

$k_s := -0.0018226 \cdot \frac{1}{day}$ from manually smoothed data shown below

MW-6 and EW-2 Tank Cavity Source Area		
01/22/07	0	20000
03/12/07	50	12000
05/31/07	129	8200
08/28/07	216	13000
04/02/08	430	5900
07/08/08	526	3800
10/04/08	612	6700
02/11/10	1099	2800
05/07/11	1545	1300
02/25/12	1833	650
06/18/13	2306	1900
01/22/07	0	20000
03/12/07		
05/31/07		
08/28/07	216	13000
04/02/08		
07/08/08		
10/04/08	612	6700
02/11/10	1099	2800
05/07/11	1545	1300
02/25/12	1833	650
06/18/13		



$$v_c := \frac{v_s}{R_f}$$

$$\alpha_x(L_s) := (0.83 \cdot m) \cdot \left(\log\left(\frac{L_s}{m}\right)\right)^{2.414}$$

$$\alpha_y(L_s) := 0.1 \cdot \alpha_x(L_s)$$

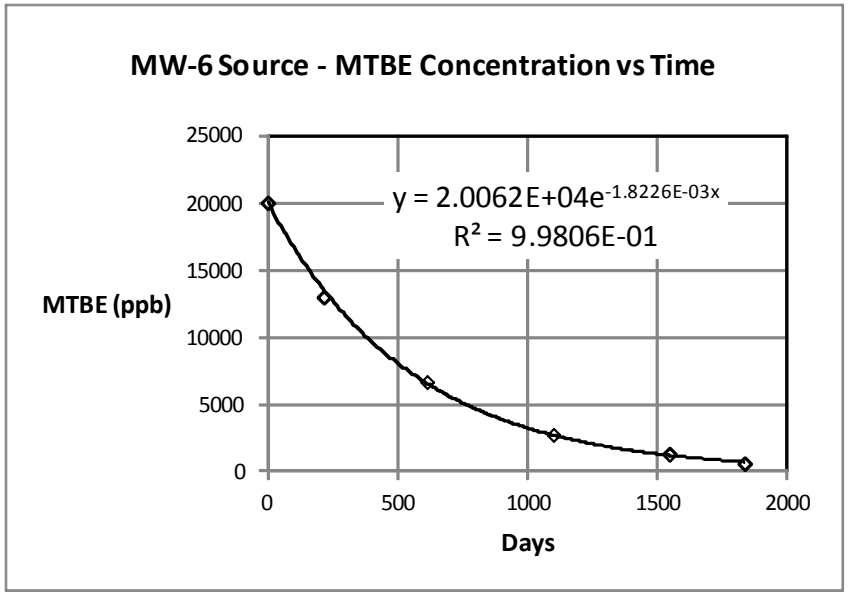
$$\alpha_z(L_s) := 0.05 \cdot \alpha_x(L_s)$$

$$C_o := 20000 \times 10^{-3} \cdot \frac{mg}{L}$$

Initial MTBE concentration in tank pit

$$C_{Threshold} := 5 \times 10^{-3} \cdot \frac{mg}{L}$$

Threshold odor and taste concentration



Concentration as function of longitudinal distance, x, from source, horizontal transverse distance, y, and vertical transverse distance z from rectangular cross section source area (20' deep by 45' wide).
Analysis includes apparent "lumped" decay of MTBE in tank cavity with time.

<u>With Source Decay:</u>

$$C(x,y,z,L_s,t_c) := C_o \cdot e^{\left[-k_s \cdot \left(t_c - \frac{x}{v_c}\right)\right]} \cdot \left(\frac{1}{8}\right) \cdot \mathrm{erfc}\left[\frac{x - v_c \cdot t_c}{2 \cdot \sqrt{(\alpha_x(L_s)) \cdot v_c \cdot t_c}}\right] \cdot \left(\mathrm{erf}\left(\frac{y + \frac{Y}{2}}{2 \cdot \sqrt{\alpha_y(L_s) \cdot x}}\right) - \mathrm{erf}\left(\frac{y - \frac{Y}{2}}{2 \cdot \sqrt{\alpha_y(L_s) \cdot x}}\right)\right) \cdot \left(\mathrm{erf}\left(\frac{z + Z}{2 \cdot \sqrt{\alpha_z(L_s) \cdot x}}\right) - \mathrm{erf}\left(\frac{z - Z}{2 \cdot \sqrt{\alpha_z(L_s) \cdot x}}\right)\right)$$

Determine L_s assuming the plume front is located where the concentration of MTBE becomes detectable (*i.e.* 5 x 10^{-4} mg/L)

$$C(779ft, 0 \cdot ft, 0 \cdot ft, 779 \cdot ft, 12119 \cdot day) = 5.0319 \times 10^{-4} \cdot \frac{mg}{L}$$

Note that t_c = 12119 days from iterative solution

$$C(730ft, 0 \cdot ft, 0 \cdot ft, 779 \cdot ft, 12119 \cdot day) = 5.0003 \times 10^{-3} \cdot \frac{mg}{L}$$

33.2 years to reach well at threshold concentration assuming decay of MTBE source concentration

Without Source Decay:

$$C_{no_source_decay}(x,y,z,L_s,t_c) := C_o\cdot\left(\frac{1}{8}\right)\cdot \mathrm{erfc}\left[\frac{x - v_c\cdot t_c}{2\cdot\sqrt{(\alpha_x(L_s))\cdot v_c\cdot t_c}}\right]\cdot\left(\mathrm{erf}\left(\frac{y+\frac{Y}{2}}{2\cdot\sqrt{\alpha_y(L_s)\cdot x}}\right) - \mathrm{erf}\left(\frac{y-\frac{Y}{2}}{2\cdot\sqrt{\alpha_y(L_s)\cdot x}}\right)\right)\cdot\left(\mathrm{erf}\left(\frac{z+Z}{2\cdot\sqrt{\alpha_z(L_s)\cdot x}}\right) - \mathrm{erf}\left(\frac{z-Z}{2\cdot\sqrt{\alpha_z(L_s)\cdot x}}\right)\right)$$

$$C_{no_source_decay}(811ft, 0\cdot ft, 0\cdot ft, 811\cdot ft, 7331\cdot day) = 5.0886\times 10^{-4}\cdot\frac{mg}{L}$$

Note that t_c = 7331 days from iterative solution

$$C_{no_source_decay}(730ft, 0\cdot ft, 0\cdot ft, 811\cdot ft, 7331\cdot day) = 4.98345\times 10^{-3}\cdot\frac{mg}{L}$$

20.1 years to reach well at threshold concentration assuming no decay of MTBE source concentration

MTBE detection limit: $0.50\times 10^{-3}\cdot\frac{mg}{L}$ $\quad C(730\cdot ft, 0\cdot ft, 0\cdot ft, 730\cdot ft, 11138\cdot day) = 5.001\times 10^{-4}\cdot\frac{mg}{L}$

Detectable concentration at 30.5 years assuming concentration decay at source

$year := 365.25 \cdot day$

$t_c := 1000, 1010 .. 20000$

$C(730 \cdot ft, 0 \cdot ft, 0 \cdot ft, 730 \cdot ft, t_c \cdot day) =$

$0.0000 \cdot 10^0$
$0.0000 \cdot 10^0$
$0.0000 \cdot 10^0$
$0.0000 \cdot 10^0$
$0.0000 \cdot 10^0$
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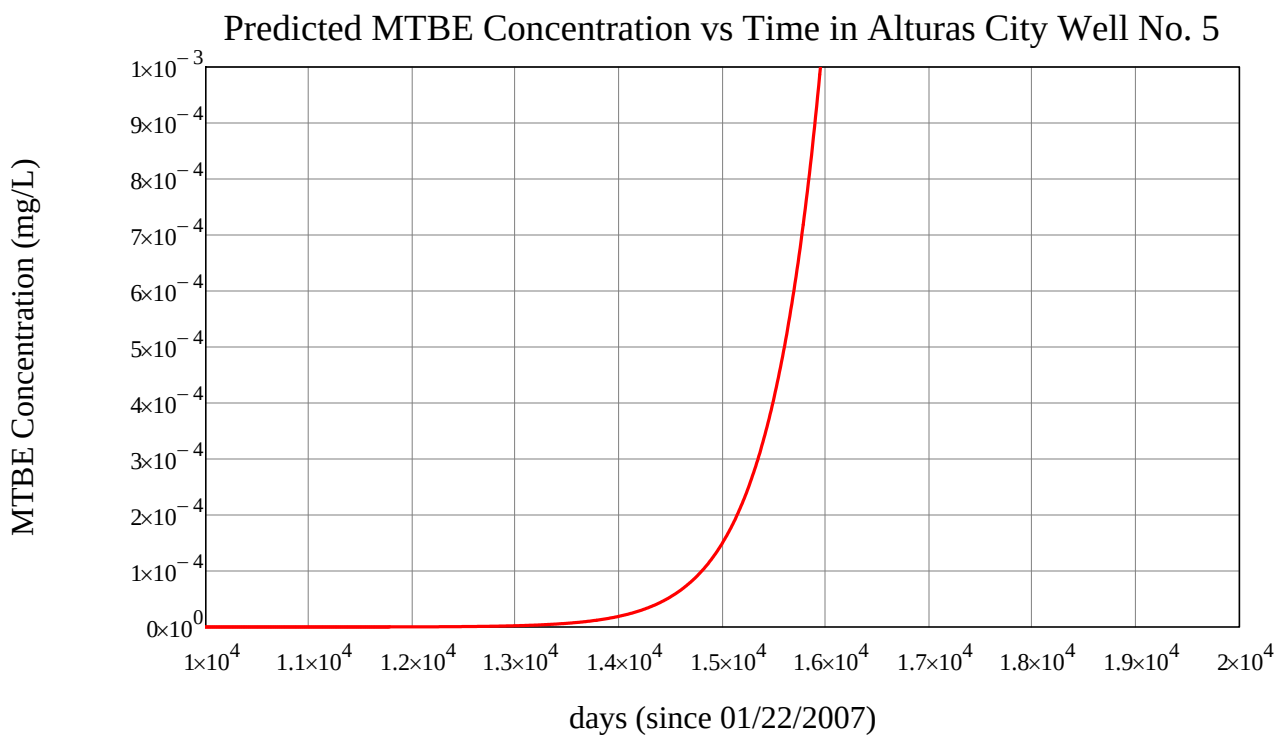
$0.0000 \cdot 10^0$
$0.0000 \cdot 10^0$
...

$\cdot \frac{mg}{L}$



Estimate Potential Leakage and MTBE Transport through Middle Aquitard

Well Pair MW-15A and MW-15B

Assuming horizontal flow in aquifers resulting in constant head distribution vertically through each aquifer and vertical flow in the aquitards (not strictly true for the potentiometric surfaces measured in the field)

This example demonstrates the time for any MTBE in Unit 3 to reach a detectable concentration in Unit 5. The concentration of MTBE in Unit 3 was assumed to be 5700 ppb which is the highest concentration that has been measured in MW-4.

Hydraulic head in Shallow Confined Aquifer: $h_{15A} := 4368.69 \cdot ft$

Hydraulic head in Lower Leaky Aquifer: $h_{15B} := 4353.43 \cdot ft$

Middle Aquitard thickness: $z_{15} := 20 \cdot ft$

Vertical gradient:

$$i_{15} := \frac{h_{15A} - h_{15B}}{z_{15}} = 0.76300$$

Assumed vertical K_v: $K_{v15} := 5.9 \times 10^{-7} \cdot \frac{cm}{s}$

Assumed n_e: $n_{e15} := 0.25$

$$q_{v15} := \frac{K_{v15} \cdot i_{15}}{n_{e15}} = 1.801 \times 10^{-6} \cdot \frac{cm}{s} \qquad q_{v15} = 5.1043 \times 10^{-3} \cdot \frac{ft}{day}$$

Advective travel time:

$$t_{15} := \frac{z_{15}}{q_{v15}} = 10.73 \cdot year \qquad \alpha_z(20 \cdot ft) = 0.08\,ft \qquad R_f = 1.06$$

One dimensional mass transport (MTBE); time required breakthrough at detection limit:

Assuming hypothetical MTBE concentration in Unit 3 (Shallow Confined Aquifer): $C_{zo} := 5700 \times 10^{-3} \cdot \frac{mg}{L}$ $\qquad C_{Threshold} := 0.5 \times 10^{-3} \cdot \frac{mg}{L}$

$$C_{z1}(C_{zo}, z_{15}, q_{v15}, t_c) := C_{zo} \cdot \frac{1}{2} \cdot \left[erfc\left(\frac{z_{15} - \frac{q_{v15} \cdot t_c}{R_f}}{2 \cdot \sqrt{\alpha_z(z_{15}) \cdot \frac{q_{v15} \cdot t_c}{R_f}}} \right) + \left[\left[e^{\left(\frac{z_{15}}{\alpha_z(z_{15})} \right)} \right] \cdot erfc\left(\frac{z_{15} + \frac{q_{v15} \cdot t_c}{R_f}}{2 \cdot \sqrt{\alpha_z(z_{15}) \cdot \frac{q_{v15} \cdot t_c}{R_f}}} \right) \right] \right]$$

$$C_{z1}(C_{zo}, z_{15}, q_{v15}, 2993 \cdot day) = 5.041 \times 10^{-4} \cdot \frac{mg}{L}$$

$$t_{v15_Threshold} := 2993 \cdot day = 8.19 \cdot year$$

References

Poehls, D.J. and Smith, G.J., Eds. 2009. Encyclopedic Dictionary of Hydrogeology. Boston (MA). Academic Press.

Domenico, P.A. and Schwartz, F.W. 1998. Physical and Chemical Hydrogeology. 2nd Ed. New York (NY). John Wiley & Sons.

Spitz, K. and Moreno, J.. 1996. A Practical Guide to Groundwater and Solute Transport Modeling. New York (NY): John Wiley & Sons.

Wiedemeier, T.H., Rifai, H.S., Newwll, C.J., and Wilson, J.T. 1999. Natural Attenuation of Fuels and Chlorinated Solvents in the Subsurface. New York (NY) John Wiley & Sons.

Xu, M. and Eckstein, Y. 1995. Use of weighted least squares method in evaluation of the relationship between dispersivity and field scale. *Ground Water* 33, no. 6:905-908.