



GROUNDWATER PURGING AND SAMPLING FORM

GENERAL INFORMATION

Project Name: UPRR Freeman

Date: 09-12-17

Well ID: LASHAW AG

Field Team: L. Baumann, J. Brown

Time Arrived at Well: 12:05

Weather Conditions: Sunny 80°

PURGE INFORMATION

Initial DTW (ft btc): _____

Time Begin Purging: _____

Purge Method: _____

Time	DTW (ft btc)	Purge Volume (gal)	pH	Sp. Cond. ($\mu\text{S/cm}$) <i>ms/cm</i>	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	ORP (mV)	TDS (mg/L)	Comm. (color, odor)
1215		2.0	7.66	0.309	0.0	5.87	15.18	86		no odor

Sample Identification: LASHAW-AG-GW-091217

Sample Time: 12:18

Analysis: _____

Sample Volume: _____

QA/QC Sample ID: _____

QA/QC Sample Time: _____

Field Duplicate: _____

Equipment Blank: _____

MS/MSD: _____

Comments: _____



GROUNDWATER PURGING AND SAMPLING FORM

GENERAL INFORMATION

Project Name: UPKK Freeman

Date: 9-19-17

Well ID: Randall

Field Team: L. Baumann / J. Brown

Time Arrived at Well: _____

Weather Conditions: Rain

PURGE INFORMATION

Initial DTW (ft btc): /

Time Begin Purging: _____

Purge Method: _____

Time	DTW (ft btc)	Purge Volume (gal)	pH	Sp. Cond. (µS/cm) <i>ms/cm</i>	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	ORP (mV)	TDS (mg/L)	Comm. (color, odor)
1025	/	2	8.07	.383	7.7	17.49	12.20	141 141	.249	/

Sample Identification: Randall-GW-091917

Sample Time: ~~1026~~ 1026

Analysis: _____

Sample Volume: _____

QA/QC Sample ID: ~~F00~~ FD01-GW-091917

QA/QC Sample Time: 1500

Field Duplicate: FD01-GW Equipment Blank: _____

MS/MSD: _____

Comments: _____



GROUNDWATER PURGING AND SAMPLING FORM

GENERAL INFORMATION

Project Name: Marlow UPRC-Freeman Date: 9-19-17
 Well ID: Marlow well Field Team: L. Barman/J. Brown
 Time Arrived at Well: 1118 Weather Conditions: Rain

PURGE INFORMATION

Initial DTW (ft btc): /
 Time Begin Purging: /
 Purge Method: /

Time	DTW (ft btc)	Purge Volume (gal)	pH	Sp. Cond. (µS/cm) ms/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	ORP (mV)	TDS (mg/L)	Comm. (color, odor)
1308	/	2	7.61	.384	1.1	10.02	11.82	174		

Sample Identification: Marlow-GW-091917 Sample Time: 1310

Analysis: _____ Sample Volume: _____

QA/QC Sample ID: FD02-GW-091917 QA/QC Sample Time: 1530

Field Duplicate: X Equipment Blank: _____ MS/MSD: X

Comments: _____

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-3d
MW 30d

Field Team: JE/SD

Date: 1/15/18

Weather/Temp: 40°, sunny

Arrival Time: 1115

Well Condition: Good

Initial DTW (ft btc): 32.06

Purge Method: Bladder pump

Purge Rate⁵: ~ 100 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	MS Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1125	33.60		10.54	7.97	0.297	25.6	3.97	94	Clear ↓
1130	33.78		10.68	7.62	0.297	100.0	5.15	36	
1135	-		10.55	7.50	0.312	901.0	5.28	24	
1140	34.00		10.57	7.42	0.334	Ø	5.48	8	
1145	34.16		10.86	7.42	0.322	Ø	5.86	23	
1150	34.29		11.05	7.42	0.317	Ø	6.19	37	
1155	34.34		11.11	7.42	0.311	Ø	6.53	44	
1200	34.40		11.12	7.39	0.309	Ø	6.71	45	
1205	34.40		11.27	7.40	0.306	Ø	6.94	46	
1210	35.11		11.20	7.42	0.301	Ø	7.22	47	
1215	35.60		11.04	7.41	0.296	Ø	7.53	50	
1220	36.13		11.09	7.44	0.292	Ø	7.71	58	
1225	36.26	2.00	11.03	7.41	0.292	Ø	7.71	62	
<hr/>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW3d-6W-011518

Sample Time: 1240

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 2.0

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



40

SITE: UPRR Freeman

Well ID: MW-40

Field Team: Brown/Espinoza

Date: 12-15-17

Weather/Temp: 30° Snowy

Arrival Time: 12:25

Well Condition: Good

Initial DTW (ft btc): 110.59

Purge Method: Bladder pump

Purge Rate⁵: 200 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
12:30	Begin Pumping								
12:37	111.03		8.20	7.30	0.415	45.9	7.61	120	
12:42	111.65		9.72	7.32	0.431	717	4.92	120	
12:47	112.09		10.06	7.29	0.435	678	4.23	123	
12:52	112.12		10.10	7.30	0.429	485	4.80	127	
12:57	112.20		10.11	7.29	0.412	278	6.11	132	
13:02	111.28		9.16	7.25	0.407	209	6.76	139	
13:07	112.0		9.66	7.25	0.404	175	7.03	144	
13:12	111.65		9.58	7.26	0.403	145	7.52	148	
13:17	111.42		9.48	7.25	0.403	123	7.37	152	
13:22	111.43		9.49	7.23	0.402	105	7.67	155	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW-40-GW-121517

Sample Time: 13:25

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous iron 0.22 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-6D

Field Team: Brown/Espinoza

Date: 12-20-17

Weather/Temp: 30° overcast

Arrival Time: 09:00

Well Condition: Good

Initial DTW (ft btc): 125.45

Purge Method: Bladder pump

Purge Rate⁵: 100 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
09:17	Begin Pumping								
09:26	125.49		7.85	7.66	0.373	0.0	7.74	174	
09:31	125.48		7.47	7.62	0.363	0.0	6.25	178	
09:36	125.49		7.00	7.61	0.362	4.7	5.80	181	
09:41	125.48		6.59	7.59	0.365	12.4	5.71	183	
09:46	125.48		6.42	7.55	0.364	11.4	5.30	185	
09:51	125.48		6.17	7.54	0.354	16.5	5.50	186	
09:56	125.48		5.81	7.53	0.364	17.6	5.46	188	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW6D-GW-122017

Sample Time: 10:00

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~2 gal

Field Duplicate ID: Ø

Field Duplicate Time: _____

Comments: Ferrous iron 0.31 mg/L

Groundwater Purging and Sampling Form



SITE: UPPER Freeman

Well ID: MW-60

Field Team: JE/SO

Date: 1/15/18

Weather/Temp: 40°, sunny

Arrival Time: _____

Well Condition: Good

Initial DTW (ft btc): 37.28

Purge Method: Bladder pump

Purge Rate⁵: ~ 100 ml/min

PID reading: 0

Pump Depth: Mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1450	37.34		9.91	8.32	0.415	386.0	9.58	65	Cloudy
1455	37.33		9.68	7.92	0.473	0	7.06	9.77	
1500	37.33		9.57	7.78	0.499	0	5.93	77	
1505	37.33		9.28	7.68	0.513	0	5.33	78	
1510	37.33		9.12	7.60	0.517	0	5.12	79	
1515	37.33		8.91	7.57	0.523	0	4.70	79	
1520	37.33		9.17	7.53	0.521	0	4.43	80	
1525	37.33		9.10	7.48	0.520	0	4.07	78	
1530	37.33		8.59	7.48	0.528	0	4.43	78	
1535	37.33		8.46	7.48	0.529	0	4.29	78	
1540	37.33		8.23	7.46	0.527	0	4.26	80	
<i>(Handwritten lines across the table)</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW60-6W-01518

Sample Time: 1540

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: the Turb meter malfunction.

Iron = 0.11 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-85

Field Team: JE/SD

Date: 12/14/17

Weather/Temp: 20°, cloudy, calm

Arrival Time: 1115

Well Condition: Good

Initial DTW (ft btc): -

Purge Method: -

Purge Rate⁵: -

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1120			10.45	6.50	0.365	26.0	3.79	230	Clear
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 85-GW-121417 Sample Time: 1120

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID : _____ Field Duplicate Time: _____

Comments: Iron = 0.00 ppm
Purged dry, sampled next day

Groundwater Purging and Sampling Form



SITE: UPPER Freeman

Well ID: MW-94

Field Team: JE/SB

Date: 1/15/18

Weather/Temp: 40°, sunny

Arrival Time: 945

Well Condition: Good

Initial DTW (ft btc): 70.78

Purge Method: Bladder

Purge Rate⁵: ~ 200 ml/min

PID reading: 0

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1015	30.79	.10	9.96	6.37	1.55	36.1	7.71	183	Clear
1020	30.79	.40	10.66	6.81	1.82	127.0	6.65	144	↓
1025	30.79	1.00	10.93	7.40	1.76	153.0	5.82	110	
1030	30.79	1.30	11.05	7.57	1.70	105.3	5.75	92	
1035	30.79	1.50	11.00	7.66	1.65	70.2	5.96	83	
1040	30.79	1.70	11.02	7.72	1.58	46.3	6.05	81	
1045	30.79	2.00	10.95	7.73	1.52	37.3	6.08	83	
1050	30.79	2.50	10.96	7.70	1.45	33.4	6.15	85	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW94-GW-01518

Sample Time: 1050

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Iron = 0.06 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Mw-9d

Field Team: Espinosa / Brown

Date: 12/20/17

Weather/Temp: 30°, cloudy, calm

Arrival Time: 1215

Well Condition: Good

Initial DTW (ft btc): 31.90

Purge Method: LF

Purge Rate⁵: 100 ml/min

PID reading: 0.2 ppm

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1225	Begin Pumping								
1227	32.03	-	9.30	7.32	0.433	3.7	7.19	194	Clear
1232	32.0	-	9.28	7.19	0.425	30.7	11.53	15	↓
1237		-	9.07	7.19	0.429	17.8	11.47	25	
1242		-	9.13	7.14	0.443	46.2	11.57	65	
1247		-	9.19	7.11	0.448	51.4	11.71	100	
1252		-	9.28	7.10	0.452	41.2	11.53	120	
1257		-	9.59	7.10	0.447	28.0	11.41	133	
1302	32.02	-	9.45	7.10	0.450	26.8	11.19	139	
1307	32.05	-	9.65	7.10	0.448	17.0	10.99	145	
1312	32.0	-	9.88	7.09	0.447	14.2	10.65	149	
1317	32.0	-	9.86	7.09	0.447	13.3	10.58	154	
1322	32.0	-	9.83	7.09	0.448	2.6	10.49	157	↓
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Mwad-GW-122017

Sample Time: 1325

Analysis: See Coe

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 22 gal

Field Duplicate ID: 0

Field Duplicate Time: 0

Comments: Iron = 0.24 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-105

Field Team: JE/SP

Date: 12/14/17

Weather/Temp: 20°, cloudy, calm

Arrival Time: 945

Well Condition: Good

Initial DTW (ft btc): —

Purge Method: —

Purge Rate⁵: —

PID reading: —

Pump Depth: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
<u>950</u>			<u>8.97</u>	<u>7.66</u>	<u>0.554</u>	<u>40.8</u>	<u>7.40</u>	<u>200</u>	<u>Clear</u>
<u>950</u>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTU

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW105-GW-121417

Sample Time: 950

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): _____

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Iron = Meter error

purged dry, sampled following day

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-148D

Field Team: Brown / Espinoza

Date: 12-15-17

Weather/Temp: 30° Overcast / snowing

Arrival Time: 9:15

Well Condition: Good

Initial DTW (ft btc): 16.27

Purge Method: Bladder pump

Purge Rate⁵: 200 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
09:22	Begin Pumping								
09:25	17.52		9.71	6.98	0.408	37.8	3.50	54	
09:30	18.38		10.09	7.33	0.467	120	6.79	-118	
09:35	18.82		10.15	7.26	0.427	100	5.23	-110	
09:40	18.98		10.19	7.28	0.389	67.0	3.60	-102	
09:45	18.85		10.19	7.36	0.382	58.0	3.13	-97	
09:50	19.05		10.15	7.30	0.373	57.6	2.73	-88	
09:55	18.95		10.15	7.39	0.367	233	2.78	-87	
10:00	19.25		10.09	7.29	0.358	193	3.06	-75	
10:05	19.19		10.15	7.34	0.352	166	3.37	-74	
10:10	19.20		10.08	7.36	0.349	137	3.67	-69	
10:15	19.08		10.03	7.46	0.348	126	3.99	-63	
10:20	19.12		9.97	7.47	0.344	110	4.31	-68	
10:25	19.14		9.97	7.50	0.341	96.9	4.59	-65	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW14D-GW-121517

Sample Time: 10:25

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous iron 1.51 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-15D

Field Team: Brown/Espinoza

Date: 12-20-17

Weather/Temp: 30° overcast

Arrival Time: 10:40

Well Condition: Good

Initial DTW (ft btc): 87.45

Purge Method: Bladder pump

Purge Rate⁵: 150 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
10:45	Begin Pumping								
10:54	87.45		7.05	7.65	0.388	31.0	9.43	181	
10:59	87.45		7.25	7.49	0.380	18.8	7.00	184	
11:04	87.45		7.60	7.47	0.378	5.0	7.54	188	
11:09	87.45		7.70	7.45	0.378	10.9	7.56	190	
11:14	87.46		8.45	7.45	0.369	61.4	11.61	191	
11:19	87.47		8.60	7.45	0.365	80.9	12.76	190	
11:24	87.45		8.60	7.43	0.363	92.2	11.54	191	
11:29	87.46		8.54	7.43	0.367	87.4	11.77	192	
11:34	87.46		8.64	7.45	0.364	74.9	11.66	192	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW15D-GW-122017

Sample Time: 11:35

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 29 gal

Field Duplicate ID: Ø

Field Duplicate Time: _____

Comments: Ferrous iron 0.18 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-16D

Field Team: Brown/Espinoza

Date: 12-20-17

Weather/Temp: 30° overcast

Arrival Time: 14:20

Well Condition: Good

Initial DTW (ft btc): 47.31

Purge Method: Bladder pump

Purge Rate⁵: 100 mL/min

PID reading: N/A

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
14:26	Begin Pumping								
14:27	47.70		10.27	7.37	0.488	6.1	6.40	71	
14:32	47.55		9.69	7.50	0.486	12.9	11.61	47	
14:37	47.50		10.21	7.45	0.490	13.3	11.68	91	
14:42	47.62		10.25	7.45	0.491	2.7	11.27	109	
14:47	47.50		10.30	7.45	0.488	0.0	11.06	116	
14:52	47.65		10.36	7.46	0.493	0.0	11.21	122	
14:57	47.61		10.31	7.45	0.493	0.0	11.68	126	
15:02	47.57		10.28	7.49	0.494	0.0	11.63	129	
15:07	47.62		10.22	7.45	0.494	0.0	11.70	132	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW16D-GW-12 2017

Sample Time: 15:10

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~2 gal

Field Duplicate ID: ∅

Field Duplicate Time: _____

Comments: Ferrous iron 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-20d

Field Team: JE/SD

Date: 12/14/17

Weather/Temp: 20°, cloudy, calm

Arrival Time: 1400

Well Condition: Good

Initial DTW (ft btc): 93.08

Purge Method: LF

Purge Rate⁵: 440 ml/min

PID reading: NA

Pump Depth: Mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1408	Begin Pumping								
1410	93.51	.25	9.62	7.77	0.510	24.2	12.49	118	Clear
1415	93.41	1.25	10.01	7.56	0.511	475	7.38	17	Clear
1420	93.35	2.00	9.91	7.56	0.514	550	7.38	24	Clear
1425	93.89	2.50	10.99	7.61	0.514	213	7.29	71	Clear
1430	93.81	3.00	11.05	7.62	0.514	67.7	7.30	98	Clear
1435	93.84	4.00	11.07	7.63	0.513	39.7	7.24	114	↓ ↓
1440	93.80	5.00	11.01	7.63	0.513	28.8	7.16	125	" "
1445	93.76	6.00	10.98	7.62	0.513	23.9	7.15	132	" "
1450	93.64	6.50	10.96	7.62	0.513	20.0	7.19	138	" "
1455	93.88	6.50	11.16	7.59	0.512	17.5	7.21	144	" "
1500	93.91	27.00	11.22	7.60	0.512	16.9	7.23	147	" "
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW20d-GW-121417

Sample Time: 1500

Analysis: See CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): total 3.5 gal

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Iron = meter not working

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-210

Field Team: JE/SD

Date: Feb 12/14/17

Weather/Temp: 20°, cloudy, calm

Arrival Time: 1300

Well Condition: Good

Initial DTW (ft btc): 63.47

Purge Method: LF

Purge Rate⁵: 440 ml/min

PID reading: NA

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1308	Begin Pumping								
1310	63.67	.5	9.97	8.23	0.388	48.5	1.74	24	Clear
1315	63.73	1.00	10.15	8.26	0.348	42.6	0.25	-146	Clear
1320	63.73	1.25	10.11	8.30	0.349	34.4	0.41	-161	Clear
1325	63.73	2.00	10.23	8.32	0.346	20.9	0.23	-148	Clear
1330	63.73	2.50	10.31	8.32	0.345	24.4	0.16	-171	Clear
1335	63.73	3.00	10.31	8.32	0.344	14.1	0.14	-171	Clear
1340									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW210-GW-121417

Sample Time: 1335

Analysis: See CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 3.5 gal

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Stable

Groundwater Purging and Sampling Form



SITE: ERR UPRR

Well ID: W-20

Field Team: JE/SP

Date: 1/16/18

Weather/Temp: 30°, cloudy, rainy

Arrival Time: _____

Well Condition: Good

Initial DTW (ft btc): 66.05

Purge Method: Submersible

Purge Rate⁵: -

PID reading: ✓

Pump Depth: 82'

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
805	66.23		10.16	6.22	0.335	26.7	9.06	231	Clear
810	66.23		10.90	6.77	0.344	13.2	9.35	1104	"
815	66.23		10.96	6.87	0.341	0.0	9.42	146	"
820	66.23		10.99	6.93	0.338	7.6	9.51	139	
825	66.23		10.96	6.97	0.337	19.5	9.50	132	
830	66.23		10.93	6.99	0.335	22.6	9.48	131	↓
<i>(Remaining rows are crossed out with a large blue X)</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W20-6W-011618

Sample Time: 830

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Marlow W20

Field Team: Brown, Espinoza

Date: 12/11/17

Weather/Temp: 25° Clear

Arrival Time: 12:45

Well Condition: _____

Initial DTW (ft btc): 17.13

Purge Method: Peristaltic

Purge Rate⁵: _____

PID reading: N/A

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
14:02	Begin Pumping								
14:07	17.28	0.1	7.87	8.66	0.165 ms/cm	0.0	0.22	-2	
14:12	17.38	0.2	8.10	8.74	0.165	0.0	0.16	-29	
14:17	17.45	0.3	8.17	8.78	0.165	0.0	0.13	-44	
14:22	17.52	0.4	8.22	8.82	0.166	0.0	0.13	-53	
14:27	17.61	0.8	8.32	8.86	0.166	0.0	0.12	-62	
14:32	17.65	1.2	8.32	8.88	0.166	0.0	0.12	-64	
14:37	17.73	2.0	8.31	8.89	0.166	0.0	0.10	-65	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Marlow W20-^{GW}121117

Sample Time: 14:40

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.0

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous iron 0.06 mg/L

Groundwater Purging and Sampling Form



SITE: UDR Freeman

Well ID: Reed Well

Field Team: Demus, Espinoza

Date: 1-9-18

Weather/Temp: 36°F, Rain

Arrival Time: _____

Well Condition: —

Initial DTW (ft btc): _____

Purge Method: —

Purge Rate⁵: _____

PID reading: —

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
			6.87	9.33	.302	0.4	3.08	58	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Reed-GW-010918

Sample Time: 9:45

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous iron = 0.03 ppm

Groundwater Purging and Sampling Form



SITE: UPRN Freeman

Well ID: Thorson Well

Field Team: JE / JC

Date: 1/5/18

Weather/Temp: 30°, cloudy

Arrival Time: 945

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Comh

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
			7.3	8.07	0.332	0.0	0.22	-104	CLEAR
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Thorson-GW-010518

Sample Time: 1000

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): _____

Field Duplicate ID: _____

Field Duplicate Time: 1000

Comments: IRON => 1.67 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Atwood H

Field Team: Brown, Espinoza

Date: 1/4/18

Weather/Temp: 30° overcast

Arrival Time: 14:00

Well Condition: N/A

Initial DTW (ft btc): N/A

Purge Method: Grab

Purge Rate⁵: 0

PID reading: N/A

Pump Depth: 0

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
14:15	-	-	7.5	7.66	0.328	0.0	2.32	111	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: ATWOOD H-GW-010418

Sample Time: 14:15

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** _____

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Iron = 0.01

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Lashaw Well

Field Team: JE

Date: 3/19/18

Weather/Temp: 40°, sunny

Arrival Time: Ø

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1	Begin Pumping								
1500	Ø	Ø	8.13	6.69	0.305	0.3	5.71	172	Clear
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lashaw-Gw-031918

Sample Time: 1500

Analysis: CoC

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): ~10 gal

Field Duplicate ID: FD3-031918

Field Duplicate Time: 1430

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Asher Well

Field Team: JE

Date: 3/20/18

Weather/Temp: 40°, sunny

Arrival Time: 8

Well Condition: good

Initial DTW (ft btc): 8

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1030	Ø	Ø	14.50	6.87	0.625	0.2	4.80	198	Clear
<i>Out C</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Asher-GW-032018

Sample Time: 1030

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 10 gal

Field Duplicate ID: FD4-032018

Field Duplicate Time: 1000

Comments: Ferrous Iron = 0.33ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Silva Well

Field Team: JE

Date: 3/20/18

Weather/Temp: 40° sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1100	Ø	Ø	11.13	6.53	0.307	1.0	5.60	148	Clear
<i>John Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Silva-GW-032018

Sample Time: 1100

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~10 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-94

Field Team: JE/ND

Date: 3/14/18

Weather/Temp: 30°, rainy

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 29.13

Purge Method: LF

Purge Rate⁵: ~ 150 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
917	Begin Pumping								
920	29.13	.2	11.67	6.42	0.592	157	3.99	11	Clear
925	29.13	.3	11.66	6.50	0.590	118	3.83	13	
930	29.13	.4	11.59	6.46	0.576	61.6	4.77	18	
935	29.13	.5	11.54	6.44	0.551	40.5	5.30	28	
940	29.13	.6	11.49	6.46	0.539	28.8	4.86	38	
945	29.13	.7	11.56	6.43	0.555	22.4	4.47	48	
950	29.13	.8	11.54	6.35	0.525	17.5	4.38	50	
955	29.13	1.0	11.59	6.38	0.557	21.9	4.69	47	
1000	29.13	1.2	11.51	6.27	0.525	15.8	4.64	58	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW94-GW-031418

Sample Time: 1000

Analysis: C₂C

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 1.2

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.01 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-30

Field Team: JE/NO

Date: 3/14/18

Weather/Temp: 40°, rainy

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 30.08

Purge Method: LF

Purge Rate⁵: ~ 200 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1033	Begin Pumping								
1035	32.60	~.2	11.01	6.38	0.288	101	5.82	100	Clear
1040	33.75	~.3	11.22	6.54	0.295	207	6.32	30	
1045	33.15	~.4	10.92	6.46	0.297	192	5.22	36	
1050	33.54	~.6	11.14	6.48	0.284	119	6.76	60	
1055	33.94	~1.0	11.23	6.54	0.282	95.2	6.77	73	
1100	34.63	~1.2	11.20	6.55	0.274	66.7	6.36	72	
1105	33.34	~1.2	10.47	6.55	0.280	61.0	6.00	95	swap tank
1110	34.38	~1.5	11.20	6.48	0.278	55.4	6.41	81	
1115	35.32	~1.7	11.28	6.30	0.276	38.2	6.47	88	
1120	35.41	~2.0	11.27	6.34	0.275	42.3	6.39	103	
1125	36.22	~2.2	11.24	6.46	0.275	34.6	6.18	101	
1130	36.34	~2.4	11.26	6.26	0.275	36.4	6.22	88	
1135	36.43	~2.5	11.15	6.30	0.276	30.0	6.28	99	
<i>JE</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW30-GW-031418

Sample Time: 1135

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 2.5

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.06 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Out of Use Freeman W260

Field Team: JE/NO

Date: 3/14/18

Weather/Temp: 40°, rainy

Arrival Time: _____

Well Condition: good

Initial DTW (ft btc): 63.64

Purge Method: LF

Purge Rate⁵: NA

PID reading: Ø

Pump Depth: 22 ft off bottom

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1223	Begin Pumping								
1225	64.93	—	11.41	6.27	0.329	1.9	8.59	115	clear
1230	65.13		11.46	6.38	0.327	4.0	7.61	122	
1235	65.13		11.53	6.40	0.327	22.6	6.96	135	
1240	65.13		11.56	6.40	0.327	21.6	6.74	143	
1245			11.07	6.94	—	—	—	—	See comments
1300	65.03		11.48	6.27	0.329	0.9	7.62	154	
1305	65.03		11.59	6.35	0.325	26.9	7.81	155	
1310	65.03		11.61	6.39	0.323	81.1	7.53	156	
1315	65.03		11.62	6.41	0.323	161	7.19	158	
1320	65.03		11.62	6.41	0.320	733	7.33	160	
1325	65.03		11.61	6.38	0.319	10.1	7.29	160	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W26-GW-031418

Sample Time: 1325

Analysis: coc

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): ~10

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron = error
had to reset pump @ 1245
purged ~10 gallons

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-190

Field Team: JE/ND

Date: 3/13/18

Weather/Temp: 60°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 55.93

Purge Method: LF

Purge Rate⁵: ~200 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1702	Begin Pumping								
1705	56.06	.1	10.94	6.94	0.409	20.2	6.63	85	Clear
1710	56.06	.2	10.52	6.87	0.415	16.7	8.54	114	
1715	56.08	.3	10.59	6.79	0.415	7.4	6.97	107	
1720	56.08	.4	10.59	6.81	0.414	7.3	6.93	109	
1725	56.08	.5	10.64	6.87	0.415	9.8	6.67	114	
Ø									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW190-GW-031318

Sample Time: 1725

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~1

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.03

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-9D

Field Team: JE/ND

Date: 3/13/18

Weather/Temp: 50°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 30.08

Purge Method: LF

Purge Rate⁵: ~ 100 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1600 1653									
	Begin Pumping								
1600 1655	30.16	.1	17.65	6.90	0.389	66.2	7.40	-85	Clear
1600	30.24	.2	12.93	6.66	0.455	53.6	6.68	30	
1605	30.24	.3	12.74	6.68	0.435	41.3	6.93	74	
1610	30.24	.4	12.72	6.59	0.424	44.8	7.26	100	
1615	30.24	.5	12.80	6.66	0.420	46.5	7.63	104	
1620	30.24	.6	12.97	6.63	0.416	33.5	6.75	110	
1625	30.24	.7	13.07	6.61	0.412	9.8	6.64	123	
1630	30.24	.8	12.76	6.57	0.414	9.9	6.66	127	
1635	30.24	.9	12.82	6.54	0.410	9.7	6.54	129	
<i>JTC</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW9D-GW-031318

Sample Time: 16:35

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 21

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-14D

Field Team: JE/ND

Date: 3/13/18

Weather/Temp: 50°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 14.31

Purge Method: LF

Purge Rate⁵: ~ 100 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1251	Begin Pumping								
1255	15.24	.1	11.42	7.00	0.353	207	1.65	-211	Clear
1300	15.28	.2	10.97	7.01	0.414	400	0.97	-212	
1305	15.28	.3	10.97	7.13	0.413	393	0.75	-221	
1310	15.28	.4	10.54	7.12	0.393	188	0.65	-219	
1315	15.28	.5	10.50	6.96	0.370	118	0.58	-202	
1320	15.28	.6	10.39	7.02	0.362	86.7	0.56	-194	
1325	15.28	.7	10.39	7.06	0.357	64.2	0.59	-193	
1330	15.28	1.0	10.47	6.97	0.347	48.2	0.79	-180	
1335	15.28	1.1	10.43	7.05	0.345	46.7	0.84	-177	
1340	15.28	1.2	10.49	6.92	0.338	42.0	1.08	-156	
1345	15.28	1.3	10.51	6.91	0.334	37.3	1.24	-150	
1350	15.28	1.4	10.46	7.03	0.330	31.6	1.42	-151	
1355	15.28	1.5	10.45	6.97	0.329	30.2	2.66	-145	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW14D-GW-031318

Sample Time: 1355

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 2 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = Ø

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-5D

Field Team: TE/NO

Date: 3/13/18

Weather/Temp: 40°, sunny

Arrival Time: Ø

Well Condition: Good

Initial DTW (ft btc): 62.59

Purge Method: LF

Purge Rate ⁵: 100 ml/min

PID reading: Ø

Pump Depth: m.d - screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1101	Begin Pumping								
1105	62.69	2.1	13.07	6.43	0.218	22.8	7.01	-87	Clear
1110	62.82	2.3	12.93	7.09	0.397	18.6	5.69	-51	↓
1115	62.89	2.4	12.95	7.06	0.393	14.4	5.86	6	
1120	62.89	2.5	13.04	7.09	0.389	17.6	5.81	26	
1125	62.89	2.6	13.09	7.09	0.385	15.5	5.73	40	
1130	62.95	2.7	13.18	7.10	0.381	15.6	5.79	50	
1135	62.93	2.8	13.20	7.09	0.387	19.6 19.8	6.26	57	
1140	62.93	2.9	13.20	7.09	0.388	19.6	6.24	62	
1145	62.93	2.10	13.24	7.10	0.384	20.2	6.23	65	
<i>John Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW5D-GW-031318

Sample Time: 1145

Analysis: Co

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 21.0

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.03 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-17D

Field Team: JE/NO

Date: 3/13/18

Weather/Temp: 40°, cloudy

Arrival Time: Ø

Well Condition: Good

Initial DTW (ft btc): 63.35

Purge Method: LF

Purge Rate⁵: ~ 150 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
925	Begin Pumping								
930	65.65	~.5	11.8	6.73	0.645	87.9	8.36	-177	Clear
935	67.21	~.7	11.42	6.74	0.672	167	7.28	-225	
940	68.79	~.9	11.52	6.82	0.679	250	6.47	-238	
945	69.92	~1.0	11.74	6.89	0.671	173	5.78	-239	
950	71.65	~1.2	11.77	6.80	0.663	107	4.99	-244	
955	72.82	~1.5	11.87	6.68	0.664	97.4	4.45	-244	
1000	73.86	~1.7	11.88	6.89	0.662	77.8	4.08	-240	
1005	74.71	~2	11.92	6.73	0.665	85.3	3.78	-232	
1010	76.39	~2.2	11.96	6.75	0.665	86.5	3.33	-248	
1015	78.02	~2.5	12.03	6.73	0.664	217	2.35	-244	
1020	79.86	~2.7	11.86	6.75	0.664	193	3.28	-238	
1025	80.86	~3	11.65	6.89	0.639	209	2.37	-236	↓

Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW17D-GW-031318

Sample Time: 1025

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 3

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.58 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-210

Field Team: JE

Date: 4/3/18

Weather/Temp: 30°, cloudy

Arrival Time: 1105

Well Condition: good

Initial DTW (ft btc): 59.67

Purge Method: LF / Bladder pump **Purge Rate⁵:** ~ 200 ml/min

PID reading: 0 **Pump Depth:** Mid screen

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1118	Begin Pumping								
1120 1122	59.82	2.3	13.30	7.66	0.209	18.4	0.10 0.00	-86	Clear
1125	59.89	2.6	13.36	7.62	0.205	12.1	0.00	-48	
1130	59.95	~1.0	13.31	7.70	0.204	8.1	0.00	-93	
1135	60.04	21.3	13.30	7.76	0.204	5.9	0.00	-102	
1140	60.13	21.5	13.25	7.78	0.205	3.4	0.00	-103	↓
<i>Site 4</i>									
Stabilization Criteria³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW210-GW-040318

Sample Time: 1140

Analysis: Coc

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 22 gal

Field Duplicate ID: 0

Field Duplicate Time: 0

Comments: Ferrus Iron = 0.27 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Lang Well

Field Team: JE

Date: 4/3/18

Weather/Temp: 30, cloudy

Arrival Time: Ø

Well Condition: Good

Initial DTW (ft btc): Ø

Purge Method: Ø Grab

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
945	Ø	Ø	19.23	6.82	0.230	3.4	3.98	128	Clear
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lang-GW-040318

Sample Time: 945

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~10 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-150

Field Team: JE/ND

Date: 3/12/18

Weather/Temp: 50°, sunny

Arrival Time: Ø

Well Condition: Good

Initial DTW (ft btc): 84.91

Purge Method: LF

Purge Rate⁵: ~ 150 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1513	Begin Pumping								
1515	84.94	0	11.87	7.02	0.375	19.8	3.09	221	Clear
1520	84.91	2.1	11.31	6.81	0.362	21.4	4.19	226	↓
1525	84.91	2.2	11.09	6.72	0.358	6.3	4.26	230	
1530	84.91	2.3	10.98	6.67	0.358	2.4	4.28	233	
1535	84.91	2.4	10.89	6.64	0.357	1.1	4.19	235	
<i>Justin Liu</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW150-GW-021218

Sample Time: 1535

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 1 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.06 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-4D

Field Team: JE/NO

Date: 3/12/18

Weather/Temp: 50° sunny

Arrival Time: Ø

Well Condition: Good

Initial DTW (ft btc): 107.70

Purge Method: LF

Purge Rate⁵: ~ 100 ml/min

PID reading: Ø

Pump Depth: m.d. - screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1215	Begin Pumping								
1220	108.12	~.1	10.37	7.03	0.373	36.4	8.38	233	Clear.
1225	108.08	2.2	10.64	6.97	0.375	45.3	8.27	231	↓
1230	108.08	2.3	10.87	6.88	0.379	44.0	8.25	230	
1235	108.08	2.4	11.09	6.80	0.392	56.8	8.34	223	
1240	108.08	2.5	11.23	6.78	0.403	60.7	8.35	221	
1245	108.08	2.6	11.82	6.77	0.414	-	8.15	215	Tank change
1250	108.08	2.7	11.65	6.67	0.473	Ø	8.13	194	Turb issues
1255	108.08	~.8	11.66	6.66	0.481	-	8.12	192	req needed
1300	108.08	21	11.64	6.64	0.489	-	8.01	189	Clear
1305									
1310									
1315									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW4D-GW-031218

Sample Time: 1300

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 1 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron > 0.22 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-100

Field Team: JE/ND

Date: 3/12/18

Weather/Temp: 40°, sunny

Arrival Time: Ø

Well Condition: Good

Initial DTW (ft btc): 45.00

Purge Method: LF

Purge Rate⁵: ~ 150 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1733	Begin Pumping								
1735	45.37	~1	10.79	6.87	0.510	23.0	4.77	116	Clear
1740	45.27	~3	10.71	6.81	0.511	12.9	4.19	124	↓
1745	45.36	~5	10.67	6.81	0.508	5.3	4.09	121	↓
1750	45.36	~1	10.66	6.79	0.509	4.0	4.07	138	Clear
<i>John Ci</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW100-GW-031218

Sample Time: 1750

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.04 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-18D

Field Team: JE/ND

Date: 3/12/18

Weather/Temp: 50°, sunny

Arrival Time: Ø

Well Condition: Good

Initial DTW (ft btc): 47.07

Purge Method: LF

Purge Rate⁵: ~ 150 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1605	Begin Pumping								
1610	47.19	~.1	11.19	7.29	0.318	8.9	3.26	20	Clear
1615	47.19	~.2	10.76	7.26	0.308	18.3	1.41	-72	
1620	47.19	~.5	10.62	7.21	0.298	5.9	0.75	-68	
1625	47.19	~1	10.59	7.15	0.294	6.1	0.53	-66	
1630	47.19	~1.5	10.55	7.14	0.291	13.8	0.52	-62	
1635	47.19	~1.7	10.53	7.15	0.288	33.5	0.53	-58	
1640	47.19	~2	10.50	7.09	0.287	45.1	0.46	-71	
1645	47.19	~2.5	10.50	7.09	0.286	37.0	0.40	-78	
1650	47.19	~2.7	10.48	7.10	0.285	43.5	0.39	-80	
1655	47.19	~3	10.47	7.11	0.283	55.3	0.41	-82	
1700	47.19	~3.5	10.47	7.15	0.288	64.7	0.37	-72	
1705	47.19	~4	10.42	7.13	0.288	66.1	0.34	-66	
<i>John L.</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW18D-GW-031218

Sample Time: 1705

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 4 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.05 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Thorson GWV

Field Team: JE

Date: 3/19/18

Weather/Temp: 40° sunny

Arrival Time: Ø

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1100	-	-	10.87	6.58	0.316	6.4	1.73	-89	Clear
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Thorson-GW-031918

Sample Time: 1100

Analysis: GC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~10 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.05 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Atwood Shop

Field Team: JE

Date: 3/19/18

Weather/Temp: 40°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1700	Ø	Ø	17.85	7.01	0.317	1.3	1.73	84	Clear
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood-GW-S-031918 (ms/msd)

Sample Time: 1700

Analysis: CO₂

QC SAMPLE (CIRCLE): MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 10 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Atwood-House

Field Team: JE

Date: 3/19/18

Weather/Temp: 40° sunny

Arrival Time: Ø

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1300	Begin Pumping								
1300	Ø	Ø	11.39	6.67	0.303	1.2	2.47	118	Clear
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood-GW-H-031918

Sample Time: 1300

Analysis: Co C

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 10 gal

Field Duplicate ID: 6WFD1-031918

Field Duplicate Time: 1245

Comments: Ferrus Iron = 0.03ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Stark Well

Field Team: JE

Date: 3/14/18

Weather/Temp: 40°, sunny

Arrival Time: Ø

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1400	Ø	Ø	9.77	6.43	0.375	0.2	6.40	182	Clear
<i>John Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Stark-GW-031918

Sample Time: 1400

Analysis: CoC

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): ~70 gal

Field Duplicate ID: FD2-031918

Field Duplicate Time: 1330

Comments: Ferrous Iron = 0.06 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-64

Field Team: JE/ND

Date: 3/12/18

Weather/Temp: 30°, sunny

Arrival Time: Ø

Well Condition: Good

Initial DTW (ft btc): 36.65

Purge Method: LF

Purge Rate⁵: ~ 100 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
950	Begin Pumping								
955	36.81	2.1	10.80	6.27	0.530	399	2.65	239	Clear
1000	36.80	2.2	10.73	6.40	0.508	350	2.24	231	Clear
1005	36.80	2.5	10.69	6.43	0.495	294	2.42	230	Clear
1010	36.80	~1	10.54	6.43	0.492	128	2.71	231	Clear
1015	36.80	~1.5	10.60	6.44	0.490	99.1	2.61	231	Clear
1020	36.80	2.2	10.63	6.43	0.486	93.8	2.61	232	Clear
1025	36.80	~2.5	10.73	6.45	0.481	104	2.57	231	Clear
1030	36.80	~3	10.71	6.46	0.480	104	2.56	231	Clear
1035	36.80	~3.5	10.82	6.46	0.479	98.4	2.36	230	Clear
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW64-GW-031218

Sample Time: 1035

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 3.5

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Iron (Ferrous) = 0.28 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Marlow Well W. 20

Field Team: JE/NO

Date: 3/15/18

Weather/Temp: 74°, cloudy

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 14.62

Purge Method: LF

Purge Rate⁵: ~100 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
942	Begin Pumping								
945	14.86	.2	6.50	8.46	0.192	19.8	2.31	-64	Clear
950	14.99	.3	6.59	8.43	0.187	20.3	1.22	-165	↓
955	15.18	.4	6.68	8.40	0.186	19.5	0.88	-211	
1000	15.31	.5	6.72	8.43	0.184	20.9	0.71	-236	
1005	15.45	.6	6.74	8.39	0.184	20.2	0.69	-212	
1010	15.61	.7	6.71	8.39	0.189	19.8	0.60	-210	
1015	15.69	.8	6.64	8.39	0.183	19.7	0.53	-208	
<i>John G.</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Marlow Well W20-GW-031518

Sample Time: 1015

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL):

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.01 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Primary School Well

Field Team: JE/ND

Date: 3/15/18

Weather/Temp: 40°, cloudy

Arrival Time: —

Well Condition: —

Initial DTW (ft btc): —

Purge Method: —

Purge Rate⁵: —

PID reading: —

Pump Depth: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
—	—	—	9.32	6.73	0.417	0.8	5.20	178	Clear
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Primary School Well - GW - 031518

Sample Time: 900

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Mw-1D

Field Team: JF/ND

Date: 3/15/18

Weather/Temp: 30°, cloudy

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 19.02

Purge Method: LF

Purge Rate⁵: ~ 100 ml/min

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1105	Begin Pumping								
1110	21.20	~1.2	9.29	6.72	0.387	380	6.28	297	Clear
1115	22.20	~1.3	9.62	6.75	0.385	288	4.41	358	↓
1120	22.76	~1.4	9.72	6.78	0.384	244	4.05	367	
1125	23.24	~1.5	9.77	6.73	0.383	180	3.81	399	
1130	23.62	~1.6	9.76	6.77	0.383	143	3.41	422	
1135	23.95	~1.7	9.79	6.75	0.382	126	3.27	429	
1140	24.31	~1.8	9.79	6.75	0.382	113	3.16	436	
1145	24.56	~1.9	9.77	6.72	0.383	96.0	3.03	440	
1150	24.76	~1.0	9.79	6.75	0.384	80.0	3.07	444	
1155	24.82	~1.1	9.87	6.77	0.384	71.9	3.16	446	
1200	25.02	~1.2	9.83	6.75	0.383	63.8	3.18	444	
1205	25.20	~1.4	9.84	6.78	0.384	75.6	3.10	445	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW1D-GW-031518

Sample Time: 1205 JF

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~1.5

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.24 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-20

Field Team: JE/NO

Date: 3/15/18

Weather/Temp: 30°, cloudy

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: LF/submersible

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: 2-ft off bottom

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1336	Begin Pumping								
1340	62.50	-	11.33	7.27	0.296	50.9	3.72	-153	Clear
1345	64.39	-	11.50	7.28	0.306	49.4	2.46	-171	
1350	69.20	-	11.69	7.30	0.323	60.3	1.55	-190	
1355	69.93	-	11.73	7.28	0.332	300	1.27	-195	
1400	70.21	-	11.78	7.26	0.340	86.8	1.18	-184	
1405	70.26	-	11.80	7.24	0.342	43.2	1.33	-169	
1410	70.13	-	11.81	7.22	0.342	40.6	1.50	-160	
1415	70.00	-	11.81	7.21	0.342	34.8	1.71	-154	
1420	69.55	-	11.81	7.18	0.342	16.8	2.29	-142	
1425	69.40	-	11.82	7.17	0.342	15.6	2.61	-137	
1430	68.84	-	11.82	7.16	0.342	10.2	2.92	-131	
1435	65.81	-	11.43	7.13	0.338	20.1	4.37	-126	
1440	65.34	-	11.49	7.11	0.338	18.9	4.32	-125	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW20-GW-031518

Sample Time: 1440

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 215 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron: 1.02 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-200

Field Team: JE/NO

Date: 3/15/18

Weather/Temp: 30°, cloudy

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 92.33

Purge Method: LF

Purge Rate⁵: ~ 100 ml/min

PID reading: Ø

Pump Depth: mid screen

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1539	Begin Pumping								
1540	93.39	.1	9.59	7.73	0.182	97.4	11.5	41	Clear
1545	93.00	.2	10.58	6.97	0.534	96.3	5.02	74.7	
1550	93.00	.3	10.81	6.93	0.526	95.2	5.95	70	
1555	93.02	.4	10.90	6.93	0.523	98.6	5.89	43	
1600	93.10	2.5	10.91	6.94	0.523	97.8	5.88	50	
<i>John Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW200-031518

Sample Time: 1600

Analysis: Co

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 1

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.77 ppm
Sampled w/ minimum subset due to battery low & access issues.

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-65

Field Team: JE/NO

Date: 3/16/18

Weather/Temp: 40° sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: Bailed / grab sample Purge Rate⁵: Ø

PID reading: Ø Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
0830	—	—	10.32	6.75	0.332	13.1	6.15	137	Clear
<i>[Large handwritten signature/initials across the table]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW65-GW-031618

Sample Time: 0830

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = error

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-115

Field Team: JE/ND

Date: 3/16/15

Weather/Temp: 30°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: bailer / grab sample

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
915	Ø	Ø	10.33	6.92	0.397	1.1	3.47	105	clean
<i>Ø A Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW115-GW-031618

Sample Time: 915

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.38 ppm
grab sample

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-105

Field Team: JE/ND

Date: 3/16/18

Weather/Temp: 30°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: Bailer / grab sample

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
0930	Ø	Ø	8.08 0.78	7.32 6.89	0.550	11.4	6.72	66	Clear
<i>[Large handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW105-GW-031618

Sample Time: 930

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrus Iron = 0.10 ppm
grab sample

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-125

Field Team: JE/ND

Date: 3/16/18

Weather/Temp: 30°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: Bailer / grab sample

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1015	-	-	10.92	6.50	0.704	0.0	5.18	129	Turbid
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: ~~MW13~~ MW125-GW-031618

Sample Time: 1015

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00 ppm
grab sample

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-85

Field Team: JE/ND

Date: 3/16/18

Weather/Temp: 40°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: Barter / grab

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1030	Ø	Ø	12.17	6.00	0.371	66.0	3.20	145	Clear
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW85-GW-031618

Sample Time: 1030

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.07 ppm
grab sample

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-105⁷⁵ JE

Field Team: JE/ND

Date: 3/16/18

Weather/Temp: 30°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: Bailer/grab

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1045	Ø	Ø	10.88	0.62	0.100	79.1	6.40	107	Clear
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW105-GW-031618

Sample Time: 1045

Analysis: CoC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.19 ppm
grab sample

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-15

Field Team: JE/ND

Date: 3/16/18

Weather/Temp: 40°, sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: bailler / grab sample Purge Rate⁵: Ø

PID reading: Ø Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1105	Ø	Ø	10.45	6.35	0.840	202	2.89	48	Turbid
<i>John Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW15-GW-031018

Sample Time: 1105

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.57 ppm
grab sample

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-95

Field Team: JE/NO

Date: 3/16/18

Weather/Temp: 40°, sunny

Arrival Time: ∅

Well Condition: good

Initial DTW (ft btc): ∅

Purge Method: Bailer / grab

Purge Rate⁵: ∅

PID reading: ∅

Pump Depth: ∅

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
1145	∅	∅	12.39	5.99	0.566	340	6.17	132	Turbid
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW95-GW-031618

Sample Time: 1145

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ∅

Field Duplicate ID: ∅

Field Duplicate Time: ∅

Comments: Ferrous Iron = 0.31 ppm
grab sample

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Marlow Well No. 2

Field Team: JE/NO

Date: 3/14/18

Weather/Temp: 40°, Sunny

Arrival Time: Ø

Well Condition: good

Initial DTW (ft btc): 46.12 top of vault

Purge Method: submersible

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1210	Begin Pumping								
1215	47.28	Ø	10.64	6.76	0.447	419	2.40	-122	Turbid
1220	47.30		10.69	6.71	0.440	255	4.66	-93	
1225	47.30		10.70	6.69	0.439	152	6.28	-78	
1230	47.30		10.71	6.68	0.440	137	6.81	-75	
1235	47.30		10.70	6.68	0.441	84.9	7.08	-73	
1240	47.30		10.69	6.68	0.443	73.2	7.66	-69	
1245	47.30		10.70	6.68	0.443	45.5	8.21	-66	
1250	47.30		10.69	6.69	0.444	34.4	8.65	-60	
1255	47.30		10.70	6.69	0.441	40.0	7.24	-67	
1300	47.30		10.76	6.71	0.439	47.1	6.30	-72	
1305	47.30		10.92	6.73	0.443	44.6	5.31	-68	
1310	SAMPLE								
<i>John Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Marlow Well 2 - GW - 031618

Sample Time: 1310

Analysis: COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 15 gal

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrrous Iron = 0.65 ppm
Ø top of vault

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-18D

Field Team: Dowdy / Espinoza

Date: 062918

Weather/Temp: Sunny 50's

Arrival Time: 0850

Well Condition: good

Initial DTW (ft btc): 47.85

Purge Method: low flow

Purge Rate⁵: 200 mL/min

PID reading: —

Pump Depth: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0852	Begin Pumping								
0855	47.70	.05	12.01	7.17	0.256	6.9	2.35	64	
0900	47.70	.1	10.98	6.99	0.266	0.9	0.74	43	
0905	47.70	.15	11.01	7.00	0.265	7.0	0.53	26	
0910	47.70	.20	11.54	7.05	0.261	0.0	0.51	23	
0915	47.70	.3	11.98	7.09	0.260	0.0	0.49	21	
0930	SAMPLE								
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062918-MW18D

Sample Time: 0930

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 0.3

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: ferrous IRON = 0.08 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-190

Field Team: Dowdy / Espinoza

Date: 062818

Weather/Temp: cloudy 60's

Arrival Time: 17:16

Well Condition: good

Initial DTW (ft btc): 55.98

Purge Method: low flow

Purge Rate⁵: 200 mL

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
17:20	Begin Pumping								
17:25	56.59	0.05	10.59	6.88	0.400	23.8	5.48	50	
17:30	56.59	.1	10.39	6.78	0.403	9.8	5.59	73	
17:35	56.59	.15	10.39	6.72	0.404	6.2	5.80	87	
17:40	56.59	.2	10.39	6.70	0.404	4.3	5.88	90	
17:45	56.59	.25	10.30	6.70	0.405	4.0	5.90	93	
18:00	SAMPLE								
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062818 - MW 190

Sample Time: 18:00

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: ferric iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-1D

Field Team: Dowdy/Espinoza

Date: 062918

Weather/Temp: Sunny 48°

Arrival Time: 0645

Well Condition: good

Initial DTW (ft btc): 17.46

Purge Method: low flow

Purge Rate⁵: 200 mL/min

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0650	Begin Pumping								
0655	20.02	0.05	10.27	6.11	0.344	351	3.90	144	
0700	20.41	0.1	10.12	5.79	0.346	332	3.53	151	
0705	20.96	0.15	10.10	5.81	0.346	320	3.51	160	
0710	21.87	0.2	10.06	5.81	0.345	242	3.05	174	
0715	22.73	0.25	10.05	5.86	0.342	276	2.94	230	
0720	22.81	0.3	10.06	5.89	0.342	259	2.88	264	
0725	22.81	0.35	10.04	5.93	0.342	257	2.85	267	
0730	22.81	0.4	10.06	5.95	0.343	253	2.89	269	
0730	SAMPLE								
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062918-MW1D

Sample Time: 0730

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 0.4

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: lemons 126N = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-16D

Field Team: DOWDY / ESPINOZA

Date: 06 29 18

Weather/Temp: SUNNY 60°

Arrival Time: 0940

Well Condition: good

Initial DTW (ft btc): 45.76

Purge Method: low flow

Purge Rate⁵: 200 mL/min

PID reading: —

Pump Depth: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0945	Begin Pumping								
0950	46.42	.05	10.55	6.57	.451	19.7	6.20	100	
0955	46.92	.1	10.19	6.22	.449	4.3	5.34	122	
1000	47.0	.15	10.39	6.32	0.451	0.0	5.77	130	
1005	46.67	.2	10.22	6.24	0.451	0.0	5.82	132	
1010	46.67	.25	10.26	6.29	0.449	0.0	5.81	133	
1015	46.67	.3	10.18	6.25	0.450	0.0	5.80	137	
1025	SAMPLE								
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062918-MW16D

Sample Time: 1025

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: 062918-FD5 Field Duplicate Time: 1000

Comments: precious IRON = 0.04 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-90

Field Team: N. Dowdy, J. Espindza

Date: 062818

Weather/Temp: cloudy 65°

Arrival Time: 1210

Well Condition: good

Initial DTW (ft btc): 29.14

Purge Method: bladder pump/low flow

Purge Rate⁵: 200 ml/min

PID reading: N/A

Pump Depth: N/A

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1213	Begin Pumping								
1215	29.22	0.05	19.22	7.02	0.443	4.5	3.36	168	
1220	29.22	0.1	17.13	6.62	0.411	329	6.49	178	
1225	29.22	0.15	16.30	6.56	0.385	366	5.53	175	
1230	29.22	0.2	16.05	6.51	0.385	290	6.05	168	
1235	29.22	0.25	15.79	6.46	0.389	169	6.04	163	
1240	29.22	0.3	15.32	6.34	0.391	172	6.03	159	
1245	29.22	0.35	15.56	6.39	0.389	168	6.01	157	
1245	SAMPLE								
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW^(NP) 062818-MW90

Sample Time: 1245

Analysis: _____

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank TOTAL PURGED (GAL): 0.35

Field Duplicate ID: 062818-FD4 Field Duplicate Time: 0805

Comments: leakous iron = 0.08 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN **Well ID:** MW-90
Field Team: N. Dowdy, J. Espinoza **Date:** 062818
Weather/Temp: cloudy 65° **Arrival Time:** 1108
Well Condition: good **Initial DTW (ft btc):** 30.05
Purge Method: bladder pump/low flow **Purge Rate⁵:** 200 mL/min
PID reading: N/A **Pump Depth:** N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1125	Begin Pumping								
1130	30.09	0.05	15.99	6.40	0.417	2.3	3.90	164	
1135	30.09	0.1	17.33	6.38	0.415	4.0	4.14	165	
1140	30.09	0.15	17.53	6.42	0.414	14.2	4.25	166	
1145	30.09	0.2	18.02	6.46	0.414	17.0	4.19	168	
1150	30.09	0.25	20.9	6.46	0.413	20.1	4.23	171	
1155	30.09	0.3	19.1	6.48	0.413	20.3	4.29	172	
1200	SAMPLE								
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062818 - MW 90 **Sample Time:** 12:00
Analysis: 062818 - FD3
QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank **TOTAL PURGED (GAL):** 0.3
Field Duplicate ID: 062818 - FD3 **Field Duplicate Time:** 0800
Comments: ferrous IRON = 0.09 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-5D

Field Team: Dondy/Espinosa

Date: 062818

Weather/Temp: cloudy 65

Arrival Time: 1440

Well Condition: good

Initial DTW (ft btc): 6204

Purge Method: low flow

Purge Rate⁵: 200 mL/min

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1445	Begin Pumping								
1450	62.52	0.05	21.56	7.21	0.231	3.5	7.17	87	
1455	62.45	0.1	18.00	7.00	0.358	1.2	7.97	123	
1500	62.45	0.15	17.14	6.89	0.367	0	6.71	132	
1505	62.45	0.2	16.74	6.88	0.372	0	6.42	135	
1510	62.45	0.25	16.07	6.86	0.371	0	6.40	139	
1515	62.45	0.3	15.50	6.83	0.372	0	6.43	144	
1530	SAMPLE								
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062818-MW5D

Sample Time: 1530

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 03

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: fenox, iron = .02 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW 200

Field Team: Dowdy/Espinoza

Date: 062818

Weather/Temp: cloudy 60's

Arrival Time: 1548

Well Condition: good

Initial DTW (ft btc): 92.18

Purge Method: low flow

Purge Rate⁵: 200 mL/min

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1550	Begin Pumping								
1555	92.91	0.05	13.85	7.10	0.478	28.3	6.25	139	
1600	92.91	0.1	13.08	6.91	0.488	341	5.97	147	
1605	92.91	0.15	12.39	6.80	0.495	148	5.95	157	
1610	92.91	0.2	12.48	6.78	0.496	96.4	5.88	159	
1615	92.91	0.25	12.33	6.78	0.495	93.2	5.87	160	
1620	92.91	0.3	12.21	6.76	0.495	90.1	5.87	161	
1625	92.91	0.35	12.19	6.75	0.494	90.0	5.87	160	
1630	SAMPLE								
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062816-MW 200

Sample Time: 1630

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: ferrous IRON: 0.11 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-210

Field Team: Dowdy/Espinoza

Date: 06/29/18

Weather/Temp: Sunny 61°

Arrival Time: 1030

Well Condition: good

Initial DTW (ft btc): 60.84

Purge Method: low flow

Purge Rate⁵: 200 mL/min

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1035	Begin Pumping								
1040	60.99	.05	11.04	7.05	0.302	11.7	3.42	103	
1045	61.09	.1	10.79	6.86	0.328	25.9	0.74	20	
1050	61.09	.15	11.15	7.08	0.323	20.5	0.37	-45	
1055	61.09	.2	10.87	7.06	0.320	17.3	0.32	-47	
1100	61.09	.25	10.87	7.06	0.319	11.9	0.28	-49	
1105	61.09	.3	10.93	7.02	0.317	9.4	0.28	-53	
1115	Sample								
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062918-MW210

Sample Time: 1115

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): .3

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: fecus row = 0.70 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-3D

Field Team: Dowdy Espinoza

Date: 062918

Weather/Temp: Sunny 48°

Arrival Time: 0550

Well Condition: good

Initial DTW (ft btc): 27.90

Purge Method: low flow

Purge Rate⁵: 200 mL/min

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0600	Begin Pumping								
0605	34.54	0.05	11.20	5.78	0.121	0.0	5.93	112	
0610	36.19	.1	11.09	5.67	0.120	2.03	6.53	122	
0615	38.41	.15	11.08	5.70	0.119	56.6	6.25	136	
0620	39.34	.2	11.07	5.74	0.119	27.3	6.40	148	
0625	39.34	.25	11.01	5.70	0.120	12.1	6.42	150	
0630	39.34	.3	11.02	5.70	0.121	9.8	6.46	155	
0630	Sample								
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062918 - MW 3D

Sample Time: 0630

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: perm 1200 = 0.29 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN **Well ID:** MW-6U
Field Team: N. Dowdy, J. Espinoza **Date:** 06/27/18
Weather/Temp: Sunny 60's breezy **Arrival Time:** 0745
Well Condition: good **Initial DTW (ft btc):** 35.84
Purge Method: bladder pump/low flow **Purge Rate⁵:** 200 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0800	Begin Pumping								
0805	35.95	0.05	11.88	2.32	1.13	401	4.45	342	
0810	35.98	0.1	11.32	2.23	1.10	216	4.26	211	
0815	35.98	0.15	11.78	2.20	1.09	180	4.30	337	
0820	35.98	0.2	11.67	2.19	1.08	166	4.20	337	
0825	35.98	0.25	12.27	2.22	1.07	133	3.94	334	
0830	35.98	0.30	11.80	2.34	1.08	115	4.42	323	
0835	35.98	0.35	11.63	2.32	1.07	76.6	4.75	327	
0840	35.98	0.4	11.96	2.33	1.06	63.6	4.64	328	
0845	35.98	0.45	11.64	2.31	1.06	61.2	4.61	328	
0845	SAMPLE								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718-MW-6U **Sample Time:** 0845

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 0.45

Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: penous iron = 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-85

Field Team: N. Dowdy, J. Espinoza

Date: 06/26/18

Weather/Temp: Sunny 70's breezy

Arrival Time: 14:00

Well Condition: good

Initial DTW (ft btc): —

Purge Method: purged previous day

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
14:07	—	—	14.60	2.77	0.353	17.7	2.55	270	
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062618 - MW-85

Sample Time: 14:10

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): —

Field Duplicate ID: —

Field Duplicate Time: —

Comments: ferrous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-95

Field Team: W. Dowdy / J. Espinoza

Date: 06/26/18

Weather/Temp: Sunny 70's breezy

Arrival Time: 14:20

Well Condition: Good

Initial DTW (ft btc): —

Purge Method: purged previous day Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
14:27	—	—	14.08	2.56	0.555	19.9	5.48	275	
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062618-MW-95

Sample Time: 14:30

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): —

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: leucous IRoW = 0.62 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: W-20

Field Team: N. Dowdy + J. Espinoza

Date: 06/25/18

Weather/Temp: Sunny 70's BREEZY

Arrival Time: 16:50

Well Condition: Good

Initial DTW (ft btc): 14.38

Purge Method: Peristaltic

Purge Rate⁵: ~200 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1655	Begin Pumping								
1700	15.25	0.05	12.38	5.59	0.105	2.6	0.54	164	
1705	15.40	0.10	11.50	5.58	0.106	0.0	0.40	121	
1710	15.40	0.15	11.39	5.49	0.106	0.1	0.36	104	
1715	15.40	0.20	12.09	5.39	0.104	0.0	0.32	90	
1720	15.40	0.25	12.28	5.32	0.103	0.0	0.26	86	
1725	15.40	0.30	12.26	5.27	0.104	0.0	0.27	83	
1730	SAMPLE								
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062518 - W20

Sample Time: 1730

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous IRON = 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-4D

Field Team: N. Dowdy, J. Espinoza

Date: 06/27/18

Weather/Temp: Sunny 60's

Arrival Time: 10:07

Well Condition: good

Initial DTW (ft btc): 108.80

Purge Method: bladder pump / low flow

Purge Rate⁵: 200 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
10:12	Begin Pumping								
10:15	109.22	0.05	22.57	2.62	0.701	221.1	7.78	350	
10:20	109.29	0.1	19.58	3.13	0.719	239	2.70	356	
10:25	109.29	0.15	19.22	2.06	0.769	605	2.17	355	
10:30	109.29	0.2	17.26	1.97	0.834	752	1.72	354	
10:35	109.29	0.25	16.94	1.94	0.875	784	1.57	352	
10:40	109.29	0.3	16.91	1.93	0.865	781	1.49	351	
10:45	109.29	0.35	16.82	1.92	0.861	777	1.47	350	
10:45	SAMPLE								
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718 - MW-4D

Sample Time: 10:45

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** _____

Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: ferrous IRON = 0.11 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-15

Field Team: N. Dowdy J. Espinoza

Date: 06/26/18

Weather/Temp: Sunny 70's breezy

Arrival Time: 15:55

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: purged previous day

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
15:57	—	—	5.26	3.09	0.796	35.9	4.73	299	
<i>[Large handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 06/26/18 - MW-15

Sample Time: 16:00

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): _____

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous iron =

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: W26

Field Team: N. Dowdy, J. Espinoza

Date: 6/25/18

Weather/Temp: sunny 70's breezy

Arrival Time: 1355

Well Condition: Good

Initial DTW (ft btc): 63.48

Purge Method: submersible

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1405	Begin Pumping								
1410	64.69	64.6 ⁽²³⁾	10.89	3.30	0.230	0.0	8.98	388	
1415	64.79	—	10.86	3.51	0.228	0.0	8.47	390	
1420	64.79	—	10.87	3.63	0.234	0.0	8.41	389	
1425	64.79	—	10.95	3.68	0.233	0.0	8.40	388	
1430	SAMPLE								
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062518 - W26

Sample Time: 1430

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: ferrous iron = 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: Randall

Field Team: N. Dowdy, J. Espinoza

Date: 06/27/13

Weather/Temp: Sunny 70's

Arrival Time: 15:00

Well Condition: good

Initial DTW (ft btc): —

Purge Method: —

Purge Rate⁵: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
15:17	—	—	21.23	5.38	0.892	3.1	4.37	126	
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718-Randall

Sample Time: 15:20

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): —

Field Duplicate ID: —

Field Duplicate Time: —

Comments: fenox's 1row = 0.02 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: Silva

Field Team: N. Dowdy, J. Espinoza

Date: 06 27 18

Weather/Temp: Sunny 70's

Arrival Time: 1700

Well Condition: good

Initial DTW (ft btc): —

Purge Method: —

Purge Rate⁵: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
17:17	—	—	16.54	5.34	0.693	0.0	6.62	112	
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718-Silva

Sample Time: 1720

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): —

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: fecus iron = 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: Stark

Field Team: N. Dowdy J. Espinoza

Date: 062718

Weather/Temp: Sunny 70's

Arrival Time: 1725

Well Condition: good

Initial DTW (ft btc): —

Purge Method: —

Purge Rate⁵: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
—	Begin Pumping								
17:33	—	—	15.91	4.83	0.621	0.0	3.14	156	
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718 - Stark

Sample Time: 1735

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): —

Field Duplicate ID: — Field Duplicate Time: —

Comments: fluoride 120W = 0.01 mg/L

Groundwater Purging and Sampling Form



SITE: G1FFF

Well ID: WS 5 Influent

Field Team: L. Baumann

Date: 7-17-18

Weather/Temp: 87°

Arrival Time: 1135

Well Condition: Fine

Initial DTW (ft btc): NA

Purge Method: flow from spigot into pail Purge Rate⁵: JKB

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1158	NA	15	16.08	6.40	0.246	12.4	8.49	219	
1200	SAMPLE								
<i>[Large handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: WS5-GW-071718

Sample Time: 1200

Analysis: all applicable for Quarterly

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 0.5

Field Duplicate ID: JKB Field Duplicate Time: JKB

Comments: [Large handwritten signature]

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: LANG

Field Team: N. Dowdy, J. Espinoza

Date: 06/27/18

Weather/Temp: Sunny 70's

Arrival Time: _____

Well Condition: good

Initial DTW (ft btc): —

Purge Method: N/A

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1557	—	—	16.84	5.34	0.748	6.1	6.59	130	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718-LANG

Sample Time: 1600

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): N/A

Field Duplicate ID: 062718-FD2

Field Duplicate Time: 1605

Comments: ferrous iron = 0.02 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-60

Field Team: Espinoza / Dowdy

Date: 6/27/18

Weather/Temp: 60°, Sunny

Arrival Time: 0703 (40) 0905

Well Condition: Good

Initial DTW (ft btc): 728.82 (40) 129.11

Purge Method: Bladder pump

Purge Rate⁵: 200 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0910	Begin Pumping								
0915	129.19	0.05	11.93	2.50	0.756	7.8	7.87	341	
0920	129.19	0.1	13.89	2.31	0.746	4.1	7.35	355	
0925	129.19	0.15	12.26	2.22	0.734	6.1	5.27	358	
0930	129.19	0.20	12.20	2.16	0.715	1.6	3.16	360	
0935	129.19	0.25	14.38	2.14	0.697	2.2	2.79	360	
0940	129.19	0.3	14.19	2.11	0.706	2.6	2.65	359	
0945	129.19	0.35	14.03	2.10	0.706	0.4	2.61	359	
0945	SAMPLE								

Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718-MW-60

Sample Time: 0945

Analysis: _____

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): 0.35

Field Duplicate ID: 062718-FD01

Field Duplicate Time: 0950

Comments: Ferrous Iron = 0.06 ppm

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: Asher Well

Field Team: N. Dowdy, J. Espinoza

Date: 06/27/18

Weather/Temp: Sunny 70's

Arrival Time: 12:51

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: N/A

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
12:57	—	—	17.12	2.51	1.12	0.0	7.97	334	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: ^(WP) 062718 - Asher Well

Sample Time: 13:00

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): N/A

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous iron = 0.10 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: Lashaw

Field Team: N. Dowdy, J. Espinoza

Date: 06 27 18

Weather/Temp: Sunny 70's

Arrival Time: 16:10

Well Condition: good

Initial DTW (ft btc): —

Purge Method: NIA

Purge Rate⁵: NIA

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
16:17	—	—	16.79	5.87	0.613	0.0	4.62	125	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718 - LASHAW

Sample Time: 16:20

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): —

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: leucous IRON = 0.04 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: LASHAW A6

Field Team: N. Dowdy, J. Espinoza

Date: 062718

Weather/Temp: good

Arrival Time: 1634

Well Condition: Sunny 70's

Initial DTW (ft btc): —

Purge Method: —

Purge Rate⁵: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
1643	—	—	22.73	5.26	0.687	0.0	2.22	87	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718-Lashaw A6

Sample Time: 1645

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): _____

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous iron = 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Marlow 2

Field Team: W. Dowdy, J. Espinoza

Date: 6/25/18

Weather/Temp: Sunny 70's breezy

Arrival Time: 14:49

Well Condition: Good

Initial DTW (ft btc): 40.56

Purge Method: Submersible

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1500	Begin Pumping								
1505	41.40	—	9.98	4.21	0.324	229	1.04	219	
1510	41.40	—	9.92	4.20	0.327	245	0.87	222	
1515	41.40	—	9.88	4.21	0.327	236	0.77	217	
1520	41.40	—	9.88	4.23	0.325	246	1.87	223	
1525	41.40	—	9.86	4.24	0.322	241	1.89	225	
1530	41.40	—	9.88	4.25	0.322	240	1.86	227	
1530	SAMPLE								
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062518-Marlow 2

Sample Time: 1530

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 0.6 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: Marlow Well

Field Team: N. Dowdy J. Espinoza

Date: 06/27/18

Weather/Temp: Sunny 70's

Arrival Time: 1415

Well Condition: good

Initial DTW (ft btc): —

Purge Method: N/A

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
14:27	—	—	15.41	5.54	2.04	0.0	9.54	93	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062718 - Marlow

Sample Time: 14:30

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): N/A

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: ferrous IRON = 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-105

Field Team: N. Dowdy, J. Espinoza

Date: 06/26/18

Weather/Temp: Sunny 70's breezy

Arrival Time: 13:05

Well Condition: good

Initial DTW (ft btc): —

Purge Method: purged previous day

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
13:18	—	—	17.11	3.01	0.520	0.0	5.75	278	
13:13									
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062618-MW-105

Sample Time: 13:20

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): —

Field Duplicate ID: —

Field Duplicate Time: —

Comments: ferrous iron = 0.18 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-125

Field Team: N. Dowdy, J. Espinoza

Date: 06/26/18

Weather/Temp: Sunny 70's breezy

Arrival Time: _____

Well Condition: good

Initial DTW (ft btc): —

Purge Method: purged yesterday

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
13:43	—	—	15.77	3.00	0.397	64.0	5.68	271	
<i>[Large handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062618-MW125

Sample Time: 13:45

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): —

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: fecous iron = 0.08 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN

Well ID: MW-135

Field Team: N. Dowdy, J. Espanosa

Date: 06/25/18

Weather/Temp: Sunny 70's breezy

Arrival Time: 15:47

Well Condition: good

Initial DTW (ft btc): 8.62

Purge Method: peristaltic

Purge Rate⁵: ~200 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1557	Begin Pumping								
1600	9.89	0.3	12.49	3.71	0.226	2.0	5.02	327	
1605	10.49	0.6	12.77	3.76	0.219	3.6	4.98	334	
1610	11.24	0.9	12.90	3.80	0.216	1.5	4.47	339	
1615	11.24	1.2	13.66	3.78	0.215	0.4	3.84	342	
1620	11.24	1.5	13.77	3.80	0.211	1.0	3.91	346	
1625	11.24	1.8	13.23	3.81	0.213	1.7	3.97	345	
1630	SAMPLE								
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³	-	-		± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 062518-MW-135

Sample Time: 1630

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Atwood ^H 5

Field Team: JE

Date: 7/31/18

Weather/Temp: 70, Sunny

Arrival Time: 800

Well Condition: NA

Initial DTW (ft btc): NA

Purge Method: NA

Purge Rate⁵: NA

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood-H-078118

Sample Time: 800

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): _____

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



SITE: Freeman, WA

Well ID: Atwood #5

Field Team: JE

Date: 7/31/18

Weather/Temp: 70, Sunny

Arrival Time: 8:00 8:30

Well Condition: NA

Initial DTW (ft btc): NA

Purge Method: NA

Purge Rate⁵: NA

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
<i>[Large handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 02318-Atwood-5-073118

Sample Time: 8:00 8:30

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID : _____ Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



SITE: Freeman, WA

Well ID: Atwood ^S # JE

Field Team: JE

Date: 7/31/18

Weather/Temp: 70, Sunny

Arrival Time: JE 8:30

Well Condition: NA

Initial DTW (ft btc): NA

Purge Method: NA

Purge Rate⁵: NA

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
<i>[Handwritten signature]</i>									
<div style="display: flex; justify-content: space-between;"> ¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft </div> <div style="display: flex; justify-content: space-between;"> ³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO ⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min) </div>									

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: 02318-Atwood-5-073118

Sample Time: JE 8:30

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Atwood H 8 JE

Field Team: JE

Date: 7/31/18

Weather/Temp: 70, sunny

Arrival Time: 800

Well Condition: NA

Initial DTW (ft btc): NA

Purge Method: NA

Purge Rate⁵: NA

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood H-078111F

Sample Time: 800

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID : _____ Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW 1D

Field Team: Dowdy + Espinoza

Date: 09 27 18

Weather/Temp: SUNNY 60.5

Arrival Time: 11 55

Well Condition: good

Initial DTW (ft btc): 20.48

Purge Method: dedicated bladder pump Purge Rate⁵: 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1205	<i>Begin Pumping</i>								
1210	22.65	0.33	12.75	6.97	440	30.5	4.78	113.5	—
1215	23.45	0.66	12.40	6.74	442	40.7	4.52	130.2	—
1220	24.57	0.99	12.50	6.70	440	22.1	4.51	143.8	—
1225	24.57	1.32	12.28	6.75	440	9.8	4.47	147.2	—
1230	24.57	1.65	12.63	6.77	437	9.6	4.41	147.9	—
<i>Natalie Dowdy</i>									
Stabilization Criteria ³				± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 1D - GW - 092718

Sample Time: 12 45

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 1.65

Field Duplicate ID: — Field Duplicate Time: —

Comments: ferrous iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: MW 15

Field Team: DOWDY + ESPINOZA

Date: 09/25/18

Weather/Temp: SUNNY 50°

Arrival Time: 1020

Well Condition: good

Initial DTW (ft btc): —

Purge Method: bailer

Purge Rate⁵: N/A - purged dry on 09/24/18

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
—	Begin Pumping								
10:27	—	—	13.09	6.65	774	18.3	5.54	249.9	—
<i>Natalie Dowdy</i>									
Stabilization Criteria³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 15 - GW - 092518

Sample Time: 1030

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): N/A - purged dry on 9/24/18

Field Duplicate ID: —

Field Duplicate Time: —

Comments: leakous iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW 2D

Field Team: Dowdy + Espinoza

Date: 09 27 18

Weather/Temp: Sunny 60.5

Arrival Time: 1057

Well Condition: good

Initial DTW (ft btc): 29.72

Purge Method: dedicated bladder pump Purge Rate⁵: 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1110	<i>Begin Pumping</i>								
1115	31.45	0.33	12.37	7.24	381	23.7	2.45	194.5	—
1120	32.51	0.66	11.47	7.00	404	102.7	0.55	-47.5	—
1125	32.51	0.99	11.47	7.09	404	52.4	0.48	-53.3	—
1130	32.51	1.32	11.54	7.15	401	21.9	0.46	-53.3	—
1135	32.51	1.65	11.49	7.17	400	15.2	0.47	-53.3	—
1140	32.51	1.99	11.43	7.18	400	9.3	0.49	-53.8	—
<i>Mattalio Dowdy</i>									
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 2D-GW-092718

Sample Time: 1145

Analysis:

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.99

Field Duplicate ID:

Field Duplicate Time:

Comments: ferrous iron = 1.62 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW 30

Field Team: Dowdy + Espinoza

Date: 09 27 18

Weather/Temp: Sunny 50's

Arrival Time: 0814

Well Condition: good

Initial DTW (ft btc): 30.19

Purge Method: dedicated bladder pump Purge Rate⁵: 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0830	Begin Pumping								
0835	32.37	0.33	12.55	5.76	404	5.3	5.15	264.9	—
0840	34.47	0.66	12.27	6.23	372	1697	4.63	94.3	—
0845	35.32	0.99	12.28	6.43	333	1333	6.51	86.3	—
0850	36.14	1.32	12.26	6.55	317	499.1	7.67	115.3	—
0855	36.92	1.65	12.18	6.59	314	169.9	7.91	137.5	—
0900	37.52	1.99	12.16	6.61	314	46.2	7.94	153.1	—
0905	37.71	2.32	12.18	6.61	314	28.3	7.95	161.6	—
0910	37.73	2.85	12.23	6.62	314	14.7	7.93	165.4	—
0915	37.74	3.18	12.29	6.63	314	9.8	7.96	168.6	—
<i>Natalie Dowdy</i>									
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 30-GW-092718

Sample Time: 0915

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 3.18

Field Duplicate ID: — Field Duplicate Time: —

Comments: ferrous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW 6D

Field Team: Dowdy + Espinoza

Date: 09/25/18

Weather/Temp: SUNNY 60'S

Arrival Time: 13:56

Well Condition: good

Initial DTW (ft btc): 132.86

Purge Method: dedicated bladder

Purge Rate⁵: 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1415	<i>Begin Pumping</i>								
1420	132.92	0.33	13.16	7.16	395	0.0	5.56	279.2	—
1425	132.92	0.66	11.94	6.89	398	0.0	2.83	282.4	—
1430	132.92	0.99	11.87	6.93	398	0.0	2.11	280.8	—
1435	132.92	1.32	11.87	7.00	397	0.0	1.99	279.3	—
1440	132.92	1.65	11.84	7.02	397	0.0	1.97	276.1	—
				<i>Natalie Dowdy</i>					
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 6D - GW - 092518

Sample Time: 1445

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 1.98

Field Duplicate ID: — Field Duplicate Time: —

Comments: ferrous iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: MW 65

Field Team: Dowdy + Espinoza

Date: 09/25/18

Weather/Temp: Sunny 47°

Arrival Time: 0758

Well Condition: good

Initial DTW (ft btc): —

Purge Method: Bailer

Purge Rate⁵: N/A - purged dry on 9/24

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
0812	—	—	10.72	6.40	342	10.7	6.66	237.5	
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 65-GW-092518

Sample Time: 0815

Analysis: —

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): N/A purged dry on 9/24

Field Duplicate ID: FD1-092518

Field Duplicate Time: 0700

Comments: 12 hrs IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: FREEMAN UPRR

Well ID: MW 6U

Field Team: DOWDY + ESPINOZA

Date: 09/25/18

Weather/Temp: Sunny 70's

Arrival Time: 1458

Well Condition: good

Initial DTW (ft btc): 37.72

Purge Method: dedicated bladder pump **Purge Rate⁵:** 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1505	Begin Pumping								
1510	37.99	0.33	14.12	7.27	299	189.9	6.01	265.1	—
1515	37.93	0.66	13.79	6.89	580	253.9	4.83	269.5	—
1520	37.93	0.99	13.01	6.73	594	225.5	4.13	271.0	—
1525	37.93	1.32	12.92	6.70	593	184.7	4.12	270.5	—
1530	37.93	1.65	12.63	6.68	589	108.8	4.39	269.6	—
1535	37.93	1.98	12.44	6.66	583	107.3	4.41	269.1	—
1540	37.93	2.31	12.41	6.66	582	106.8	4.46	269.3	—
1545	SAMPLE								
<i>Natalie Dowdy</i>									
Stabilization Criteria³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 6U-6W-092518

Sample Time: 545

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.64

Field Duplicate ID: MW 6U-6W-092518

Field Duplicate Time: 1545

Comments:

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: MW 95

Field Team: DOWDY + ESPINOZA

Date: 09/25/18

Weather/Temp: Sunny 60's

Arrival Time: 1111

Well Condition: good

Initial DTW (ft btc): —

Purge Method: Bailer

Purge Rate⁵: N/A purged dry on 09/24/18

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1127	—	—	15.31	5.91	650	16.5	6.48	259.4	—
<i>Natalie Dowdy</i>									
Stabilization Criteria³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 95-GW-092518

Sample Time: 1130

Analysis: —

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): N/A - purged dry on 9/24/18

Field Duplicate ID: F02-092518

Field Duplicate Time: 0730

Comments: ferrous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: MW 115

Field Team: DOWDY + ESPINOZA

Date: 09/25/18

Weather/Temp: SUNNY 47.0

Arrival Time: 0846

Well Condition: good

Initial DTW (ft btc): —

Purge Method: bailer

Purge Rate⁵: N/A purged dry on 9/24

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
0857	—	—	11.58	7.10	439	8.7	3.45	233.7	—
<i>Natalie Dowdy</i>									
Stabilization Criteria³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 115 - GW - 092518

Sample Time: 0900

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): N/A purged dry on 9/24

Field Duplicate ID: —

Field Duplicate Time: —

Comments: ferrous IRON? 0.01 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: MW 125

Field Team: Dowdy + Espinoza

Date: 09/25/18

Weather/Temp: SUNNY 50°

Arrival Time: 0935

Well Condition: good

Initial DTW (ft btc): —

Purge Method: bailer

Purge Rate⁵: N/A - purged dry on 9/24/18

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
0943	—	—	12.33	6.58	790	20.6	5.42	254.3	—
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 125 - GW - 092518

Sample Time: 0945

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): N/A purged dry on 9/24/18

Field Duplicate ID: —

Field Duplicate Time: —

Comments: ferrous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW 140

Field Team: Dowdy + Espinoza

Date: 09 26 18

Weather/Temp: SUNNY 60'S

Arrival Time: 1710

Well Condition: good

Initial DTW (ft btc): 14.75

Purge Method: dedicated bladder pump Purge Rate⁵: 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1715	Begin Pumping								
1720	16.12	0.33	10.40	7.37	316	48.2	2.91	2054	—
1725	16.22	0.66	10.34	6.96	335	187.3	1.81	50.4	—
1730	16.38	0.99	10.24	6.91	348	219.9	0.66	8.1	—
1735	16.41	1.32	10.26	6.92	335	92.1	0.49	6.9	—
1740	16.41	1.65	10.25	6.93	329	52.7	0.55	7.4	—
1745	16.41	1.99	10.23	6.95	322	33.4	0.67	7.9	—
1750	16.41	2.32	10.22	6.97	320	9.7	0.70	8.2	—
<i>Natalie Dowdy</i>									
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 140-GW-092618

Sample Time: 1745

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): —

Field Duplicate ID: — Field Duplicate Time: —

Comments: lenous IRON = 0.49 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW 160

Field Team: Dowdy + Espinoza

Date: 09 26 18

Weather/Temp: Sunny 40°

Arrival Time: 0922

Well Condition: good

Initial DTW (ft btc): 47.55

Purge Method: dedicated bladder pump **Purge Rate⁵:** 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0930	<i>Begin Pumping</i>								
0935	48.08	0.33	11.15	7.36	497	17.1	6.95	180.0	—
0940	48.09	0.66	11.09	6.98	495	6.2	6.77	185.4	—
0945	47.92	0.99	11.11	7.01	503	0.7	6.73	186.3	—
0950	47.92	1.32	11.48	7.02	497	0.2	6.69	189.2	—
0955	47.92	1.65	11.72	7.02	498	0.0	6.68	190.3	—
<i>Natalie Dowdy</i>									
Stabilization Criteria³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 160 - GW - 092618

Sample Time: 1015

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.65

Field Duplicate ID: MW 160 - GW - 092618

Field Duplicate Time: 1015

Comments: leucous IRON = 0.02 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: MW 18D

Field Team: - DOWDY + ESPINOZA

Date: 09 26 18

Weather/Temp: SUNNY 50'S

Arrival Time: 1021

Well Condition: good

Initial DTW (ft btc): 50.89

Purge Method: dedicated bladder pump Purge Rate⁵: 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1030	<i>Begin Pumping</i>								
1035	51.01	0.33	12.25	7.77	321	5.7	2.11	190.7	---
1040	51.01	0.66	11.41	7.52	316	3.7	1.05	171.7	---
1045	51.01	0.99	11.10	7.49	315	2.7	0.84	161.6	---
1050	51.01	1.32	10.96	7.53	313	1.8	0.55	126.1	---
1055	51.01	1.65	10.94	7.57	313	1.0	0.49	125.5	---
1100	51.01	1.98	10.92	7.58	313	0.5	0.45	123.4	---
<i>Natalie Dowdy</i>									
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 18D-GW-092618

Sample Time: 1100

Analysis: ---

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 1.98

Field Duplicate ID: --- Field Duplicate Time: ---

Comments: ferrous iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW 190

Field Team: Dowdy + Espinoza

Date: 09 26 18

Weather/Temp: Sunny 60/5

Arrival Time: 1420

Well Condition: good

Initial DTW (ft btc): 57.87

Purge Method: dedicated bladder pump **Purge Rate⁵:** flow = 250 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1430	Begin Pumping								
1435	58.21	0.33	11.11	6.93	433	11.0	4.36	115.5	—
1440	58.21	0.66	11.11	6.88	435	2.9	4.77	127.5	—
1445	58.21	0.99	11.09	6.88	432	3.5	4.85	129.1	—
1450	58.21	1.32	11.09	6.89	432	3.4	4.90	130.3	—
<i>[Handwritten signature]</i>									
Stabilization Criteria³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW190-GW-092618

Sample Time: 1500

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.32

Field Duplicate ID: — **Field Duplicate Time:** —

Comments: Penous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: MW 200

Field Team: Dowdy + Espinoza

Date: 09 26 18

Weather/Temp: Sunny 60'S

Arrival Time: 1605

Well Condition: good

Initial DTW (ft btc): 92.60

Purge Method: dedicated bladder pump **Purge Rate⁵:** 250 mL/min

Field Parameters									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1615	<i>Begin Pumping</i>								
1620	93.66	0.33	11.99	6.99	531	113.1	6.22	206.3	
1625	93.66	0.66	12.00	7.00	533	72.6	6.17	206.3	
1630	93.66	0.99	11.94	7.05	533	23.1	6.09	206.2	
1635	93.66	1.32	11.98	7.06	533	12.3	6.06	207.4	
1640	93.66	1.65	11.97	7.06	533	9.3	6.09	208.7	
<i>Matalie Dowdy</i>									
Stabilization Criteria³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW200-BW-092618

Sample Time: 1645

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.99

Field Duplicate ID: FD3-092618

Field Duplicate Time: 1800

Comments: penous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Asher

Field Team: JE

Date: 9/28/18

Weather/Temp: 50° sunny

Arrival Time: 920

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
930	Ø	Ø	15.89	7.79	588	0.0	8.94	226.6	Clean										
<i>[Handwritten signature]</i>																			
<table border="0"> <tr> <td>Stabilization Criteria³</td> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> </tr> </table>										Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Asher-GW-092818

Sample Time: 930

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Atwood H

Field Team: JE

Date: 9/28/18

Weather/Temp: 60°, sunny

Arrival Time: 1028

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																													
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.																				
Begin Pumping																													
1045	Ø	Ø	18.60	7.07	348	0.6	5.87	164.6	Clear																				
<i>[Large handwritten signature]</i>																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> <td></td> </tr> </table>										Stabilization Criteria ³													±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV		
Stabilization Criteria ³																													
			±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV																						

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood H - GW - 092818

Sample Time: 1045

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Atwoods

Field Team: JE

Date: 9/28/18

Weather/Temp: 60°, sunny

Arrival Time: 1100

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1115	Ø	Ø	17.79	7.22	359	0.9	8.74	205.4	Clear
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwoods-GW-092818

Sample Time: 1115

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: FREEMAN SCHOOL W26

Field Team: Dowdy + Espinoza

Date: 09 24 18

Weather/Temp: Sunny 70's

Arrival Time: 1450

Well Condition: good

Initial DTW (ft btc): 66.22

Purge Method: Submersible

Purge Rate⁵: Flow = 500mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1450	Begin Pumping								
1455	66.38	0.65	12.81	7.63	358	66.9	8.27	170.7	—
1500	66.42	1.30	13.45	7.04	344	19.9	7.95	210.8	—
1505	66.42	1.95	11.97	6.67	348	9.8	7.74	222.1	—
1510	66.42	2.60	11.85	6.59	342	1.4	8.53	226.0	—
1515	66.42	3.25	11.83	6.57	342	2.1	8.16	229.0	—
1520	66.42	3.90	11.82	6.61	341	2.2	8.15	231.0	—
1525	66.42	4.55	11.80	6.64	341	0.5	8.15	232.4	—
1530	SAMPLE								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W26-GW-092418

Sample Time: 1530

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5.20

Field Duplicate ID: —

Field Duplicate Time: —

Comments: _____

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Freeman Primary

Field Team: JE

Date: 10/1/18

Weather/Temp: 50°, cloudy

Arrival Time: 900

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
915	Begin Pumping								
915	Ø	Ø	14.64	7.11	399	0.7	6.24	245.7	Clear
<i>John Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Freeman Primary - GW - 100118

Sample Time: 915

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: Freeman, WA

Well ID: Lashaw-GW-100218

Field Team: JF

Date: 10/2/18

Weather/Temp: 50°, cloudy, windy

Arrival Time: 1000-1015

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1045	Begin Pumping								
1045	Ø	Ø	14.64	7.20	353	0.3	7.80	239.4	Clear
<i>[Handwritten Signature]</i>									
Stabilization Criteria ³				± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lashaw-GW-100218

Sample Time: 1045

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.02 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Lashaw Ag

Field Team: JE

Date: 10/2/18

Weather/Temp: 50°, cloudy, windy

Arrival Time: 1100

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
<i>Begin Pumping</i>																			
1115	Ø	Ø	12.60	7.13	442	1.2	3.00	247	Clear										
<i>[Signature]</i>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;">-</td> <td style="width: 10%;">-</td> <td style="width: 10%;">-</td> <td style="width: 10%;">± 0.1 units</td> <td style="width: 10%;">± 3%</td> <td style="width: 10%;">± 10%⁴</td> <td style="width: 10%;">± 0.3 mg/L</td> <td style="width: 10%;">± 10 mV</td> <td style="width: 10%;">-</td> </tr> </table>										Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-										

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lashaw Ag - GW - 100218

Sample Time: 1115

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.01 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Lang

Field Team: SE

Date: 9/28/18

Weather/Temp: 60°, sunny

Arrival Time: 1235

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
1245	Ø	Ø	14.84	7.42	452	145	8.60	219.4	Clear										
<i>[Signature]</i>																			
<table border="1"> <tr> <td>Stabilization Criteria³</td> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> </tr> </table>										Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lang-GW-092818

Sample Time: 1245

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron =

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Marlow

Field Team: JE

Date: 9/28/18

Weather/Temp: 60°, Sunny

Arrival Time: 1300

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
1315	Ø	Ø	14.76	6.89	496	0.1	8.19	245.2	Clear										
<i>[Handwritten signature]</i>																			
<table border="1"> <tr> <td>Stabilization Criteria³</td> <td>-</td> <td>-</td> <td>-</td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td>-</td> </tr> </table>										Stabilization Criteria ³	-	-	-	±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	-
Stabilization Criteria ³	-	-	-	±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	-										

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Marlow-GW-092818

Sample Time: 1315

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Randall

Field Team: JE

Date: 9/28/18

Weather/Temp: 60°, Sunny

Arrival Time: 1330

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
1345	Ø	Ø	16.29	7.10	471	1.3	8.54	243.7	Clear										
<i>[Signature]</i>																			
<table border="1"> <tr> <td>Stabilization Criteria³</td> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> </tr> </table>										Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Randall-GW-092818

Sample Time: 1345

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron =

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Reed

Field Team: JE

Date: 9/28/18

Weather/Temp: 60°, sunny

Arrival Time: 1430

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
1445	Ø	Ø	14.62	6.95	326	0.0	6.51	254.3	Clear										
<i>[Signature]</i>																			
<table border="1"> <tr> <td>Stabilization Criteria³</td> <td></td> <td></td> <td></td> <td>± 0.1 units</td> <td>± 3%</td> <td>± 10%⁴</td> <td>± 0.3 mg/L</td> <td>± 10 mV</td> <td></td> </tr> </table>										Stabilization Criteria ³				± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	
Stabilization Criteria ³				± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Reed-GW-092818

Sample Time: 1445

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø

Field Duplicate Time: Ø

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Stark-GW-092818

Field Team: JE

Date: 9/28/18

Weather/Temp: 55°, Sunny

Arrival Time: 1200

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																													
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.																				
Begin Pumping																													
1215	Ø	Ø	17.50	6.78	416	0.7	827	-9.8	Clear																				
<i>John Li</i>																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> <td></td> </tr> </table>										Stabilization Criteria ³													±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV		
Stabilization Criteria ³																													
			±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV																						

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Stark-GW-092818

Sample Time: 1215

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: Ø Field Duplicate Time: Ø

Comments: Ferrous Iron >

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Thorson

Field Team: JE

Date: 9/28/18

Weather/Temp: 55°, Sunny

Arrival Time: 1000

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
1015	Ø	Ø	14.34	7.09	329	0.0	5.82	-1.9	Clear										
<i>[Handwritten signature]</i>																			
<table border="0"> <tr> <td>³Stabilization Criteria³</td> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> </tr> </table>										³ Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	
³ Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Thorson-GW-092818

Sample Time: 1015

Analysis: Ø

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): Ø

Field Duplicate ID: _____ Field Duplicate Time: Ø

Comments: Ferrous Iron = 1.62 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: No 2

Field Team: JE

Date: 1/19

Weather/Temp: 35° sunny

Arrival Time: 1505

Well Condition: good

Initial DTW (ft btc): 42.48

Purge Method: Submersible pump Purge Rate⁵: NA

Field Parameters ¹									
Time	DTW	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	GRP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1515	42.48	NA	10.26	6.98	1.044	67.6	1.58	-127.8	
1520	43.59		10.37	7.00	1.046	30.2	0.37	-148.5	
1525	43.61		10.41	7.05	1.046	17.7	0.30	-152.7	
1530	43.61		10.43	7.06	1.017	58.1	1.38	-126.7	
1535	43.61		10.45	7.01	0.959	86.3	4.22	-84.2	
1540	43.62		10.45	6.99	0.939	120.2	5.64	-60.9	
1545	43.62		10.45	6.97	0.940	119.8	5.69	-55.8	
1550	43.62	↓	10.46	6.97	0.937	118.8	5.74	-53.2	
<i>JE</i>									
Stabilization Criteria				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: No 2 - GW - 011019

Sample Time: 1545

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 15

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 1.54 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: W20

Field Team: JE

Date: 1/10/19

Weather/Temp: 40°, cloudy

Arrival Time: 1200

Well Condition: good

Initial DTW (ft btc): ∅

Purge Method: Per. Pump

Purge Rate⁵: 2200 ml/min

PID reading: ∅

Pump Depth: ∅

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1219	∅	0	8.88	7.99	0.346	3.4	6.92	47.0	Clear
1224		0.25	8.92	8.06	0.343	11.0	1.19	-7.9	
1229		0.50	8.93	8.22	0.341	10.3	0.79	-104.3	
1234		0.75	8.93	8.37	0.340	10.5	0.71	-152.3	
1239		1.0	8.91	8.45	0.340	10.9	0.53	-179.9	
1244		1.25	8.90	8.49	0.339	10.5	0.46	-205.2	
1249	↓	1.50	8.93	8.53	0.339	10.2	0.44	-222.7	
<i>Justin</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W20-GW-011019

Sample Time: 1245

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.50

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.29 ppm

Unable to take DTW due to restricted access in well

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: WZC

Field Team: JE

Date: 1/10/19

Weather/Temp: 40° sunny

Arrival Time: 1400

Well Condition: good

Initial DTW (ft btc): 66.63

Purge Method: 4 submersible pump Purge Rate⁵: NA

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1414	66.96	Ø	11.19	7.63	0.681	0	8.00	86.5	Clear
1419	67.02		11.32	6.97	0.678	47.6	8.68	107.2	
1424	67.02		11.33	6.94	0.678	45.1	8.63	108.9	
1429	67.02		11.35	6.86	0.678	33.3	8.68	113.8	
1434	67.02		11.38	6.80	0.679	47.4	8.68	118.0	
1439	67.02	↓	11.39	6.78	0.679	35.9	8.69	121.1	
<i>[Handwritten signature]</i>									
Stabilization Criteria				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: WZC-GW-011019

Sample Time: 1445

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 15

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Asher

Field Team: JE

Date: 1/2/19

Weather/Temp: 30° Sunny/Windy

Arrival Time: 1230

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters																			
Time	DTW ²	Purge Vol. (gal)	Temp. (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
1245	Ø	Ø	12.23	7.52	0.467	0.0	8.09	41.2	Clear										
<i>[Signature]</i>																			
<table border="1"> <tr> <td>Stabilization Criteria</td> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> </tr> </table>										Stabilization Criteria				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	
Stabilization Criteria				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Asher-GW-010719

Sample Time: 1245

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 10

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Atwood H

Field Team: JF

Date: 1/4/19

Weather/Temp: 40°, cloudy

Arrival Time: 1045

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																													
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.																				
Begin Pumping																													
1115	Ø	Ø	9.57	7.37	0.188	0	4.71	134.5	Clear																				
<i>[Signature]</i>																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±0%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> <td></td> </tr> </table>										Stabilization Criteria ³													±0.1 units	±0%	±10% ⁴	±0.3 mg/L	±10 mV		
Stabilization Criteria ³																													
			±0.1 units	±0%	±10% ⁴	±0.3 mg/L	±10 mV																						

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood H - GW - 010419

Sample Time: 1115

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 10

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Atwood 5

Field Team: JE

Date: 1/4/19

Weather/Temp: 40°, cloudy

Arrival Time: 1130

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
1145	Ø	Ø	5.12	6.97	0.172	0	10.24	155.8	Clear										
<i>[Signature]</i>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;">=</td> <td style="width: 10%;">=</td> <td style="width: 10%;">=</td> <td style="width: 10%;">±0.1 units</td> <td style="width: 10%;">±3%</td> <td style="width: 10%;">±10%</td> <td style="width: 10%;">±0.3 mg/L</td> <td style="width: 10%;">±10 mV</td> <td style="width: 10%;">=</td> </tr> </table>										Stabilization Criteria ³	=	=	=	±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	=
Stabilization Criteria ³	=	=	=	±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	=										

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood 5-GW-010419

Sample Time: 1145

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 10

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrus Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Freeman Primary

Field Team: N. Dowdy

Date: 12/19/18

Weather/Temp: Cloudy 39°

Arrival Time: 1150

Well Condition: N/A

Initial DTW (ft btc): N/A

Purge Method: N/A

Purge Rate⁵: N/A

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
No parameters collected																			
<i>Nat. re. Dowdy</i>																			
(A large diagonal line is drawn across the grid from the bottom-left to the top-right)																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;">±0.1 units</td> <td style="width: 10%;">±3%</td> <td style="width: 10%;">±10%</td> <td style="width: 10%;">±0.3 mg/L</td> <td style="width: 10%;">±10 mV</td> </tr> </table>										Stabilization Criteria ³					±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV
Stabilization Criteria ³					±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV										

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Freeman Primary - GW - 121918

Sample Time: 1200

Analysis: See LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Remous IRON = 0.03

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Lang

Field Team: JE

Date: 1/15/19

Weather/Temp: 20°, sunny

Arrival Time: 1230

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, ³ etc.
Begin Pumping									
1300	Ø	Ø	9.80	7.76	0.819	10.5	7.83	78.1	Clear
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lang-GW-011519

Sample Time: 1300

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 10

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Marlow

Field Team: JE

Date: 1/2/19

Weather/Temp: 30° Sunny

Arrival Time: 1315

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
1330	Ø	Ø	12.02	7.31	0.2196	0	110.2 7.40	Ø 110.7	Clear										
<i>[Handwritten signature]</i>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;">±0.1 units</td> <td style="width: 10%;">±3%</td> <td style="width: 10%;">±10%⁴</td> <td style="width: 10%;">±0.3 mg/L</td> <td style="width: 10%;">±10mV</td> <td style="width: 10%;"></td> </tr> </table>										Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10mV	
Stabilization Criteria ³				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Marlow-GW-010719

Sample Time: 1330

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 10

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron =

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Randall

Field Team: JE

Date: 1/7/19

Weather/Temp: 30° Sunny

Arrival Time: 1400

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																													
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.																				
Begin Pumping																													
1430	Ø	Ø	14.06	7.45	0.461	0	7.87	114.5	Clear																				
<i>[Signature]</i>																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%</td> <td>±0.3 mg/L</td> <td>±10mV</td> <td></td> <td></td> </tr> </table>										Stabilization Criteria ³													±0.1 units	±3%	±10%	±0.3 mg/L	±10mV		
Stabilization Criteria ³																													
			±0.1 units	±3%	±10%	±0.3 mg/L	±10mV																						

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Randall-GW-010719

Sample Time: 1430

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 10

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Silva

Field Team: JE

Date: 1/4/19

Weather/Temp: 40° cloudy

Arrival Time: 915

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																			
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
Begin Pumping																			
930	Ø	Ø	7.31	7.43	0.214	0	7.28	101.5	Clear										
<i>[Signature]</i>																			
<table border="1"> <tr> <td>Stabilization Criteria</td> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> </tr> </table>										Stabilization Criteria				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	
Stabilization Criteria				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Silva-GW-010419

Sample Time: 930

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5/10

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Stark

Field Team: JE

Date: 1/4/19

Weather/Temp: 40° cloudy

Arrival Time: 1000

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

Field Parameters ¹																													
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.																				
Begin Pumping																													
1015	Ø	Ø	8.47	7.34	0.218	0	886	139.2	Clear																				
<i>[Signature]</i>																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Stabilization Criteria³</td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10mV</td> <td></td> <td></td> </tr> </table>										Stabilization Criteria ³													±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10mV		
Stabilization Criteria ³																													
			±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10mV																						

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Stark-GW-010419

Sample Time: 1015

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 10

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-2D

Field Team: - N. Dowdy & J. Espinoza

Date: 12/21/18

Weather/Temp: Sunny 30°

Arrival Time: 1100

Well Condition: good

Initial DTW (ft btc): 30.53

Purge Method: bladder pump

Purge Rate⁵: 400 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1105	Begin Pumping								
1110	34.94	0.53	10.37	7.66	.224	21.0	0.82	-79.9	—
1115	35.31	1.06	10.57	7.60	.217	1.7	0.48	-135.4	—
1120	36.93	1.59	10.60	7.58	.220	0	0.49	-142.2	—
1125	36.95	2.12	10.69	7.58	.222	0	0.51	-144.4	—
1130	36.95	2.65	10.52	7.56	.222	0	0.53	-142.1	—
1130	SAMPLE								
<i>Matalie Dowdy</i>									
Stabilization Criteria ³									
	±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV				

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW2D-GW-122118

Sample Time: ^(ND) 1130

Analysis: See COC

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.65

Field Duplicate ID: FD 5 - GW - 122118

Field Duplicate Time: 1135

Comments: lemons IRON = 1.64 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-3D

Field Team: N. Dowdy & J. Espinoza

Date: 12/18/18

Weather/Temp: Drizzle 40s

Arrival Time: 1120

Well Condition: good

Initial DTW (ft btc): 31.76

Purge Method: bladder pump

Purge Rate⁵: 400 ml/min

Field Parameters									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1130	Begin Pumping								
1135	32.59	.53	10.52	8.25	.174	8.3	8.30	28.1	—
1140	32.84	1.06	10.51	8.00	.174	1.4	6.16	18.0	—
1145	32.87	1.59	11.13	7.78	.187	263	5.63	-10.2	—
1150	32.87	2.09	11.27	7.69	.184	144	7.15	-29.2	—
1155	32.87	2.62	11.29	7.62	.179	25.2	7.17	-24.3	—
1200	32.87	3.15	11.23	7.60	.178	8.7	7.23	-21.4	—
1200	SAMPLE								
<i>unclear Dowdy</i>									
Stabilization Criteria									
				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 3D - GW - 121818

Sample Time: 1200

Analysis: see COC

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): 3.15

Field Duplicate ID: FD01 - GW - 121818

Field Duplicate Time: 1205

Comments: leakage flow = 0.0

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-40

Field Team: JE

Date: 11/15/19

Weather/Temp: 20°, sunny

Arrival Time: 1027

Well Condition: good/needs pump cleaned

Initial DTW (ft btc): 477 107.24

Purge Method: bladder pump

Purge Rate⁵: ~150 ml/min

PID reading: Ø

Pump Depth: ~ mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1030	Begin Pumping								
1038	107.65	0.25	7.61	7.78	0.903	49.3	5.85	80.5	Turbid
1043	107.84	0.50	7.85	7.59	0.905	487.5	4.12	51.5	
1048	107.85	0.75	8.12	7.45	0.936	498.3	2.38	28.1	
1053	107.84	1.00	8.00	7.38	0.929	377.0	20.0	20.6	D.O. = 2.95
1058	107.84	1.25	8.01	7.31	0.902	238.2	3.20	18.0	
1103	107.79	1.50	8.05	7.30	0.908	197.2	3.05	19.2	D.O. = 3.25
<i>JE</i>									
Stabilization Criteria ³	-	-	-	±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW40-GW-011519

Sample Time: 1100

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.37 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-5D
Field Team: N. Dowdy + J. Espinoza **Date:** 12/18/18
Weather/Temp: Rain 30's **Arrival Time:** 0830
Well Condition: good **Initial DTW (ft btc):** 61.92
Purge Method: bladder pump **Purge Rate⁵:** 300 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0910	Begin Pumping								
0915	62.81	.35	11.10	7.59	.328	0	9.73	202.2	—
0920	62.87	0.70	11.18	7.70	.279	0	8.91	193.8	—
0925	62.87	1.05	11.04	7.76	.259	2.7	8.98	185.0	—
0930	62.87	1.40	11.06	7.77	.257	0	9.87	182.6	—
0935	62.87	1.75	11.20	7.81	.259	0	9.91	177.7	—
0940	62.87	2.10	11.16	7.83	.258	0.2	9.95	175.2	—
0945	SAMPLE								
<i>Natalie Dowdy</i>									
Stabilization Criteria									
				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW5D-GW-121818 **Sample Time:** 0945

Analysis: See LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 2.10

Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: ferrous IRON = 0.0

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-6D

Field Team: - N. Dowdy + J. Espinoza

Date: 12/17/18

Weather/Temp: P. Sunny 40's

Arrival Time: 1500

Well Condition: good

Initial DTW (ft btc): 123.37

Purge Method: bladder pump

Purge Rate⁵: 400 mL/min

Field Parameters ¹									
Time	DTW	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1505	Begin Pumping								
1510	123.49	0.53	10.13	7.41	.530	0	6.27	126.5	—
1515	123.48	1.06	10.28	7.15	.546	2.1	3.82	138.2	—
1520	123.49	1.59	10.36	7.16	.552	0.7	3.63	135.3	—
1525	123.49	2.12	10.36	7.17	.556	0	3.56	131.3	—
1530	123.49	2.65	10.33	7.17	.557	0	3.53	130.3	—
1535	123.49	3.18	10.34	7.17	.557	0	3.50	129.4	—
1545	Sample —								
<i>Mattie Dowdy</i>									
Stabilization Criteria									
			±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV		

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW6D-6W-121718

Sample Time: 1545

Analysis: See COL

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 3.18

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: ferric iron =

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-60
Field Team: N. Dowdy J. Espinoza **Date:** 12/17/18
Weather/Temp: P. Sunny 40's **Arrival Time:** 1355
Well Condition: good **Initial DTW (ft btc):** 37.97
Purge Method: bladder pump **Purge Rate⁵:** 400 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp. (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1400	Begin Pumping								
1405	38.20	0.53	11.54	7.14	.786	20.6	5.37	132.4	yellow/brown water
1410	38.22	1.06	11.59	6.81	.787	25.0	5.13	138.5	_____
1415	38.24	1.59	11.41	6.75	.780	20.7	5.01	135.6	water clearing
1420	38.24	2.12	11.25	6.74	.771	14.5	5.00	135.4	_____
1425	38.24	2.65	11.16	6.68	.754	12.4	5.01	138.5	_____
1430	38.24	3.18	11.16	6.68	.739	10.0	4.94	138.7	_____
1435	38.24	3.71	11.17	6.69	.737	7.6	4.92	138.1	_____
1445	SAMPLE								
<i>Mattie Dowdy</i>									
Stabilization Criteria									
				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW60-GW-121718 **Sample Time:** 1445
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 3.71
Field Duplicate ID: same MW60-GW-121718 **Field Duplicate Time:** SAME
Comments: ferrous IRON = 0.04

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-85

Field Team: N. Dowdy

Date: 12/20/18

Weather/Temp: RAIN 40'S

Arrival Time: 1600

Well Condition: good

Initial DTW (ft btc): —

Purge Method: N/A

Purge Rate⁵: N/A

Field Parameters									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
NO GW Parameters collected									
<i>Natalie Dowdy</i>									
Stabilization Criteria ³				±0.4 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 85-GW-122018

Sample Time: 1620

Analysis: See COL

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): —

Field Duplicate ID: — Field Duplicate Time: —

Comments: purged dry on 12/19/18
ferric IRON = 0.11

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-9D

Field Team: N. Dowdy + J. Espinoza

Date: 12/18/18

Weather/Temp: Drizzle 40's

Arrival Time: 1225

Well Condition: good

Initial DTW (ft btc): 32.13

Purge Method: bladder pump

Purge Rate⁵: 400 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1235	Begin Pumping								
1240	32.26	0.53	11.74	7.71	.447	0.8	4.09	29.7	—
1245	32.37	1.06	11.77	7.56	.407	0.4	5.07	33.3	—
1250	32.69	1.59	11.78	7.57	.363	0	6.15	41.5	—
1255	32.69	2.12	11.78	7.53	.361	0	6.27	48.9	—
1300	32.69	2.65	11.78	7.51	.360	0	6.31	49.7	—
1300	SAMPLE								
<i>Matable Dowdy</i>									
Stabilization Criteria									
				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW9D-GW-121818

Sample Time: 1300

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.65

Field Duplicate ID: FD02-GW-121818

Field Duplicate Time: 1305

Comments: penous IRON = 0.06

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-90

Field Team: N. Dowy + J. Espinoza

Date: 12/18/18

Weather/Temp: Drizzle 40/5

Arrival Time: 1320

Well Condition: good

Initial DTW (ft btc): 31.26

Purge Method: bladder

Purge Rate⁵: 400 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1325	Begin Pumping								
1330	31.26	0.53	10.53	7.78	.543	111	7.15	70.5	_____
1335	31.26	1.06	10.97	8.05	.821	137	8.35	62.3	_____
1340	31.26	1.59	10.99	8.37	.832	130	8.53	61.0	_____
1345	31.26	2.12	10.89	8.47	.816	75.5	8.66	60.7	_____
1350	31.26	2.65	10.75	8.54	.796	53.5	8.66	61.4	_____
1355	31.26	3.18	10.63	8.59	.793	27.2	8.71	62.9	_____
1400	31.26	3.71	10.63	8.61	.790	9.9	8.68	63.6	_____
1400	SAMPLE								
<i>Natalie Dowdy</i>									
Stabilization Criteria									
				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW90-GW-121818

Sample Time: 1400

Analysis: See COL

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): 3.71

Field Duplicate ID: FD03-GW-121818

Field Duplicate Time: 1405

Comments: ferrous iron = 0.02

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-115

Field Team: N. Dowdy

Date: 12/20/18

Weather/Temp: RAIN 40/5

Arrival Time: 1320

Well Condition: good

Initial DTW (ft btc):

Purge Method: N/A

Purge Rate⁵: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp. (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
	No GW Parameters collected								
<i>Notable Windy</i>									
(A large diagonal line is drawn across the grid from the bottom-left to the top-right)									
Stabilization Criteria				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW115-GW-122018

Sample Time: 1330

Analysis: See LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): N/A

Field Duplicate ID:

Field Duplicate Time:

Comments: purged dry on 12/20/18

remains IRON = 0.0

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-13s

Field Team: JE

Date: 1/10/19

Weather/Temp: 40°, cloudy

Arrival Time: 1040

Well Condition: good

Initial DTW (ft btc): 10.34

Purge Method: peri pump

Purge Rate⁵: 2200 ml/min

PID reading: Ø

Pump Depth: bottom

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1050	<u>Begin Pumping</u>								
1056	11.70	0	10.05	7.75	0.627	2.0	7.05	71.1	Clear
1101	11.98	0.25	10.07	7.40	0.629	2.2	6.96	81.7	
1106	12.72	0.50	10.09	7.14	0.627	1.7	6.85	88.8	
1111	13.06	0.75	10.08	7.08	0.626	3.4	6.95	91.4	
1116	13.50	1.0	10.09	7.01	0.625	3.0	6.93	94.6	
<i>JE</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW13S-GW-011019

Sample Time: 1115

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.0

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.17 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-140

Field Team: JE

Date: 1/4/19

Weather/Temp: 30° Sunny

Arrival Time: 1200

Well Condition: good

Initial DTW (ft btc): 15.40

Purge Method: bladder pump

Purge Rate⁵: 2200 ml/min

PID reading: Ø

Pump Depth: screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1218	Begin Pumping								
1224	17.48	0	9.08	7.68	0.635	59.8	2.20	-57.9	Clear
1229	17.73	0.25	9.33	7.51	0.648	25.1	0.78	-96.4	
1234	17.60	0.50	9.28	7.36	0.618	16.8	1.09	-88.7	
1239	17.68	0.75	9.23	7.33	0.616	9.9	0.97	-85.4	
1244	17.30	1.00	9.16	7.29	0.609	8.8	1.22	-84.5	
1249		1.25	9.08	7.27	0.609	7.6	1.24	-83.2	
<i>John Li</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW140-6W-011419

Sample Time: 1245

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.53 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-15D
Field Team: N. Dowdy J. Espinoza **Date:** 12/17/18
Weather/Temp: P. Sunny 40's **Arrival Time:** 1245
Well Condition: good **Initial DTW (ft btc):** 85.36
Purge Method: bladder pump **Purge Rate⁵:** 400 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1300	Begin Pumping								
1305	85.36	0.53	10.52	7.39	.544	0	6.63	124.3	—
1310	85.35	1.06	10.54	7.17	.547	0	6.74	124.7	—
1315	85.35	1.59	10.50	7.15	.548	0	6.72	124.1	—
1320	85.35	2.12	10.35	7.14	.546	0	6.72	123.6	—
1325	85.35	2.65	10.30	7.13	.545	0	6.69	124.3	—
1330	85.35	3.18	10.19	7.12	.544	0	6.67	125.1	—
1345	SAMPLE								
<i>Natalie Dowdy</i>									
Stabilization Criteria									
				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW15D-GW-121718 **Sample Time:** 1345
Analysis: See LOC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 3.18
Field Duplicate ID: same MW15D-GW-121718 **Field Duplicate Time:** SAME
Comments: ferrous IRON = 0.0

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-16D

Field Team: N. Dowdy + J. Espinoza

Date: 12/17/18

Weather/Temp: cloudy 40's

Arrival Time: 1015

Well Condition: good

Initial DTW (ft btc): 47.75

Purge Method: bladder pump

Purge Rate⁵: 400 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1020	Begin Pumping								
1025	48.63	0.53	10.42	7.28	0.731	0	6.48	90.1	_____
1030	48.51	1.06	10.45	7.20	0.734	0	6.51	92.7	_____
1035	48.62	1.59	10.46	7.13	0.734	0	6.45	97.3	_____
1040	48.68	2.12	10.48	7.13	0.733	0	6.45	97.9	_____
1045	48.68	2.65	10.47	7.12	0.732	0	6.49	100.1	_____
1050	48.68	3.18	10.43	7.12	0.730	0	6.49	101.9	_____
1100	SAMPLE								
<i>Matahe Dowdy</i>									
Stabilization Criteria									
				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW16D-6W-121718

Sample Time: 1100

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 3.18

Field Duplicate ID: same: MW16D-6W-121718

Field Duplicate Time: _____

Comments: penous IRON = 0.0

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-170
Field Team: N. Dowdy + J. Espinoza **Date:** 12/18/18
Weather/Temp: Rain 40's **Arrival Time:** 1015
Well Condition: good **Initial DTW (ft btc):** 69.6296
Purge Method: bladder pump **Purge Rate⁵:** 400 mL/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1030	<i>Begin Pumping</i>								
1035	66.02	0.53	10.94	8.11	.379	22.3	9.54	-97.6	—
1040	69.09	1.06	11.47	7.90	.392	17.6	1.01	-133.3	—
1045	71.72	1.59	11.66	7.82	.397	4.7	0.58	-143.0	—
1050	75.20	2.12	11.82	7.76	.401	0	0.45	-149.0	—
1055	77.63	2.65	11.82	7.74	.401	0	0.40	-152.3	—
1100	78.19	3.18	11.84	7.72	.402	0	0.39	-155.4	—
1100	<i>SAMPLE</i>								
<i>unstable supply</i>									
<i>(A large diagonal line is drawn across the remaining empty rows of the table.)</i>									
Stabilization Criteria				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW170-GW-121818 **Sample Time:** 1100
Analysis: see COL
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 3.18
Field Duplicate ID: _____ **Field Duplicate Time:** _____
Comments: ferrous iron = 0.61
* all parameters stable except water level *

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-18D

Field Team: - N. Dowdy J. Espinoza

Date: 12/17/18

Weather/Temp: cloudy 40's

Arrival Time: 1115

Well Condition: good

Initial DTW (ft btc): 47.51

Purge Method: bladder pump

Purge Rate⁵: 400 mL/min

Field Parameters ¹																			
Time	DTW	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.										
1120	Begin Pumping																		
1125	47.52	0.53	9.33	7.56	0.454	0	1.67	105.6	_____										
1130	47.55	1.06	9.49	7.54	0.452	0	1.43	102.2	_____										
1135	47.61	1.59	9.50	7.61	0.449	1.2	0.75	85.4	_____										
1140	47.61	2.12	9.54	7.65	0.447	0.6	0.54	71.4	_____										
1145	47.61	2.65	9.61	7.67	0.447	0	0.43	67.8	_____										
1150	47.61	3.18	9.68	7.71	0.447	0	0.35	64.5	_____										
1155	47.61	3.71	9.74	7.71	0.448	0	0.30	63.7	_____										
1200	SAMPLE																		
<i>Maxwell Dowdy</i>																			
<table border="1"> <tr> <td>Stabilization Criteria</td> <td></td> <td></td> <td></td> <td>±0.1 units</td> <td>±3%</td> <td>±10%⁴</td> <td>±0.3 mg/L</td> <td>±10 mV</td> <td></td> </tr> </table>										Stabilization Criteria				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	
Stabilization Criteria				±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV											

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW18D-GW-121718

Sample Time: 1200

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 3.71

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: ferrous IRON = 0.06

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-200

Field Team: JE

Date: 1/15/19

Weather/Temp: 20°, sunny

Arrival Time: 915

Well Condition: good

Initial DTW (ft btc): 92.79

Purge Method: bladder pump

Purge Rate⁵: ~200 ml/min

PID reading: 0

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
924	<u>Begin Pumping</u>								
927	93.61	0	10.20	10.02	1.263	70.3	6.09	90.1	<u>Turbid</u>
932	94.27	0.25	10.53	8.11	1.146	91.1	6.09	132.4	
937	93.93	0.50	10.43	7.84	1.133	35.0	6.03	133.6	
942	93.98	0.75	10.43	7.68	1.123	16.5	6.01	133.3	
947	94.02	1.0	10.47	7.57	1.100	8.6	6.10	131.4	
952	93.98	1.25	10.47	7.56	1.098	7.0	6.22	130.6	
957	93.99	1.50	10.51	7.51	1.088	5.6	6.35	128.6	
<u>JE</u>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW200-GW-011519

Sample Time: 1000

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 150

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.12 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-21D

Field Team: N. Dawdy + J. Espinoza

Date: 12/17/18

Weather/Temp: Cloudy 40's

Arrival Time: 0910

Well Condition: Good

Initial DTW (ft btc): 60.81

Purge Method: bladder pump

Purge Rate⁵: 400 mL/min

Field Parameters ¹									
Time	DTW	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0930	Begin Pumping								
0935	61.05	0.53	9.92	6.71	0.540	0	2.93	141.2	
0940	61.11	1.06	10.07	6.92	0.516	0.3	0.50	26.0	
0945	61.16	1.59	10.06	7.12	0.517	1.2	0.37	-36.8	
0950	61.17	2.12	10.07	7.17	0.516	0	0.32	-38.1	
0955	61.17	2.65	10.09	7.19	0.516	0	0.31	-39.7	
1000	SAMPLE								
<i>stabilize cloudy</i>									
Stabilization Criteria									
				±0.1 units	±3%	±10%	±0.3 mg/L	±10 mV	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW21D-GW-121718

Sample Time: 1000

Analysis: SIL LCL

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.65

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous IRON 0.14

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: out of use Marlow Well No. 2

Field Team: Sunny 50's

Date: 03/20/19

Weather/Temp: N Dowdy

Arrival Time: 1030

Well Condition: good

Initial DTW (ft btc): 41.51

Purge Method: mini monsoon pump

Purge Rate⁵: N/A**

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1055	Begin Pumping								
1100	42.26	2.5	10.31	7.87	.404	107	—*	-89.7	cloudy
1105	42.39	5.0	10.34	7.97	.405	84.9	—	-116	
1110	42.39	7.5	10.38	8.06	.405	50.1	—	-126	
1115	42.39	10.0	10.39	8.11	.403	47.4	—	-124	
1120	42.39	12.5	10.39	8.16	.399	46.2	—	-120	
1120	collect sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: No. 2 - GW - 032019

Sample Time: 1120

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 12.5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Penous IRON = 1.84 mg/L

* DO reading 0.00 mg/L

** Estimated flow @ 0.5 gal/min, variable flow w/ pump

Groundwater Purging and Sampling Form



out-of-use Marlow well

SITE: UPRR Freeman

Well ID: W20

Field Team: N. Dowdy

Date: 03/19/19

Weather/Temp: Sunny 40's

Arrival Time: 1150

Well Condition: good

Initial DTW (ft btc): 15.85

Purge Method: peristaltic pump

Purge Rate⁵: 300 ml/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹										
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.	
1200	Begin Pumping									
1205	15.92	0.3	8.87	8.48	.161	10.7	— *	47.7	CLEAR	
1210	15.95	0.6	8.55	8.60	.156	9.3	—	15.1		
1215	15.95	0.9	8.45	8.55	.155	6.4	—	9.2		
1220	15.95	1.2	8.45	8.53	.154	3.1	—	-4.5		
1225	15.95	1.5	8.48	8.51	.154	0	—	-5.4		
1230	15.95	1.8	8.47	8.51	.154	0	—	-7.2		
1235	—	2.1	Collect Sample							
<i>Natalie Dowdy</i>										
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W20-GW-031919

Sample Time: 1235

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.1

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Remous IRON = 0.08 mg/L
*DO reading 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: W-26

Field Team: N. Dowdy

Date: 03/20/19

Weather/Temp: Sunny 40's

Arrival Time: 0900

Well Condition: good

Initial DTW (ft btc): 65.60

Purge Method: monsoon pump

Purge Rate⁵: N/A**

PID reading: _____

Pump Depth: N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0935	Begin Pumping								
0940	65.82	~2.5	10.97	7.87	.286	0	—*	192	Clear
0945	65.82	~5.0	11.12	8.33	.285	0	—	179	
0950	65.82	~7.5	11.15	8.29	.285	0	—	167	
0955	65.82	~10.0	11.16	8.17	.284	0	—	166	
1000	65.82	~12.5	11.20	8.15	.284	0	—	164	
1000	Collect Sample								
<i>Matalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W26-GW-032019

Sample Time: 1000

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 12.5

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: ferrous IRON = 0.0 mg/L
* DO reading 0.00 mg/L
** Variable flow rate est @ 0.5 GPM

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-1D
Field Team: N. Dowdy **Date:** 03/18/19
Weather/Temp: Sunny 40's **Arrival Time:** 1200
Well Condition: good **Initial DTW (ft btc):** 20.55
Purge Method: bladder pump **Purge Rate⁵:** 300 mL/min
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1205	<i>Begin Pumping</i>								
1210	23.49	0.3	10.51	6.99	0.332	17.4	0.00*	48.8	Clear
1215	26.58	0.6	10.48	6.79	0.330	12.8	" "	63.8	
1220	27.35	0.9	10.44	6.74	0.330	10.3	" "	67.3	
1225	27.72	1.2	10.43	6.67	0.329	7.4	" "	74.7	
1230	28.11	1.5	10.47	6.64	0.329	3.8	" "	79.4	
1235	28.27	1.8	10.48	6.63	0.328	0.0	" "	79.8	
1300	<i>Collect Sample</i>								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW1D-6W-031819 **Sample Time:** 1300
Analysis: See LOC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.8
Field Duplicate ID: _____ **Field Duplicate Time:** _____
Comments: ferrous IRON = 0.12 mg/L
* DO reading 0.00

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-15

Field Team: N. Dowdy

Date: 03/13/19

Weather/Temp: Sunny 30's

Arrival Time: 1310

Well Condition: good

Initial DTW (ft btc):

Purge Method: bailed

Purge Rate⁵:

PID reading:

Pump Depth:

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1325	—	—	12.89	6.86	.873	13.8	3.50	73.2	
<i>Natalie Dowdy</i>									
<i>(A diagonal line is drawn across the remaining empty rows of the table.)</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW15-gw-031319

Sample Time: 1330

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):**

Field Duplicate ID: **Field Duplicate Time:**

Comments: Well bailed dry on 03/12/19
ferrous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-2D

Field Team: N. Dowdy

Date: 03/18/19

Weather/Temp: Sunny 3015

Arrival Time: 1100

Well Condition: good

Initial DTW (ft btc): 29.63

Purge Method: bladder pump

Purge Rate⁵: 300 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1115	Begin Pumping								
1120	32.51	0.3	10.55	6.81	.361	27.4	0.00*	24.2	Clear
1125	33.62	0.6	10.64	6.74	.289	13.8	" "	-1.3	
1130	34.58	0.9	10.64	6.74	.288	7.3	" "	-7.3	
1135	34.59	1.2	10.65	6.82	.289	0.0	" "	-11.4	
1140	34.59	1.5	10.79	6.87	.296	0.0	" "	-13.6	
1145	Collect Sample								
<i>N. Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW20-GW-031819

Sample Time: 1145

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.8

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous iron = 1.81 mg/L

* DO still reading 0.00 after recalibrating

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-30
Field Team: N. Dowdy S. Espinoza **Date:** 03/15/19
Weather/Temp: P. Cloudy 30's **Arrival Time:** 1040
Well Condition: good **Initial DTW (ft btc):** 30.16
Purge Method: bladder **Purge Rate⁵:** 350 mL/min
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1050	Begin Pumping								
1055	33.76	0.3	11.08	7.26	.306	4.5	6.13	28.1	
1100	34.81	0.6	11.31	7.06	.296	2.0	7.20	28.2	
1105	35.62	0.9	11.15	6.98	.290	0.7	7.63	52.5	
1110	35.71	1.2	10.85	6.94	.283	0.1	7.74	57.3	
1115	35.72	1.5	10.89	6.91	.287	0.2	7.78	59.1	
1115	collect sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW30-GW-031519 **Sample Time:** 1115
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.5
Field Duplicate ID: FD3-GW-031519 **Field Duplicate Time:** 1120
Comments: ferrous iron = 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-4D

Field Team: N. Dowdy

Date: 03/19/19

Weather/Temp: Sunny 50's

Arrival Time: 1347

Well Condition: good

Initial DTW (ft btc): 105.30

Purge Method: bladder pump

Purge Rate⁵: 250mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1400	Begin Pumping								
1405	106.54	0.3	9.64	8.23	.389	37.9	—*	-10.4	cloudy
1410	106.54	0.6	9.90	7.67	.298	56.4	—	-65.9	
1415	106.54	0.9	10.00	7.63	.293	57.9	—	-63.2	
1420	106.54	1.2	9.99	7.60	.290	58.3	—	-60.1	
1425	Collect Sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW4D-GW-031919

Sample Time: 1425

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.2

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous IRON = 0.25 mg/L

* DO reading 0.00 mg/L

Turbidity is not > 10 NTUs but within 10%

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-5D
Field Team: N. Dowdy **Date:** 03/18/19
Weather/Temp: Sunny 40's **Arrival Time:** 1340
Well Condition: good **Initial DTW (ft btc):** 62.43
Purge Method: bladder pump **Purge Rate⁵:** 300 mL/min
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1400	Begin Pumping								
1405	63.06	0.3	13.38	7.62	.361	0.0	0.00*	77.7	Clear
1410	63.06	0.6	13.04	7.49	.361	0.0	0.00	83.9	
1415	63.06	0.9	12.91	7.44	.360	0	0.00	90.3	
1420	63.06	1.2	12.86	7.40	.358	0	0.00	96.4	
1425	63.06	1.5	12.79	7.41	.358	0	0.00	97.2	
1430	Collect Sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW5D-GW-031819 **Sample Time:** 1430
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.8
Field Duplicate ID: _____ **Field Duplicate Time:** _____
Comments: fecous brown = 0.10 mg/l
* DO reading 0.00

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-6D

Field Team: ND + JE

Date: 03/14/19

Weather/Temp: Sunny 40's

Arrival Time: _____

Well Condition: good

Initial DTW (ft btc): 121.33

Purge Method: bladder pump

Purge Rate⁵: 300 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1530	Begin Pumping								
1535	121.36	0.3	9.48	7.36	.370	0	7.12	90.4	Clear
1540	121.36	0.6	9.81	7.31	.367	0	4.72	92.8	
1545	121.36	0.9	9.86	7.25	.366	0	3.84	98.6	
1550	121.36	1.2	9.87	7.25	.366	0	3.72	99.9	
1555	121.36	1.5	9.91	7.23	.367	0	3.68	102.8	
1600	Collect Sample								
<i>metabolic activity</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW6D-GW-031419

Sample Time: 1600

Analysis: See LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.8

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-65
Field Team: N. Dowdy **Date:** 03/13/19
Weather/Temp: Sunny 30's **Arrival Time:** 1410
Well Condition: good **Initial DTW (ft btc):** _____
Purge Method: bailed **Purge Rate⁵:** _____
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1425	—	—	11.24	8.12	0.286	4.3	8.12	74.1	Clear
<i>Natalie Dowdy</i>									
Stabilization Criteria ³									
	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW65-GW-031319 **Sample Time:** 1430
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** _____
Field Duplicate ID: _____ **Field Duplicate Time:** _____
Comments: Well purged dry on 3/12/19
lemons 120W = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-6U

Field Team: ND + JE

Date: 03/14/19

Weather/Temp: Sunny 40's

Arrival Time: 1405

Well Condition: good

Initial DTW (ft btc): 37.66

Purge Method: bladder pump

Purge Rate⁵: 350 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1420	Begin Pumping								
1425	37.72	.3	10.42	7.73	.409	15.4	7.74	56.9	
1430	37.72	.6	9.32	7.19	.420	15.8	7.70	75.3	
1435	37.72	.9	9.14	7.14	10.361	22.9	8.02	91.0	
1440	37.72	1.2	9.13	7.14	0.364	18.3	8.00	92.6	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW6U-GW-031419

Sample Time: 1445

Analysis: See LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: traceous IRON = 0.00 mg/l

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-7S

Field Team: N. Dowdy

Date: 03/13/19

Weather/Temp: Sunny 30's

Arrival Time: 1240

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: _____

Purge Rate⁵: _____

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1255	_____	_____	9.06	7.17	0.553	9.7	2.46	80.2	
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW7S-GW-031319

Sample Time: 1300

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): _____

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: well bailed dry on 03/12/19

ferric IRON = 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-85

Field Team: N. Dowdy

Date: 03/13/19

Weather/Temp: Sunny 30's

Arrival Time: 1210

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: bailed

Purge Rate⁵: _____

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1225	_____	_____	12.10	6.90	0.399	4.0	5.35	60.6	
<i>M. Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW85-GW-031319

Sample Time: 1230

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** _____

Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: Well purged dry on 03/12/19
ferrous iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-9D

Field Team: N. Dowdy + J. Espinoza

Date: 03/15/19

Weather/Temp: P. Sunny 3015

Arrival Time: 0930

Well Condition: good

Initial DTW (ft btc): 31.54

Purge Method: bladder pump

Purge Rate⁵: 300mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0940	Begin Pumping								
0945	31.92	0.3	11.27	7.00	0.491	0	7.17	110.4	clear
0950	31.94	0.6	11.36	6.93	0.480	0	7.33	113.3	
0955	31.80	0.9	11.41	6.86	0.463	0	7.54	118.8	
1000	31.80	1.2	11.47	6.82	0.458	0	7.62	122.5	
1005	31.80	1.5	11.51	6.81	0.455	0	7.65	124.3	
1010	31.80	1.8	11.47	6.81	0.453	0	7.69	125.4	
1015	collect sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW9D-GW-031519

Sample Time: 1015

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.1

Field Duplicate ID: FD2-GW-031519

Field Duplicate Time: 1020

Comments: ferrous iron = 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freedom **Well ID:** MW-90
Field Team: N. Dowdy J. Espinoza **Date:** 03/15/19
Weather/Temp: P. cloudy 30's **Arrival Time:** 0825
Well Condition: good **Initial DTW (ft btc):** 30.60
Purge Method: bladder pump **Purge Rate⁵:** 350 mL/min
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0835	Begin Pumping								
0840	30.62	0.3	10.52	7.11	1.504	58.1	3.99	40.2	Some turbidity
0845	30.62	0.6	10.83	6.80	1.435	45.5	3.59	70.0	
0850	30.62	0.9	11.03	6.70	1.319	25.0	3.52	80.1	
0855	30.62	1.2	11.02	6.69	1.302	12.0	3.57	79.8	
0900	30.62	1.5	11.01	6.67	1.300	5.5	3.55	80.2	
0900	Collect sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW90-GW-031519 **Sample Time:** 0900
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.5
Field Duplicate ID: FDI-GW-031519 **Field Duplicate Time:** 0905
Comments: feces iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-115

Field Team: N. Dowdy

Date: 03/13/19

Weather/Temp: Sunny 25°

Arrival Time: 1015

Well Condition: good

Initial DTW (ft btc):

Purge Method: bailed

Purge Rate⁵:

PID reading:

Pump Depth:

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1020	—	—	10.24	8.56	.403	3.9	7.16	30.8	
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW115-GW-031319

Sample Time: 1030

Analysis: See coc

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):**

Field Duplicate ID: **Field Duplicate Time:**

Comments: * well purged dry on 3/12/19
ferrous iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-135

Field Team: N. Dowdy

Date: 03/19/19

Weather/Temp: Sunny 50/5

Arrival Time: 1535

Well Condition: good

Initial DTW (ft btc): 9.46

Purge Method: peristaltic pump

Purge Rate⁵: 250 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1545	Begin Pumping								
1550	11.12	0.3	11.63	7.82	290	0	—*	37.7	clear
1555	12.27	0.6	10.80	7.24	285	0	—	43.8	
1600	12.65	0.9	10.64	7.17	279	0	—	47.1	
1605	13.09	1.2	10.59	7.13	279	0	—	49.3	
1610	13.49	1.5	10.54	7.10	280	0	—	53.2	
1615	Collect Sample								
<i>Mattie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW135-GW-031919

Sample Time: 1615

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.8

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Removal Iron = 0.03 mg/L

*DO Reading 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-14D

Field Team: N. Dowdy

Date: 03/18/19

Weather/Temp: Sunny 30's

Arrival Time: 0930

Well Condition: good

Initial DTW (ft btc): 14.68

Purge Method: bladder pump

Purge Rate⁵: 300mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0950	Begin Pumping								
0955	15.37	0.3	8.59	7.61	.413	22.7	32.5 ^{32.5}	31.1	Clear
1000	16.70	0.6	10.16	7.47	.290	23.1	0.00*	-75.1	
1005	16.92	0.9	10.39	7.05	.256	20.1	0.00*	-61.0	
1010	16.98	1.2	10.46	6.97	.246	14.3	0.00*	-57.2	
1015	17.02	1.5	10.45	6.94	.242	8.7	0.00	-55.3	
1015	collect Sample								
<i>N. Dowdy</i>									
Stabilization Criteria ³	-	-	-	±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW14D-GW-03/18/19

Sample Time: 1015

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: fecus IRON = 0.01 mg/L
* DO sensor not working properly, will calibrate @ next well, sensor is reading 0.00

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-15D
Field Team: JD + JE **Date:** 03/14/19
Weather/Temp: Sunny 30'S **Arrival Time:** 1010
Well Condition: good **Initial DTW (ft btc):** 83.41
Purge Method: bladder pump **Purge Rate⁵:** 350 mL/min
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1040	Begin Pumping								
1045	83.40	.3	9.47	7.76	.390	0.8	9.17	189.1	Clear
1050	83.40	.6	8.95	7.66	.388	0	6.73	184.9	
1055	83.41	.9	8.23	7.61	.381	0	6.72	181.5	
1100	83.41	1.2	7.71	7.60	.376	0	6.76	179.0	
1100	collect sample								
<i>Instable Dandy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW15D-6W-031419 **Sample Time:** 1100

Analysis: See LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.2

Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: penous IRON = 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-16D
Field Team: N. Dowdy **Date:** 3/19/19
Weather/Temp: Sunny 40's **Arrival Time:** 0840
Well Condition: good **Initial DTW (ft btc):** 46.58
Purge Method: bladder pump **Purge Rate⁵:** 300mL/min
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0850	Begin Pumping								
0855	46.67	0.3	9.32	8.33	.673	0.0	0.0*	213	CLEAR
0900	46.74	0.6	9.36	8.10	.518	0	0.0*	194	
0905	46.83	0.9	8.96	7.86	.498	0	0.0*	184	
0910	46.83	1.2	9.20	7.79	.493	0	0.0*	177.6	
0915	46.83	1.5	9.32	7.71	.493	0	0.0*	172.4	
0920	46.83	1.8	9.32	7.70	.494	0	0.0*	169.3	
0920	Collect Sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW16D-GW-031919 **Sample Time:** 0920
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.8
Field Duplicate ID: _____ **Field Duplicate Time:** _____
Comments: ferrous iron = 0.00 mg/L
* DO reading 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR

Well ID: MW-17D

Field Team: N. Dowdy

Date: 03/20/19

Weather/Temp: Sunny 50's

Arrival Time: 1200

Well Condition: good

Initial DTW (ft btc): 62.90

Purge Method: bladder pump

Purge Rate⁵: 350 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1230	Begin Pumping								
1235	65.20	0.3	12.32	7.88	.541	20.9	—*	-71.1	cloudy
1240	67.56	0.6	12.06	7.63	.530	18.2	—	-103	
1245	68.98	0.9	12.00	7.52	.524	15.7	—	-113	clearing up
1250	71.15	1.2	12.00	7.50	.524	17.3	—	-114	
1255	73.11	1.5	12.01	7.51	.523	19.7	—	-120	cloudy
1300	74.64	1.8	12.05	7.51	.524	17.1	—	-122	
1300	Collect Sample								
<i>N. Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW17D-GW-032019

Sample Time: 1300

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.8

Field Duplicate ID: FD4-GW-032019

Field Duplicate Time: 1305

Comments: Ferrous Iron = 0.62 mg/L
* DO reading 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-18D

Field Team: N. Dowdy

Date: 03/19/19

Weather/Temp: Sunny 40's

Arrival Time: 0950

Well Condition: good

Initial DTW (ft btc): 45.08

Purge Method: bladder pump

Purge Rate⁵: 300 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1005	<i>Begin Pumping</i>								
1010	45.16	0.3	9.47	8.13	.291	0	—*	139.7	CLEAR
1015	45.20	0.6	9.79	8.43	.289	0	—	124.5	
1020	45.20	0.9	10.12	8.35	.285	0	—	71.6	
1025	45.20	1.2	10.14	8.35	.284	0	—	52.4	
1030	45.20	1.5	9.94	8.35	.284	0	—	47.6	
1035	45.20	1.8	9.90	8.34	.284	0	—	45.2	
1035	<i>Collect Sample</i>								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW18D-GW-031919

Sample Time: 1035

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.8

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous IRON = 0.19 mg/L
* DO reading 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-19D

Field Team: N. Dowdy

Date: 03/20/19

Weather/Temp: Sunny 60's

Arrival Time: 1340

Well Condition: good

Initial DTW (ft btc): 56.96

Purge Method: bladder pump

Purge Rate⁵: 350 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1400	Begin Pumping								
1405	57.16	0.3	10.02	8.60	.384	9.8	—*	8.5	clear
1410	57.16	0.6	9.94	8.16	.380	8.4	—	24.8	
1415	57.16	0.9	9.55	7.87	.381	5.1	—	34.4	
1420	57.16	1.2	9.42	7.81	.380	0	—	39.7	
1425	57.16	1.5	9.39	7.80	.380	0	—	43.1	
1445	Collect Sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW19D-GW-032019

Sample Time: 1445

Analysis: See LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 1.5

Field Duplicate ID: FD5-GW-032019 Field Duplicate Time: 1450

Comments: Ferrous IRON = 0.03 mg/L

* DO reading 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-20D
Field Team: N. Dowdy + J. Espinoza **Date:** 03/15/19
Weather/Temp: P. Sunny 30's **Arrival Time:** 1203
Well Condition: good **Initial DTW (ft btc):** 93.09
Purge Method: bladder **Purge Rate⁵:** 350 mL/min
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1235	Begin Pumping								
1240	94.12	0.3	10.32	7.54	.518	14.6	6.71	86.5	
1245	94.17	0.6	10.55	7.37	.525	37.3	6.02	89.4	
1250	94.17	0.9	10.57	7.33	.525	11.5	5.95	92.3	
1255	94.17	1.2	10.62	7.30	.525	3.6	5.90	94.3	
1300	94.17	1.5	10.67	7.29	.524	0.9	5.88	95.6	
1300	Collect + Sample								
<i>Neutralize + Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW20D-GW-031519 **Sample Time:** 1300
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.5
Field Duplicate ID: _____ **Field Duplicate Time:** _____
Comments: ferric iron = 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: JPRR Freeman

Well ID: MW-21D

Field Team: ND + JE

Date: 03/14/19

Weather/Temp: Sunny 40°

Arrival Time: 1140

Well Condition: good

Initial DTW (ft btc): 58.68

Purge Method: bladder pump

Purge Rate⁵: 350 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1230	Begin Pumping								
1235	58.92	.3	9.94	8.06	.339	0	1.29	66.8	Clear
1240	59.01	.6	9.99	7.97	.333	0	0.72	-43.9	
1245	59.01	.9	9.79	7.95	.334	0	0.57	-47.4	
1250	59.01	1.2	9.96	7.96	.331	0	0.51	-49.2	
1255	Collect Sample								
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW21D-GW-031419

Sample Time: 1300

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.8

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-255

Field Team: N. Dowdy

Date: 03/13/19

Weather/Temp: Sunny 30's

Arrival Time: 1105

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: bailed

Purge Rate⁵: _____

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1125	_____	_____	13.88	7.08	4.338	11.2	8.01	60.2	
<i>Natalie Dowdy</i>									
<div style="display: flex; justify-content: space-between;"> Stabilization Criteria³ - - - ± 0.1 units ± 3% ± 10%⁴ ± 0.3 mg/L ± 10 mV - </div>									

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW255-GW-031319

Sample Time: 1130

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): _____

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: well purged dry on 03/12/19
ferrous iron = 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** Asher
Field Team: N. Dowdy **Date:** 03/21/19
Weather/Temp: Sunny 40's **Arrival Time:** 1000
Well Condition: good **Initial DTW (ft btc):** _____
Purge Method: _____ **Purge Rate⁵:** _____
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
1010	—	5	13.26	7.31	.451	0	—	77.5	Clear
<i>Mattale Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Asher - GW - 032119 **Sample Time:** 1015
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 5
Field Duplicate ID: same as above **Field Duplicate Time:** 1015
Comments: ferrous IRON = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Atwood home +

Field Team: N. Dowdy

Date: 03/21/19 Shop

Weather/Temp: Sunny 40's

Arrival Time: 1045

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: _____

Purge Rate⁵: _____

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
1105	—	5	9.59	7.19	.255	0	—	91.8	clear
<i>Natalie Dowdy</i>									
1115	—	5	7.92	7.65	.269	0	—	116.5	clear
<i>Natalie Dowdy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood - 6W - 032119

Sample Time: 1110
1120

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5 + 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: ferrous IRON HOME = 0.00 mg/L
" " Shop = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: LANG

Field Team: N. Dowdy

Date: 03/21/19

Weather/Temp: Sunny 40's

Arrival Time: 1320

Well Condition: good

Initial DTW (ft btc):

Purge Method:

Purge Rate⁵:

PID reading:

Pump Depth:

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
<u>1325</u>	<u> </u>	<u>5</u>	<u>12.09</u>	<u>8.11</u>	<u>.327</u>	<u>8.1</u>	<u> </u>	<u>90.8</u>	<u>clear</u>
<i>Natalie Dowdy</i>									
(A large diagonal line is drawn across the remaining empty rows of the table.)									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lang-gw-032119

Sample Time: 1330

Analysis: See COS

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID:

Field Duplicate Time:

Comments: Penous, 120N = 0.00mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** Randall
Field Team: N. Dowdy **Date:** 03/21/19
Weather/Temp: Sunny 50's **Arrival Time:** 1445
Well Condition: good **Initial DTW (ft btc):** _____
Purge Method: _____ **Purge Rate⁵:** _____
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
1455	—	5	15.6	7.47	344	1.3	—	142.2	Clear
<i>Natalie Dowdy</i>									
<div style="display: flex; justify-content: space-between;"> <div> Stabilization Criteria³ - - - ± 0.1 units ± 3% ± 10%⁴ ± 0.3 mg/L ± 10 mV - </div> </div>									

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Randall-GW-032119 **Sample Time:** 1500
Analysis: See COC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 5
Field Duplicate ID: _____ **Field Duplicate Time:** _____
Comments: penous iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Reed

Field Team: N. Dowdy

Date: 03/21/19

Weather/Temp: Sunny 50s

Arrival Time: 1250

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: _____

Purge Rate⁵: _____

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
<u>1350</u>	—	<u>5</u>	<u>10.31</u>	<u>7.95</u>	<u>248</u>	<u>6.1</u>	—	<u>99.3</u>	<u>clear</u>
<i>Mattie Dowdy</i>									
Stabilization Criteria ³									
	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Reed-GW-032119

Sample Time: 1400

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Remous 1 Row = 0.01 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** Stark
Field Team: N. Dowdy **Date:** 03/21/19
Weather/Temp: Sunny 50's **Arrival Time:** 1235
Well Condition: good **Initial DTW (ft btc):** _____
Purge Method: _____ **Purge Rate⁵:** _____
PID reading: _____ **Pump Depth:** _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
<u>1240</u>	—	<u>5</u>	<u>7.47</u>	<u>8.13</u>	<u>.318</u>	<u>0</u>	—	<u>77.5</u>	<u>clear</u>
<i>Mattale Dowdy</i>									
Stabilization Criteria ³									
	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Stark-GW-032119 **Sample Time:** 1245
Analysis: See LOC
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 5
Field Duplicate ID: Same as above **Field Duplicate Time:** 1245
Comments: ferrous IRON = 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: Thorson

Field Team: N. Dowdy

Date: 03/21/19

Weather/Temp: Sunny 40°S

Arrival Time: 1140

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: _____

Purge Rate⁵: _____

PID reading: _____

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1155	—	5	10.93	7.82	.250	0	—	-16.7	Clear
<i>Natalie Dowdy</i>									
<div style="border: 1px solid black; width: 100%; height: 100%; transform: rotate(-45deg); opacity: 0.5; pointer-events: none;"> Natalie Dowdy </div>									
Stabilization Criteria³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Thorson-GW-032119

Sample Time: 1200

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 5

Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: ferrous IRON = 0.95 mg/l

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-1D

Field Team: ND, ICS

Date: 6/26/19

Weather/Temp: 60°, cloudy

Arrival Time: 0720

Well Condition: Good

Initial DTW (ft btc): 17.96

Purge Method: low flow

Purge Rate⁵: 300 mL/min

PID reading: —

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0735	<u>Begin Pumping 0.35</u>								
0740	20.08	1.50	11.50	6.78	0.563	10.8	5.05	204.3	
0745	21.09	0.70	11.17	6.82	0.393	3.4	4.95	210.4	
0750	21.72	1.05	11.12	6.83	0.329	0.0	5.20	210.2	
0755	22.63	1.40	11.18	6.83	0.385	0.0	5.17	208.5	
0800	23.19	1.75	11.13	6.84	0.384	0.0	4.93	207.9	
0805	<u>collected samples</u>								
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW1D-GW-062619

Sample Time: 0805

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.75

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.04 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-3D

Field Team: ND, KS

Date: 6/26/19

Weather/Temp: 70°, sunny

Arrival Time: 1400

Well Condition: Good

Initial DTW (ft btc): 27.03

Purge Method: low flow

Purge Rate⁵: 300 mL/min

PID reading: -

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1410	Begin Pumping								
1415	29.44	0.35	17.60	6.97	0.302	0.0	6.86	79.8	
1420	30.69	0.70	14.54	6.71	0.313	208.3	5.92	83.6	
1425	31.45	1.05	14.22	6.71	0.319	162.1	6.72	44.3	
1430	31.84	1.40	14.38	6.71	0.299	89.5	7.40	45.4	
1435	32.22	1.75	14.20	6.72	0.289	28.8	7.82	73.0	
1440	32.44	2.10	14.15	6.73	0.286	14.7	7.84	86.6	
1445	32.44	2.45	14.08	6.73	0.285	11.4	7.89	92.9	
1450	32.44	2.80	14.16	6.73	0.285	4.2	7.93	90.1	
1455	Collect Sample								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW3D-GW-062619

Sample Time: 1455

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.80

Field Duplicate ID: FD3-GW-062619

Field Duplicate Time: 1200

Comments: Ferrus Iron = 0.05 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-4D

Field Team: ND, KS

Date: 6/26/19

Weather/Temp: 70°, Sunny

Arrival Time: 1250

Well Condition: Good

Initial DTW (ft btc): 106.56

Purge Method: Low flow

Purge Rate⁵: 300 mL/min

PID reading: —

Pump Depth: _____

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1300	Begin Pumping								
1305	107.32	0.35	18.40	7.08	0.169	220.4	7.67	197	
1310	107.21	0.70	15.41	6.71	0.177	314.7	5.72	-36.5	
1315	107.36	1.05	13.91	6.58	0.226	316.6	4.12	-54.2	
1320	107.56	1.40	13.39	6.61	0.225	261.4	1.58	-68.8	
1325	107.71	1.75	13.87	6.64	0.231	214.1	1.18	-74.8	
1330	107.71	2.10	13.76	6.68	0.247	116.4	0.97	-84.1	
1335	107.71	2.45	13.77	6.70	0.252	101.8	0.97	-83.3	
1340	Samples collected								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW4D-GW-062619

Sample Time: 1340

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.45

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 3.30 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-5D

Field Team: ND, KS

Date: 6/25/19

Weather/Temp: 70°, sunny

Arrival Time: 0845

Well Condition: Good

Initial DTW (ft btc): 61.74

Purge Method: low flow

Purge Rate⁵: 300 mL/min

PID reading: -

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0850	Begin Pumping								
0900	62.31	0.35	14.93	7.19	0.430	0.0	9.31	91.6	
0905	62.30	0.70	14.57	7.12	0.426	0.0	8.84	100.4	
0910	62.35	1.05	14.42	7.09	0.425	0.0	9.05	108.6	
0915	62.35	1.40	14.35	7.12	0.424	0.0	9.75	114.8	
0920	62.35	1.75	14.38	7.12	0.423	0.0	9.21	116.0	
0925	62.35	2.10	14.34	7.13	0.423	0.0	8.74	118.4	
0930	62.35	2.45	14.33	7.13	0.423	0.0	9.71	120.8	
0935	Samples Collected								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MWSD-GW-062519

Sample Time: 9:35

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.45

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.016 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-6U

Field Team: ND KS

Date: 6/26/19

Weather/Temp: 70°, Sunny

Arrival Time: 1030

Well Condition: Good

Initial DTW (ft btc): 36.72

Purge Method: Low flow

Purge Rate⁵: 300 ml/min

PID reading: —

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1055	Begin Pumping								
1100	36.93	0.35	12.90	6.69	0.523	353.1	4.04	147.4	
1105	36.85	0.70	13.71	6.69	0.522	159.2	4.09	147.3	
1110	36.73	1.05	15.31	6.71	0.525	152.0	4.13	146.8	
1115	36.73	1.40	14.74	6.71	0.523	118.2	4.18	147.5	
1120	36.73	1.75	16.21	6.74	0.514	94.9	4.08	146.8	
1125	36.73	2.10	12.45	6.72	0.512	175.0	4.45	145.9	
1130	36.73	2.45	13.67	6.71	0.515	118.5	4.32	148.7	
1135	36.73	2.80	14.66	6.73	0.516	122.3	4.16	148.4	
1140	36.73	3.15	14.82	6.73	0.518	123.8	4.15	148.7	
collected samples @ 1145									

Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW6U-GW-062619

Sample Time: 1145

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 3.15

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.15 mg/L

Pressure hose for pump broke, not enough flow to collect MS/MSD samples here

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-9D

Field Team: ND, KS

Date: 6/24/19

Weather/Temp: 70°, cloudy

Arrival Time: 1420

Well Condition: Good

Initial DTW (ft btc): 30.59

Purge Method: low flow

Purge Rate⁵: 300 mL/min

PID reading: —

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1430	Begin Pumping								
1435	30.69	0.35	14.02	6.86	0.501	5.6	7.08	221.9	
1440	30.67	0.70	14.14	6.76	0.492	3.9	7.25	225.3	
1445 1510	30.93	0.105	12.79	6.73	0.483	2.6	7.48	230.4	
1515	30.92	1.40	12.80	6.75	0.482	0.1	7.74	228.8	
1520	30.93	1.75	12.47	6.78	0.480	0.0	8.02	227.4	
1525	31.03 30.92	2.10	12.45	6.78	0.480	0.0	8.17	227.5	
1530	30.99	2.45	12.41	6.78	0.480	0.0	7.96	227.8	
1535	Collected samples								
<i>rest</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW9D-GW-062419

Sample Time: 1835 1535

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.45

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrus Iron = 0.0 mg/L
1440-~~1510~~¹⁵⁰⁰ the Geotech Control unit wasn't functioning,
Continued taking readings 1510

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-90

Field Team: ND, KS

Date: 6/24/19

Weather/Temp: 70° cloudy

Arrival Time: 1120

Well Condition: Good

Initial DTW (ft btc): 29.71

Purge Method: Low flow

Purge Rate⁵: 300 mL/min

PID reading: ---

Pump Depth: ---

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1130	Begin Pumping								
1135	31.72	0.35	14.03	6.75	0.638	154.2	6.29	207.9	
1140	31.75	0.70	14.42	6.78	0.560	161.9	6.64	206.5	
1145	31.74	1.05	14.03	6.79	0.508	81.6	6.90	207.0	
1150	31.75	1.40	14.15	6.80	0.504	64.1	6.89	208.0	
1155	29.73	1.75	14.69	6.81	0.507	57.7	6.75	209.4	
1200	29.73	2.10	15.40	6.81	0.504	50.3	6.69	209.6	
1205	29.73	2.45	15.51	6.78	0.502	44.1	6.62	209.1	
1210	29.73	2.80	15.96	6.80	0.501	36.5	6.41	209.6	
1215	29.73	3.15	16.42	6.81	0.500	38.4	6.33	209.4	
1220	29.73	3.50	16.82	6.81	0.500	39.3	6.15	209.5	
1225	collected samples								
KIP & P									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW90-GW-062419

Sample Time: 1225

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 3.50

Field Duplicate ID: FDI-GW-062419

Field Duplicate Time: 1230

Comments: Ferrous Iron = 0.07 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-105

Field Team: ND, KS

Date: 6/27/19

Weather/Temp: 60° cloudy

Arrival Time: 0900

Well Condition: Good

Initial DTW (ft btc): —

Purge Method: Bailed

Purge Rate⁵: —

PID reading: —

Pump Depth: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
0910	—	—	12.19	7.36	.580	32.7	8.44	168.9	
<i>Mistake Upwardly</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW105-GW-062719

Sample Time: 0915

Analysis: see C0C

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): —

Field Duplicate ID: —

Field Duplicate Time: —

Comments: Ferrous Iron = 0.00 mg/L
Bailed 6/26/19

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-16D

Field Team: ND, K.S

Date: 6/25/19

Weather/Temp: 70° sunny

Arrival Time: 1235

Well Condition: Good

Initial DTW (ft btc): 45.50

Purge Method: Low flow

Purge Rate⁵: 300 mL/min

PID reading: —

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1245	Begin Pumping								
1250	46.08	0.35	11.61	7.07	0.566	0.0	5.70	108.7	
1255	45.92	0.70	11.19	6.97	0.565	0.0	6.47	121.0	
1300	45.92	1.05	11.30	7.01	0.566	0.0	6.57	123.7	
1305	45.92	1.40	11.28	7.02	0.568	0.0	6.65	126.7	
1310	45.92	1.75	11.32	7.02	0.567	0.0	6.59	129.6	
1315	collected samples								
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW16D-GW-062519

Sample Time: 1315

Analysis: See COL

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.75

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-17D

Field Team: ND, KS

Date: 6/25/19

Weather/Temp: 70', sunny

Arrival Time: 0725

Well Condition: Good

Initial DTW (ft btc): 62.36

Purge Method: low flow

Purge Rate⁵: 300 mL/min

PID reading: —

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0735	Begin Pumping								
0740	64.61	0.35	13.20	7.13	0.740	2.2	4.00	207.7	
0745	65.79	0.70	12.91	7.15	0.682	22.4	2.02	85.4	
0750	65.79	1.05	12.75	7.04	0.629	50.9	0.99	-54.6	
0755	68.11	1.40	12.68	6.98	0.570	38.0	0.49	-93.0	
0800	69.90	1.75	12.72	6.99	0.563	18.0	0.36	-110.7	
0805	71.14	2.10	12.74	7.00	0.566	6.4	0.29	-120.3	
0810	72.81	2.45	12.76	6.99	0.436	4.4	0.23	-128.9	
0815	73.93	2.80	12.77	6.99	0.568	3.8	0.22	-132.4	
0820	75.40	3.15	12.85	6.98	0.567	6.8	0.24	-128.4	
0825	Collected samples								
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW17D - GW - 062519

Sample Time: 0825

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 3.15

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.52 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-18D

Field Team: ND, KS

Date: 6/25/19

Weather/Temp: 70°, sunny

Arrival Time: 1330

Well Condition: Good

Initial DTW (ft btc): 45.42

Purge Method: low flow

Purge Rate⁵: 300 mL/min

PID reading: —

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1340	Begin Pumping								
1345	45.61	0.35	12.50	7.56	0.323	0.0	0.99	80.0	
1350	45.55	0.70	12.53	7.56	0.317	0.0	0.59	31.4	
1355	45.55	1.05	12.18	7.66	0.318	0.0	0.16	13.7	
1400	45.55	1.40	12.67	7.68	0.318	0.0	0.11	-4.3	
1405	45.33	1.75	12.48	7.68	0.319	0.0	0.11	-14.1	
1410	Samples collected								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW18D-GW-062519

Sample Time: 1410

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.75

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrus Iron = 0.00 mg/L
MS/MSD collected

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-19D

Field Team: ND, KS

Date: 6/27/19

Weather/Temp: 65°, partly cloudy

Arrival Time: 1420

Well Condition: Good

Initial DTW (ft btc): 56.71

Purge Method: Low Flow

Purge Rate⁵: 300 mL/min

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1430	Begin Pumping								
1435	57.20	0.35	10.8	7.06	.457	17.2	5.10	160.4	
1440	57.03	0.70	10.8	7.03	.459	13.8	5.49	160.6	
1445	56.97	1.05	10.86	6.98	0.462	9.2	5.87	160.7	
1450	56.97	1.40	10.93	6.98	0.462	9.4	5.88	161.0	
1455	56.97	1.75	10.98	6.96	0.459	9.1	5.79	161.4	
1500	Collect Sample								
<i>Mattie Dandy</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW19D-GW-062719

Sample Time: 1500

Analysis: see COL

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.75

Field Duplicate ID: FD4-GW-⁰⁶²⁷¹⁹~~062~~

Field Duplicate Time: 0800

Comments: Ferrous Iron = 0.00 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-20D

Field Team: ND, KS

Date: 6/25/19

Weather/Temp: 70° sunny

Arrival Time: 0950

Well Condition: Good

Initial DTW (ft btc): 92.31

Purge Method: Low flow

Purge Rate⁵: 300 mL/min

PID reading: —

Pump Depth: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1000	Begin Pumping								
1005	92.87	0.35	12.34	7.32	0.543	8.0	6.49	118.4	
1010	92.61	0.70	12.68	7.22	0.544	20.3	5.41	122.4	
1015	92.64	1.05	12.60	7.15	0.545	146.1	5.46	123.6	
1020	92.60	1.40	12.59	7.11	0.546	166.5	5.61	124.3	
1025	92.58	1.75	12.66	7.10	0.546	164.0	5.74	125.2	
1030	92.60	2.10	12.71	7.09	0.547	141.4	5.85	126.4	
1035	92.61	2.45	12.79	7.09	0.547	118.7	5.91	127.3	
1040	Collected samples								
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW20D-GW-062519

Sample Time: 1040

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.45

Field Duplicate ID: MW20D-GW-062519

Field Duplicate Time: 1040

Comments: Ferrous Iron = 0.09 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-21D

Field Team: NID, KS

Date: 6/24/19

Weather/Temp: 70°, windy Sunny

Arrival Time: 1030/140

Well Condition: Good

Initial DTW (ft btc): ~~58.7~~ 58.6

Purge Method: Low flow

Purge Rate⁵: 300 mL/min

PID reading: _____

Pump Depth: _____

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1050	Begin Pumping								
1145	58.85	0.35	13.56	7.77	0.386	0.0	0.85	92.7	
1150	58.83	0.70	13.25	7.69	0.384	0.0	0.57	55.0	
1155	58.87	1.05	12.40	7.69	0.384	0.0	0.37	4.6	
1200	58.87	1.40	12.39	7.73	0.382	0.0	0.18	-36.6	
1205	58.88	1.75	12.56	7.74	0.290	0.0	0.14	-57.1	
1210	58.87	2.10	12.39	7.74	0.290	0.0	0.17	-69.6	
1215	Samples collected								
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

1140

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW21D-GW-062519

Sample Time: 1215

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.10

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.00 mg/L
Attempted to collect samples on 6/24/19 but pressure gauges weren't working so got a new one and returned on 6/25/19

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-245

Field Team: ND, KS

Date: 6/27/19

Weather/Temp: 60°, cloudy

Arrival Time: 1055

Well Condition: Good

Initial DTW (ft btc): —

Purge Method: Bailed

Purge Rate⁵: —

PID reading: —

Pump Depth: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
—	Begin Pumping								
1105	—	—	12.96	6.10	1.123	109.1	4.43	140.9	—
<i>[Handwritten signature]</i>									
Stabilization Criteria ³									
	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW245-GW-062719

Sample Time: 1110

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): —

Field Duplicate ID: — Field Duplicate Time: —

Comments: Ferrous Iron = 0.46 mg/L
Bailed dry 6/26/19

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Asher

Field Team: JE / KS

Date: 6/13/19

Weather/Temp: 70° Sunny

Arrival Time: 930

Well Condition: ∅

Initial DTW (ft btc): ∅

Purge Method: ∅

Purge Rate⁵: ∅

PID reading: ∅

Pump Depth: ∅

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
945	∅	∅	12.65	7.33	0.576	∅	3.85	164.5	Clear
<i>[Large handwritten scribble]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Asher - GW - 061319

Sample Time: 945

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.03ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Atwood H

Field Team: JE/KS

Date: 6/17/19

Weather/Temp: 70° Sunny

Arrival Time: 1020

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1045	Begin Pumping								
1045	Ø	Ø	12.92	7.15	0.510	Ø	1.22	188.9	Clear
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood H - GW 061719

Sample Time: 1045

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Atwood S

Field Team: JE/ks

Date: 6/17/19

Weather/Temp: 70° Sunny

Arrival Time: 1050

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1100	Ø	Ø	19.39	7.22	0.554	Ø	2.45	225.9	clear
<i>[Handwritten signature: J. E.]</i>									
<i>[Large handwritten 'X' mark]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Atwood S - GW - 061719

Sample Time: 1100

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrrous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Lang

Field Team: JE/KS

Date: 6/17/19

Weather/Temp: 70° sunny

Arrival Time: 1230

Well Condition: ∅

Initial DTW (ft btc): ∅

Purge Method: ∅

Purge Rate⁵: ∅

PID reading: ∅

Pump Depth: ∅

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1245	∅	∅	14.26	6.92	0.1664	∅	1.58	123.7	clear
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings, minimum parameter subset: pH, sp cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lang-GW-061719

Sample Time: 1245

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.04 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Lashaw Ag

Field Team: JELKS

Date: 6/17/19

Weather/Temp: 80°, Sunny

Arrival Time: 1205

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1215	Begin Pumping								
1215	Ø	Ø	17.05	7.13	0.665	Ø	0.77	114.4	Clear
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing, total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: LashawAg-GW-061719

Sample Time: 1215

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.06ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Marlow

Field Team: JE/KS

Date: 6/17/19

Weather/Temp: 80°, Sunny

Arrival Time: 1305

Well Condition: ∅

Initial DTW (ft btc): ∅

Purge Method: ∅

Purge Rate⁵: ∅

PID reading: ∅

Pump Depth: ∅

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1315	Begin Pumping								
1315	∅	∅	12.75	5.95	0.724	∅	1.08	126.5	clear
<i>[Large handwritten scribble]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Marlow-GW-061719

Sample Time: 1315

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.03 ppm

Groundwater Purging and Sampling Form



SITE: W Freeman

Well ID: Silva

Field Team: JE/KS

Date: 6/13/19

Weather/Temp: 70°, sunny

Arrival Time: 845

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
900	Ø	Ø	13.14	7.05	0.361	Ø	4.17	125.3	Clear
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Silva-GW-061319

Sample Time: 900

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Stark

Field Team: JE/KS

Date: 6/13/19

Weather/Temp: 70°, Sunny

Arrival Time: 1010

Well Condition: ∅

Initial DTW (ft btc): ∅

Purge Method: ∅

Purge Rate⁵: ∅

PID reading: ∅

Pump Depth: ∅

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1030	∅	∅	12.73	6.97	0.355	∅	3.35	209.7	Clear
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Stark-GW-061319

Sample Time: 1030

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrus Iron = 0.0 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Thorson

Field Team: JE/KS

Date: 6/17/19

Weather/Temp: Sunny, 70°

Arrival Time: 1115

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1130	Ø	Ø	15.36	7.31	0.504	Ø	1.30	0.1	Clear
<i>LOSE</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Thorson-GW-061719

Sample Time: 1130

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.59 ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: W55

Field Team: DE/KS

Date: 6/17/19

Weather/Temp: 70° Sunny

Arrival Time: 945

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1600	Begin Pumping								
1000	Ø	Ø	7.87	7.14	0.608	Ø	1.07	205.9	Clear
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W55-GW-061719

Sample Time: 1600

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Famous Iron = 0.00 ppm

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-2D

Field Team: M-Green / CVO, K. Savage / SPK

Date: 9/18/19

Weather/Temp: 55°F, Calm, overcast

Arrival Time: 0920

Well Condition: Missing 1 Bolt

Initial DTW (ft btc): 29.88' BTOL

Purge Method: Bladder Pump

Purge Rate⁵: 0.1 Gpm

PID reading: 0.0 ppm

Pump Depth: 138' BTOL

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0925	Begin Pumping								
0928	31.12	0.3	11.47	7.13	0.271	2.8	3.12	191.8	Clear, No odor
0931	31.59	0.6	11.52	7.07	0.276	0.7	2.15	128.6	
0934	33.09	0.9	11.18	7.17	0.295	19.6	0.84	-49.5	
0937	33.67	1.2	11.14	7.10	0.288	12.7	0.72	-76.7	
0940	34.32	1.5	11.15	7.04	0.281	9.1	0.58	-74.6	
0943	34.58	1.8	11.16	7.04	0.284	6.3	0.58	-75.9	
0946	34.70	2.1	11.17	7.07	0.288	5.9	0.59	-79.2	
<i>KS</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW2D-GW-091819

Sample Time: 0950

Analysis: See COU

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.1

Field Duplicate ID: —

Field Duplicate Time: —

Comments: Ferrous Iron: 1.04 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-3D

Field Team: M. Green/CVO, K. Savage/SPK

Date: 9/20/19

Weather/Temp: (air, overcast, 50°F)

Arrival Time: 0820

Well Condition: (M) Good Missing, 10ft

Initial DTW (ft btc): 30.81' BTAC

Purge Method: bladder pump

Purge Rate⁵: 0.1 GPM

PID reading: 0.0 ppm

Pump Depth: 176.5' BTAC

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0827	Begin Pumping								
0833	0.1 0.6	0.6	11.02	6.82	0.416	13.1	7.72	218.5	Clear, No odor
0836	34.45	0.7	11.88	6.82	0.327	977	6.41	62.5	Cloudy, No odor
0839	36.05	1.2	11.86	6.82	0.313	376	7.10	39.2	
0842	36.21	1.5	11.96	6.82	0.302	205	7.57	48.3	
0845	36.65	1.8	11.98	6.81	0.299	101	7.34	55.4	
0848	37.00	2.1	11.96	6.81	0.294	55	7.98	51.0	
0851	37.30	2.4	11.94	6.81	0.292	48.7	8.03	83.6	
0854	37.48	2.7	11.94	6.80	0.290	38.1	8.11	90.9	
0857	37.60	3.0	11.98	6.80	0.290	31.8	8.11	98.5	
0900	37.62	3.3	11.97	6.80	0.290	24.6	8.11	103	
0903	37.81	3.6	11.96	6.79	0.290	21.2	8.12	107	
0906	37.80	3.9	11.97	6.79	0.288	22.5	8.07	109	

Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW3D-GW-092019

Sample Time: 0910

Analysis: See CA

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 4

Field Duplicate ID: - Field Duplicate Time: -

Comments: Ferrous Iron: 0.0 mg/L, water just below lip of well in monument, sheen on water in well box.

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: mw-4D

Field Team: M. Green/CVO, K. Savage/Sk

Date: 9/17/2019

Weather/Temp: Partly Cloudy, 65°F, Calm

Arrival Time: 1341

Well Condition: missing 1 Bolt

Initial DTW (ft btc): 109.35

Purge Method: Bladder Pump

Purge Rate⁵: 0.05

PID reading: 0.0 ppm

Pump Depth: 184' BTOC

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1330	Begin Pumping								
1400	109.66	0.5	14.06	6.705	0.285	400	6.7	-5	cloudy, no odor
1403	104.52	0.65	13.60	6.95	0.286	375	6.33	-31.2	
1406	110.72	0.80	13.34	6.84	0.258	343	3.76	-37.3	
1409	110.55	0.95	13.23	6.78	0.288	331.8	3.75	-36.5	
1412	110.32	1.1	12.77	6.65	0.280	202.1	2.89	-41.3	
1415	110.14	1.25	12.72	6.59	0.275	204.8	2.71	-46.1	
1418	110.25	1.40	12.54	6.55	0.211	235.0	2.42	-49.0	
1421	110.10	1.55	12.29	6.52	0.263	220.1	1.62	-53.3	
1424	110.25	1.7	12.12	6.47	0.265	216.0	1.61	-59.2	
1427	110.23	1.85	11.93	6.46	0.272	214.8	1.77	-59.6	
1430	110.25	2.00	11.88	6.47	0.277	213.7	1.82	-58.3	

Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW4D-GW-091719

Sample Time: 1435

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 2

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: DTW 184' BTOC, bubbles coming through tubing @ beginning, had to run pump @ exceptional high (200 PSI) pressure to get small flow, suspect broken line or bladder

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-6D

Field Team: M. Green, K. Savage

Date: 9/19/19

Weather/Temp: 55° foggy

Arrival Time: 0904

Well Condition: Good

Initial DTW (ft btc): 128.82

Purge Method: Bladder

Purge Rate⁵: 0.05 gpm

PID reading: 3.0 (Breathing zone = 0.0)

Pump Depth: Greater than 200'

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0920	Begin Pumping								
0925	128.88	0.25	11.32	7.32	0.371	1.6	6.41	167.6	
0930	128.88	0.50	11.32	7.27	0.369	0.0	4.31	168.8	
0933	128.88	^{0.75} 0.75	11.19	7.27	0.367	1.0	2.73	169.2	
0936	128.88	^{1.00} 1.00	11.25	7.26	0.369	0.0	1.87	169.7	
0939	128.88	^{1.25} 1.25	11.30	7.26	0.369	0.1	1.91	169.8	
0942	128.88	1.10	11.37	7.25	0.369	0.0	1.86	169.6	
0945	128.88	1.25	11.51	7.26	0.369	0.0	1.77	169.1	
0950	Begin LF sampling								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW6D-GW-091919

Sample Time: 0950

Analysis: see C06

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 1.25

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 0.08 mg/L, transducer has not been replaced to

Groundwater Purging and Sampling Form



SITE: UPRR Fee man

Well ID: MW-65

Field Team: M. Green / CVO

Date: 9/13/19 / 9/14/19

Weather/Temp: Overcast, breeze, 75°F

Arrival Time: 1550 / 1150

Well Condition: Good

Initial DTW (ft btc): 36.02 / 36.15

Purge Method: submersible pump

Purge Rate⁵: 0.5 Gpm

PID reading: 0.0 ppm

Pump Depth: 43' BTOC

9/13
9/14

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1556	<u>Begin Pumping 1.5</u>								
1557	<u>DTW</u>	<u>1.5</u>	<u>12.61</u>	<u>7.26</u>	<u>0.910</u>	<u>45.7</u>	<u>8.53</u>	<u>172.5</u>	<u>Cloudy, No odor</u>
1205	<u>36.15</u>	<u>0.15</u>	<u>12.61</u>	<u>7.26</u>	<u>0.910</u>	<u>45.7</u>	<u>8.53</u>	<u>172.5</u>	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings, minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW-65-GW-190914

Sample Time: 1210

Analysis: See coc

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 1.5

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: DTB: 44.29, Purged well dry, grab sample on 9/14/19
Ferrous Iron 0.12 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: AAW-6D mw-60

Field Team: M Green K. Savage

Date: 9/19/19

Weather/Temp: 55°, foggy

Arrival Time: 0810

Well Condition: Good

Initial DTW (ft btc): 37.75

Purge Method: Bladder

Purge Rate⁵: 0.13 gpm

PID reading: 0.0

Pump Depth: ~53'

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0828	Begin Pumping								
0831	37.98	0.39	11.45	6.66	0.574	176.4	5.83	182.7	
0834	38.28	0.78	11.54	6.76	0.565	183.3	5.86	110.9	
0837	38.17	1.17	11.52	6.74	0.554	87.8	5.64	183.2	
0841 0840	38.37	1.56	11.51	6.73	0.552	49.4	5.62	183.2	
0844	38.38	1.95	11.47	6.71	0.552	45.5	5.50	182.9	
0847	38.42	2.34	11.47	6.70	0.550	50.8	5.48	182.4	
0850	38.39	2.73	11.47	6.70	0.550	51.7	5.49	182.2	
0852	38.44	3.12	11.47	6.70	0.550	48.5	5.48	182.0	
0855	Begin	LF Sampling							
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MU/6U-GW-091919

Sample Time: 0855

Analysis: See ~~600~~ COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 3.12

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrrous Iron = 0.15 mg/L
Had to borrow water hose from mw-6D, hose was decont'd before and after use

Groundwater Purging and Sampling Form



SITE: LPRR Freeman

Well ID: MW-75

Field Team: M. Green / CVO

Date: 9/13/19 / 9/14/19

Weather/Temp: Overcast, calm, 70°F

Arrival Time: 1745 / 1535

Well Condition: Good, missing 1 Bolt

Initial DTW (ft btc): 30.07 - BTW / 30.13

Purge Method: Submersible Pump

Purge Rate⁵: 0.5 GPM

PID reading: 0.0 ppm

Pump Depth: 45' BTWC

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1757	Begin Pumping								
1800	Dry	1.5	-	-	-	-	-	-	Pumped dry
1545	30.13	0.15	20.0	6.55	0.374	35.2	3.2	190.1	Cloudy, No odor
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW-75-GW-190914

Sample Time: 1550

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: DTW: 46.75' BTWC, pumped dry, Grab sample on 9/14/19
Ferrous iron 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-95

Field Team: M. Green / CVO

Date: 9/13/19/32.73 ^{9/14/19} ₍₂₆₎

Weather/Temp: Overcast, calm, 65°f

Arrival Time: 1840 / 1730

Well Condition: Good, missing 1 Bolt

Initial DTW (ft btc): 32.86 / 32.73

Purge Method: Submersible pump

Purge Rate⁵: 0.5 GPM

PID reading: 0.0 ppm

Pump Depth: 40' BTOC

9/13
9/14

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1846	Begin Pumping								
1848	dry	1	-	-	-	-	-	-	Pumped dry
1735	32.73	0.15	14.15	6.00	0.640	102.4	6.06	221.6	Cloudy, No odor
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW-95-GW-190914

Sample Time: 1740

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 1

Field Duplicate ID: MW-95-GW-190914B Field Duplicate Time: 1740

Comments: DIB: 111.00 BTOC pumped dry, Grab sample on 9/14/19
transducer in well, Ferrous iron: 0.21 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-9U

Field Team: M. Green, K. Savage

Date: 9/20/19

Weather/Temp: 55°

Arrival Time: 1043

Well Condition: Good

Initial DTW (ft btc): 31.72

Purge Method: Bladder

Purge Rate⁵: 0.1 gpm

PID reading: 0.0

Pump Depth: ~68

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1105	Begin Pumping								
1108	31.81	0.30	12.40	6.79	0.456	0.0	7.04	95.4	
1111	31.81	0.60	12.38	6.74	0.456	98.4	7.15	87.5	
1114	31.81	0.90	12.48	6.69	0.457	74.0	7.07	80.6	
1117	31.81	1.20	12.35	6.60	0.460	23.8	7.13	72.2	
1120	31.81	1.50	12.33	6.56	0.463	14.4	7.24	80.9	
1123	31.81	1.80	12.32	6.53	0.465	11.2	7.26	85.4	
1126	31.81	2.10	12.32	6.53	0.466	10.3	7.26	87.3	
1130	Begin LF Sampling								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW9U-GW-092019 Sample Time: 1130

Analysis: See COC

QC SAMPLE (CIRCLE): (ED) MS/MSD EQ Blank TOTAL PURGED (GAL): 2.10

Field Duplicate ID: MW9U-GW-092019B Field Duplicate Time: 1130

Comments: Ferrous Iron = 0.19 mg/L
Had to borrow water hose from MW-9D decand before use
Collected Field Blank using DI water due to being located next to Highway 27
MW9U-FB-092019

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-105

Field Team: M. Green/CUO

Date: 9/13/19 / 9/14/19

Weather/Temp: Partly Cloudy, Windy 72°F

Arrival Time: 1400 / 0930

Well Condition: Good, missing 2 9/16" bolts

Initial DTW (ft btc): 49.15 / 49.15

Purge Method: Purge & Grab 545 Pump

Purge Rate⁵: 0.5 GPM

PID reading: 0.0 ppm

Pump Depth: 74' BTOC

9/13
9/14

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1450	Begin Pumping								
1500	DEY	5	-	-	-	-	-	-	Pumped Dry
1005	49.15	0.15	13.26	7.21	0.579	12.6	88.7 ³ 9.21	137.7	No color/odor, clear
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW-105-GW-190914

Sample Time: 1010

Analysis: See CX

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: IDB: 75.68, transducer in well, Purged well dry, Grab sample on 9/14/19
Ferrous Iron: 0.07 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-115

Field Team: M. Green / CVO

Date: 9/13/19 / 9/14/19

Weather/Temp: overcast, breeze 70°F

Arrival Time: 1615 / 12:40

Well Condition: Good, 1 Bolt missing

Initial DTW (ft btc): 57.61' BTDC / 57.67

Purge Method: submersible pump

Purge Rate⁵: 0.5 GPM

PID reading: 0.0 ppm

Pump Depth: 79' BTDC

9/13
9/14

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1624	Begin Pumping								
1638	Dry	6	-	-	-	-	-	-	Pumped dry
1250	57.67	0.15	12.85	7.20	0.396	9.3	4.84	165.5	Clear, No odor
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW-115-GW-190914

Sample Time: 1255

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 6

Field Duplicate ID: MW-115-GW-190914MS Field Duplicate Time: 1255

Comments: DTW: 80.42' BTDC, purged well dry, grab sample on 9/14/19
transducer in well, Ferrrous Iron: 0.13 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-125

Field Team: M. Green/CVO

Date: 9/13/19 / 9/14/19

Weather/Temp: overcast, breeze, 75°F

Arrival Time: 1525 / 1115

Well Condition: Good

Initial DTW (ft btc): 38.95 - BTOC / 79.00

Purge Method: Sub Pump

Purge Rate⁵: 0.5 GPM

PID reading: 0.0 ppm

Pump Depth: 54 - BTOC

Field Parameters¹

9/13/19
9/14

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1535	Begin Pumping								
1538	DTW	1.5	-	-	-	-	-	-	Pumped dry
1120	39.00	0.15	13.17	6.61	0.691	32.0	5.66	195.0	clear, no odor
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW-125-GW-190914

Sample Time: 1125

Analysis: see coc

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.5

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: DTW: 55.87 - BTOC, Purged well dry, Gas sample on 9/14/19
Ferrous Iron 0.09 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman **Well ID:** MW-135
Field Team: M. Green / CUB K. Savage / SK **Date:** 09/16/19
Weather/Temp: 55°F, overcast, Windy **Arrival Time:** 1050
Well Condition: Good **Initial DTW (ft btc):** 10.38' BTWC
Purge Method: Peristaltic Pump **Purge Rate⁵:** 0.05 gpm → 0.030 GPM
PID reading: 0.2 ppm **Pump Depth:** 28.20' BTWC @1111

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1051	Begin Pumping								
1056	11.43	0.25	12.77	6.90	0.305	0	6.96	151.1	Clear, No odor
1057 110	12.39	0.5	11.70	6.79	0.301	0	6.80	160.5	
1100 110	12.92	0.75	11.45	6.76	0.300	0	6.79	164.0	
1105 1111	13.50	1	11.64	6.71	0.299	0	6.79	166.2	Decrease Purge Rate
1116	13.66	1.15	11.90	6.67	0.299	0	6.702	169.6	to 0.03 GPM
1121	13.89	1.30	12.08	6.67	0.299	0	6.67	171.7	Clear - No odor
1126	14.02	1.45	12.34	6.69	0.298	0	6.78	172.4	
1131	14.22	1.60	12.50	6.72	0.298	0	6.72	173.0	
<i>[Handwritten signature and scribbles]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW135-GW-091619 **Sample Time:** 1135

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1.60

Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: DTW: 33.20' BTWC, Ferrrous Iron: 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-14D

Field Team: M. Green, K. Savage

Date: 9/19/19

Weather/Temp: 65°, sunny

Arrival Time: 1425

Well Condition: Good

Initial DTW (ft btc): 14.72

Purge Method: Bladder

Purge Rate⁵: 0.1 gpm

PID reading: 0.0

Pump Depth: ~126.34

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1434	Begin Pumping								
1437	16.95	0.30	10.65	7.08	0.309	69.9	1.36	-27.2	
1440	17.79	0.60	10.72	6.94	0.324	23.8	1.03	-69.9	
1443	18.43	0.90	10.67	6.76	0.312	9.2	1.40	-47.7	
1446	18.53	1.20	10.72	6.71	0.307	4.2	1.86	-39.6	
1449	18.60	1.50	10.74	6.71	0.305	0.9	2.33	-36.3	
1452	18.76	1.80	10.77	6.75	0.299	0.0	3.63	-30.4	
1455	18.92	2.10	10.81	6.75	0.298	0.0	4.02	-28.2	
1500	Begin LF Sampling								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW14D-CW-091919

Sample Time: 1500

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.10

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.16 mg/L

Groundwater Purging and Sampling Form



SITE: Upper Freeman

Well ID: MW-15D

Field Team: M. Green/CVO, K. Savage/SPK

Date: 9/17/19

Weather/Temp: partly cloudy, breeze, 65°F

Arrival Time: 1300

Well Condition: missing 1 Bolt

Initial DTW (ft btc): 86.92

Purge Method: Bladder

Purge Rate⁵: 0.1 Gpm

PID reading: 0.0 ppm

Pump Depth: 124

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1300	Begin Pumping								
1309	86.95	0.3	11.44	7.55	0.364	0	6.17	98.7	Clear, No odor
1312	86.95	0.6	10.91	7.04	0.360	0	6.81	97.7	
1315	86.95	0.9	10.84	6.95	0.360	0	6.95	109.3	
1318	86.95	1.2	10.83	6.89	0.360	0	6.98	118.0	
1321	86.95	1.5	10.02	6.86	0.359	0	6.94	123.5	
1324	86.95	1.8	10.93	6.86	0.360	0	6.94	127.5	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW15D-CW-091719

Sample Time: 1325

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ≈ 1.8

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron: 0.21 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: mw-18D

Field Team: M. Green, K. Savage

Date: 9/17/19

Weather/Temp: 100° cloudy

Arrival Time: 1129

Well Condition: Good, water in mount

Initial DTW (ft btc): 48.35

Purge Method: Bladder

Purge Rate⁵: 0.13 gpm

PID reading: 0.0

Pump Depth: ~153'

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1135	Begin Pumping								
1140	44.47	0.105	11.09	7.78	0.307	0.0	1.85	11.2	
1143	48.52	1.04	10.97	7.75	0.300	0.0	0.82	-65.0	
1146	48.54	1.43	10.95	7.71	0.298	0.0	0.61	-78.9	
1149	44.57	1.82	10.94	7.68	0.297	0.0	0.56	-84.1	
1152	44.58	2.21	10.88	7.64	0.297	0.0	0.53	-87.5	
1155	48.58	2.60	10.89	7.63	0.297	0.0	0.51	-89.9	
1200	Begin Cif Sampling								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW18D - Crw. 09.17.19

Sample Time: 1200

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.60

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.21 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-19D

Field Team: M. Green K. Savage

Date: 9/17/2019

Weather/Temp: 55° cloudy

Arrival Time: 0922

Well Condition: Crowd, some water in manuf

Initial DTW (ft btc): 58.40

Purge Method: Bar Bladder

Purge Rate⁵: 0.11 gpm

PID reading: 0.0

Pump Depth: ~163

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0932	Begin Pumping								
0935	58.62	0.33	10.77	7.09	0.435	0.0	3.20	90.6	
0938	58.73	0.66	10.84	6.97	0.440	0.0	3.66	92.9	
0941	58.91	0.99	10.83	6.96	0.440	0.0	3.86	94.9	
0944	58.91	1.32	10.90	6.90	0.443	0.0	4.14	102.1	
0947	58.63	1.65	10.90	6.89	0.445	0.0	4.20	105.7	
0950	58.71	1.98	10.88	6.89	0.446	0.0	4.20	107.4	
0953	58.73	2.31	10.88	6.88	0.447	0.0	4.23	108.6	
1000	Begin Sampling								
8									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW19D - GW - 091719

Sample Time: 1000

Analysis: see LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 2.31

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-20D

Field Team: M. Green / CVO, K. Savage / SPH

Date: 9/18/19

Weather/Temp: light rain, 55°F

Arrival Time: 1300

Well Condition: Stamped wrong "MW-20U"

Initial DTW (ft btc): 92.47' BTC

Purge Method: Bladder Pump

Purge Rate⁵: 0.1 GPM

PID reading: ~~0.0~~ PPM 8.3 PPM

Pump Depth: 141' BTC

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1318	Begin Pumping								
1321	93.58	0.3	11.65	7.53	0.498	7.5	6.48	88.5	Clear, No odor
1324	93.65	0.6	11.71	7.22	0.501	130.2	5.46	96.6	Cloudy, No odor
1327	93.65	0.9	11.77	7.01	0.505	111.9	5.82	108.9	
1330	93.71	1.2	11.78	6.98	0.505	63.2	6.03	113.6	
1333	93.69	1.5	11.79	6.97	0.505	45.0	6.04	116.4	
1336	93.62	1.8	11.81	6.98	0.505	31.1	6.08	118.7	
1339	93.52	2.1	11.84	7.00	0.505	20.5	6.08	120.3	
1342	93.48	2.4	11.85	7.02	0.505	14.5	6.06	121.2	Clear, No odor
1344	93.51	2.6	11.87	7.01	0.504	9.8	6.16	121.7	
<i>← se</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW20D-GW-091819

Sample Time: 1345

Analysis: See COC

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank TOTAL PURGED (GAL): 2.5

Field Duplicate ID: MW20D-GW-091819B Field Duplicate Time: 1345

Comments: Ferrous Iron 0.06 mg/L water in well box below lip of well, bailed out. Well is mislabeled @ as "MW-20U"
Bradbury Zone PID: 0.0ppm

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-210

Field Team: Mark Green, Karlu Savage

Date: 9/17/2019

Weather/Temp: 55°, cloudy

Arrival Time: 0805

Well Condition: Good

Initial DTW (ft btc): 61.65

Purge Method: Bladder

Purge Rate⁵: 0.05 gpm

PID reading: 0.0

Pump Depth: ~120'

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0825	Begin Pumping								
0840	61.90	0.15	10.39	7.68	0.379	0.0	0.66	-104.1	
0843	61.83	0.30	10.48	7.71	0.379	0.0	0.56	-124.9	
0846	61.94	0.45	10.41	7.72	0.379	0.0	0.55	-129.9	
0849	61.97	0.60	10.47	7.71	0.378	0.7	0.48	-136.0	
0852	62.09	0.75	10.51	7.72	0.377	0.0	0.46	-139.9	
Begin LF Sampling									
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW210-GW-091719

Sample Time: 0900

Analysis: see COL

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 0.75

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: 2 seconds = 25 mL

Ferrous Iron = 0.24 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-245

Field Team: JE

Date: 10/4/19

Weather/Temp: 40°, cloudy

Arrival Time: 1030

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: Grab Sample

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1045	Ø	Ø	11.44	5.97	0.439	2.2	3.93	130.5	Clear / some sediment in sample
<i>[Signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 245-GW-100419

Sample Time: 1045

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Purged dry on 10/3/19 via submersible
Ferrous Iron = 0.28 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-255

Field Team: JE

Date: 10/4/19

Weather/Temp: 40° cloudy

Arrival Time: 945

Well Condition: good

Initial DTW (ft btc): Ø

Purge Method: grab sample

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	µs/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1000	Ø	Ø	10.34	6.01	0.486	0.0	7.27	236.8	Clear
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 255-GW-100419

Sample Time: 1000

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Purged dry via submersible on 10/3/19
Ferrrous Iron = 0.14 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: W-20

Field Team: M. Green/CVO, K. Savage/SPH

Date: 9/16/19

Weather/Temp: Overcast, 55%, calm

Arrival Time: 1200

Well Condition: Good

Initial DTW (ft btc): 17.35

Purge Method: Peristaltic Pump

Purge Rate⁵: 0.05 Gpm

PID reading: 0.0 pfm

Pump Depth: unknown

Field Parameters¹

DTW
NA

17.60
17.71
17.85
17.89

⊖
⊖
⊖

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1210	Begin Pumping								
1215	0.25 → 0.25	0.25	10.36	7.68	0.114	171.2	1.56	-38.9	Brown, no odor
1220	0.5	0.5	10.24	7.61	0.112	159.4	0.71	-25.8	
1225	0.75	0.75	10.09	7.57	0.111	130.2	0.66	-153.5	
1230	1.00	1.00	10.16	7.51	0.111	103.3	0.72	-174.4	
1235	18.09	1.25	10.03	7.47	0.111	72.9	0.75	-170.5	
1240	18.19	1.5	10.00	7.50	0.111	62.1	0.74	-196.3	
+245 1245	18.30	1.75	9.98	7.51	0.111	47.4	0.69	-188.1	
1255 1250	18.35	2	9.98	7.52	0.111	47.5	0.65	-195.9	
1300 1255	18.38	2.25	9.98	7.55	0.111	41.5	0.65	-191.2	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W20-GW-041619

Sample Time: 1300

Analysis: SCC CDC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 2.25

Field Duplicate ID: — Field Duplicate Time: —

Comments: DTB: 115.6' BDOC Ferrrous Ironing 1.25 mg/L, Ferruducer in well

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: W-26

Field Team: M. Green / CVO, K. Savage / SPLK

Date: 9/16/19

Weather/Temp: 60's, overcast, breeze

Arrival Time: 0825

Well Condition: Good NO Cap, Casing top is Jugged

Initial DTW (ft btc): 66.59' BTOC

Purge Method: Submersible Pump

Purge Rate⁵: 0.25^{gpm}

PID reading: 0.0 ppm

Pump Depth: 9.5' BTOC

Field Parameters¹

Purge Vol. (gal)	Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
NA	0830	Begin Pumping								
0.75	0841	66.68	0.375	11.78	6.46	0.334	0	9.19	209.7	Clear, No odor
1.5	0844	66.68	0.750	11.76	6.48	0.341	0	9.32	214.2	
2.25	0847	66.68	1.125	11.84	6.50	0.341	0	9.27	214.2	
3.00	0850	66.68	1.5	12.08	6.52	0.342	0	9.21	213.7	
3.75	0853	66.68	1.875	12.10	6.52	0.342	0	9.21	213.3	
4.5	0856	66.68	2.25	12.11	6.53	0.342	0	9.17	212.8	
5.25	0859	66.68	2.625	12.12	6.54	0.341	0	9.16	211.8	
6.00	0902	66.68	3.000	12.16	6.56	0.341	0	9.06	210.6	
6.75	0905	66.68	3.375	12.16	6.58	0.341	0	8.96	208.7	
7.5	0908	66.68	3.750	12.18	6.58	0.340	0	9.02	208.0	
8.25	0911	66.68	4.125	12.19	6.59	0.340	0	8.98	207.2	
9.00	0914	66.68	4.5	12.20	6.59	0.340	0	9.01	206.6	
9.75	0917	66.68	4.875	12.20	6.60	0.340	0	9.03	205.2	
10.5	0920	66.68	5.25	12.20	6.60	0.339	0	9.00	204.9	
11.25	0923	66.68	5.625	12.20	6.62	0.339	0	8.93	203.8	
Stabilization Criteria ³	-	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W-26-GW-190916 W26-GW-091619

Sample Time: 0925 0905

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank me TOTAL PURGED (GAL): 3

Field Duplicate ID: W-26-GW-190916B W26-GW-091619B Field Duplicate Time: 0905 0925

Comments: DTW: 141.85' BTOC, See notes in yellow book
FD ID: W26-GW-091619B, EB ID: EB-01-190916
EB line: 0930, Ferron Iron: 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Asher-GW-100319

Field Team: JF/KS

Date: 10/3/19

Weather/Temp: 50°, cloudy

Arrival Time: 956

Well Condition: good

Initial DTW (ft btc): 0

Purge Method: Grab

Purge Rate⁵: 0

PID reading: 0

Pump Depth: 0

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1000	—	10	11.61	7.11	0.549	0.0	8.81	224.8	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Asher-GW-100319

Sample Time: 1000

Analysis: see LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 10

Field Duplicate ID: Asher-GW-100319

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.02 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: LANG-GW-0118

Field Team: M. Green/CVO, K. Savage/SPK

Date: 12/20/18

Weather/Temp: 55°F, overcast, breeze, rain

Arrival Time: 1220

Well Condition: NA

Initial DTW (ft btc): NA

Purge Method: Residential Tap

Purge Rate⁵: NA

PID reading: 0.0 ppm

Pump Depth: NA

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<u>NA</u>	Begin Pumping								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: LANG-GW-0118 LANG-GW-041819

Sample Time: 1235

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 25 Gal

Field Duplicate ID: -

Field Duplicate Time: -

Comments: Water purged was initially orange, purged until clear
Ferrous Iron: 0.03 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Lashaw

Field Team: JE/KS

Date: 10/3/19

Weather/Temp: 50° Cloudy

Arrival Time: 1035

Well Condition: good

Initial DTW (ft btc): _____

Purge Method: Ø

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
1045	Ø	Ø	13.33	7.00	0.335	0.0	7.14	223.3	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings. minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lashaw-GW-100319

Sample Time: 1045

Analysis: See COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank
-GW-100319

TOTAL PURGED (GAL): 10

Field Duplicate ID: FD4-100319

Field Duplicate Time: 1048

Comments: Ferrous Iron = 0.05 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Lashaw Ag

Field Team: KS, AJE

Date: 10/03/2019

Weather/Temp: 50°, cloudy

Arrival Time: 1125

Well Condition: Good

Initial DTW (ft btc): —

Purge Method: —

Purge Rate⁵: —

PID reading: —

Pump Depth: —

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1145			9.25	7.07	0.378	0.0	2.85	218.9	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Lashaw Ag GW-09-100317

Sample Time: 1145

Analysis: see COC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 10

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrous Iron = 0.02 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Marlow No. 2

Field Team: JE

Date: 10/10/19

Weather/Temp: 50°, sunny

Arrival Time: 1325

Well Condition: Ø

Initial DTW (ft btc): Ø

Purge Method: Grab

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1330	Ø								→
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Marlow 2-GW-101019

Sample Time: 1330

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): Ø

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: No parameters taken, purged during RTSS

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Reed

Field Team: KS/JE

Date: 10/3/2019

Weather/Temp: 55°, cloudy, raining

Arrival Time: 1315

Well Condition: Good

Initial DTW (ft btc): -

Purge Method: -

Purge Rate⁵: -

PID reading: -

Pump Depth: -

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>Begin Pumping</i>									
1325	-	-	11.05	6.79	0.305	0.0	2.58	191.2	
<i>rose</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Reed-GW-100319

Sample Time: 1330

Analysis: see COL

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 10

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Ferrus Iron = 0.47 mg/L

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: Silva

Field Team: JE/KS

Date: 10/3/19

Weather/Temp: 50°, cloudy

Arrival Time: 910

Well Condition: Good

Initial DTW (ft btc): Ø

Purge Method: Grab

Purge Rate⁵: Ø

PID reading: Ø

Pump Depth: Ø

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
915	Ø	Ø	9.54	6.82	0.389	0.0	8.19	219.0	Clear
<i>[Large handwritten signature/initials across the table]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: Silva-GW-100319

Sample Time: 915

Analysis: see LOC

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 10

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 0.0 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: MW-1S

Field Team: M. ENDO, M. LOPEZ

Date: 08/03/2016

Weather/Temp: PARTLY CLOUDY, MID 70'S °F, W WIND @ 4-6mph

Arrival Time: 1445

Well Condition: 2" PVC

Initial DTW (ft btc): @ 1233 = 21.45

Purge Method: START PURGE ON 08/03/16 @ 1449

Purge Rate⁵: HAND BAILING N/A

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
Stabilization Criteria³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW1S - 1608 **Sample Time:** N/A

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** ~1 GAL

Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: BAILED WELL DRY. END PURGE @ 1507.
DTW: 21.52' @ 1623 8/3/16

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: MW-1S

Field Team: M. ENDO & M. LOPEZ

Date: 08/04/16

Weather/Temp: SUNNY, Low 60's °F, ENE winds @ 2-3 mph

Arrival Time: 08:08

Well Condition: 2" PVC, OK

Initial DTW (ft btc): 08:14 = 21.44

Purge Method: 1.5" ~ 1.0L BAILEY (PE) **Purge Rate⁵:** HAND

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond. (S/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
0822			13.60	6.39	0.104	30.5	6.29	83	SLIGHTLY CLOUDY NO ODOR, NO SHEEN
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW1S-1608 **Sample Time:** 0820

Analysis: 8260B

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 1 BAILEY

Field Duplicate ID: - **Field Duplicate Time:** -

Comments: TRP³ @ 08:08 PID in HS = 146ppm, BE = 0.0ppm. WATER CLOSER TO BOTTOM OF WELL IS TRANSPARENT BROWNISH COLOR.

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: MW-1D

Field Team: M. ENDO & M. LOPEZ

Date: 08/04/16

Weather/Temp: SUNNY, Low 70's °F, ENE winds @ 2-3 mph

Arrival Time: 0835

Well Condition: 2" PVC, OK

Initial DTW (ft btc): @ 0838 = 22.18

Purge Method: 1.5" DIAM, 2 L. OL PE BAILER Purge Rate⁵: HAND

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0848	Begin Pumping <i>ms/cm</i>								
0850									
0849	22.18	1.2	13.97	7.01	48.9	47.6	689	-170	SLIGHTLY CLOUDY NO ODOR, NO SHEEN
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW1D-1608

Sample Time: 0850

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): ~1 FULL BAILER

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: @ 0835 P10 IN HS = 12.2 ppm, IN B2 = 0.0 ppm - UTILIZING HAND BAILER TO COLLECT SAMPLE AFTER PURGED WELL DRY ON 08/03/16.

Groundwater Purging and Sampling Form



SITE: MW-2 UPRR-FREEMAN

Well ID: MW-2

Field Team: M. ENDO & M. LOPEZ

Date: 08/03/16

Weather/Temp: MOSTLY SUNNY, UPPER 70'S°F, SE WINDS @ 3-6mph

Arrival Time: 1705

Well Condition: CLEAR, 2" PVC

Initial DTW (ft btc): @ 1228 / @ 1715 w/ pump = 31.33 / = 30.76

Purge Method: SUBMERSIBLE PUMP

Purge Rate⁵: 142.79 mL/min @ 51 Hz

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	(mS/cm) Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1721	Begin Pumping SUCTION DEPTH @ 140 FT btc SS GEOSUB CONTROLLER SET @ 49 Hz								
1730	32.35	0.4075	15.54	7.39	40.2	13.3	5.77	-180	CLEAR, NO ODOR
1734	32.55	0.5694	14.07	7.23	39.2	14.8	4.54	-227	"
1738	32.55	0.7313	13.96	7.17	39.1	23.9	3.87	-259	SLIGHTLY CLOUDY NO ODOR
1742	32.55	0.8748	13.76	7.10	39.4	33.0	3.38	-293	"
1746	32.57	1.0183	13.58	7.08	39.7	44.7	3.10	-328	"
1750	32.57	1.1618	13.64	7.06	39.8	58.1	2.68	-355	SLIGHTLY CLOUDY VERY SLIGHT SWEET ODOR
* 1754	32.60	1.3053	13.56	7.06	40.0	214.0	2.77	-407	"
1758	32.68	1.4223	13.38	7.07	40.6	285	2.57	-444	MODERATELY CLOUDY VERY SLIGHT SWEET ODOR
1802	32.58	1.5394	13.70	7.07	40.3	305	2.46	-453	"
1806	32.50	1.6564	13.72	7.07	40.5	337	2.43	-458	"
1810	32.50	1.7735	13.59	7.07	40.6	343	2.42	-460	"
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW2-1608

Sample Time: 1815

Analysis: 82608

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank

TOTAL PURGED (GAL): 1.8527

Field Duplicate ID: MW20FD-1608

Field Duplicate Time: 1200

Comments: SIGNIFICANT AIR BUBBLES FORMING IN FLOW CELL, LITTLE TO NO BUBBLES IN PUMP LINE. NO VISIBLE SHEEN.

WHILE COLLECTING SAMPLE, WATER WAS VERY EFFERVECENT

* FLOW CELL WAS DISTURBED AND TURBIDITY READING INCREASED FOR REMAINDER OF PURGE.

Groundwater Purging and Sampling Form



SITE: UPRR R1

Well ID: SP03 MW3

Field Team: GREER / DEMUS

Date: 6/13/16

Weather/Temp: P CLOUDY, 60° BREEZE

Arrival Time: 8:25 850

Well Condition: NEW/OK

Initial DTW (ft btc): 29.08

Purge Method: SUBMERSIBLE

Purge Rate⁵: 450 mL/min #

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
10:05	Begin Pumping								
10:07	32.71	0.5	13.5	7.00	450	42.0	19.99 ^M	139	
10:12	33.82	1.0	14.1	7.13	413	158	19.99 ⁺	136	
10:17	34.02	1.5	14.5	7.13	415	140	19.99 ⁺	134	
10:22	34.70	2.0	13.6	7.14	410	135	19.99 ⁺	132	
10:27	34.90	2.5	14.0	7.16	409	128	19.99 ^M	130	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW3-1608

Sample Time: 10:30

Analysis: 82608

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: FD-1608 Field Duplicate Time: _____

Comments: D.O. measurement flushing. Purge rate started at 450 mL/min, but reduced with falling head to 240 mL/min.

Groundwater Purging and Sampling Form



SITE: UPRR-FREEMAN

Well ID: MW-4

Field Team: M. ENDO / M. LOPEZ

Date: 8-4-2016

Weather/Temp: CLEAR, UPPER 70'S, WINDS LIGHT & VARIABLE

Arrival Time: 1305

Well Condition: 2 1/2" GOOD, PL: 0.0 @ WH & 0.0 @ BZ

Initial DTW (ft btc): 114.98 ^{8/3/16 @ 1110 / 8/4/16 @ 1330} / 114.35

Purge Method: SUBMERSIBLE [SAMPLE w/ BAILEY] Purge Rate ⁵: 359.42 mL/min @ 233HZ

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	mS/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1338	Begin Pumping		PUMP SUCTION DEPTH = 180 FT BZ			SS GEOSUB CONTROLLER SET @ 227HZ = 360 mL/min			
1348	117.30		12.64	7.38	47.2	332.0	16.00	217	SLIGHTLY CLOUDY NO ODR
1351	117.42		12.60	7.43	46.4	332.0	17.24	217	"
1356	117.36		12.86	7.31	46.5	254.6	16.88	221	MOSTLY CLEAR NO ODR
1359	117.28		12.84	7.27	45.4	100.0	17.50	224	"
1402	117.10		12.85	7.20	47.5	406	18.12	229	CLEAR NO ODR
1405	117.09		NA +3.07	7.16	45.8	633.0	15.79	NA	"
1405	SAMPLED w/ BAILEY								
1505	NA		22.47	6.77	45.3	17.5	13.20	278	MOSTLY CLEAR NO ODR, NO SHEEN
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTU

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW4-1608

Sample Time: 1510

Analysis: VOC'S by 8260B

QC SAMPLE (CIRCLE): (FD) MSMSD EQ Blank

TOTAL PURGED (GAL): 5 GAL

Field Duplicate ID: MW40FD-1608

Field Duplicate Time: 0800

Comments: WHILE LOWERING PUMP TO 187.5 FT BZ (MID SCREEN) WE ENCOUNTERED "BOTTOM" @ 185.1 FT BZ.

PUMP INTAKE WAS LIFTED AND SET @ 180 FT BZ. PID @ 15 = 0.0 ppm, BZ = 0.0 ppm. @ 1406

POWER INVERTER OVERHEAT ERROR, PUMP OFF. ATTEMPTED TO RESTART @ 1415 = SAME ERROR @ 232 HZ.

@ 1428 RESTART PUMP. AND OVERHEAT ERROR OCCURED. PULL TUBING AND TAKE BAILED GAAB SAMPLE.

FIELD DUPLICATE ~~MCS~~

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: MW-5

Field Team: M. ENDO & M. LOPEZ

Date: 08/03/16

Weather/Temp: MOSTLY SUNNY, LOW 70'S°F, CALM WINDS

Arrival Time: 1930

Well Condition: 2" PVC, OK

Initial DTW (ft btc): @ 1040 / @ 1935 w/ purg = 63.47 / = 63.42

Purge Method: SUBMERSIBLE PUMP

Purge Rate⁵: 272.61 mL/min @ 95Hz

Field Parameters ¹										
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	ms/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.	
1940	Begin Pumping		DTW = 63.98						SS GEOSUB CONTROLLER SET @ 93Hz = 288 mL/min	
									PUMP SECTION DEPTH = 134.6 FT btc	
1954	64.55		13.83	7.14	61.3	65.6	7.02	219	SLIGHTLY CLOUDY NO ODOR	
1957	64.59		13.77	7.09	62.7	85.9	6.89	201	"	
2000	64.59		13.77	7.04	63.1	110.0 110.0	6.80	183	"	
2003	64.59		13.94	6.99	62.7	106.0	6.21	175	"	
2006	64.55		13.97	6.97	63.3	*401.0	6.68	167	"	
2009	64.68		13.93	6.95	66.1	*468.0	6.60	162	MOSTLY CLEAR NO ODOR	
2012	64.70		13.80	6.94	68.0	*493.0	6.55	160	"	
2015	64.65		13.90	6.94	*70.9	*414.0	6.53	157	"	
			PARAMETERS STABLE, PROCEED TO SAMPLE (MINUS * PARAMETERS)							
Stabilization Criteria³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW5-1608 + MW5-1608-HS
MW5-1608-HSD

Sample Time: 2020

Analysis: 8260B

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** _____

Field Duplicate ID : _____ **Field Duplicate Time:** _____

Comments: * Error code #3 on HOLIB-UZZ.

COMPLETE SAMPLING @ 2035 DTW = 64.92 FT btc.

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: MW-65

Field Team: MURPHY, MENDO

Date: 8/3/2016

Weather/Temp: SCATTERED CLOUDS, LIGHT WIND SW, MID 70'S

Arrival Time: 1725

Well Condition: GOOD, PID: 0.2 ppm

Initial DTW (ft btc): 36.49 @ 1119

Purge Method: BAILER (DISPOSIBLE)

Purge Rate⁵: BAIL

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	ms/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1036	NA	NA	15.0	6.81	36.4	817.2	10.55	232	CLOUDY, BROWN NO SHEEN, NO ODOR
1045	NA	NA	17.37	7.22	36.5	745.0	8.46	223	"
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

DN
08/04/16

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW65-1608

Sample Time: 1040

Analysis: 8260B

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~3.0 GAL

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: 1730 BEGAN PURGING WELL DRY
1755 END OF PURGING WELL

ON 08/04/16 RETURN TO LOCATION, @ 1026 DTW = 37.37 FT BTC, PID IN HS = 0.0 ppm, IN B2 = 0.0 ppm
COMPLETE SAMPLING @ 1045, ~ 2 BAILETS.

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: MW 6D

Field Team: GREER / DEMUS

Date: 8 19 16

Weather/Temp: CLEAR, WIND, 65°

Arrival Time: 0810

Well Condition: NEW

Initial DTW (ft btc): 134.65

Purge Method: SUBMERSIBLE PUMP Purge Rate⁵: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
8 39	Begin Pumping								
0842	134.89	0.2	15.2	6.56	52.0 mS	20	6.52	283	
0847	134.90	1.5	13.2	6.90	47.6	21	4.68	217	
0852	134.90	2.25	13.5	6.99	45.4	16	4.81	191	
0857	134.90	3.25	13.9	7.04	43.8	11	5.13	177	
0902	134.90	4.00	13.9	7.05	43.2	11	5.27	167	
0907	134.89	4.25	14.0	7.13	43.3	2	5.69	170	INVERTER FAILED @ 902. RESTART
0912	134.90	5.00	13.9	7.07	43.0	1	5.28	152	
0917	134.90	6.00	14.1	7.08	42.5	1	5.16	152	
0922	134.90	7.25	14.2	7.09	42.6	1	5.26	152	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW6D-0816

Sample Time: 9:25

Analysis: 82608

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: PUMP DEPTH ~ 195' BTC DUE TO LIMIT IN PUMP LENGTH.

Groundwater Purging and Sampling Form



SITE: UPRR Fremont

Well ID: MD3 SBO3/MW 7

Field Team: Grace, Dennis

Date: 6/13/16

Weather/Temp: M SUNNY, 55° BREEZE

Arrival Time: 840

Well Condition: NEW

Initial DTW (ft btc): 31.02

Purge Method: SUBMERSIBLE

Purge Rate⁵: 150 ml/min *

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	ms/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
8:52	Begin Pumping								
8:53	30.95	0.1	12.0	5.86	519	43.4	19.74	201	
8:58	31.53	0.3	11.8	6.62	524	112 *	19.50	181	
9:03	31.64	0.5	12.3	6.76	2.80	122	18.63	169	
9:08	31.53	0.7	12.7	6.80	0.983	163	18.57	156	
9:13	31.55	0.9	13.0	6.82	0.453	221	19.31	150	
9:18	31.11	1.1	13.1	6.88	0.449	232	19.47	146	
9:23	31.19	1.3	13.6	6.86	0.456	236	19.51	142	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: SBO3-0 SBO3-1606

Sample Time: 930

Analysis: 82603

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: POSSIBLE TURBIDITY SENSOR ISSUE - WATER IS CLEAR

Groundwater Purging and Sampling Form



SITE: UPRR FREEMAN

Well ID: S305/MW8

Field Team: WREER/DEMUS

Date: 6/13/16

Weather/Temp: M CLOUDY 65°

Arrival Time: 1055

Well Condition: NEW - OK

Initial DTW (ft btc): 35.50

Purge Method: SUBMERSIBLE

Purge Rate⁵: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1105	Begin Pumping								
1107	36.35	0.1	14.7	6.57	0.854	139	19.99*	108	
1112	37.72	0.3	13.1	6.50	*FLASHING	128	2.37	100	
1117	37.98	0.5	13.5	6.48	*	102	13.47	93	
1122	38.19	0.7	13.8	6.49	*	96	15.30	85	
1127	39.25	0.9	13.5	6.46	+	87	16.3	88	
1132	39.65	1.1	14.4	6.41	*	72	14.3	77	
1137	39.74	1.3	14.3	6.40	*	80.0	13.44	75	
1142	40.34	1.5	14.0	6.39	*	80.1	13.49	74	
1147	41.11	1.7	14.3	6.39	*	81.6	14.23	74	
1152	41.63	1.9	14.2	6.38	*	93.7	14.60	74	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: S305-1606

Sample Time: 1155

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD3A EQ Blank

TOTAL PURGED (GAL): _____

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: _____

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: MW-10

Field Team: M. ENDO & M. LOPEZ

Date: 08/03/16

Weather/Temp: NIGHT, LOW 70'S °F, CALM WINDS

Arrival Time: 2140

Well Condition: 2" PVC, OK

Initial DTW (ft btc): 1138 = 50.93

Purge Method: BAILER

Purge Rate⁵: HAND

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
<i>ms/cm</i>									
PID IN HS = 1.0 ppm, IN BZ = 0.0 ppm.									
1108	55.60	500m	17.73	7.16	53.0	11.5	5.29	-104	CLEAR, VERY FINE PARTICULATE SUSPENDED SLIGHTLY EFFERVECENT
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW10-1608

Sample Time: 1110 ON 08/04/16

Analysis: 8260B

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 0.13 GAL

Field Duplicate ID: N/A

Field Duplicate Time: N/A

Comments: FINISHED BAILING WELL DRY @ 2235. ~ 7 -> 7.5 GAL PURGED.

RETURN TO LOCATION ON 08/04/16 @ 1059. DTW = 55.60 FT BTC. PID IN HS = 0.0 ppm, BZ = 0.0 ppm (POSITIVE PRESSURE WHEN OPENING J-PLUG).

Groundwater Purging and Sampling Form



SITE: UPRR-FREEMAN

Well ID: MW-11

Field Team: M. LOPEZ, M. ENDO

Date: 8/3/2016

Weather/Temp: CLEAR, LOW 70'S, NO WIND

Arrival Time: 1945

Well Condition: IN GOOD CONDITION, PID: 2.0 WH/DO_{BR}

Initial DTW (ft btc): 57.63 @ 1132

Purge Method: BAILER

Purge Rate⁵: HAND

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1950	Begin Pumping								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: _____

Sample Time: N/A

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 24, 0

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: 2048 END PURGING WELL, UNABLE TO KEEP UP W/ RECHARGE, WILL TRY USING PUMP

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: MW-11

Field Team: M. ENDO & M. LOPEZ

Date: 4/10/08 08/04/16

Weather/Temp: SUNNY, Low 80's °F, WNW winds @ 6-8 mph

Arrival Time: 1610
ON 08/03/16 →
 Initial DTW (ft btc): 1132 / 1625 wi
57.63 / 56.78 pump

Well Condition: 2" PVC, OK

Purge Method: SUBMERSIBLE PUMP Purge Rate ⁵: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	mS/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1630	Begin Pumping PUMP SUCTION DEPTH = 72.5 FT BTC SS GEOSUB CONTROLLER SET @ 97 Hz = 115 mL/min								
1647	BEGIN PUMPING AGAIN	SS	GEOSUB	CONTROLLER	SET @	65 Hz =	180 mL/min	NA	
1657	60.17		16.25	7.30	45.7	85.5	3.95	-14	SLIGHTLY CLOUDY NO ODC. EFFERVESENT
1700	60.26		16.08	7.23	45.5	79.3	3.71	-20	"
1703	60.35		15.47	7.19	45.8	76.0	3.57	-23	"
1706	60.41		16.06	7.13	45.0	72.3	3.25	-28	"
1709	60.46		16.50	7.09	44.8	72.7	3.02	-30	"
1712	60.49		16.22	7.07	45.3	73.4	2.98	-32	"
	PARAMETERS STABLE, PROCEED TO SAMPLE.								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: ~~MW30 FD-1608~~ MW11-1608

Sample Time: 1715

Analysis: 82603

QC SAMPLE (CIRCLE): (FD) MS/MSD EQ Blank TOTAL PURGED (GAL): 2 GAL

Field Duplicate ID: MW30 FD-1608 Field Duplicate Time: 0800

Comments: PID IN HS = 0.0 ppm, IN BZ = 0.6 ppm @ 1612. @ 1639 INVERTER OVERHEAT ERROR @ 99 Hz → PUMP OFF. CONNECT INVERTER TO FIELD VEHICLE BATTERY, CAR RUNNING & RESTART @ 1647 = PUMP WORKING @ 115 mL/min @ 65 Hz INSTEAD OF 97 Hz.

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: MW-12

Field Team: M. ENDO & M. LOPEZ

Date: 08/04/16

Weather/Temp: SUNNY, UPPER 70'S, W WINDS @ 4-6 mph

Arrival Time: 0930

Well Condition: 2" PVC, OK

Initial DTW (ft btc): 01155 = 41.33 / 0946 = 39.60 w/ pump

Purge Method: SUBMERSIBLE

Purge Rate⁵: 0951 = 189 mL/min @ 1008 2100 mL/min

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	ms/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0951	Begin Pumping SS GEOPUMP GEOSUMP CONTROLLER SET @ PUMP SECTION DEPTH = 51 FT BTC 62 Hz = 180 mL/min								
1005	42.21		19.46	6.61	47.8	141.0	5.90	-161	MODERATELY CLOUDY SHINY SUSPENDED PARTICULATES, NO SHEEN
1008	42.77		13.57	6.64	49.5	190.0	4.81	-261	NA
1133	RETURNED TO WELL - DTW: 45.03. RECHARGE US ¹ SINCE PURGE DRY, WILL SAMPLE & COLLECT ONE ADDITIONAL WQ READING SET								
1144	46.73		17.43	7.38	43.0	High	5.52	-144	VERY TURBID, MILKY WHITE W/ VERY FINE SUSPENDED PARTICULATES
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW12-1608

Sample Time: 1145

Analysis: 8260B

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): ~ 2.0

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: 0934 PID IN HS = 12.6 ppm, BZ = 0.0 ppm. @ 1006 FLOWCELL FULL, VERY SLOW PURGE RATE (~ 100 mL/min) W/ DRAW DOWN @ 0.1374 FT/min. PURGE WELL TO SUCTION DEPTH AND ALLOW RECHARGE BEFORE SAMPLING. @ 1014 COMPLETE PURGE.

@ 1133 DTW = 45.03 FT BTC. TURN PUMP ON @ 1140 @ 68 Hz TO SAMPLE

* DRAW DOWN W/ 2100 mL/min. STOP DRAWS TO SAMPLE. INCREASE RATE TO PURGE WELL DRY

Groundwater Purging and Sampling Form



SITE: UPRR - FREEMAN

Well ID: FD MW-20 W-20

Field Team: M. ENDO & M. LOPEZ

Date: 08/04/11

Weather/Temp: SUNNY, LOW 80'S °F, NW WINDS @ 4-5 mph

Arrival Time: 1805
ON 08/03/11 → @ 1058 / @ 1814 w/ PUMP
 Initial DTW (ft btc): = 20.12 / = 19.69

Well Condition: 6" STEEL CASING, PUMP DOWN WELL

Purge Method: SUBMERSIBLE

Purge Rate ⁵: 315 m³/min @ 29 Hz

Field Parameters ¹										
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	mS/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.	
1818	Begin Pumping PUMP SUCTION DEPTH = 82 FT BTL SS GEOSUMP CONTROLLER SET @ 28 Hz = 450 m ³ /min									
1822	20.21	0.4755	10.50	6.90	44.5	106	10.56	78	TRANSPARENT, SLIGHTLY BROWN, NO ODOR.	
1825	20.43	0.8321	10.20	6.85	44.1	73.6	8.77	74	"	
1828	20.61	1.1491	10.19	6.76	43.8	61.8	8.27	72	TRANSPARENT, VERY SLIGHTLY BROWNISH COLOR NO ODOR.	
1831	20.72	1.4662	10.32	6.68	43.2	87.8	7.78	70	"	
1834	20.86 20.86	1.6776	10.27	6.62	42.6	91.9	7.51	70	"	
1837	20.95 20.95	1.8889	10.32	6.56	42.4	95.8	8.15	70	"	
1840	21.07	2.1002	10.51	6.52	42.1	133.4	7.89	70	"	
1843	21.13	2.3116	10.67	6.47	41.7	141.6	7.57	67	"	
1846	21.18	2.523	10.82	6.41	41.5	144.6	7.60	68	"	
		2.7344	PARAMETERS STABLE, PROCEED TO SAMPLE							
	21.30	FINAL DTW @ 1853.								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-	

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: FD MW-20 W20-1606

Sample Time: 1850

Analysis: 82603

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): ~2.9

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: @ 1810 P10 IN HS = 0.0, BZ = 0.0 ppm. SLIGHT DRAWDOWN @ 29 Hz, BUT NO FLOW @ 28 Hz. COMPLETE SAMPLING @ 1853.

Groundwater Purging and Sampling Form



SITE: UPRR-FREEMAN **Well ID:** W-26
Field Team: M-ENDO & M-LOPEZ **Date:** 08/04/16
Weather/Temp: SUNNY, UPRR 70's °F, N WINDS @ 4-5 mph **Arrival Time:** 1930
Well Condition: BROKEN 4" PVC **Initial DTW (ft btc):** @ 1146 / @ 1943 *w/ purr*
= 67.10 / = 66.85
Purge Method: SUBMERSIBLE **Purge Rate⁵:** 450 ml/min

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	ms/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1945	Begin Pumping SS GEO SUMP CONTROLLER SET @ 88 Hz PUMP SUCTION DEPTH = 92 FT BTCL = 450 ml/min								
1951	66.87	0.7133	13.03	6.47	40.4	28.0	9.44	264	CLEAR, NO ODOUR
1954	66.88	1.0699	12.68	6.49	40.2	29.1	8.95	261	"
1957	66.88	1.4265	12.81	6.44	40.0	38.0	9.20	259	"
2000	66.88	1.7831	12.82	6.43	39.9	*52.9	8.83	260	CRYSTAL CLEAR NO ODOUR
2003	66.88	2.1397	12.87	6.40	39.9	*66.3	8.92	259	"
	All parameters stable, BESIDES TURBIDITY (MALFUNCTIONING). PROCEED TO SAMPLE.								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals ² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs ⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: W26-1608 **Sample Time:** 2010
Analysis: 8260B
QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank **TOTAL PURGED (GAL):** 2.4 gal
Field Duplicate ID: _____ **Field Duplicate Time:** _____

Comments: @ 1935 PID IN HS = 0.0 ppm, BZ = 0.0 ppm
DURING PUMP DECON THE PLASTIC WIRE GUIDE FELL DOWN WELL. NO ATTEMPT TO RETRIEVE.

* TURBIDITY READINGS JUMPING ± 15 NTU.

1072

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-17D

Field Team: McComb

Date: 04/13/17

Weather/Temp: 46°F, Windy, overcast

Arrival Time: _____

Well Condition: Good

Initial DTW (ft btc): 63.82

Purge Method: Submersible pump SS Geopump Purge Rate ⁵: (59.90 after pump set up)

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	ms/cm Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>(liters)</i> Begin Pumping									
0949	59.90	initial	9.41	7.24	0.440	55	10.35	245	clear, no odor
0958	68.46	2 liters	11.71	7.65	0.432	537	9.09	175	
1015	71.68	5	12.28	7.76	0.436	235	7.68	106	light tan, no odor
1032	73.80	8	12.02	7.85	0.415	124	7.46	95	" "
1050	74.30	10	12.07	7.88	0.405	71.5	7.24	99	light grey, no odor
1105	74.40	11.1	12.39	8.00	0.398	62.7	6.97	92	" "
1115	74.32	12.1	12.67	8.02	0.393	59.1	6.79	86	" "
1125	74.30	13.1	13.01	8.04	0.387	56.0	6.67	82	" "
1135	74.28	14.1	13.30	8.05	0.380	59.3	6.51	82	" "
1145	74.28	15.1	13.33	8.04	0.377	39.5	6.43	82	" "
1155	74.28	16.1	13.36	8.00	0.371	25.4	6.39	83	" "
Stabilization Criteria ³	-	-	-	±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	-

¹ collect field parameters in 3-5 minute intervals
² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft
³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO
⁴ for turbidity readings > 10 NTUs
⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW17D-GW-041317 Sample Time: _____

Analysis: 8260B; 6000 (filtered); 2320 B/310.1; 40CFR 136/415.2; 300.0; 376.2; RSK175 GC-FID

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: SS Geopump w/ drop tube (act @ 214' bgs)

(94 in control box)

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-17D pg 2 of 2

Field Team: McLure

Date: 04/13/17

Weather/Temp: overcast, low 40s, windy

Arrival Time: _____

Well Condition: Good

Initial DTW (ft btc): 63.82

Purge Method: Submersible pump

Purge Rate⁵: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
<i>liters</i>									
<i>Begin Pumping</i>					<i>ms/cm</i>				
1205	74.30	17.1	13.35	7.95	0.362	17.4	6.38	85	clear, no odor
1215	74.28	18.1	13.41	7.94	0.358	14.7	6.35	88	" "
1225	74.30	19.1	13.40	7.91	0.357	11.7	6.36	90	" "
1235	74.30	20.1	13.40	7.92	0.357	13.1	6.36	93	" "
				<i>End Purge</i>					
<i>RM 4/13/17</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW17D-GW-041317

Sample Time: 12:38

Analysis: See pg 1

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED ^{liters} (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Ferrous Iron = 0.15 mg/L

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-15D

Field Team: L. Braumann

Date: 7/7/17

Weather/Temp: 74°F Sunny

Arrival Time: 0641

Well Condition: Good, New

Initial DTW (ft btc): 88.75

Purge Method: Low flow

Purge Rate⁵: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
852	88.75								
0855	88.77	.4	16.31	7.25	0.357	66.4	16.42	222	Lt. Gray
0858	88.75	.55	15.41	7.25	.357	69.1	15.93	222	
0901	88.75	.90	13.34	7.25	.369	50.4	13.92	222	
0904	88.75	1.20	13.4	7.26	.372	20.8	12.91	218	
0907	88.75	1.75	13.4	7.26	.372	13.7	13.7	218	
0910	88.75	2.25	13.38	7.29	.374	8.80	12.27	205	
0913	88.75	2.6	13.7	7.31	.372	6.67	11.82	200	
0916	88.75	2.75	13.72	7.33	.371	5.58	11.65	196	
0919	88.75	3.1	13.71	7.34	.373	2.95	11.53	193	
091	88.75	3.75							
Stabilization Criteria ³	-	-	-	±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW15D-GW-070717

Sample Time: 0920

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 3.75

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Fe=0.0

Groundwater Purging and Sampling Form



SITE: UPRR Freeman

Well ID: MW-20D

Field Team: L. Bouman / J. Brown

Date: 7/7/17

Weather/Temp: 81°F / sun w/ some clouds

Arrival Time: 1054

Well Condition: _____

Initial DTW (ft btc): 992.27

Purge Method: _____

Purge Rate⁵: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1125	92.2	.							
1132	93.73	.85	16.73	7.07	.564	276	12.71	83	
1135	94.30	1.25	15.04	7.03	.574	282	12.82	72	Tan color
1138	94.20	1.55	15.83	6.97	.573	139	11.56	72	
1141	94.21	2.0	15.36	6.91	.582	69.5	11.34	75	
1144	94.09	2.5	15.41	6.85	.575	23.9	11.01	80	
1147	94.2	3.0	15.17	6.80	.573	15.5	11.05	87	
1151	94.02	3.75	16.6	6.67	.555	14.7	10.11	110	
1154	94.80	4.25	14.82	6.50	.556	16.0	10.75	118	
1157	95.55	5.0	14.86	6.39	.551	15.0	10.53	123	
1159	95.58	5.5	14.82	6.30	.548	17.8	10.43	131	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

End sampling @ 12:15

Sample ID: MW20D-GW-070717

Sample Time: 1200

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 87 gal

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Fe = 0.0

Groundwater Purging and Sampling Form



SITE: M Freeman, WA - UPRR

Well ID: MW-21D

Field Team: L. Boumann / J. Brown

Date: 7-11-17

Weather/Temp: Sun, lt. wind, ~80°

Arrival Time: 1335

Well Condition: New

Initial DTW (ft btc): 63.35

Purge Method: Low flow w/ portable pump, had already been purged once in the AM. Purge Rate⁵: _____

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1355	63.35								
1357	63.69	.5	17.67	8.23	.356	34.2	4.84	174	Some foaming on surface
1359	63.67	.75	16.54	8.12	.353	17.8	5.08	164	
1401	63.74	1.05	16.63	8.03	.352	11.1	4.61	148	
1403	63.87	1.5	15.69	8.00	.358	8.83	4.62	133	∅ odor
1405	63.83	2.0	16.09	7.97	.358	9.21	4.43	108	
1407	63.83	2.45	15.93	7.95	.358	8.10	4.45	102	
1409	63.82	2.75	15.25	7.89	.361	5.68	4.52	93	
Stabilization Criteria ³	-	-	-	±0.1 units	±3%	±10% ⁴	±0.3 mg/L	±10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW21D-GW-071117

Sample Time: 1410

Analysis: all

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: _____

Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method



Project: UPRR Freeman

Building: Ø

Field Sample ID	Location	Canister ID	Flow Controller ID	Initial Pressure ("Hg)	Start Date	Start Time	Check (6/20 hr)		End Date	End Time	Final Pressure ("Hg)
							Time	Pressure ("Hg)			
SV101A-5		1203	FC1500	27	2/6/18	1611	-	-	2/7/18	1150	5
SV101A-15	Not collected	2819	FC1432	28	↓	1611	-	-	↓		
SV101B-25		2745 838 2813	FC1039	28	↓	1612	-	-	↓	1122	5
SV101B-34	no sample collected, no recharge	2745 2748	FC0081	28	↓	1612	-	-	↓	-	-

Weather Conditions

General weather conditions: 40°, breezy breezy
dup 1 = SV101B-25 dup 2 = SV101B-34

Temperature Range (indoor and outdoor): _____

Was there significant precipitation within 12 hours prior to (or during) the sampling event? No

Soil Vapor Sampling Log



Project: <u>UPRR Freeman</u>		Sampler: <u>Jon Espinoza (JE)</u>	
Sample Location Information			
Property ID/Address: <u>Cornin Facility</u>			
Condition of ground in the surrounding area: <u>Asphalt/gravel</u>			
Location ID: <u>SU-104</u>		Sample ID: <u>SU104B5' SU104-5'</u>	
Sample Location Description: <u>New silos</u>			
Soil Vapor Probe Leak Checking and Sampling Log			
Manifold Leak Check			
Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.			(Pass) Fail
Describe corrective measures taken to pass the manifold leak test: <u>NA</u>			
Soil Vapor Probe Helium Leak Check and Purge Results			
Purge rate (mL/Min): <u>200 ml/min</u>	Helium Conc. in the Purged Vapor: <u>0 ppm</u>		
Start and End Times: <u>1630 1040</u>	Calculated leak percentage: <u>0%</u>		
Purge Vacuum ("Hg): <u>4.5</u>	Probe Leak Check Result*: <u>(Pass)</u> Fail		
Avg. Helium Conc. in the Enclosure: <u>27.0%</u> 0% *The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% (0.23/35*100 = 0.66%). Do NOT collect a soil vapor sample if the leak check fails.			
Total Volume Purged (L): _____			
Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):			
MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u>0</u>	O ₂ (%): <u>0</u>	O₂ (%): _____ CO₂ (%): _____ CH₄ (%): _____	
H ₂ S (ppm): <u>0</u>	LEL (%): <u>0</u>		
CO (ppm): <u>0</u>			
Sampling Information			
Evacuated Canister or Bottle-Vac			
Canister Size (L): <u>0.6</u>	Initial Pressure (" Hg): <u>28.5" Hg</u>		
Canister ID: <u>2029</u>	Start Date and Time: <u>2/6/18 1051</u>		
Flow Controller ID: <u>FC1408</u>	End Date and Time: <u>2/7/18 910</u>		
Sampling Rate (mL/min, hours): <u>24 hr</u>	Final Pressure (" Hg): <u>2.5"</u>		
Sampling Vacuum ("Hg): _____			
Tedlar Bag			
Tedlar Bag size (L): _____		Sampling Rate (mL/min): _____	
Sampling Date: _____		Sampling Start and End Times: _____	
Sorbent Tube			
Sorbent Tube type and size: _____		Sampling Date: _____	
Sorbent Tube ID: _____		Sampling Start and End Times: _____	
Initial Flow Rate (mL/min): _____		Final Flow Rate (mL/min): _____	
Calculated Sampling Volume: _____			
Weather Conditions and Additional Notes			
Weather Conditions During Sampling: <u>40°, breezy</u>			
Additional Notes: <u>Purge vacuum > 7", will collect sample anyway.</u>			

Soil Vapor Sampling Log



Project: UPRR Freeman, WA Sampler: JE

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of ground in the surrounding area: Asphalt/gravel
 Location ID: SU104B Sample ID: SU104B-15
 Sample Location Description: Near sites

Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact. (Pass) Fail

Describe corrective measures taken to pass the manifold leak test: Ø

Soil Vapor Probe Helium Leak Check and Purge Results

Purge rate (mL/Min): 200 mL/min Helium Conc. in the Purged Vapor: 225 ppm (0.025%)
 Start and End Times: 1055 1112 Calculated leak percentage: 0.07%
 Purge Vacuum ("Hg): 77" Hg Probe Leak Check Result*: (Pass) Fail
 Avg. Helium Conc. in the Enclosure: 31.3%
 Total Volume Purged (L): NA

*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% [0.23/35*100 = 0.66%]. Do NOT collect a soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u>Ø</u>	O ₂ (%): <u>Ø</u>	O ₂ (%): <u>Ø</u>	CO₂ (%):
H ₂ S (ppm): <u>Ø</u>	LEL (%): <u>Ø</u>	CO ₂ (%): <u>Ø</u>	CH₄ (%):
CO (ppm): <u>Ø</u>			

Sampling Information

Evacuated Canister or Bottle-Vac

Canister Size (L): 6L Initial Pressure (" Hg): -28
 Canister ID: 3314 Start Date and Time: 2/6/18 1115
 Flow Controller ID: FC1407 End Date and Time: 2/7/18 909
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): -2"
 Sampling Vacuum ("Hg):

Tedlar Bag

~~Tedlar Bag size (L): Sampling Rate (mL/min):
 Sampling Date: Sampling Start and End Times:~~

Sorbent Tube

~~Sorbent Tube type and size: Sampling Date:
 Sorbent Tube ID: Sampling Start and End Times:
 Initial Flow Rate (mL/min): Final Flow Rate (mL/min):
 Calculated Sampling Volume:~~

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 40°, breezy

Additional Notes: Purge vacuum 77" Hg, will set up summer can anyways. No recharge on 2nd purge attempt

Soil Vapor Sampling Log



Project: <u>UPRR Freeman</u>		Sampler: <u>JE</u>	
Sample Location Information			
Property ID/Address: <u>Freeman, WA</u>			
Condition of ground in the surrounding area: <u>Asphalt/gravel</u>			
Location ID: <u>SV104B</u>		Sample ID: <u>SV104B-22</u>	
Sample Location Description: <u>Near silos</u>			
Soil Vapor Probe Leak Checking and Sampling Log			
Manifold Leak Check			
Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.			
Describe corrective measures taken to pass the manifold leak test:		<input checked="" type="radio"/> Pass <input type="radio"/> Fail	
Soil Vapor Probe Helium Leak Check and Purge Results			
Purge rate (mL/Min):	<u>200 ml/min</u>	Helium Conc. in the Purged Vapor:	<u>0 ppm</u>
Start and End Times:	<u>1131 1137</u>	Calculated leak percentage:	<u>0%</u>
Purge Vacuum ("Hg):	<u>77" Hg</u>	Probe Leak Check Result*:	<input checked="" type="radio"/> Pass <input type="radio"/> Fail
Avg. Helium Conc. in the Enclosure:	<u>21.5%</u>	<small>*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% [0.23/35*100 = 0.66%]. Do NOT collect a soil vapor sample if the leak check fails.</small>	
Total Volume Purged (L):	<u>0</u>		
Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):			
MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm):	<u>0</u>	O ₂ (%):	<u>0</u>
H ₂ S (ppm):	<u>0</u>	LEL (%):	<u>0</u>
CO (ppm):	<u>0</u>	O ₂ (%):	<u>0</u>
		CO ₂ (%):	<u>0</u>
		CH ₄ (%):	<u>0</u>
Sampling Information			
Evacuated Canister or Bottle-Vac			
Canister Size (L):	<u>6 L</u>	Initial Pressure (" Hg):	<u>29"</u>
Canister ID:	<u>689</u>	Start Date and Time:	<u>2/6/18 1141</u>
Flow Controller ID:	<u>FC1379</u>	End Date and Time:	<u>2/7/18 911</u>
Sampling Rate (mL/min, hours):	<u>24 hr</u>	Final Pressure (" Hg):	<u>5"</u>
Sampling Vacuum ("Hg):	<u>NA</u>		
Tedlar Bag			
Tedlar Bag size (L):		Sampling Rate (mL/min):	
Sampling Date:		Sampling Start and End Times:	
Sorbent Tube			
Sorbent Tube type and size:		Sampling Date:	
Sorbent Tube ID:		Sampling Start and End Times:	
Initial Flow Rate (mL/min):		Final Flow Rate (mL/min):	
Calculated Sampling Volume:			
Weather Conditions and Additional Notes			
Weather Conditions During Sampling: <u>40° breezy</u>			
Additional Notes: <u>Purge vacuum jumped immediately over 7", tried again, no recharge.</u>			

Soil Vapor Sampling Log



Project: UPRR Freeman Sampler: JF

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of ground in the surrounding area: Asphalt/gravel
 Location ID: SV104B Sample ID: SV104B-27'
 Sample Location Description: Near Sijos

Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact. (Pass) Fail

Describe corrective measures taken to pass the manifold leak test: _____

Soil Vapor Probe Helium Leak Check and Purge Results

Purge rate (mL/Min): 200 ml/min Helium Conc. in the Purged Vapor: 0 ppm
 Start and End Times: 1154 1200 Calculated leak percentage: 0%
 Purge Vacuum ("Hg): > 7" Probe Leak Check Result*: (Pass) Fail
 Avg. Helium Conc. in the Enclosure: 16.8%
 Total Volume Purged (L): NA

*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% [0.23/35*100 = 0.66%]. Do NOT collect a soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm):	<u>0</u>	O ₂ (%):	<u>0</u>
H ₂ S (ppm):	<u>0</u>	LEL (%):	<u>0</u>
CO (ppm):	<u>0</u>	CO ₂ (%):	<u>0</u>
		CH ₄ (%):	<u>0</u>

Sampling Information

Evacuated Canister or Bottle-Vac

Canister Size (L): 6L Initial Pressure (" Hg): 30"
 Canister ID: Z106 Start Date and Time: 2/6/18 1200
 Flow Controller ID: FC1444 End Date and Time: 2/7/18 911
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): 4"
 Sampling Vacuum ("Hg): _____

Tedlar Bag

~~Tedlar Bag size (L): _____ Sampling Rate (ml/min): _____
 Sampling Date: _____ Sampling Start and End Times: _____~~

Sorbent Tube

~~Sorbent Tube type and size: _____ Sampling Date: _____
 Sorbent Tube ID: _____ Sampling Start and End Times: _____
 Initial Flow Rate (mL/min): _____ Final Flow Rate (mL/min): _____
 Calculated Sampling Volume: _____~~

Weather Conditions and Additional Notes

~~Weather Conditions During Sampling: _____
 Additional Notes: _____~~

↓ Purge vacuum > 7" Hg, no recharge, will collect anyways ↓

Soil Vapor Sampling Log



Project: UPRR Freeman Sampler: JE

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of ground in the surrounding area: Asphalt/Gravel
 Location ID: Near silos Sample ID: SV102-5'
 Sample Location Description: Near silos

Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact. (Pass) Fail
 Describe corrective measures taken to pass the manifold leak test: NA

Soil Vapor Probe Helium Leak Check and Purge Results

Purge rate (mL/Min): 200 ml/min Helium Conc. in the Purged Vapor: 0 ppm
 Start and End Times: 1401 1405 Calculated leak percentage: 0%
 Purge Vacuum ("Hg): >7" Probe Leak Check Result*: (Pass) Fail
 Avg. Helium Conc. in the Enclosure: 28.9%
 Total Volume Purged (L): NA
*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% [0.23/35*100 = 0.66%]. Do NOT collect a soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u>0</u>	O ₂ (%): <u>0</u>	O ₂ (%): _____	_____
H ₂ S (ppm): <u>0</u>	LEL (%): <u>0</u>	CO ₂ (%): _____	_____
CO (ppm): <u>0</u>		CH ₄ (%): _____	_____

Sampling Information

Evacuated Canister or Bottle-Vac

Canister Size (L): 6L Initial Pressure (" Hg): 29"
 Canister ID: 3320 Start Date and Time: 2/6/18 1411
 Flow Controller ID: FC 1417 End Date and Time: 2/7/18 1158
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): 16"
 Sampling Vacuum ("Hg): _____

Tedlar Bag

~~Tedlar Bag size (L): _____ Sampling Rate (mL/min): _____
 Sampling Date: _____ Sampling Start and End Times: _____~~

Sorbent Tube

~~Sorbent Tube type and size: _____ Sampling Date: _____
 Sorbent Tube ID: _____ Sampling Start and End Times: _____
 Initial Flow Rate (mL/min): _____ Final Flow Rate (mL/min): _____
 Calculated Sampling Volume: _____~~

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 40°, breezy
 Additional Notes: purge vacuum >7", will collect anyways

Soil Vapor Sampling Log



Project: UPRR Freeman Sampler: JE

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of ground in the surrounding area: Asphalt/gravel
 Location ID: SV102B Sample ID: SV102B-15'
 Sample Location Description: Near sifos

Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact. (Pass) Fail

Describe corrective measures taken to pass the manifold leak test: _____

Soil Vapor Probe Helium Leak Check and Purge Results

Purge rate (mL/Min): 200 ml/min Helium Conc. in the Purged Vapor: 0 ppm
 Start and End Times: 1415 1423 Calculated leak percentage: 0%
 Purge Vacuum ("Hg): >7" Probe Leak Check Result*: (Pass) Fail
 Avg. Helium Conc. in the Enclosure: 19.3%
 Total Volume Purged (L): NA

*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% [(0.23/35)*100 = 0.66%]. Do NOT collect a soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm):	O ₂ (%):	O ₂ (%):	
H ₂ S (ppm):	LEL (%):	CO ₂ (%):	
CO (ppm):		CH ₄ (%):	

Sampling Information

Evacuated Canister or Bottle-Vac

Canister Size (L): 6L Initial Pressure (" Hg): 29"
 Canister ID: 52 Start Date and Time: 2/6/18 1427
 Flow Controller ID: FC 1358 End Date and Time: 2/7/18 918
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): 5"
 Sampling Vacuum ("Hg): _____

Tedlar Bag

~~Tedlar Bag size (l): _____ Sampling Rate (mL/min): _____
 Sampling Date: _____ Sampling Start and End Times: _____~~

Sorbent Tube

~~Sorbent Tube type and size: _____ Sampling Date: _____
 Sorbent Tube ID: _____ Sampling Start and End Times: _____
 Initial Flow Rate (mL/min): _____ Final Flow Rate (mL/min): _____
 Calculated Sampling Volume: _____~~

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 40°, breezy

Additional Notes: purge vacuum >7", will collect anyway

Soil Vapor Sampling Log



Project: UPRR Freeman Sampler: JE

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of ground in the surrounding area: Asphalt/gravel
 Location ID: SU102B Sample ID: SU102B-25'
 Sample Location Description: Near silos

Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact. (Pass) Fail

Describe corrective measures taken to pass the manifold leak test: Ø

Soil Vapor Probe Helium Leak Check and Purge Results

Purge rate (mL/Min): 7200 ml/min Helium Conc. in the Purged Vapor: 0 ppm
 Start and End Times: _____ Calculated leak percentage: 0%
 Purge Vacuum ("Hg): 7.7" Probe Leak Check Result*: (Pass) Fail
 Avg. Helium Conc. in the Enclosure: 3.8%
 Total Volume Purged (L): Ø

*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% [0.23/35*100 = 0.66%]. Do NOT collect a soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm):	O ₂ (%):	O ₂ (%):	_____
H ₂ S (ppm):	LEL (%):	CO ₂ (%):	_____
CO (ppm):		CH ₄ (%):	_____

Sampling Information

Evacuated Canister or Bottle-Vac

Canister Size (L): 60 L Initial Pressure (" Hg): 28"
 Canister ID: 2683 818 Start Date and Time: 2/16/18 1450
 Flow Controller ID: FC0003 FC1463 End Date and Time: _____
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): _____
 Sampling Vacuum ("Hg): _____

Tedlar Bag

Tedlar Bag size (L): _____ Sampling Rate (mL/min): _____
 Sampling Date: _____ Sampling Start and End Times: _____

Sorbent Tube

Sorbent Tube type and size: _____ Sampling Date: _____
 Sorbent Tube ID: _____ Sampling Start and End Times: _____
 Initial Flow Rate (mL/min): _____ Final Flow Rate (mL/min): _____
 Calculated Sampling Volume: _____

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 40° breezy

Additional Notes: purge vacuum great greater than 7" will collect any anys due to hole SV points are installed chamber not a good fit for the test. Swap summa due to bad regulator. Sample not collected due to no recharge.

Soil Vapor Sampling Log



Project: UPRR Freeman Sampler: JE

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of ground in the surrounding area: Asphalt/gravel
 Location ID: SV103B Sample ID: SV103B-5'
 Sample Location Description: Near silos

Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact. Pass Fail
 Describe corrective measures taken to pass the manifold leak test: NA

Soil Vapor Probe Helium Leak Check and Purge Results

Purge rate (mL/Min): 200 ml/min Helium Conc. in the Purged Vapor: 0 ppm
 Start and End Times: 1256 1301 Calculated leak percentage: 0%
 Purge Vacuum ("Hg): 4" Hg Probe Leak Check Result*: Pass Fail
 Avg. Helium Conc. in the Enclosure: 13.3%
 Total Volume Purged (L): 1 L

*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% $[0.23/35 * 100 = 0.66\%]$. Do NOT collect a soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u>0</u>	O ₂ (%): <u>0</u>	O ₂ (%): <u>0</u>	CO₂ (%):
H ₂ S (ppm): <u>0</u>	LEL (%): <u>0</u>	CO ₂ (%): 0	CH₄ (%):
CO (ppm): <u>0</u>			

Sampling Information

Evacuated Canister or Bottle-Vac

Canister Size (L): 6L Initial Pressure (" Hg): 28"
 Canister ID: 2304 Start Date and Time: 1305 2/6/18
 Flow Controller ID: FC1454 End Date and Time: 2/7/18 910
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): 5"
 Sampling Vacuum ("Hg): 28" initial

Tedlar Bag

Tedlar Bag size (L): _____ Sampling Rate (mL/min): _____
 Sampling Date: _____ Sampling Start and End Times: _____

Sorbent Tube

Sorbent Tube type and size: _____ Sampling Date: _____
 Sorbent Tube ID: _____ Sampling Start and End Times: _____
 Initial Flow Rate (mL/min): _____ Final Flow Rate (mL/min): _____
 Calculated Sampling Volume: _____

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 40°, breezy
 Additional Notes: Pass both leak checks. No field screen completed.

Soil Vapor Sampling Log



Project: UPRR Freeman Sampler: JE

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of ground in the surrounding area: Asphalt/gravel
 Location ID: SV103B Sample ID: SV103B-19'
 Sample Location Description: Near Cites

Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact. (Pass) Fail
 Describe corrective measures taken to pass the manifold leak test: Re Tighten Swagelok connections

Soil Vapor Probe Helium Leak Check and Purge Results

Purge rate (mL/Min): 200 ml/min Helium Conc. in the Purged Vapor: 0 ppm
 Start and End Times: 1110 1115 Calculated leak percentage: 0%
 Purge Vacuum ("Hg): 77" C Probe Leak Check Result*: (Pass) Fail
 Avg. Helium Conc. in the Enclosure: 22.3%
 Total Volume Purged (L): NA

*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% [0.23/35*100 = 0.66%]. Do NOT collect a soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm):	<u>0</u>	O ₂ (%):	<u>0</u>
H ₂ S (ppm):	<u>0</u>	LEL (%):	<u>0</u>
CO (ppm):	<u>0</u>	CO ₂ (%):	<u>0</u>
		CH ₄ (%):	<u>0</u>

Sampling Information

Evacuated Canister or Bottle-Vac

Canister Size (L): 6L Initial Pressure (" Hg): 28"
 Canister ID: 6064 Start Date and Time: 2/6/18
 Flow Controller ID: FC 1368 End Date and Time: 4/13/19
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): 0
 Sampling Vacuum ("Hg):

Tedlar Bag

~~Tedlar Bag size (L): _____ Sampling Rate (mL/min): _____
 Sampling Date: _____ Sampling Start and End Times: _____~~

Sorbent Tube

~~Sorbent Tube type and size: _____ Sampling Date: _____
 Sorbent Tube ID: _____ Sampling Start and End Times: _____
 Initial Flow Rate (mL/min): _____ Final Flow Rate (mL/min): _____
 Calculated Sampling Volume: _____~~

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 40°, breezy

Additional Notes: Purge vacuum > 77Hg, will collect dryways. No sample collected (no recharge)

Soil Vapor Sampling Log



Project: UPRR Freeman Sampler: JF

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of ground in the surrounding area: Asphalt (grave)
 Location ID: SV103B Sample ID: SV103B-24'
 Sample Location Description: Near silos

Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact. Pass Fail
 Describe corrective measures taken to pass the manifold leak test: Ø

Soil Vapor Probe Helium Leak Check and Purge Results

~~Purge rate (mL/Min): _____ Helium Conc. in the Purged Vapor: _____
 Start and End Times: _____ Calculated leak percentage: _____
 Purge Vacuum ("Hg): _____ Probe Leak Check Result*: Pass Fail
 Avg. Helium Conc. in the Enclosure: _____
 Total Volume Purged (L): _____~~
*The soil vapor probe passes the leak test if the helium concentration in the purged soil vapor is less than 5% of what it was in the helium enclosure during purging. For example, if the helium concentration in the purged soil vapor is 2,300 ppm that is 0.23%, and the average helium concentration in the enclosure was 35%, then the percentage leak is 0.66% $(0.23/35 * 100 = 0.66\%)$. Do NOT collect a soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): _____	O ₂ (%): _____	O ₂ (%): <u>Ø</u>	
H ₂ S (ppm): _____	LEL (%): _____	CO ₂ (%): <u>Ø</u>	
CO (ppm): _____		CH ₄ (%): <u>Ø</u>	

Sampling Information

Evacuated Canister or Bottle-Vac

~~Canister Size (L): 6L Initial Pressure (" Hg): _____
 Canister ID: 3320 Start Date and Time: 2/10/18
 Flow Controller ID: FC 1117 End Date and Time: _____
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): _____
 Sampling Vacuum ("Hg): _____~~

Tedlar Bag

~~Tedlar Bag size (L): _____ Sampling Rate (mL/min): _____
 Sampling Date: _____ Sampling Start and End Times: _____~~

Sorbent Tube

~~Sorbent Tube type and size: _____ Sampling Date: _____
 Sorbent Tube ID: _____ Sampling Start and End Times: _____
 Initial Flow Rate (mL/min): _____ Final Flow Rate (mL/min): _____
 Calculated Sampling Volume: _____~~

Weather Conditions and Additional Notes

Weather Conditions During Sampling: Ø
 Additional Notes: Water pulled while purging, no sample collected

Subslab Soil Vapor Sampling Log



Project: UPRR Freeman
 Sampler: JE/SO

Sample Location Information

Property ID/Address: Com. Facility
 Condition of slab in the surrounding area: Good
 Location ID: Near silos Sample ID: SV-105
 Sample Location Description (Room Name/Number and surrounding, identifying features):

Subslab Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.	Pass	Fail
	NA	NA

Describe corrective measures taken to pass the manifold leak test: NA

Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results

Purge rate (mL/Min): <u>200 ml/min</u>	Probe Leak Check Result*:	Pass	Fail
Start Time: <u>930</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Purge Vacuum ("Hg): NA
 End Time: 932
 *The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u> </u>	O ₂ (%): <u> </u>	O ₂ (%): <u> </u>	
H ₂ S (ppm): <u> </u>	LEL (%): <u> </u>	CO ₂ (%): <u> </u>	
CO (ppm): <u> </u>		CH ₄ (%): <u> </u>	

Sampling Information

Evacuated Canister or Bottle-Vac

Container Size (L): 6L Initial Pressure (" Hg): 28.5
 Container ID: 1651 Start Date and Time: 2/28/18 1146
 Flow Controller ID: FC0447 End Date and Time: 2/29/18 1003
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): 31/18 2.75
 Sampling Vacuum ("Hg):

Tedlar Bag

Tedlar Bag size (L): Start Date and Time:
 Sampling Rate (mL/min): End Date and Time:

Sorbent Tube

Sorbent Tube type and size: Start Date and Time:
 Sorbent Tube ID: End Date and Time:
 Initial Flow Rate (mL/min): Final Flow Rate (mL/min)
 Calculated Sampling Volume:

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 30°, sunny

Additional Notes: Manifold not used for 24 hr sample

Subslab Soil Vapor Sampling Log



Project: <u>UPRR Freeman</u>					
Sampler: <u>JE/SD</u>					
Sample Location Information					
Property ID/Address: <u>Gran Facility</u>					
Condition of slab in the surrounding area: <u>Good</u>					
Location ID: <u>Near silos</u>	Sample ID: <u>SV-106</u>				
Sample Location Description (Room Name/Number and surrounding, identifying features):					
Subslab Soil Vapor Probe Leak Checking and Sampling Log					
Manifold Leak Check					
Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Pass</td> <td style="width:50%; text-align: center;">Fail</td> </tr> <tr> <td style="text-align: center;"><u>NA</u></td> <td></td> </tr> </table>	Pass	Fail	<u>NA</u>	
Pass	Fail				
<u>NA</u>					
Describe corrective measures taken to pass the manifold leak test: <u>NA</u>					
Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results					
Purge rate (mL/Min): <u>200 ml/min</u>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Pass</td> <td style="width:50%; text-align: center;">Fail</td> </tr> <tr> <td style="text-align: center;"><u>8</u></td> <td></td> </tr> </table>	Pass	Fail	<u>8</u>	
Pass		Fail			
<u>8</u>					
Start Time: <u>935</u>					
Purge Vacuum ("Hg): <u>-</u>					
End Time: <u>937</u>	*The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.				
Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):					
MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter			
Total VOCs (ppm): <u>-</u>	O ₂ (%): <u>-</u>	O ₂ (%): <u>-</u>			
H ₂ S (ppm): <u>-</u>	LEL (%): <u>-</u>	CO ₂ (%): <u>-</u>			
CO (ppm): <u>-</u>		CH ₄ (%): <u>-</u>			
Sampling Information					
Evacuated Canister or Bottle-Vac					
Container Size (L): <u>6L</u>	Initial Pressure (" Hg): <u>28</u>				
Container ID: <u>2167</u>	Start Date and Time: <u>2/28/18 1147</u>				
Flow Controller ID: <u>FC1442</u>	End Date and Time: <u>2/29/18 7:18</u>				
Sampling Rate (mL/min, hours): <u>24 hr</u>	Final Pressure (" Hg): <u>25</u>				
Sampling Vacuum ("Hg):					
Tedlar Bag					
Tedlar Bag size (L): <u>-</u>	Start Date and Time: <u>-</u>				
Sampling Rate (mL/min): <u>-</u>	End Date and Time: <u>-</u>				
Sorbent Tube					
Sorbent Tube type and size: <u>-</u>	Start Date and Time: <u>-</u>				
Sorbent Tube ID: <u>-</u>	End Date and Time: <u>-</u>				
Initial Flow Rate (mL/min): <u>-</u>	Final Flow Rate (mL/min): <u>-</u>				
Calculated Sampling Volume: <u>-</u>					
Weather Conditions and Additional Notes					
Weather Conditions During Sampling: <u>30°, SUNNY</u>					
Additional Notes: <u>Manifold not used for 24 hr sample.</u>					
<u>Water in sun, sample no good.</u>					

Subslab Soil Vapor Sampling Log



Project: UPRR Freeman
 Sampler: JE/SD

Sample Location Information

Property ID/Address: Grain Facility
 Condition of slab in the surrounding area: Good
 Location ID: Near Silos Sample ID: SV-107
 Sample Location Description (Room Name/Number and surrounding, identifying features):

Subslab Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.

Pass	Fail
<u>NA</u>	

Describe corrective measures taken to pass the manifold leak test: NA

Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results

Purge rate (mL/Min): 700 ml/min Probe Leak Check Result*:

Pass	Fail
<input checked="" type="checkbox"/>	

Start Time: 940
 Purge Vacuum ("Hg): -
 End Time: 942

*The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector	LandTec GEM Landfill Gas Meter
Total VOCs (ppm): <u>-</u> O ₂ (%): <u>-</u>	O ₂ (%): <u>-</u>
H ₂ S (ppm): <u>-</u> LEL (%): <u>-</u>	CO ₂ (%): <u>-</u>
CO (ppm): <u>-</u>	CH ₄ (%): <u>-</u>

Sampling Information

Evacuated Canister or Bottle-Vac

Container Size (L): 6L Initial Pressure (" Hg): 29
 Container ID: 3334 Start Date and Time: 2/28/18 1148
 Flow Controller ID: FC16291264 JE End Date and Time: 3/2/18 1001
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): 2.75
 Sampling Vacuum ("Hg): -

Tedlar Bag

Tedlar Bag size (L): - Start Date and Time: -
 Sampling Rate (mL/min): - End Date and Time: -

Sorbent Tube

Sorbent Tube type and size: - Start Date and Time: -
 Sorbent Tube ID: - End Date and Time: -
 Initial Flow Rate (mL/min): - Final Flow Rate (mL/min): -
 Calculated Sampling Volume: -

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 30° sunny

Additional Notes: BA Manifold not used for 24 hr sample.

Subslab Soil Vapor Sampling Log



Project: UPRR Freeman
 Sampler: JE/SO

Sample Location Information

Property ID/Address: Grain Facility
 Condition of slab in the surrounding area: Good
 Location ID: Under facility Sample ID: SV-108
 Sample Location Description (Room Name/Number and surrounding, identifying features):
Far north

Subslab Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.	Pass	Fail
	NA	NA

Describe corrective measures taken to pass the manifold leak test: NA

Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results

Purge rate (mL/Min): <u>200 ml/min</u>	Probe Leak Check Result*:	Pass	Fail
Start Time: <u>1415</u>		<input checked="" type="checkbox"/>	
Purge Vacuum ("Hg): <u>-</u>	*The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.		
End Time: <u>1418</u>			

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u>-</u>	O ₂ (%): <u>-</u>	O ₂ (%): <u>-</u>	
H ₂ S (ppm): <u>-</u>	LEL (%): <u>-</u>	CO ₂ (%): <u>-</u>	
CO (ppm): <u>-</u>		CH ₄ (%): <u>-</u>	

Sampling Information

Evacuated Canister or Bottle-Vac

Container Size (L): <u>6L</u>	Initial Pressure (" Hg): <u>730</u>
Container ID: _____	Start Date and Time: <u>2/28/18 1415</u>
Flow Controller ID: _____	End Date and Time: <u>2/29/18 1622</u>
Sampling Rate (mL/min, hours): <u>24 hr</u>	Final Pressure (" Hg): <u>-30</u>
Sampling Vacuum ("Hg): _____	

Tedlar Bag

Tedlar Bag size (L): <u>-</u>	Start Date and Time: <u>-</u>
Sampling Rate (mL/min): <u>-</u>	End Date and Time: <u>-</u>

Sorbent Tube

Sorbent Tube type and size: <u>-</u>	Start Date and Time: <u>-</u>
Sorbent Tube ID: <u>-</u>	End Date and Time: <u>-</u>
Initial Flow Rate (mL/min): <u>-</u>	Final Flow Rate (mL/min): <u>-</u>
Calculated Sampling Volume: <u>-</u>	

Weather Conditions and Additional Notes

Weather Conditions During Sampling: Under building

Additional Notes: Manifold not used for 24 hr sample
Summa not filling, no sample collected

Subslab Soil Vapor Sampling Log



Project: UPRR Freeman
 Sampler: JE 150

Sample Location Information

Property ID/Address: Grain Facility
 Condition of slab in the surrounding area: Good
 Location ID: Under facility Sample ID: SU-109
 Sample Location Description (Room Name/Number and surrounding, identifying features):
Mid location

Subslab Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.

Pass	Fail
—	—

Describe corrective measures taken to pass the manifold leak test: —

Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results

Purge rate (mL/Min): 200 ml/min Probe Leak Check Result*:

Pass	Fail
✓	—

Start Time: 1419
 Purge Vacuum ("Hg): —
 End Time: 1421

*The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm):	—	O ₂ (%):	—
H ₂ S (ppm):	—	LEL (%):	—
CO (ppm):	—	CO ₂ (%):	—
		CH ₄ (%):	—

Sampling Information

Evacuated Canister or Bottle-Vac

Container Size (L): 6L Initial Pressure (" Hg): -29.5
 Container ID: _____ Start Date and Time: 2/28/18 1417
 Flow Controller ID: _____ End Date and Time: 2/29/18 1021
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): -28 3/1/18
 Sampling Vacuum ("Hg): _____

Tedlar Bag

Tedlar Bag size (L): _____ Start Date and Time: _____
 Sampling Rate (mL/min): _____ End Date and Time: _____

Sorbent Tube

Sorbent Tube type and size: _____ Start Date and Time: _____
 Sorbent Tube ID: _____ End Date and Time: _____
 Initial Flow Rate (mL/min): _____ Final Flow Rate (mL/min) _____
 Calculated Sampling Volume: _____

Weather Conditions and Additional Notes

Weather Conditions During Sampling: Under building

Additional Notes: Manifold not used for 24 hr sampling
No sample collected, sunna not filling

Subslab Soil Vapor Sampling Log



Project: UPRR Freeman
 Sampler: JE/SD

Sample Location Information

Property ID/Address: Grain Facility
 Condition of slab in the surrounding area: Good
 Location ID: Under Facility Sample ID: SV-110
 Sample Location Description (Room Name/Number and surrounding, identifying features):
For South

Subslab Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.	Pass	Fail
	<u>NA</u>	<u>NA</u>

Describe corrective measures taken to pass the manifold leak test: NA

Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results

Purge rate (mL/Min): <u>700 ml/min</u>	Probe Leak Check Result*:	Pass	Fail
Start Time: <u>1423</u>		<u>X</u>	
Purge Vacuum ("Hg): <u>—</u>	*The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.		
End Time: <u>1425</u>			

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u>—</u>	O ₂ (%): <u>—</u>	O ₂ (%): <u>—</u>	
H ₂ S (ppm): <u>—</u>	LEL (%): <u>—</u>	CO ₂ (%): <u>—</u>	
CO (ppm): <u>—</u>		CH ₄ (%): <u>—</u>	

Sampling Information

Evacuated Canister or Bottle-Vac

Container Size (L): <u>60 L</u>	Initial Pressure (" Hg): <u>27</u>
Container ID: _____	Start Date and Time: <u>2/28/18 1419</u>
Flow Controller ID: _____	End Date and Time: <u>2/29/18 1099</u>
Sampling Rate (mL/min, hours): <u>24 hr</u>	Final Pressure (" Hg): <u>26.5 3/1/18</u>
Sampling Vacuum ("Hg): _____	

Tedlar Bag

Tedlar Bag size (L): <u>—</u>	Start Date and Time: <u>—</u>
Sampling Rate (mL/min): <u>—</u>	End Date and Time: <u>—</u>

Sorbent Tube

Sorbent Tube type and size: <u>—</u>	Start Date and Time: <u>—</u>
Sorbent Tube ID: <u>—</u>	End Date and Time: <u>—</u>
Initial Flow Rate (mL/min): <u>—</u>	Final Flow Rate (mL/min): <u>—</u>
Calculated Sampling Volume: <u>—</u>	

Weather Conditions and Additional Notes

Weather Conditions During Sampling: Under building

Additional Notes: DUP-1, Manifold not used for 24 hr sampling
Summa not filling, no sample collected

Subslab Soil Vapor Sampling Log



Project: UPRR Freeman
 Sampler: JE/SP

Sample Location Information

Property ID/Address: Grain Facility
 Condition of slab in the surrounding area: Good
 Location ID: Under Facility Sample ID: SU-111
 Sample Location Description (Room Name/Number and surrounding, identifying features):
Sump

Subslab Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.

Pass	Fail
<u>NA</u>	<u>NA</u>

Describe corrective measures taken to pass the manifold leak test: NA

Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results

Purge rate (mL/Min): 200 ml/min
 Start Time: 1427
 Purge Vacuum ("Hg): -
 End Time: 1429

Probe Leak Check Result*:

Pass	Fail
<input checked="" type="checkbox"/>	<input type="checkbox"/>

*The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u>-</u>	O ₂ (%): <u>-</u>	O ₂ (%): <u>-</u>	
H ₂ S (ppm): <u>-</u>	LEL (%): <u>-</u>	CO ₂ (%): <u>-</u>	
CO (ppm): <u>-</u>		CH ₄ (%): <u>-</u>	

Sampling Information

Evacuated Canister or Bottle-Vac

Container Size (L): 6 L Initial Pressure (" Hg): 28.5
 Container ID: 1074 Start Date and Time: 2/25/18 1421
 Flow Controller ID: FC1371 End Date and Time: 31/1/18 1232
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): 9
 Sampling Vacuum ("Hg): -

Tedlar Bag

Tedlar Bag size (L): - Start Date and Time: -
 Sampling Rate (mL/min): - End Date and Time: -

Sorbent Tube

Sorbent Tube type and size: - Start Date and Time: -
 Sorbent Tube ID: - End Date and Time: -
 Initial Flow Rate (mL/min): - Final Flow Rate (mL/min): -
 Calculated Sampling Volume: -

Weather Conditions and Additional Notes

Weather Conditions During Sampling: Under building

Additional Notes: A Manifold not used for 24 hr sample. No longer filling past -9" Hg, will pull can and submit sample.

Subslab Soil Vapor Sampling Log



Project: UPRR Freeman
 Sampler: JE

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of slab in the surrounding area: Good
 Location ID: Gran Facility Sample ID: SU-112
 Sample Location Description (Room Name/Number and surrounding, identifying features):

Subslab Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.

	Pass	Fail
	<input checked="" type="checkbox"/>	

Describe corrective measures taken to pass the manifold leak test: NA

Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results

Purge rate (mL/Min): ~ 200 mL/min Probe Leak Check Result*:

	Pass	Fail
	<input checked="" type="checkbox"/>	

Start Time: 930
 Purge Vacuum ("Hg): _____
 End Time: 933

*The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter	
Total VOCs (ppm): <u>—</u>	O ₂ (%): <u>—</u>	O ₂ (%): <u>—</u>	
H ₂ S (ppm): <u>—</u>	LEL (%): <u>—</u>	CO ₂ (%): <u>—</u>	
CO (ppm): <u>—</u>		CH ₄ (%): <u>—</u>	

Sampling Information

Evacuated Canister or Bottle-Vac

Container Size (L): <u>60L</u>	Initial Pressure (" Hg): <u>-22"</u>
Container ID: <u>3333</u>	Start Date and Time: <u>4/2/18 946</u>
Flow Controller ID: <u>FC0750</u>	End Date and Time: <u>4/3/18 824</u>
Sampling Rate (mL/min, hours): <u>24 hr</u>	Final Pressure (" Hg): <u>-1.5</u>
Sampling Vacuum ("Hg): <u>Ø</u>	

Tedlar Bag

Tedlar Bag size (L): <u>Ø</u>	Start Date and Time: <u>Ø</u>
Sampling Rate (mL/min): <u>Ø</u>	End Date and Time: <u>Ø</u>

Sorbent Tube

Sorbent Tube type and size: <u>Ø</u>	Start Date and Time: <u>—</u>
Sorbent Tube ID: <u>—</u>	End Date and Time: <u>—</u>
Initial Flow Rate (mL/min): <u>—</u>	Final Flow Rate (mL/min): <u>—</u>
Calculated Sampling Volume: <u>—</u>	

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 30°, cloudy

Additional Notes: Manifold not used

Subslab Soil Vapor Sampling Log



Project: UPKR Freeman
 Sampler: JE

Sample Location Information

Property ID/Address: Freeman, WA
 Condition of slab in the surrounding area: Good
 Location ID: Grain Facility Sample ID: SU-113
 Sample Location Description (Room Name/Number and surrounding, identifying features):

Subslab Soil Vapor Probe Leak Checking and Sampling Log

Manifold Leak Check

Manifold leak check (procedure: ensure manifold holds pressure at -10 "Hg for 30 seconds). If using a pelican-case pump, open the lid during leak check to ensure all interior pieces are in-tact.

	Pass	Fail
<u>Ø</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Describe corrective measures taken to pass the manifold leak test: AAA

Subslab Soil Vapor Probe Water Dam Leak Check and Purge Results

Purge rate (mL/Min): ~ 200 mL/min Probe Leak Check Result*:

	Pass	Fail
<u>Ø</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Start Time: 933
 Purge Vacuum ("Hg): _____
 End Time: 935

*The subslab soil vapor probe passes the water dam leak check if there are no bubbles observed and the water level does not draw down during purge. Do NOT collect a subslab soil vapor sample if the leak check fails.

Field Analysis (required readings are determined on a project-specific basis. Fill in all that are necessary):

MiniRAE or MultiRAE Photoionization Detector		LandTec GEM Landfill Gas Meter
Total VOCs (ppm): <u>—</u> O ₂ (%): <u>—</u>		O ₂ (%): <u>—</u>
H ₂ S (ppm): <u>—</u> LEL (%): <u>—</u>		CO ₂ (%): <u>—</u>
CO (ppm): <u>—</u>		CH ₄ (%): <u>—</u>

Sampling Information

Evacuated Canister or Bottle-Vac

Container Size (L): 6L Initial Pressure (" Hg): -27"
 Container ID: 3367 Start Date and Time: 4/2/18 944
 Flow Controller ID: 1386 End Date and Time: 4/3/18 825
 Sampling Rate (mL/min, hours): 24 hr Final Pressure (" Hg): -3
 Sampling Vacuum ("Hg): Ø

Tedlar Bag

Tedlar Bag size (L): — Start Date and Time: —
 Sampling Rate (mL/min): — End Date and Time: —

Sorbent Tube

Sorbent Tube type and size: — Start Date and Time: —
 Sorbent Tube ID: — End Date and Time: —
 Initial Flow Rate (mL/min): — Final Flow Rate (mL/min): —
 Calculated Sampling Volume: —

Weather Conditions and Additional Notes

Weather Conditions During Sampling: 30° cloudy

Additional Notes: Manifold not used

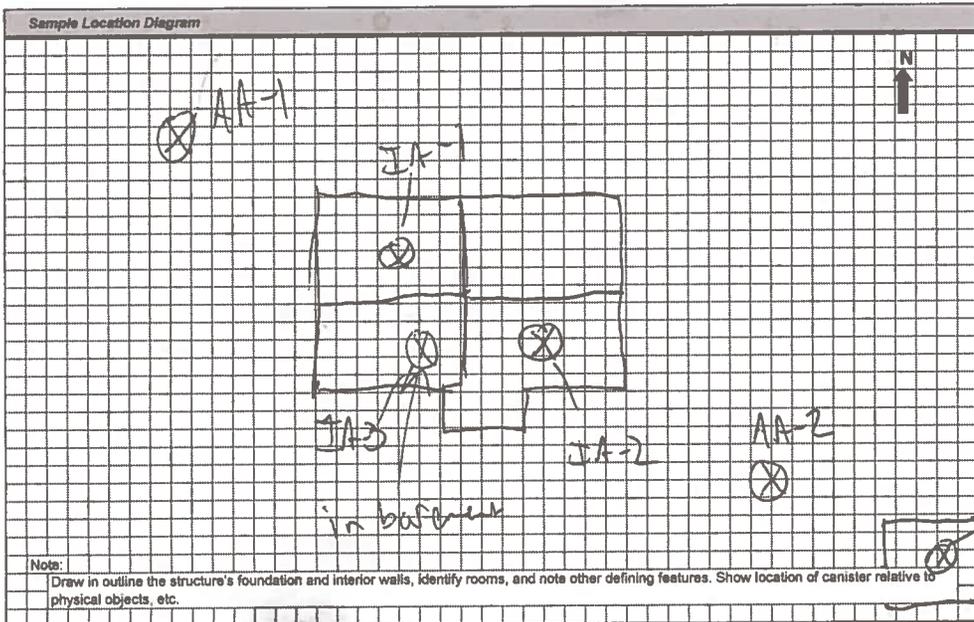
Vapor Intrusion Best Practices

Indoor, Outdoor, and Crawl Space Air Sampling Log - Canister Method

Project Information	
Project Name: <u>UPRR Freeman</u>	Project #: <u>UPSRWA05, CS, EV, 10, 02-03</u>
Sampler Name: <u>M. Green/CVO, L. Swager/SPK</u>	Date: <u>9/19/19</u>

Sampling Data Log									
Sample Location	Canister ID	Flow Controller ID	Initial Canister Pressure (Hg)	Initial Flow Controller Rate (ml/min)	9/19/19 Start Date & Time	9/20/19 End Date & Time	Final Pressure (Hg)	Final Flow Controller Rate (ml/min)	
AA-1	DAVEY-AA1	3370	FC1384	-30	0.373	9/19/19 12:57	1017	-5.5	0.373
AA-2	DAVEY-AA2	2048	FC1353	-28	0.373	1301	1018	-5.5	0.373
IA-1	DAVEY-IA1	3363	FC0001	-28	0.373	1308	1018	-5.5	0.373
IA-2	DAVEY-IA2	3318	FC1461	-27.5	0.373	1314	1019	-5.5	0.373
IA-3	DAVEY-IA3	2382	FC0124	-30	0.373	1319	1019	-10.5	0.373
IA-4	DAVEY-IA4	2825	FC1425	-28	0.373	1329	1021	-5	0.373

9/20/19 @ 1020 -4.5



Weather conditions and indoor temperature: _____

Other Observations and Comments (note any unique circumstances): pumphouse ventilated for approximately 90 minutes, chemicals removed before sampling
Digital gauge was not accurate, used dedicated analog gauge provided by Cals.

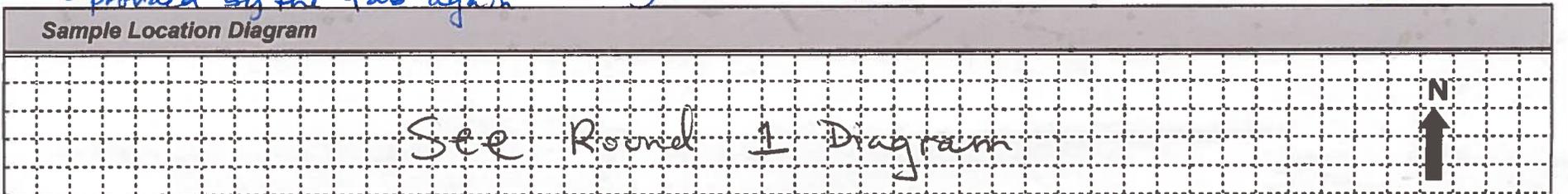
Vapor Intrusion Best Practices

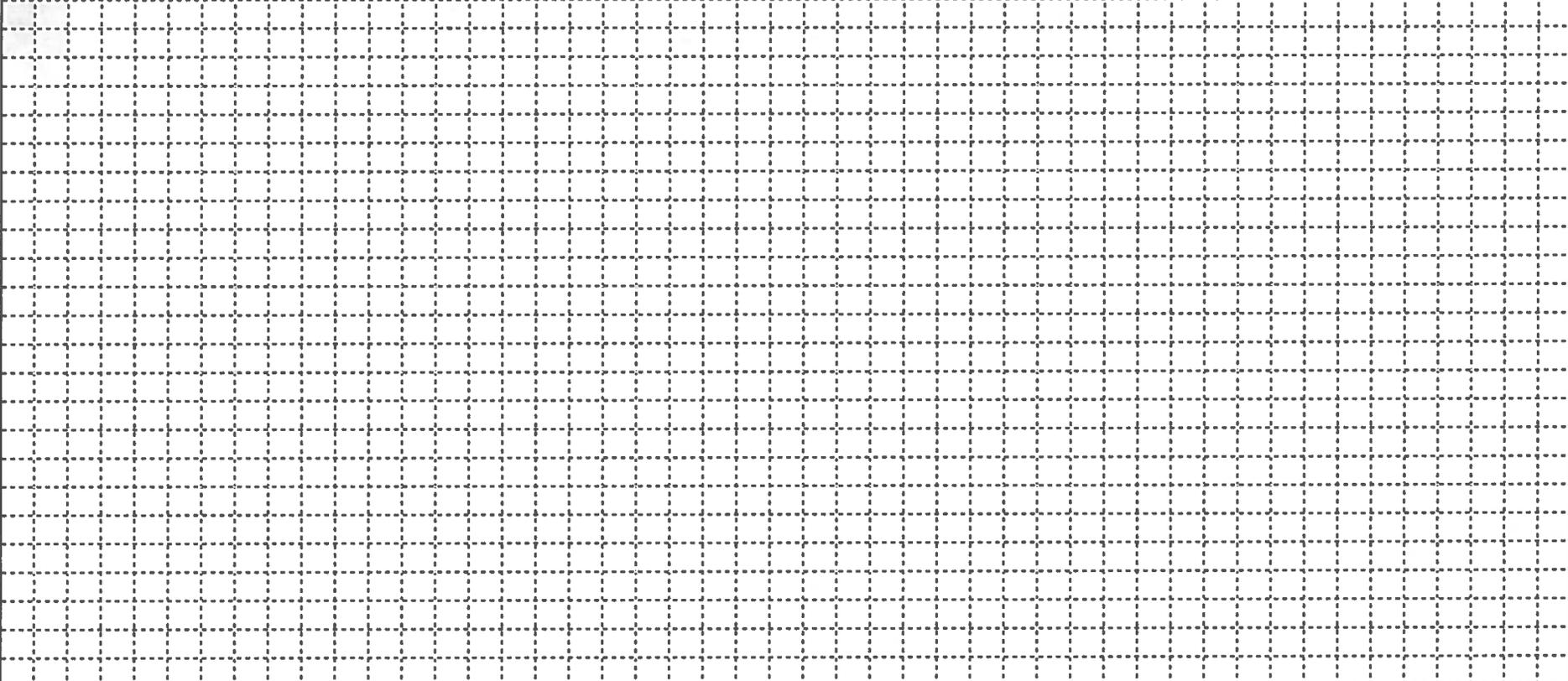
Indoor, Outdoor, and Crawl Space Air Sampling Log - Canister Method

Project Information	
Project Name: <u>UPRR Freeman</u>	Project #: <u>UPSRWA05-A.CS.EV.10.02-03</u>
Sampler Name: <u>K. Savage, S. Demus</u>	Date: <u>9/26/2019</u>

Sampling Data Log									
Sample Location	All have 092618 Field ID	Canister ID	Flow Controller ID	Initial Canister Pressure ("Hg)	Initial Flow Controller Rate (ml/min)	9/26 Start Date & Time	9/27 End Date & Time	Final Pressure ("Hg)	Final Flow Controller Rate (ml/min)
AA-1	Davey2-AA1	3371	FC1446	-28" Hg -30" Hg -27" Hg		1340 ¹³⁴³	0833	-7" Hg	
AA-2	Davey2-AA2	3586	FC0288	-26" Hg		1345	0835	-6.0" Hg	
IA-1	Davey2-IA1	3635	FC1846	-27 inHg		1342	0840	-7.0" Hg	
IA-2	Davey2-IA2	2123	FC0849	-28 inHg		1342	0841	-8" Hg	
IA-3	Davey2-IA3	2114	FC0874	-30" Hg		1340	0842	-8" Hg	
IA-4 (vapor phase)	Davey2-IA4	3456	FC1900	-29" Hg		1346	0835	-8.5" Hg	
AA-1 (FD)	Davey2-FD	2812	FC2274	-29 inHg		1343 ⁰⁷⁰⁰	0833 ⁰⁷⁰⁰	-7.5" Hg	

*Requested a new gauge for second sampling event. New gauge was inaccurate, use analog gauge provided by the lab again.





Note:

Draw in outline the structure's foundation and interior walls, identify rooms, and note other defining features. Show location of canister relative to physical objects, etc.

Weather conditions and indoor temperature: Placed canisters in locations and began sampling.
After second check on 9/26/2019, it began to rain. We directed the hose intakes at the top towards the ground to hopefully decrease possibility of moisture ~~entering~~ entering canisters

Other Observations and Comments (note any unique circumstances):
.....
.....

Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method



Project: UPRR Freeman, WA
 Building: _____

Field Sample ID	Location	Canister ID	Flow Controller ID	Initial Pressure ("Hg)	Start Date	Start Time	Check (6/20 hr)		End Date	End Time	Final Pressure ("Hg)
							Time	Pressure ("Hg)			
RES2-CS-082917	Residence, no. 2	1496	0923	-27.20	8/28/17	1534	1122	0" Hg	8/29/17	1122	+0.70
RES1-IA-082917	Residence, no. 1	1084	0922	-27.28	8/28/17	1545	1129	-2.5" Hg	8/29/17	1129	+0.70
FDEIA-082917	Residence, no. 1	2687	0922	-27.19	8/28/17	1545	1129	-2.5" Hg	8/29/17	1129	+1.01
RES2-05-083017	Residence, no. 2	1700	1223	-27.20	8/29/17	1225					
RES1-IA-083017	Residence, no. 1	1468	648	-27.15	8/29/17	1227					

failed
 failed
 stopped early
 +1.0g
 failed

Weather Conditions

General weather conditions: Sunny, scattered clouds, calm winds, ~20% humidity

Temperature Range (indoor and outdoor): 92°F (outdoor)

Was there significant precipitation within 12 hours prior to (or during) the sampling event? Prior: no; during: no

Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method



Project: UPRR Freeman, WA

Building: _____

Field Sample ID	Location	Canister ID	Flow Controller ID	Initial Pressure ("Hg)	Start Date	Start Time	Check (6/20 hr)		End Date	End Time	Final Pressure ("Hg)
							Time	Pressure ("Hg)			
RES1-IA-082917	Residence no. 1	1496	0923	-27.20							
RES2-CS-082917	Residence no. 2	1468	0648	-27.28							

Weather Conditions

General weather conditions: Sunny, scattered clouds, calm winds, ~20% humidity

Temperature Range (indoor and outdoor): 92° (outdoor)

Was there significant precipitation within 12 hours prior to (or during) the sampling event? Prior: no, during:

Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method



Project: UPRR - Freeman

Building: _____

Field Sample ID	Location	Canister ID	Flow Controller ID	Initial Pressure ("Hg)	Start Date	Start Time	Check (6/20 hr)		End Date	End Time	Final Pressure ("Hg)
							Time	Pressure ("Hg)			
RR-CSV-092617 092717 Randall-CSV	Randall crawlspace	2822	FC0337	28.20	9/26/17	1310	1045	-5	9-27-17	1202	-3.20
Marlow-CSV-092617 -092717 Marlow-CSV	Marlow Cellar	0849	FC1276	28.01	9/26/17	1300	1037	-2	9-27-17	1037	-2.11
FD-CSV-092617 092717 FD-CSV	Marlow Cellar	2115	FC1276	28.10	9/26/17	1300	1037	-2	9-27-17	1037	-2.18

Weather Conditions

General weather conditions: _____

Temperature Range (indoor and outdoor): _____

Was there significant precipitation within 12 hours prior to (or during) the sampling event? No

Well Completion Diagrams



DATE: 7/15/2016 WELL ID: MW-1D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : 30' E off RR, NE of Facility

Drilling Method: Sonic

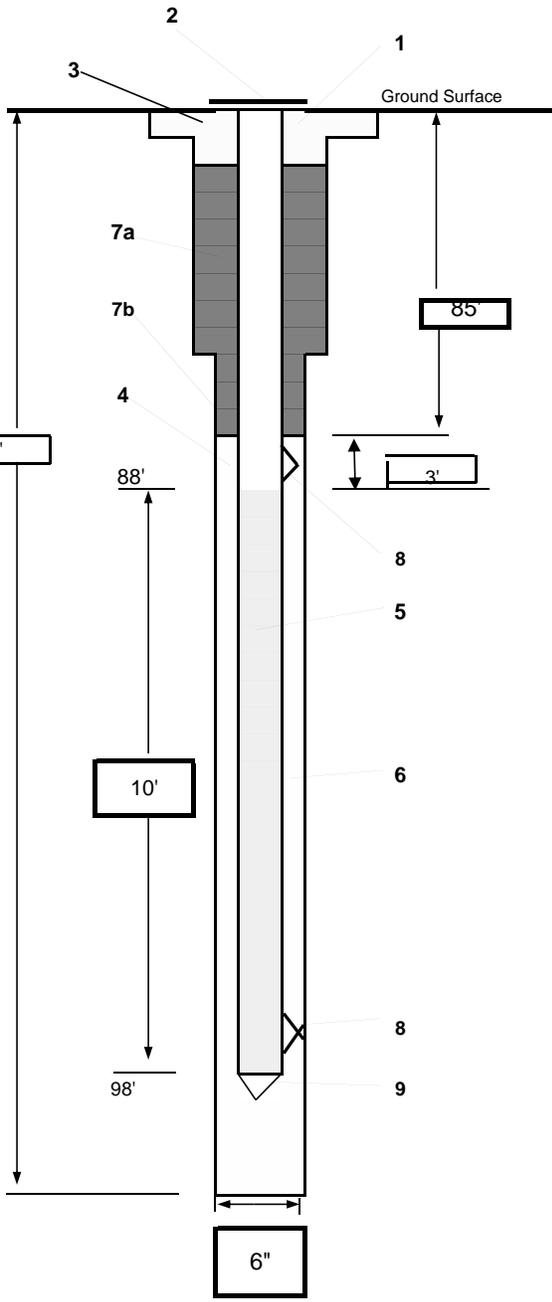
Drilling Contractor: Environmental West

Well Construction Start Time: 7-15-16 / 13:45

Completion Time: 7-15-16 / 16:00

Project Number :

661508.10.02.02



Generalized Monitoring Well Completion Diagram

1- Surface completion	Flush Mount
2- Casing Flushmount	36" DIA
3- Surface Completion/Pad	Concrete
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.010" Slot
6- Type screen filter	20x40 sand (107-85' bgs)
7a- Type of seal - Depth	3/8" Bentonite Pellets
7b- Type of seal - Depth	
8- Centralizers (if applicable)	98', 87', 30'
9- Sump below screen	6" Conical
Well Development:	
Comments:	64'-106' 3/8" bentonite pellets



DATE: 7/6/2016 WELL ID: MW-1S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : 30' E off RR, NE of Facility

Drilling Method: Sonic

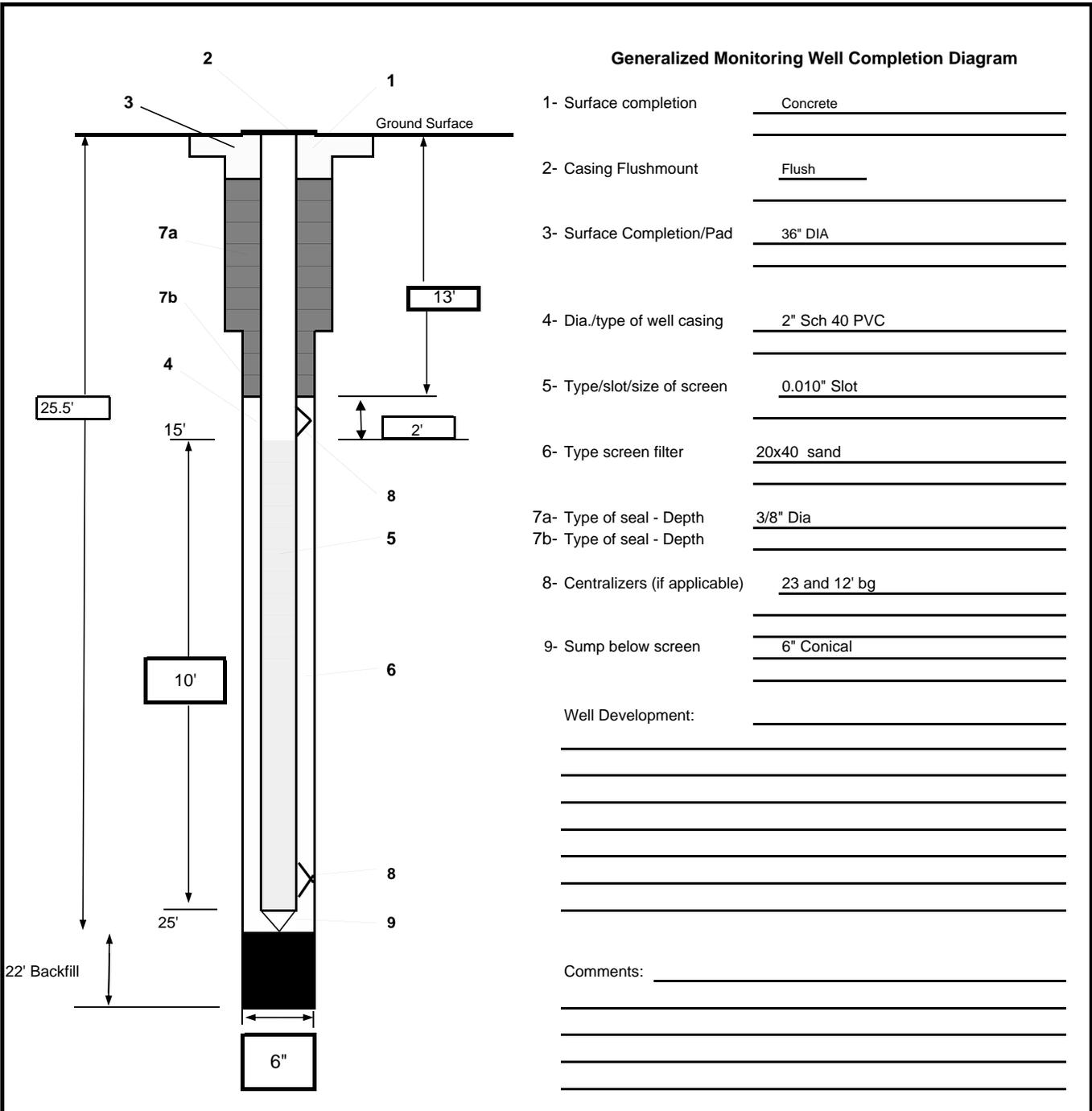
Drilling Contractor: Environmental West

Well Construction Start Time: 7-6-16 / 11:15

Completion Time: 7-6-16 / 12:45

Project Number :

661508.10.02.02





DATE: 7/12/2016 WELL ID: MW-2D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : SE of Facility, 30' NE of RR

Drilling Method: Sonic

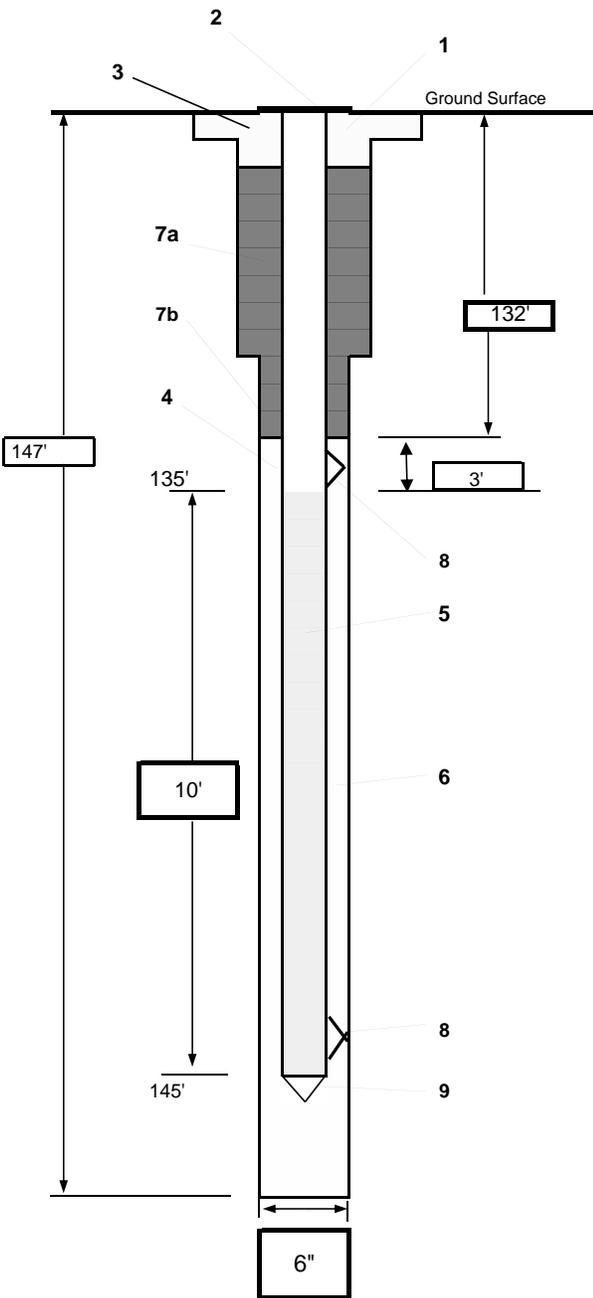
Drilling Contractor: Environmental West

Well Construction Start Time: 7-12-16 / 11:00

Completion Time: 7-12-16 / 15:00

Project Number :

661508.10.02.02



Generalized Monitoring Well Completion Diagram

1- Surface completion	Flush Mount
2- Casing Flushmount	36" DIA
3- Surface Completion/Pad	Concrete
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.010" Slot
6- Type screen filter	20x40 sand (107-85' bgs)
7a- Type of seal - Depth	3/8" Bentonite Pellets
7b- Type of seal - Depth	
8- Centralizers (if applicable)	145', 134', 100', 50'
9- Sump below screen	6" Conical

Well Development:

Comments: 64'-106' 3/8" bentonite pellets



DATE: 5/18/2016 WELL ID: MW-3D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Between HWY 27 and Grain Facility

Drilling Method: Air Rotary

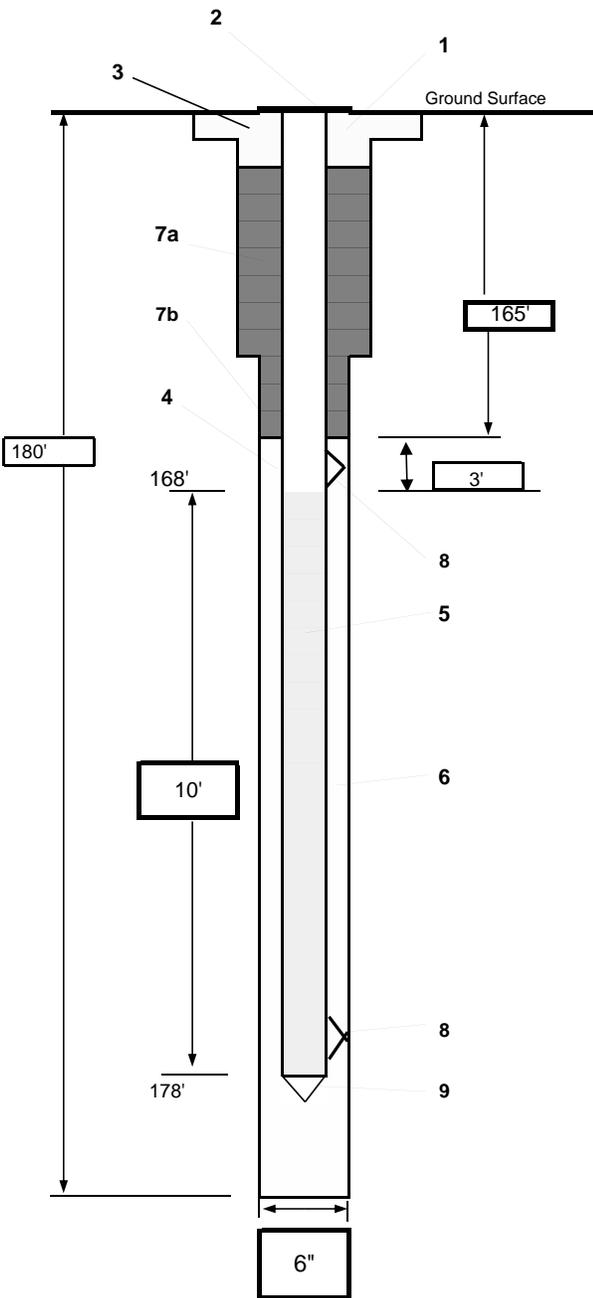
Drilling Contractor: Environmental West

Well Construction Start Time: 5-18-16 / 13:30

Completion Time: 5-19-16 / 13:00

Project Number :

661508.10.02.02



Generalized Monitoring Well Completion Diagram

1- Surface completion	Concrete
2- Casing Flushmount	6" Steel
3- Surface Completion/Pad	24" Dia
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	Pre-Pack Screen
6- Type screen filter	20x40 Silica Sand
7a- Type of seal - Depth	3/8" TR Pellets - 165-155'
7b- Type of seal - Depth	Grout Mix 155-0'
8- Centralizers (if applicable)	None - Advised due to grout injection via stinger pipe
9- Sump below screen	6" Conical
Well Development:	

Comments:



DATE: 7/15/2016 WELL ID: MW-5D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : School Fields, S of School

Drilling Method: Air Rotary

Drilling Contractor: Environmental West

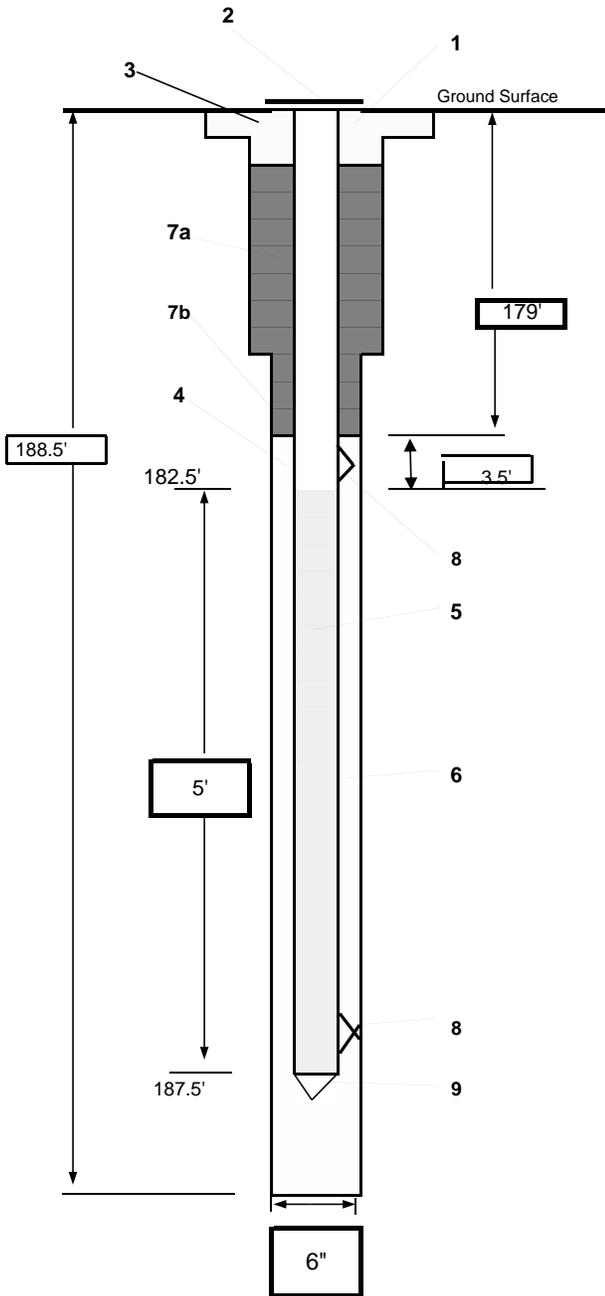
Well Construction Start Time: 7-14-16 / 15:30

Completion Time: 7-15-16 / 15:00

Project Number :

661508.10.02.02

Generalized Monitoring Well Completion Diagram



1- Surface completion	Flush
2- Casing Flushmount	24"
3- Surface Completion/Pad	24" Concrete
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.020"
6- Type screen filter	10x20 Silica Sand
7a- Type of seal - Depth	3/8" TR Pellets - (13')
7b- Type of seal - Depth	Grout
8- Centralizers (if applicable)	None - Hole Collapse Concerns
9- Sump below screen	6" Conical

Well Development:

Comments:



DATE: 6/22/2016 WELL ID: MW-5D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : School Fields, S of School

Drilling Method: Air Rotary

Drilling Contractor: Environmental West

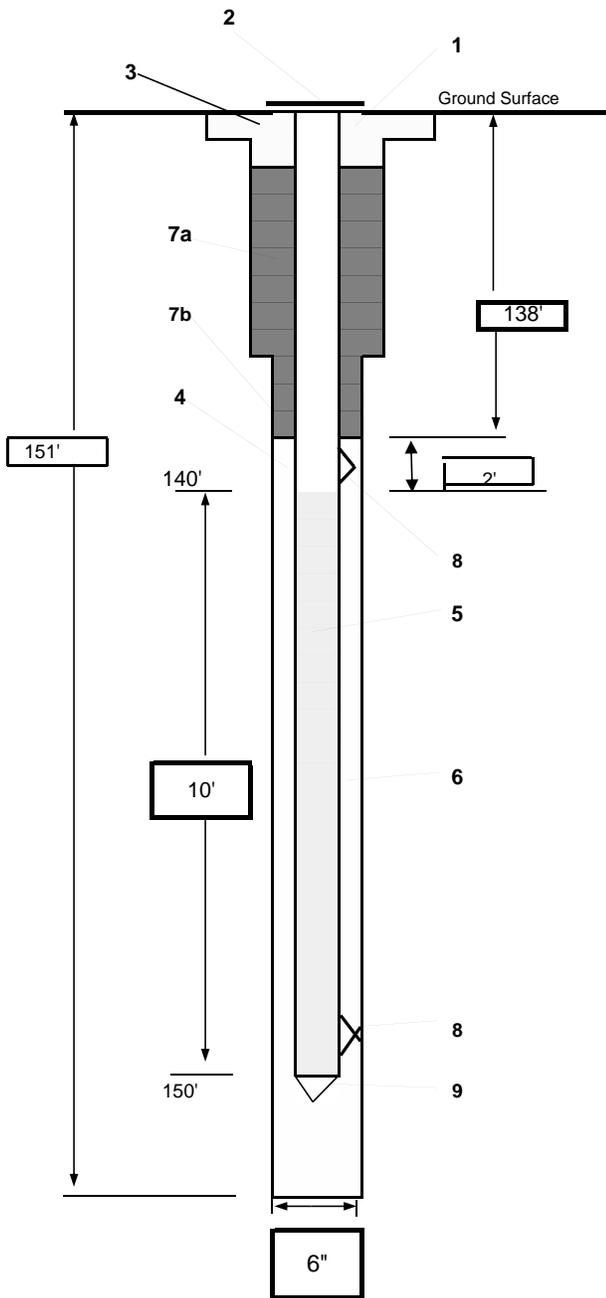
Well Construction Start Time: 6-22-16 / 09:00

Completion Time: 6-22-16 / 16:00

Project Number :

661508.10.02.02

Generalized Monitoring Well Completion Diagram



1- Surface completion	Concrete
2- Casing Flushmount	6" Flush Mount
3- Surface Completion/Pad	24" Concrete
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	Pre-Pack Screen
6- Type screen filter	20x40 Silica Sand
7a- Type of seal - Depth	3/8" TR Pellets - (138-126')
7b- Type of seal - Depth	Grout Mix 126-0'
8- Centralizers (if applicable)	None - Due to risk of catching onto grout stinger pipe
9- Sump below screen	6" Conical
Well Development:	

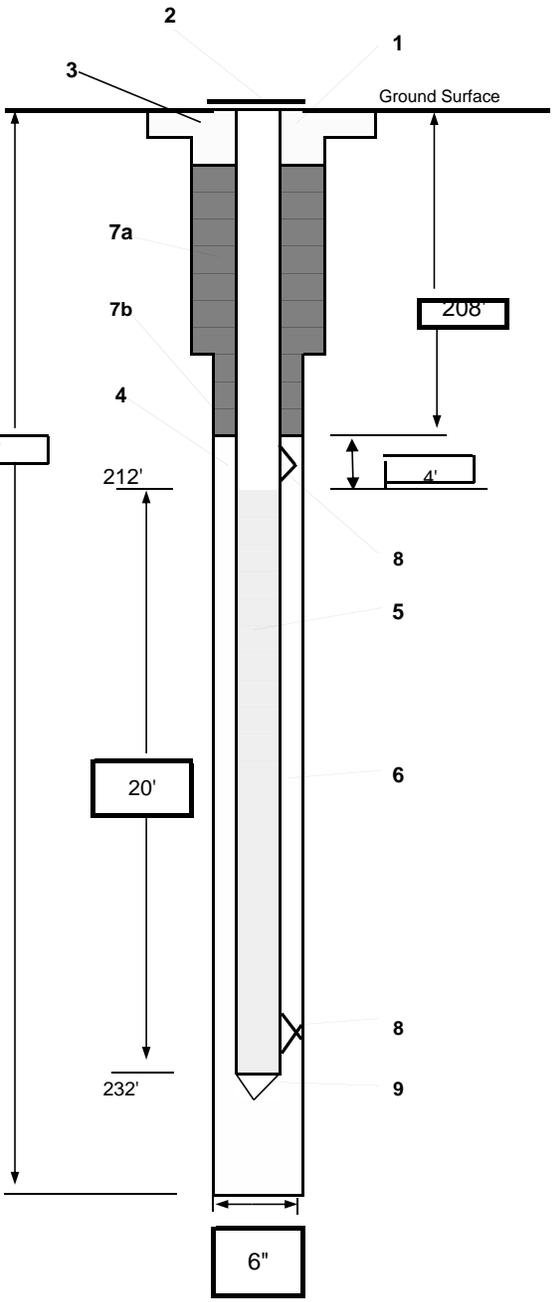
Comments: Boring advanced to 155' bgs. Backfilled with bentonite from 155-151'



DATE: 7/11/2016 WELL ID: MW-6D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman LOCATION : 40' SW of School Well in Grass, Freeman, WA
 Drilling Method: Air Rotary Drilling Contractor:
 Well Construction Start Time: Completion Time: Project Number : 661508.10.02.0



Generalized Monitoring Well Completion Diagram

1- Surface completion	Flush Mount - 36" Dia
2- Casing Flushmount	
3- Surface Completion/Pad	36" Dia - Concrete
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.020" Slot
6- Type screen filter	10x20 sand
7a- Type of seal - Depth	208-198 3/8" Pellets
7b- Type of seal - Depth	198-0 Grout
8- Centralizers (if applicable)	232', 211', 150', 100', 50 (5)
9- Sump below screen	6" Conical
Well Development:	
Comments:	64'-106' 3/8" bentonite pellets



DATE: 8/16/2017 WELL ID: MW-6U

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA

Drilling Method: Air Rotary

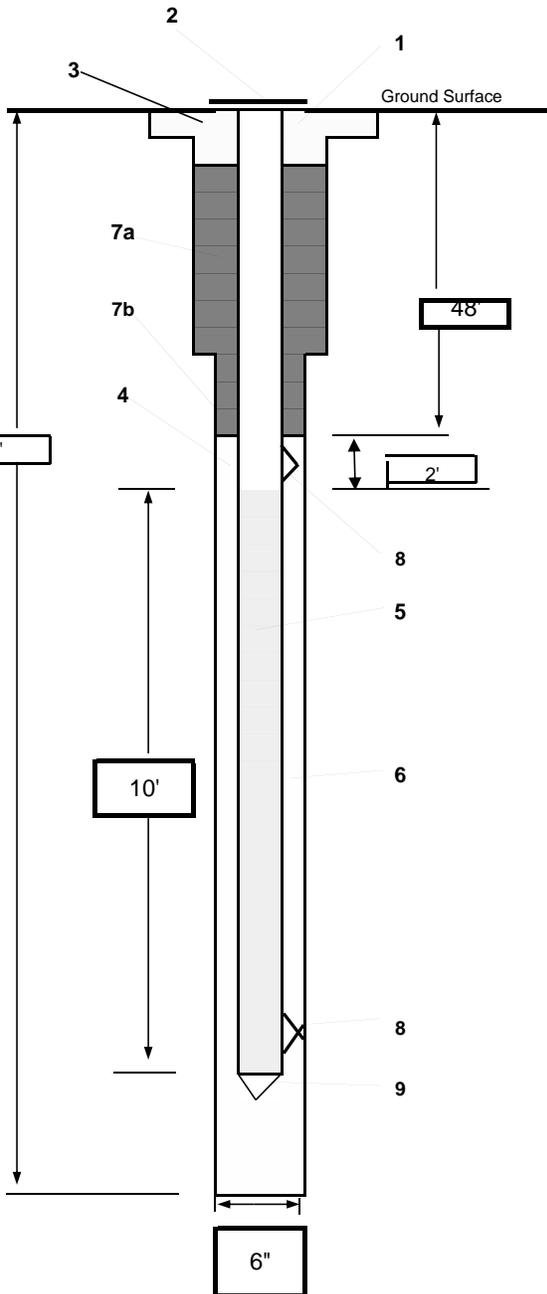
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 14:00 8/15/17

Completion Time: >12:45 8/16/17

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	Flush Mount
2- Casing Flushmount	8" flush steel monument
3- Surface Completion/Pad	2 ft diameter concrete pad
4- Dia./type of well casing	
5- Type/slot/size of screen	2" schedule 40 PVC 10 slot screen
6- Type screen filter	10x20 silica sand
7a- Type of seal - Depth	0-46' 3/8" bentonite pellets
7b- Type of seal - Depth	46'-48' 3/8"TR30 bentonite pellets
8- Centralizers (if applicable)	60', 50', 30', 10'
9- Sump below screen	
Well Development:	
Comments:	64'-106' 3/8" bentonite pellets



DATE: 5/16/2016 WELL ID: MW-7S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : SE Area Near Silos

Drilling Method: Sonic

Drilling Contractor: Environmental West

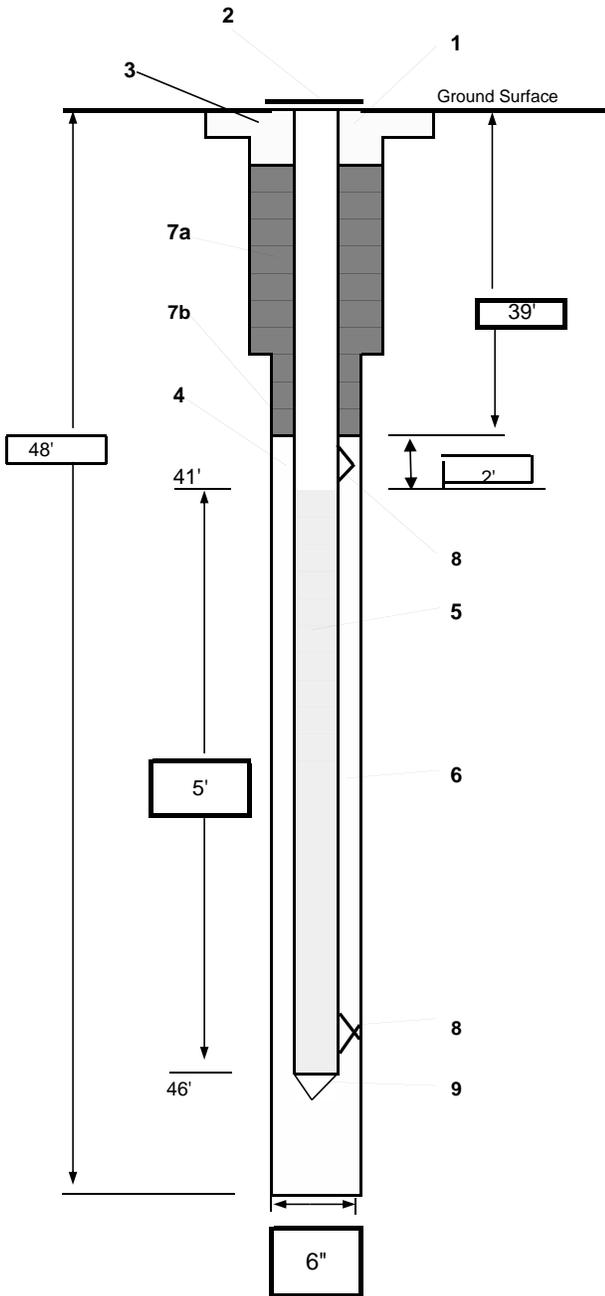
Well Construction Start Time: 5-16-16 / 0945

Completion Time: 5-16-16 / 1145

Project Number :

661508.10.02.02

Generalized Monitoring Well Completion Diagram



1- Surface completion	Concrete
2- Casing Flushmount	6" Flush Mount
3- Surface Completion/Pad	24" Concrete
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.010" Slot
6- Type screen filter	20x40 Silica Sand
7a- Type of seal - Depth	3/8" Bentonite Chips
7b- Type of seal - Depth	
8- Centralizers (if applicable)	46' and 40'
9- Sump below screen	6" Conical

Well Development:

Comments:



DATE: 5/18/2016 WELL ID: MW-8S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : SE Area Near Silos

Drilling Method: Sonic

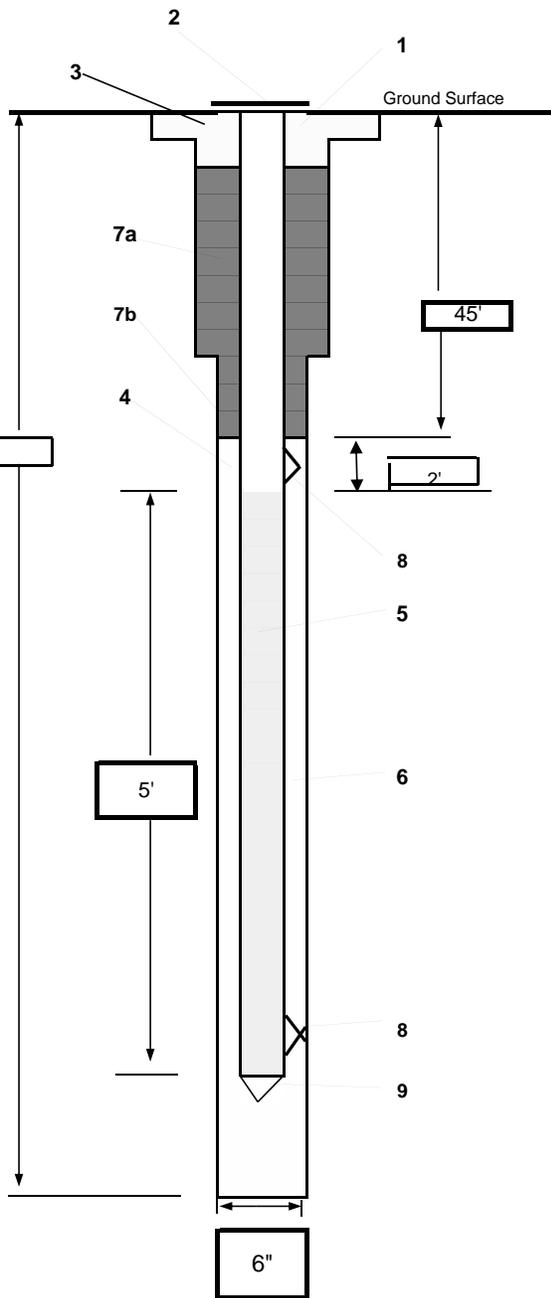
Drilling Contractor: Environmental West

Well Construction Start Time: 5-18-16 / 0740

Completion Time: 5-16-16 / 1100

Project Number :

661508.10.02.02



Generalized Monitoring Well Completion Diagram

1- Surface completion	Concrete
2- Casing Flushmount	Steel 6" Dia
3- Surface Completion/Pad	24" Dia
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.010" Slot
6- Type screen filter	20x40 Silica Sand
7a- Type of seal - Depth	3/8" Bentonite Chips
7b- Type of seal - Depth	
8- Centralizers (if applicable)	51' and 45'
9- Sump below screen	6" Conical

Well Development:

Comments:

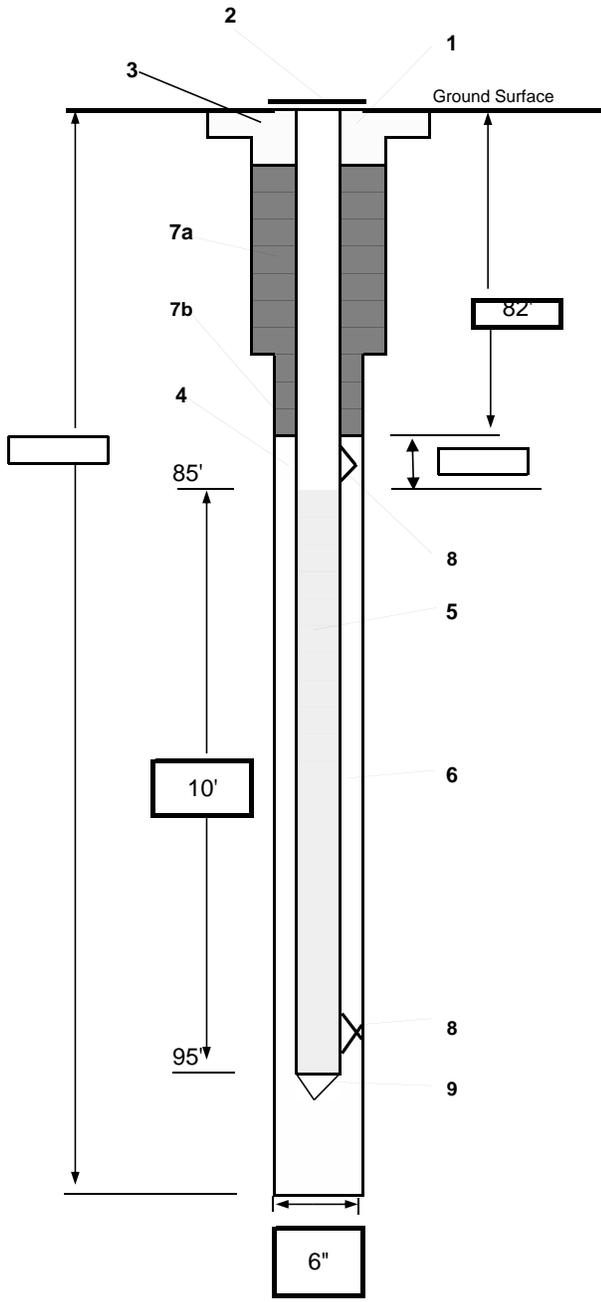


DATE: 12/15/2016 WELL ID: MW-9D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman LOCATION : Freeman, WA
 Drilling Method: Air Rotary Drilling Contractor: Environmental West Exploration
 Well Construction Start Time: 12/15/16 11:50 Completion Time: 12/18/2016 Project Number : 661508

Generalized Monitoring Well Completion Diagram



1- Surface completion	Portland
2- Casing Flushmount	10" Diameter, Drop in, Bolt down
3- Surface Completion/Pad	
4- Dia./type of well casing	2" Schedule 40 PVC
5- Type/slot/size of screen	Machine 0.010" Schedule 40 PVC
6- Type screen filter	10/20 Filter Sand Eight 50lb bags
7a- Type of seal - Depth	Bentonite Slurry
7b- Type of seal - Depth	Pel Plug Bentonite Pellets
8- Centralizers (if applicable)	95', 58', 30'
9- Sump below screen	0.3'
Well Development:	
Comments:	



DATE: 5/17/2016 WELL ID: MW-9S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : S of Grain Facility, Near Hwy 27

Drilling Method: Sonic

Drilling Contractor: Environmental West

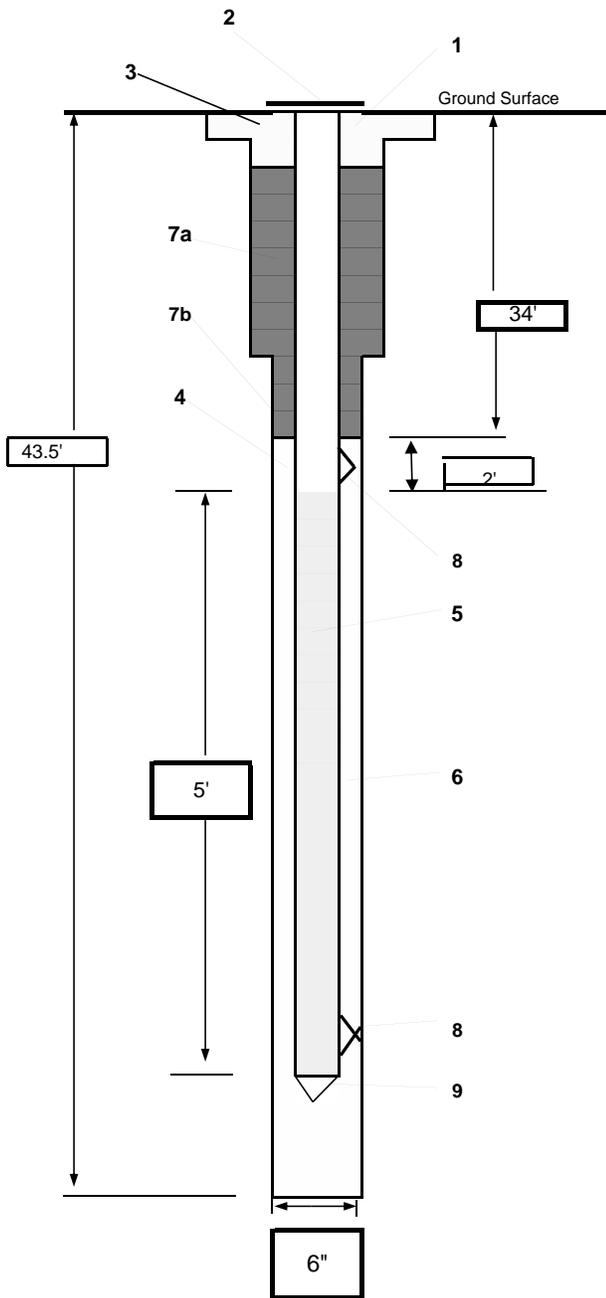
Well Construction Start Time: 5-17-16 / 0740

Completion Time: 5-17-16 / 0900

Project Number :

661508.10.02.02

Generalized Monitoring Well Completion Diagram



1- Surface completion	Concrete
2- Casing Flushmount	Flush Steel 6" Dia
3- Surface Completion/Pad	24" Dia
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.010" Slot
6- Type screen filter	20x40 Silica Sand
7a- Type of seal - Depth	3/8" Bentonite Chips
7b- Type of seal - Depth	
8- Centralizers (if applicable)	41' and 35'
9- Sump below screen	6" Conical

Well Development:

Comments:



DATE: 8/17/2017 WELL ID: MW-9U

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA

Drilling Method: Air Rotary

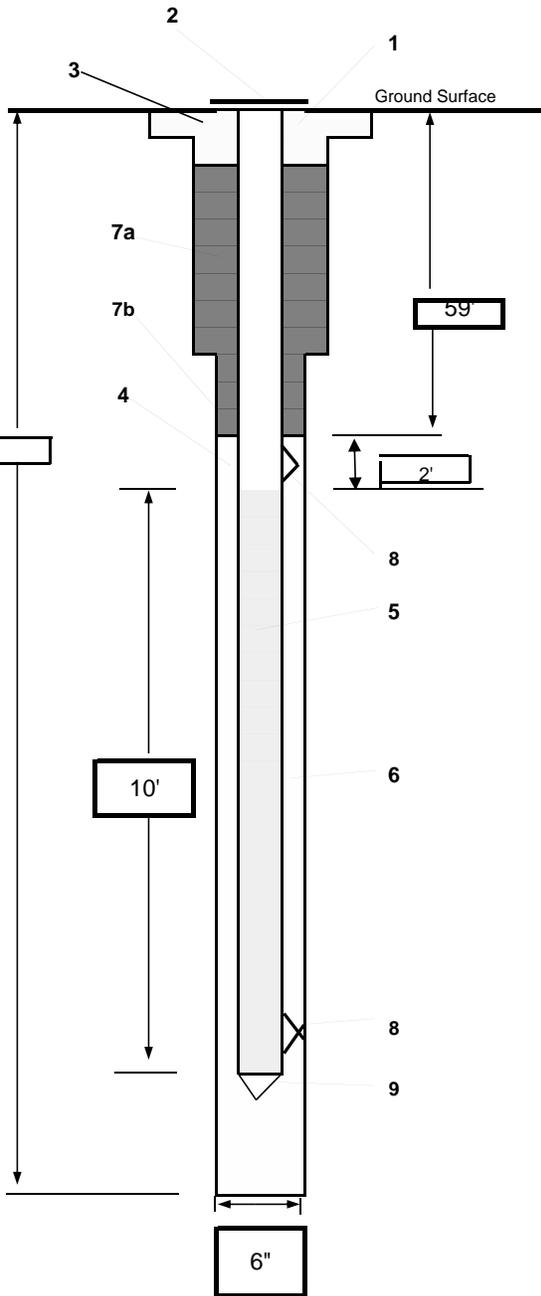
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 10:15 8/17/17

Completion Time: 16:00 8/17/17

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	Flush Mount
2- Casing Flushmount	8" flush steel monument
3- Surface Completion/Pad	2 ft diameter concrete pad
4- Dia./type of well casing	
5- Type/slot/size of screen	2" schedule 40 PVC 10 slot screen
6- Type screen filter	59'-75' - 10x20 silica sand
7a- Type of seal - Depth	0-57' - 3/8" bentonite pellets
7b- Type of seal - Depth	57'-59' - 3/8" TR30 bentonite pellets
8- Centralizers (if applicable)	72', 62', 42', 22'
9- Sump below screen	
Well Development:	
Comments:	75'-80' - 3/8" bentonite pellets



DATE: 7/8/2016 WELL ID: MW-10S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : N of Bus Depot, N of Access Road, in Grass

Drilling Method: Sonic

Drilling Contractor: Environmental West

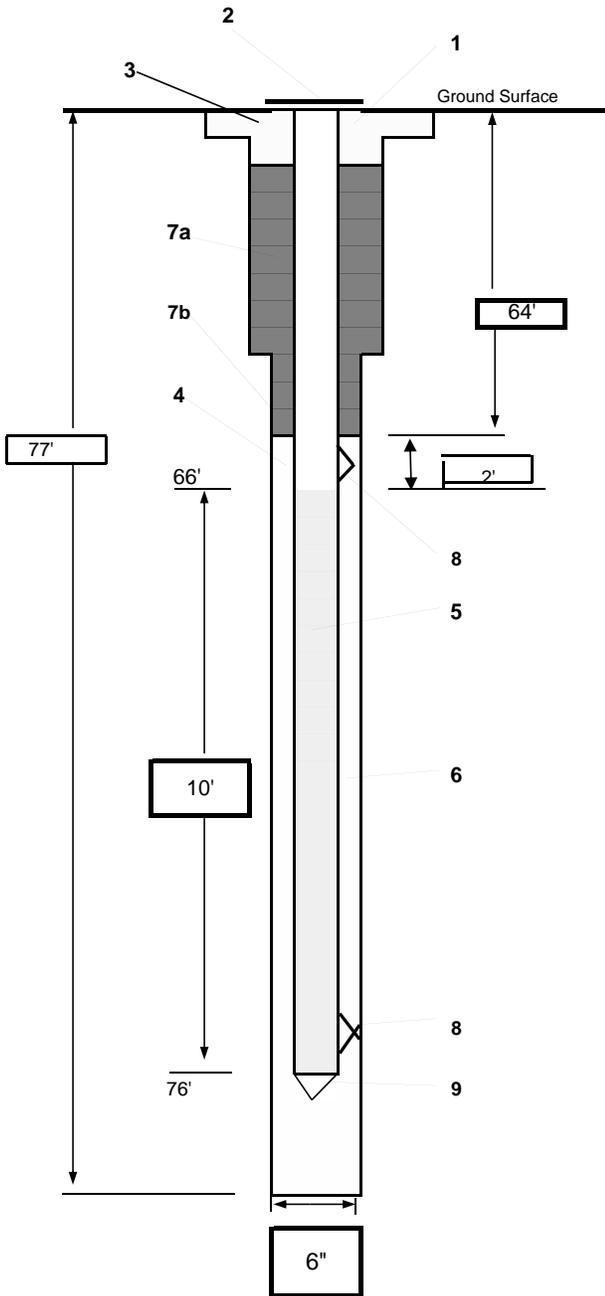
Well Construction Start Time: 7-8-16 / 1000

Completion Time: 7-8-16 / 1330

Project Number :

661508.10.02.02

Generalized Monitoring Well Completion Diagram



1- Surface completion	Concrete
2- Casing Flushmount	Flush Mount
3- Surface Completion/Pad	Concrete, 36" Dia
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.010" Slot
6- Type screen filter	20x40 Silica Sand
7a- Type of seal - Depth	3/8" Bentonite Chips
7b- Type of seal - Depth	
8- Centralizers (if applicable)	76' and 65' bgs
9- Sump below screen	6" Sump, Conical

Well Development:

Comments: _____



DATE: 6/29/2016 WELL ID: MW-11S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : S of Bus Barn, Just S of Curbing

Drilling Method: Sonic

Drilling Contractor: Environmental West

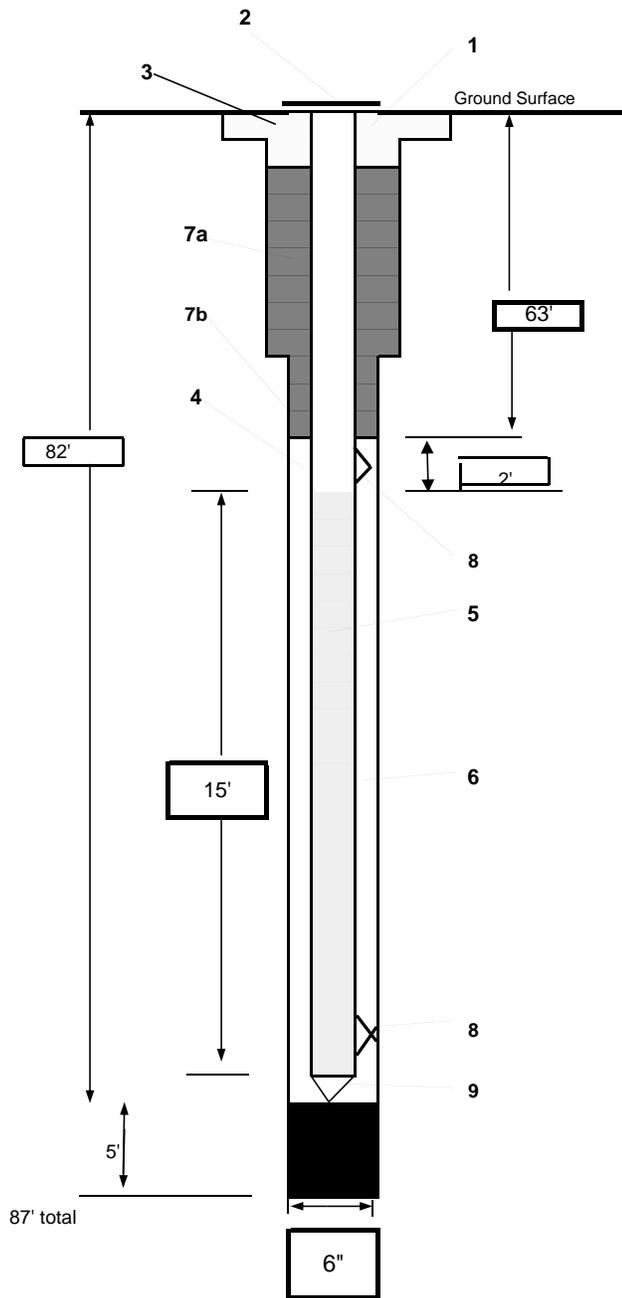
Well Construction Start Time: 6-29-16 / 0900

Completion Time: 6-29-16 / 1200

Project Number :

661508.10.02.02

Generalized Monitoring Well Completion Diagram



1- Surface completion	Concrete
2- Casing Flushmount	Flush 6" Dia
3- Surface Completion/Pad	36" Dia
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.010" Slot
6- Type screen filter	20x40 Silica Sand
7a- Type of seal - Depth	3/8" Bentonite Chips
7b- Type of seal - Depth	
8- Centralizers (if applicable)	80' and 64' bgs
9- Sump below screen	6" Sump, Conical

Well Development:

Comments: Backfill 87-82' with 3/8" Bentonite



DATE: 7/21/2016 WELL ID: MW-12S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Field S of Hwy 27 and Jackson Rd

Drilling Method: Sonic

Drilling Contractor: Environmental West

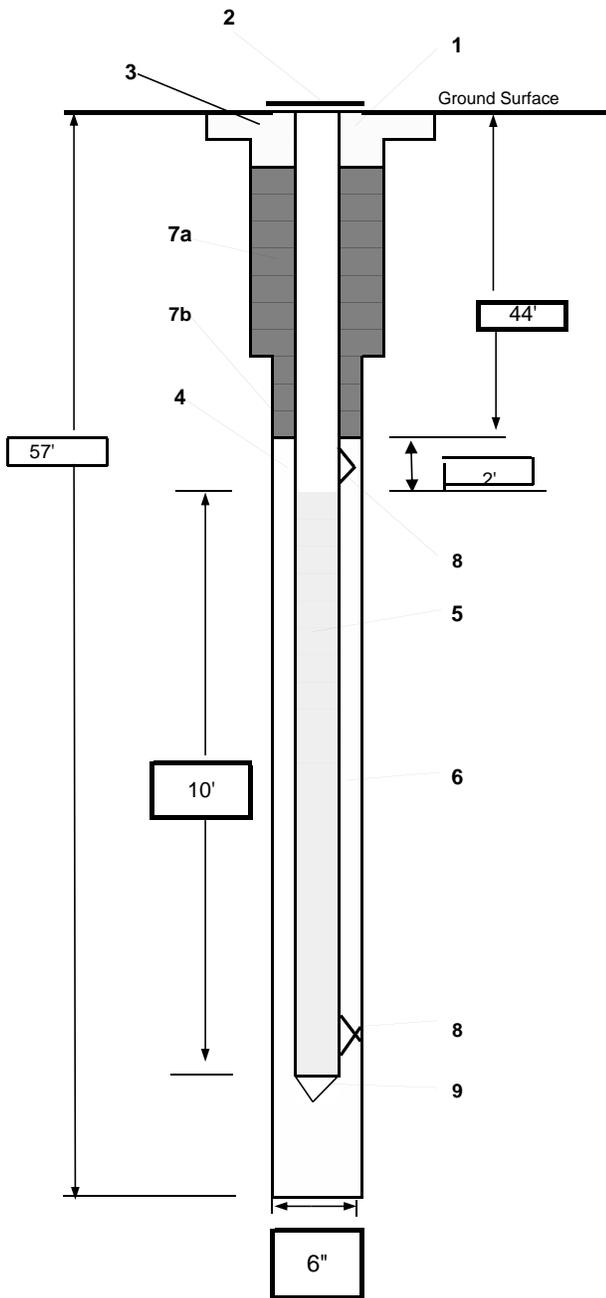
Well Construction Start Time: 7-21-16 / 1200

Completion Time: 7-21-16 / 1630

Project Number :

661508.10.02.02

Generalized Monitoring Well Completion Diagram



1- Surface completion	Concrete
2- Casing Flushmount	Steel Flush 6" Dia
3- Surface Completion/Pad	24" Dia
4- Dia./type of well casing	2" Sch 40 PVC
5- Type/slot/size of screen	0.010" Slot
6- Type screen filter	20x40 Silica Sand
7a- Type of seal - Depth	3/8" Bentonite Chips
7b- Type of seal - Depth	
8- Centralizers (if applicable)	56' and 45' bgs
9- Sump below screen	6" Conical

Well Development:

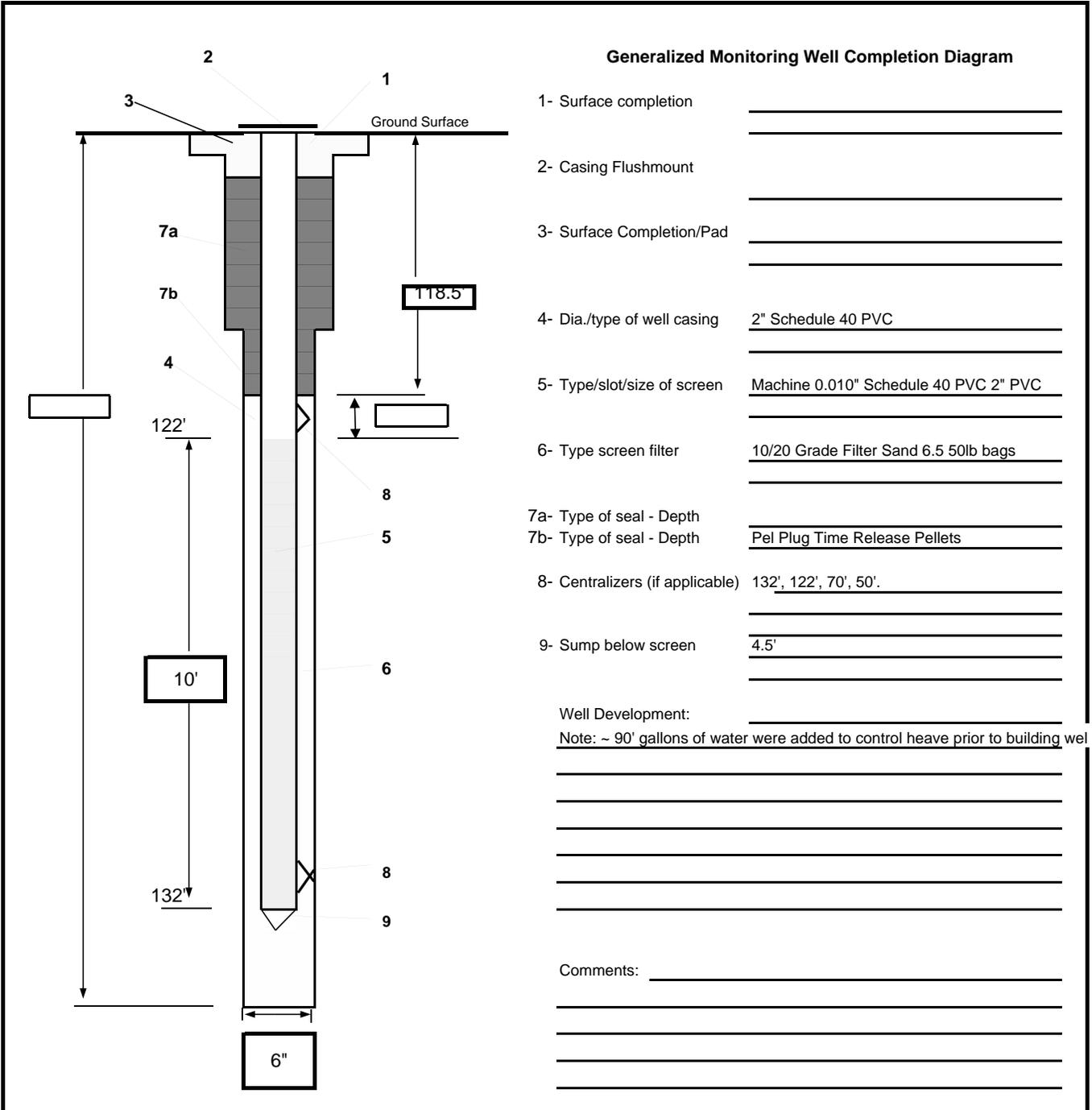
Comments: Backfill 87-82' with 3/8" Bentonite



DATE: 1/27/2017 WELL ID: MW-14D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman LOCATION : Freeman, WA
 Drilling Method: Air Rotary Drilling Contractor: Environmental West Exploration
 Well Construction Start Time: 1/27/17 12:30 Completion Time: Project Number : 661508

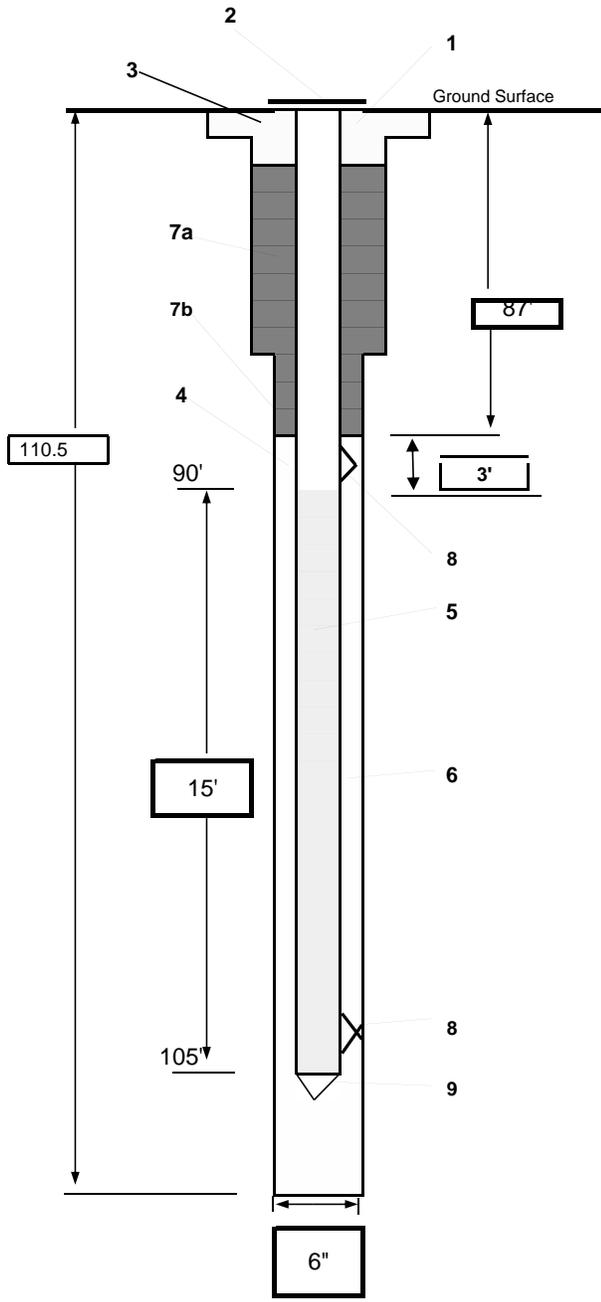




DATE: 1/27/2017 WELL ID: MW-16D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman LOCATION : Freeman, WA
 Drilling Method: Air Rotary Drilling Contractor: Environmental West Exploration
 Well Construction Start Time: 1/27/17 11:10 Completion Time: 12/27/2016 Project Number : 661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	<u>Portland</u>
2- Casing Flushmount	<u>10" Diameter; Drop in; Bolt down</u>
3- Surface Completion/Pad	<u></u>
4- Dia./type of well casing	<u>2" Dia Schedule 40 PVC</u>
5- Type/slot/size of screen	<u>Machine 0.010" Schedule 40 PVC 2" PVC</u>
6- Type screen filter	<u>6.5 (50lb) bags of 10/20 Grade Filter Sand from 87' to 105' bgs</u>
7a- Type of seal - Depth	<u>30 (50lb) bags of 3/8" Bentonite Chips from 3-78</u>
7b- Type of seal - Depth	<u>4 Buckets of Bentonite Pellets from 78 - 87' bgs</u>
8- Centralizers (if applicable)	<u>105', 90', 40'</u>
9- Sump below screen	<u>0.3'</u>
Well Development:	<u>3 (50 lb) bags of 10/20 sand from 105' to 107' bc</u>
	<u>1.5 Buckets of Bentonite Chips from 107' to 110.5 bgs</u>
Comments:	<u>6.5 (50lb) bags of</u>



DATE: 4/5/2017 WELL ID: MW-17D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA

Drilling Method: Air Rotary

Drilling Contractor: Environmental West Exploration

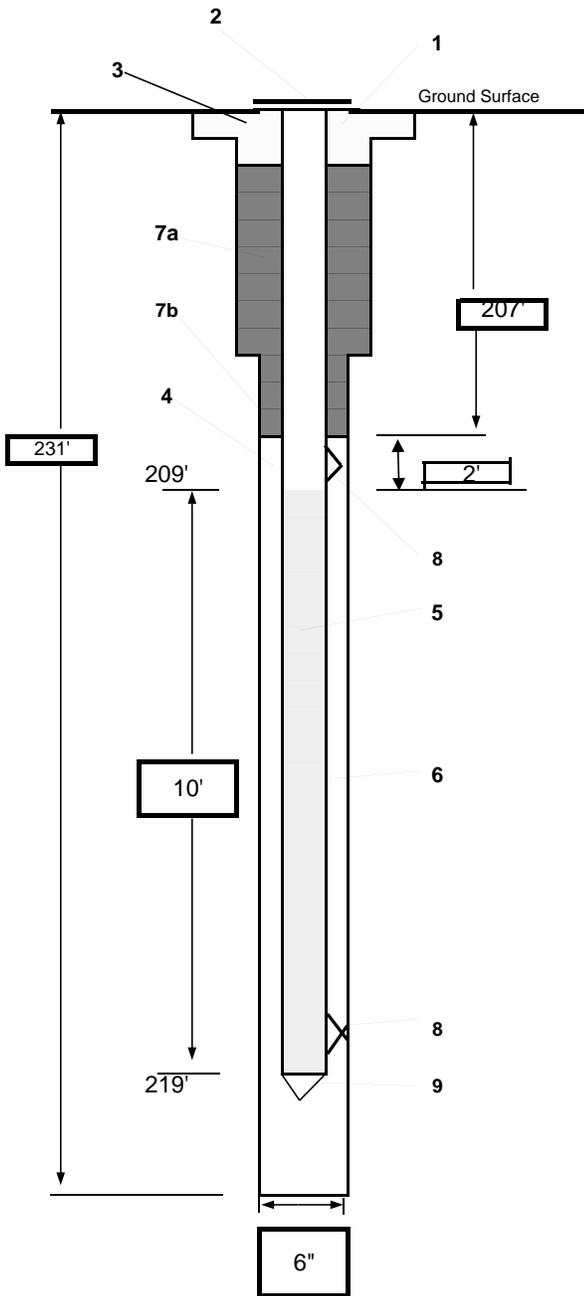
Well Construction Start Time: 4/5/17 13:55

Completion Time: 4/5/17 15:30

Project Number :

661508

Generalized Monitoring Well Completion Diagram



1- Surface completion	8" flush steel monument
2- Casing Flushmount	Protective Casing
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 40 PVC riser
5- Type/slot/size of screen	Machine 0.010" Schedule 40 PVC
6- Type screen filter	10/20 Grade Filter Sand (4 bags)
7a- Type of seal - Depth	0'-191' bgs Bentonite Grout (15 bgs/~215 gal)
7b- Type of seal - Depth	191'-207' bgs Bentonite Pellets (3 buckets)
8- Centralizers (if applicable)	219', 209', 159', 59'
9- Sump below screen	3-inch
Well Development:	Surge/Purge/Pump 83 gallons
Note:	
Comments:	

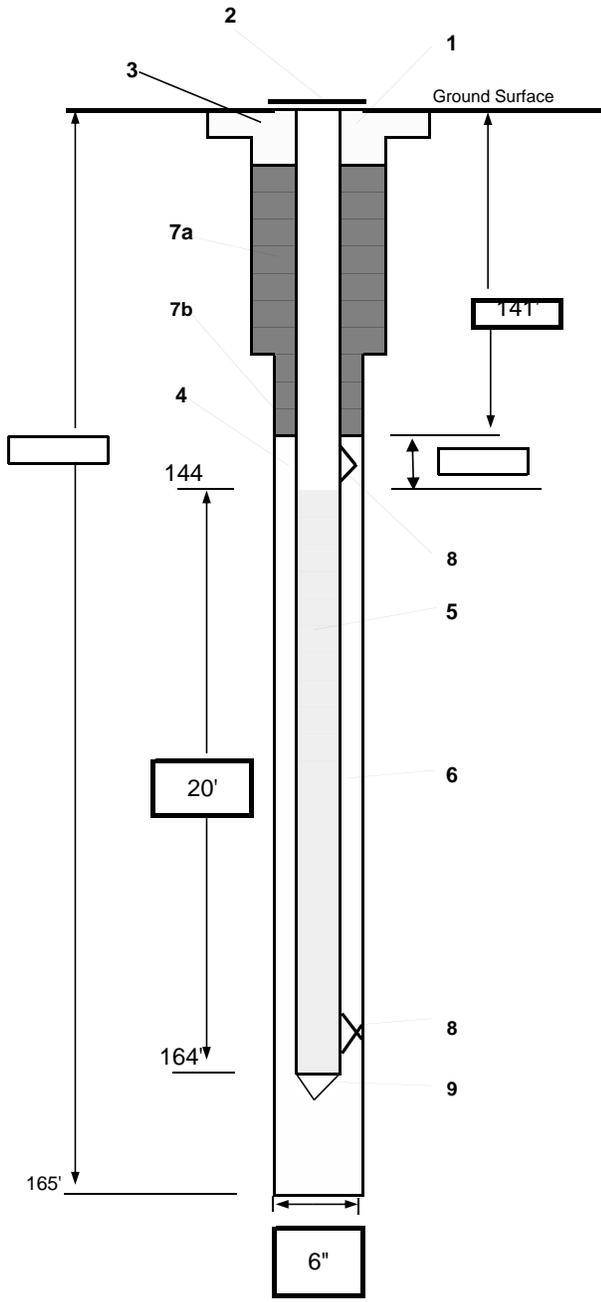


DATE: 1/10/2017 WELL ID: MW-18D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman LOCATION : Freeman, WA
 Drilling Method: Air Rotary Drilling Contractor: Environmental West Exploration
 Well Construction Start Time: 1/10/17 19:00 Completion Time: 1/10/17 11:20 Project Number : 661508

Generalized Monitoring Well Completion Diagram



1- Surface completion	Portland
2- Casing Flushmount	10" Diameter; Drop in; Bolt down
3- Surface Completion/Pad	
4- Dia./type of well casing	2" Dia Schedule 40 PVC
5- Type/slot/size of screen	Machine Slot 0.010" Schedule 40 PVC
6- Type screen filter	10/20 Grade Filter Sand
7a- Type of seal - Depth	Bentonite Slurry Grout
7b- Type of seal - Depth	Pel Plug Bentonite Pellets
8- Centralizers (if applicable)	164', 144', 80', 30'
9- Sump below screen	0.3'
Well Development:	
Comments:	



DATE: 4/26/2017 WELL ID: MW-19D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA

Drilling Method: Air Rotary

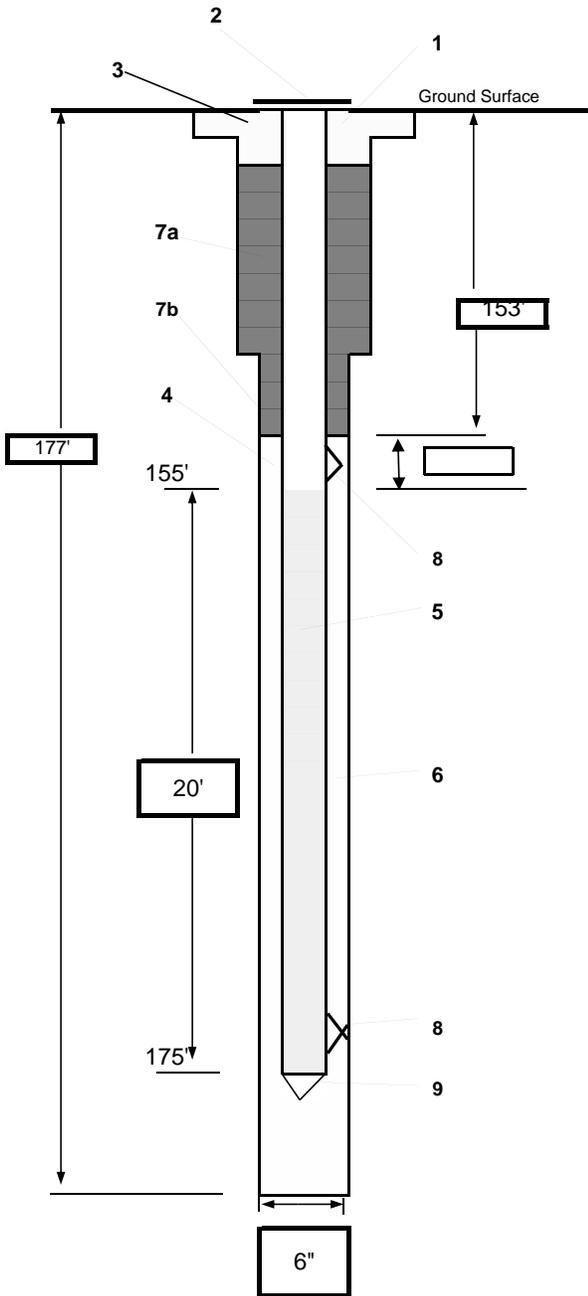
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 4/26/17 14:30

Completion Time:

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 40 PVC
5- Type/slot/size of screen	Machine 0.010" Schedule 40 PVC 2" PVC
6- Type screen filter	10/20 Grade Filter Sand
7a- Type of seal - Depth	Bentonite grout
7b- Type of seal - Depth	3/8" Time Release Pellets
8- Centralizers (if applicable)	175', 154', 125', 95', 65', 35'
9- Sump below screen	6-inch conical
Well Development:	
Note:	
Comments:	

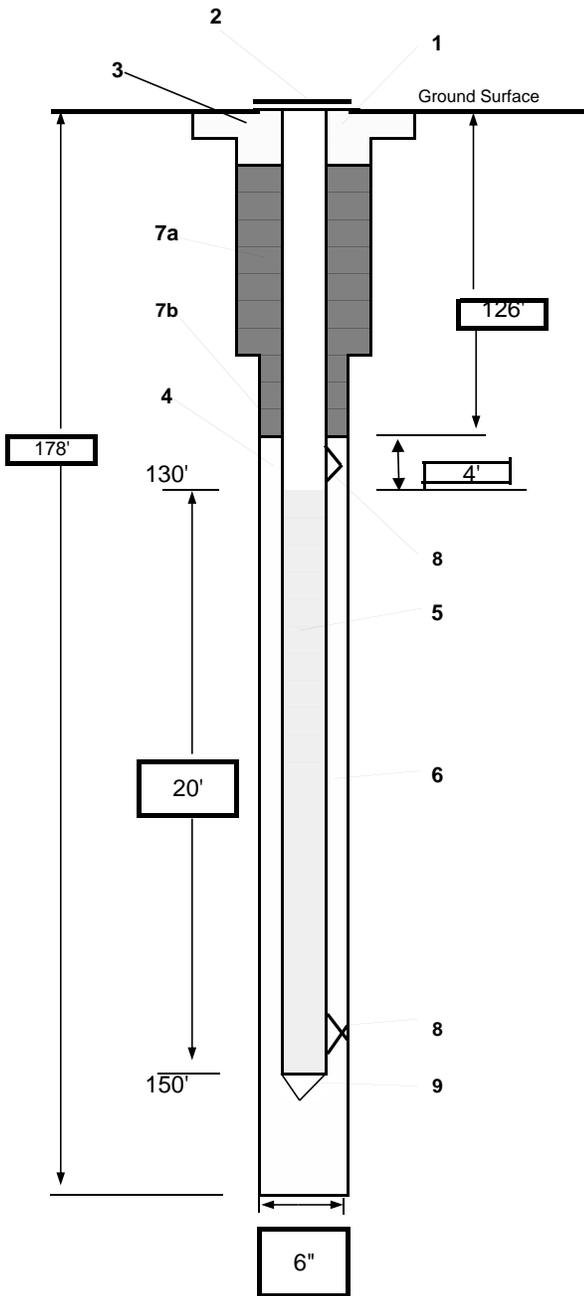


DATE: 6/16/2017 WELL ID: MW-20D

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman LOCATION : Freeman, WA
 Drilling Method: Air Rotary Drilling Contractor: Environmental West Exploration
 Well Construction Start Time: 6/16/17 08:00 Completion Time: 6/16/17 15:45* Project Number : 661508

Generalized Monitoring Well Completion Diagram



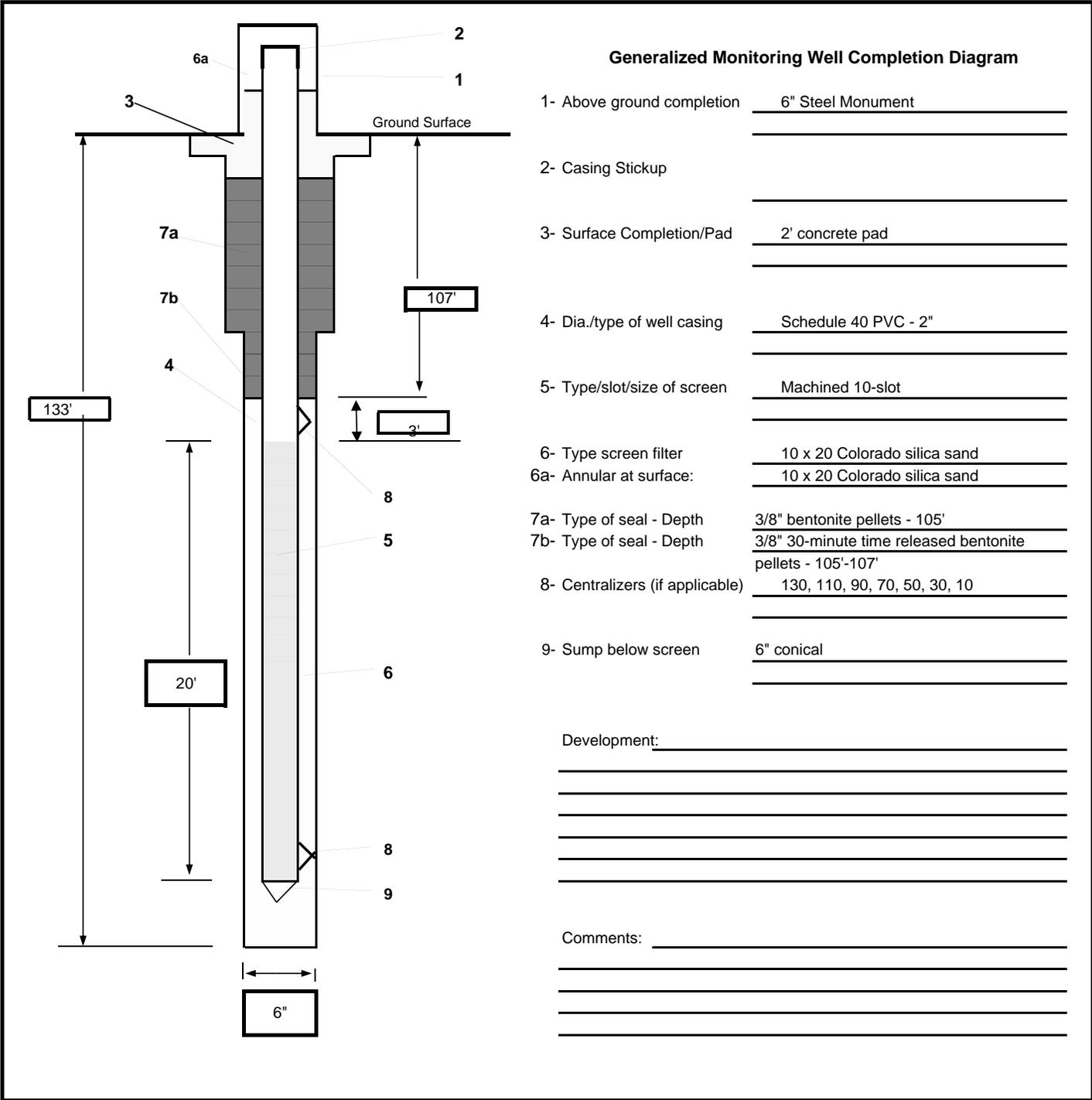
1- Surface completion	<u>flush mount</u>
2- Casing Flushmount	<u></u>
3- Surface Completion/Pad	<u>24" diameter concrete pad. 2" thick.</u>
4- Dia./type of well casing	<u>2" Schedule 40 PVC riser</u>
5- Type/slot/size of screen	<u>10 slot/20ft screen</u>
6- Type screen filter	<u>10/20 Colarado Silica Sand</u>
7a- Type of seal - Depth	<u>3/8" holeplug bentonite chips to 94.5 ft bgs</u>
7b- Type of seal - Depth	<u>3/8" time release pellets</u>
8- Centralizers (if applicable)	<u>Plug TR30 (126-94.5 ft bgs)</u>
9- Sump below screen	<u>5-inch</u>
Well Development:	<u>To be completed at later point.</u>
Note:	<u></u>
	<u></u>
	<u></u>
	<u></u>
	<u></u>
Comments:	<u>Borehole TD= 178'bgs</u>
	<u>Backfilled with time release 3/8" TR30 from 152-178' bgs</u>
	<u></u>
	<u>* - Includes supply run outer well construction. Several hour lapse.</u>



DATE: 7/6/2017 WELL ID: MW-21D

MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman Project Number: 661508
 DRILLING METHOD: Air Rotary LOCATION : Georgia Cross Property
 Well Construction Start Time: 10:30 Completion Time: 13:00 Project Number : 661508





DATE: 12/11/2018 WELL ID: MW-24S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA Grain Facility Lot

Drilling Method: Air Rotary

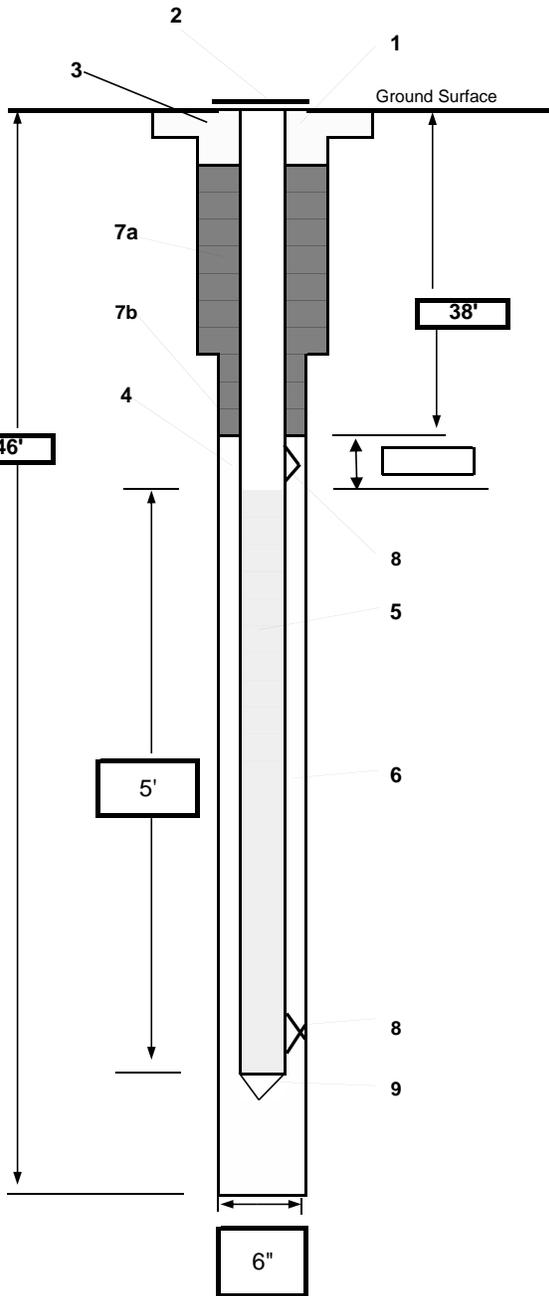
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 12/11/18 9:45

Completion Time: 12/11/2018 16:30

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	NA
3- Surface Completion/Pad	24" concrete pad 0-2'
4- Dia./type of well casing	2" Schedule 40 PVC
5- Type/slot/size of screen	10 slot sch 40 PVC
6- Type screen filter	20/40 sand
7a- Type of seal - Depth	Bentonite chips 2-38'
7b- Type of seal - Depth	NA
8- Centralizers (if applicable)	NA
9- Sump below screen	6" conical
Well Development:	Purged dry via submersible
Note:	
Comments:	



DATE: 12/12/2018 WELL ID: MW-25S

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA Grain Facility Lot

Drilling Method: Air Rotary

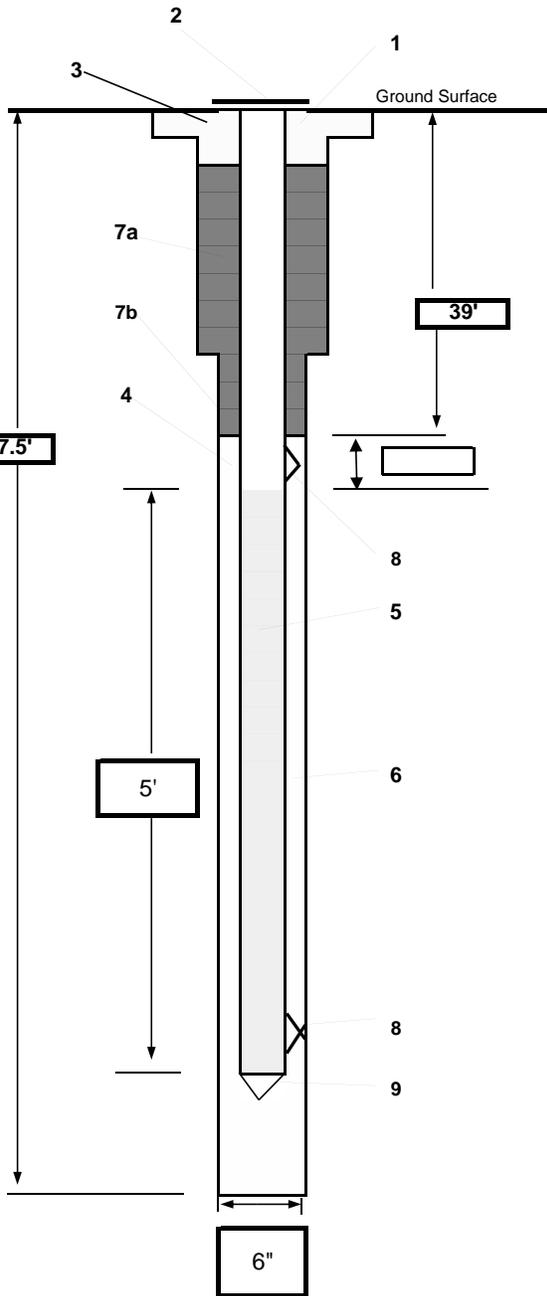
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 12/12/18 11:15

Completion Time: 12/12/2018 15:00

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	NA
3- Surface Completion/Pad	24" concrete pad 0-2'
4- Dia./type of well casing	2" Schedule 40 PVC
5- Type/slot/size of screen	10 slot sch 40 PVC
6- Type screen filter	20/40 sand
7a- Type of seal - Depth	Bentonite chips 2-39'
7b- Type of seal - Depth	NA
8- Centralizers (if applicable)	NA
9- Sump below screen	6" conical
Well Development:	Purged dry via submersible
Note:	
Comments:	



DATE: 5/16/2019 WELL ID: MW-26

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA RC-03 Boring

Drilling Method: Air Rotary

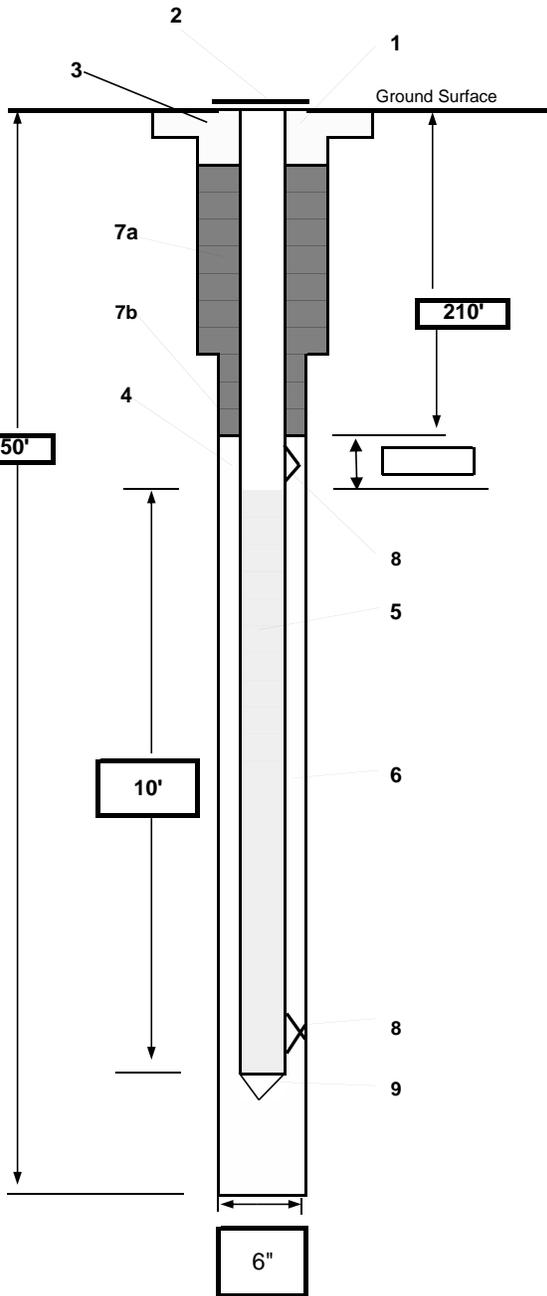
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 5/16/19 15:00

Completion Time: 5/16/2019 16:30

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	NA
3- Surface Completion/Pad	24" concrete pad 0-2'
4- Dia./type of well casing	2" Schedule 80 PVC
5- Type/slot/size of screen	10 slot sch 80 PVC
6- Type screen filter	12/20 sand
7a- Type of seal - Depth	Bentonite chips 2-190'
7b- Type of seal - Depth	Bentonite pellets 190-210'
8- Centralizers (if applicable)	NA
9- Sump below screen	6" conical
Well Development:	Will develop at a later date

Note:

Well was first a temp well installed in RC-03 boring. Later converted to MW-26 (permanent well)

Comments:



DATE: 5/29/2019 WELL ID: RC-02/MW-27

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA near MW-17D in RC-02

Drilling Method: Air Rotary

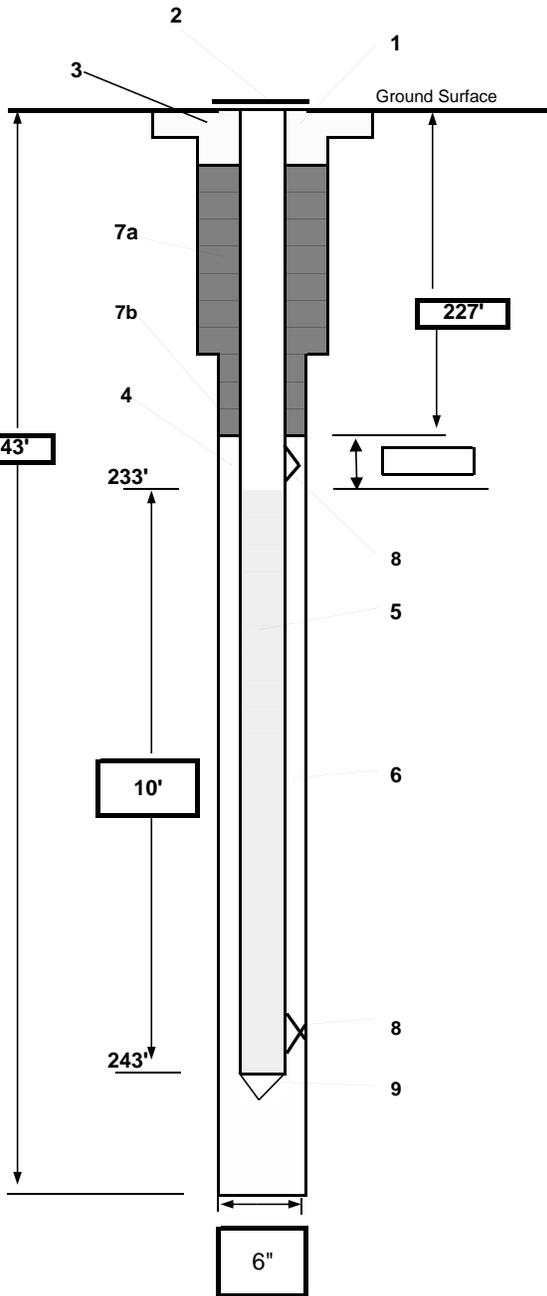
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 5/29/2019 11:00

Completion Time: 5/30/2019 17:00:00 PM

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 80 PVC
5- Type/slot/size of screen	10 slot sch 80 PVC
6- Type screen filter	10/20 Grade Filter Sand
7a- Type of seal - Depth	Bentonite chips- 2-190'
7b- Type of seal - Depth	Bentonite pellets - 190-227'
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	



DATE: 5/31/2019 WELL ID: MW-28

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA near MW-19D and MW-27

Drilling Method: Air Rotary

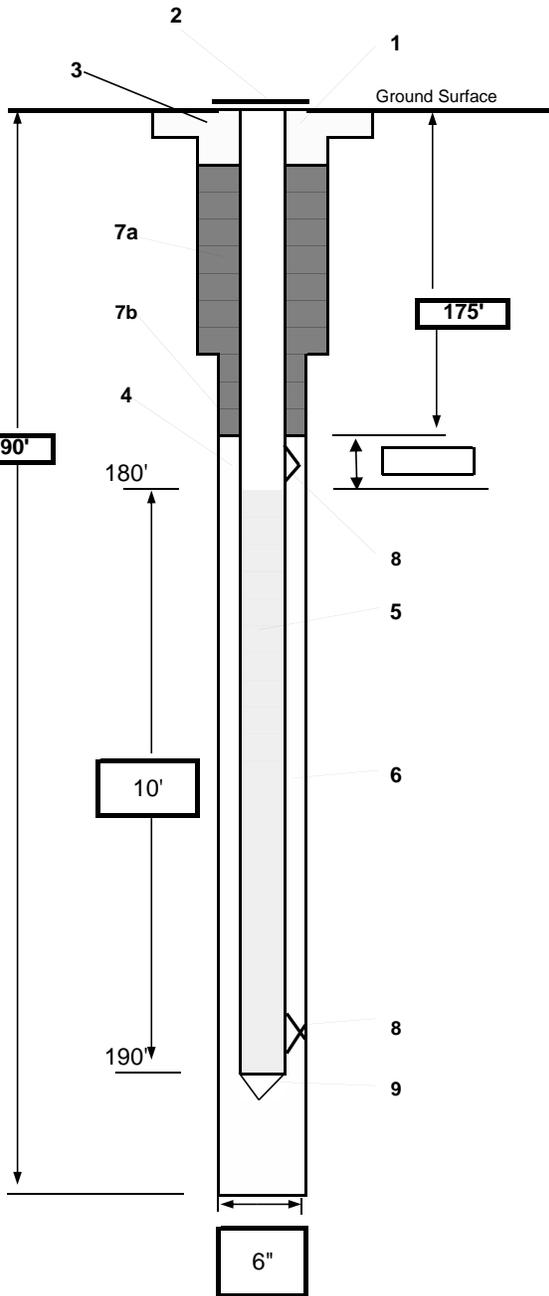
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 5/31/2019 09:00

Completion Time: 6/3/2019 15:00:00 PM

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" sch 80 PVC
5- Type/slot/size of screen	10 slot sch 80 PVC
6- Type screen filter	12/20 Filter Sand
7a- Type of seal - Depth	Bentonite chips- 2-152'
7b- Type of seal - Depth	Bentonite pellets-152-175'
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	



DATE: 6/6/2019 WELL ID: MW-29

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA near MW-19D, MW-27 and MW-28

Drilling Method: Air Rotary

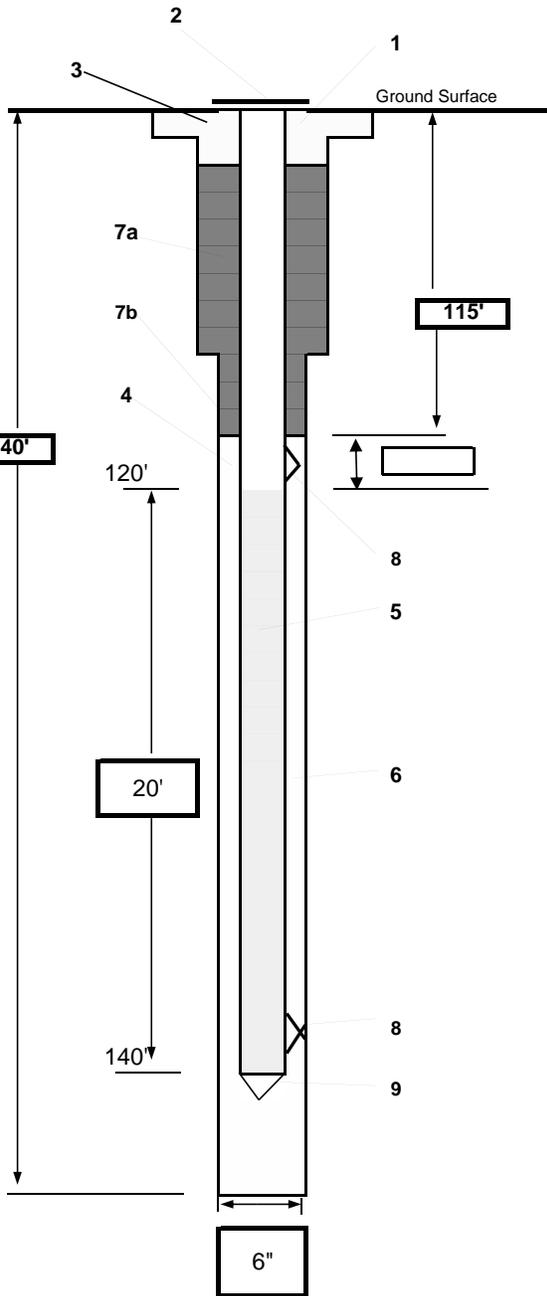
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 6/6/2019 11:45

Completion Time: 6/7/2019 13:00:00 PM

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 80 PVC
5- Type/slot/size of screen	10 slot Schedule 80 PVC
6- Type screen filter	12/20 Filter Sand
7a- Type of seal - Depth	Bentonite chips- 2-101'
7b- Type of seal - Depth	Bentonite pellets-101-115'
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	



DATE: 6/24/2019 WELL ID: MW-30

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA; RC-02 Cluster

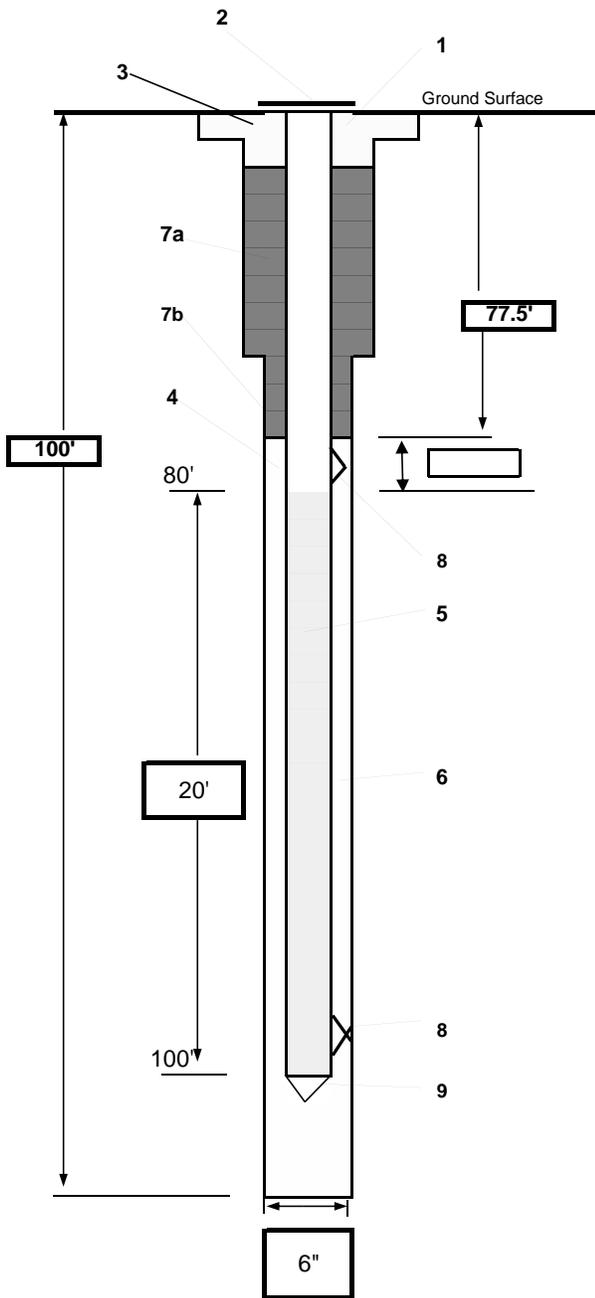
Drilling Method: Air Rotary

Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 6/24/2019 09:45 Completion Time: 6/26/2019 12:30

Project Number : 661508

Generalized Monitoring Well Completion Diagram



1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 40 PVC
5- Type/slot/size of screen	10 slot Schedule 40 PVC
6- Type screen filter	12/20 Filter Sand
7a- Type of seal - Depth	Bentonite chips- 2-77.5'
7b- Type of seal - Depth	
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	

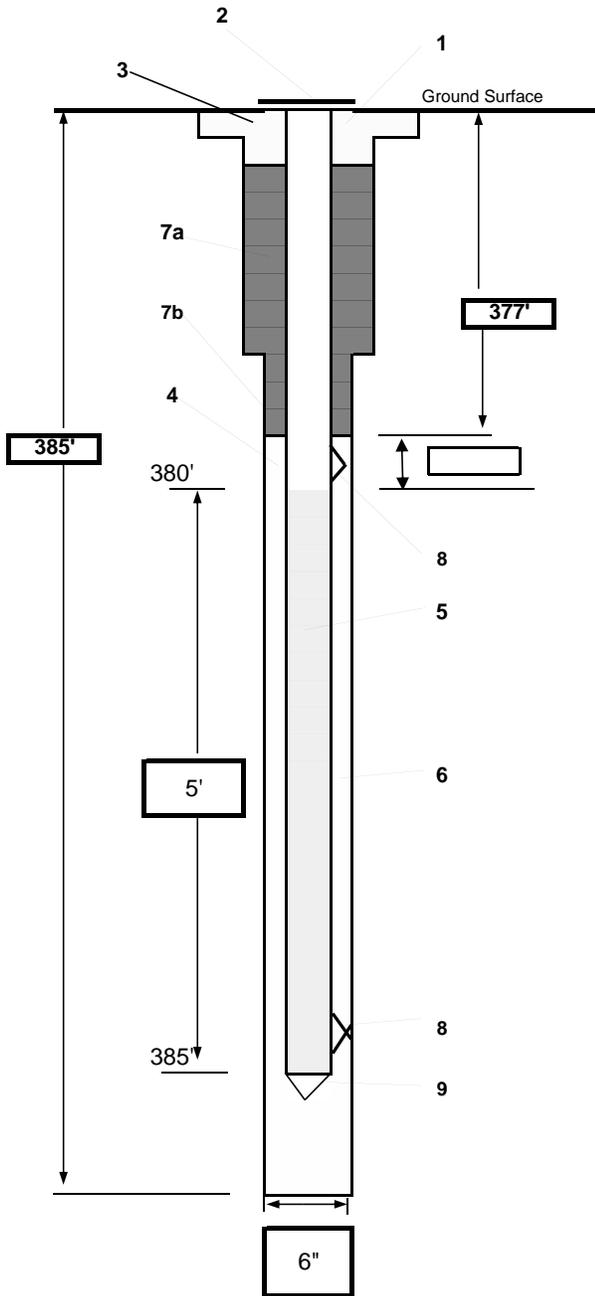


DATE: 6/28/2019 WELL ID: RC-04/MW-31

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman LOCATION : Freeman, WA; RC-04 Bore Hole
 Drilling Method: Air Rotary Drilling Contractor: Environmental West Exploration
 Well Construction Start Time: 6/28/2019 12:30 Completion Time: 7/1/2019 17:00:00 PM Project Number : 661508

Generalized Monitoring Well Completion Diagram



1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 80 PVC
5- Type/slot/size of screen	10 slot Schedule 80 PVC
6- Type screen filter	12/20 Filter Sand
7a- Type of seal - Depth	Bentonite chips- 2-30'
7b- Type of seal - Depth	Bentonite Grout- 30-292' & Bentonite Pellets-292-
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	



DATE: 7/3/2019 WELL ID: MW-32

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA; near RC-04/MW-31

Drilling Method: Air Rotary

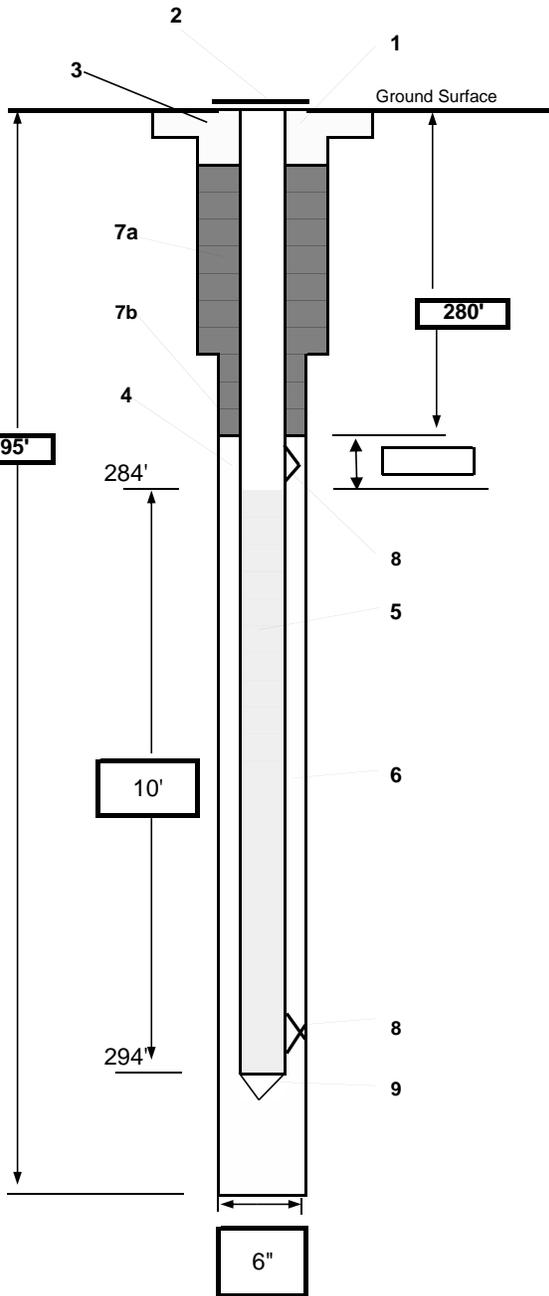
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 7/3/2019 09:00

Completion Time: 7/8/2019 17:00:00 PM

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 80 PVC
5- Type/slot/size of screen	10 slot Schedule 80 PVC
6- Type screen filter	12/20 Filter Sand
7a- Type of seal - Depth	Bentonite chips- 2-20'
7b- Type of seal - Depth	Bentonite Grout- 20-255' & Bentonite Pellets-255-
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	



DATE: 7/10/2019 WELL ID: MW-33

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

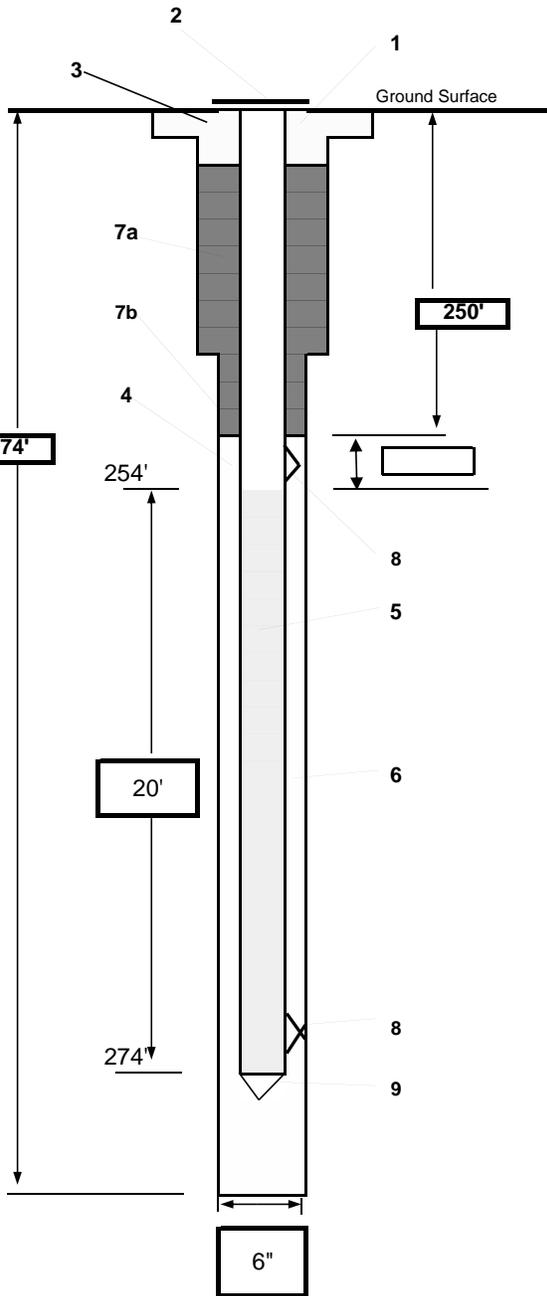
LOCATION : Freeman, WA; near RC-04/MW-31

Drilling Method: Air Rotary

Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 7/10/2019 15:00 Completion Time: 7/12/2019 10:45

Project Number : 661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 80 PVC
5- Type/slot/size of screen	10 slot Schedule 80 PVC
6- Type screen filter	12/20 Filter Sand
7a- Type of seal - Depth	Bentonite chips- 3-21'
7b- Type of seal - Depth	Bentonite Grout- 21-214' & Bentonite Pellets-214-
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	



DATE: 7/15/2019 WELL ID: MW-34

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA; near RC-04/MW-31

Drilling Method: Air Rotary

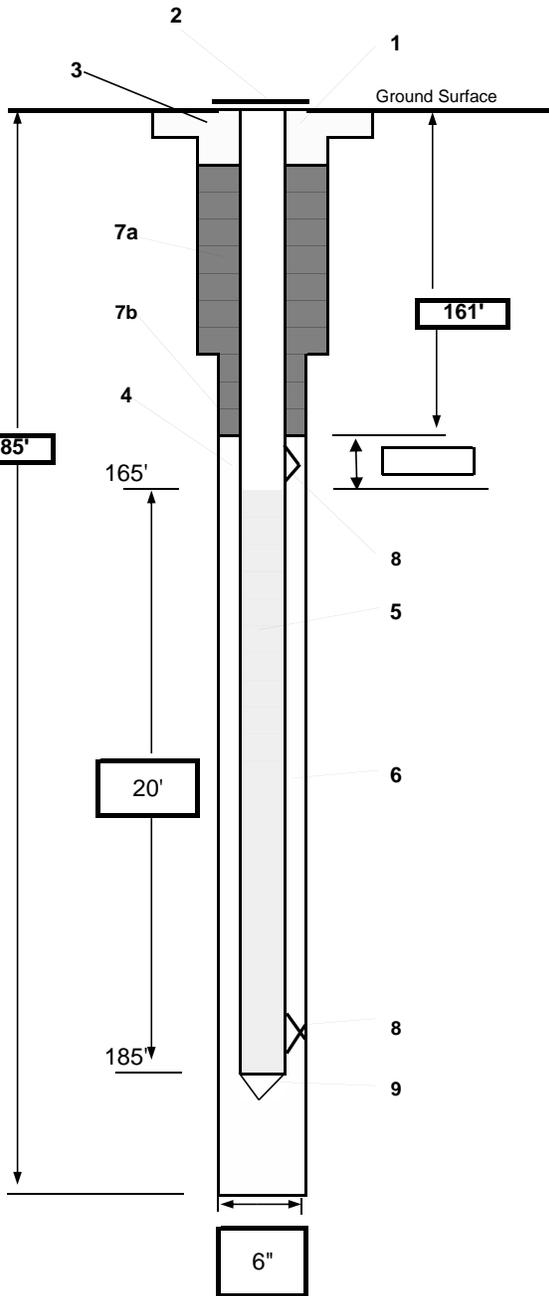
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 7/15/2019 12:30

Completion Time: 7/17/2019 11:30

Project Number :

661508



Generalized Monitoring Well Completion Diagram

1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 80 PVC
5- Type/slot/size of screen	10 slot Schedule 80 PVC
6- Type screen filter	12/20 Filter Sand 161'-185'
7a- Type of seal - Depth	Bentonite chips- 2-131"
7b- Type of seal - Depth	Bentonite Pellets- 131'-161"
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	

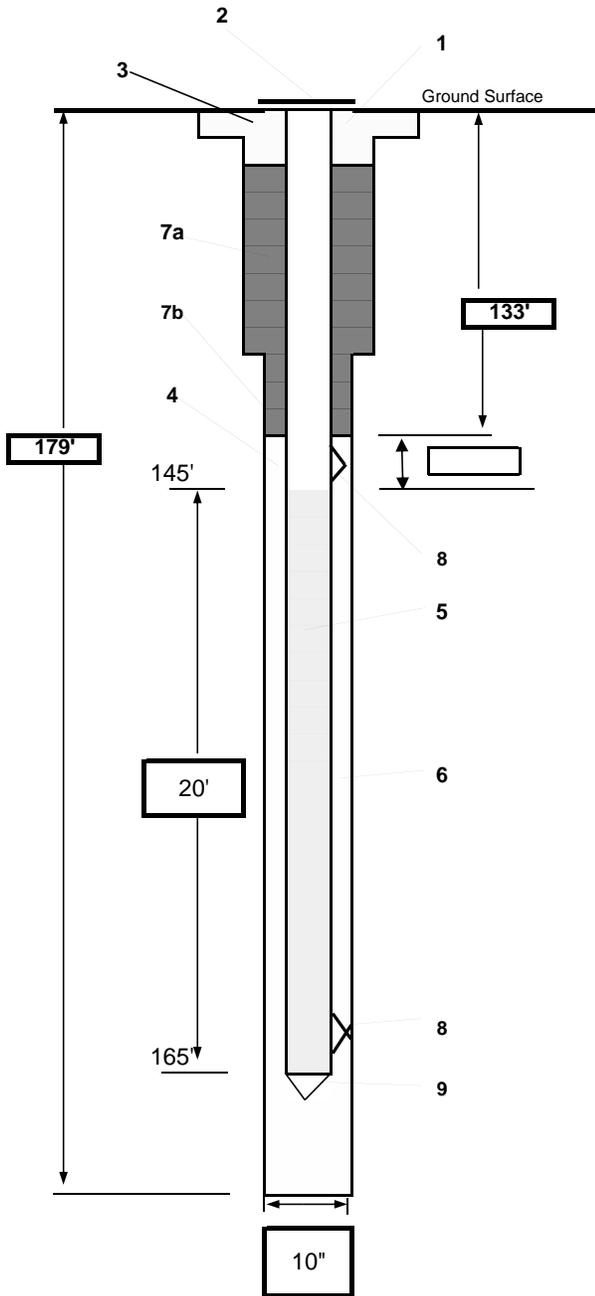


DATE: 7/24/2019 WELL ID: MW-35/RC-03

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman LOCATION : Freeman, WA; RC-03 Bore Hole
 Drilling Method: Air Rotary Drilling Contractor: Environmental West Exploration
 Well Construction Start Time: 7/24/2019 Completion Time: 8/7/2019 Project Number : 661508

Generalized Monitoring Well Completion Diagram



1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	6" Schedule 80 PVC
5- Type/slot/size of screen	30 slot stainless steel
6- Type screen filter	8/12 Filter Sand #30 transition sands
7a- Type of seal - Depth	Bentonite grout- Ground Surface-127.5'
7b- Type of seal - Depth	Bentonite Pellets-127.5-133'
8- Centralizers (if applicable)	
9- Sump below screen	10' blank casing section
Well Development:	
Note:	Transition sand-133-138'
Comments:	



DATE: 8/8/2019 WELL ID: MW-36

FLUSH-MOUNT MONITORING WELL COMPLETION DIAGRAM

PROJECT : UPRR Freeman

LOCATION : Freeman, WA; near RC-03

Drilling Method: Air Rotary

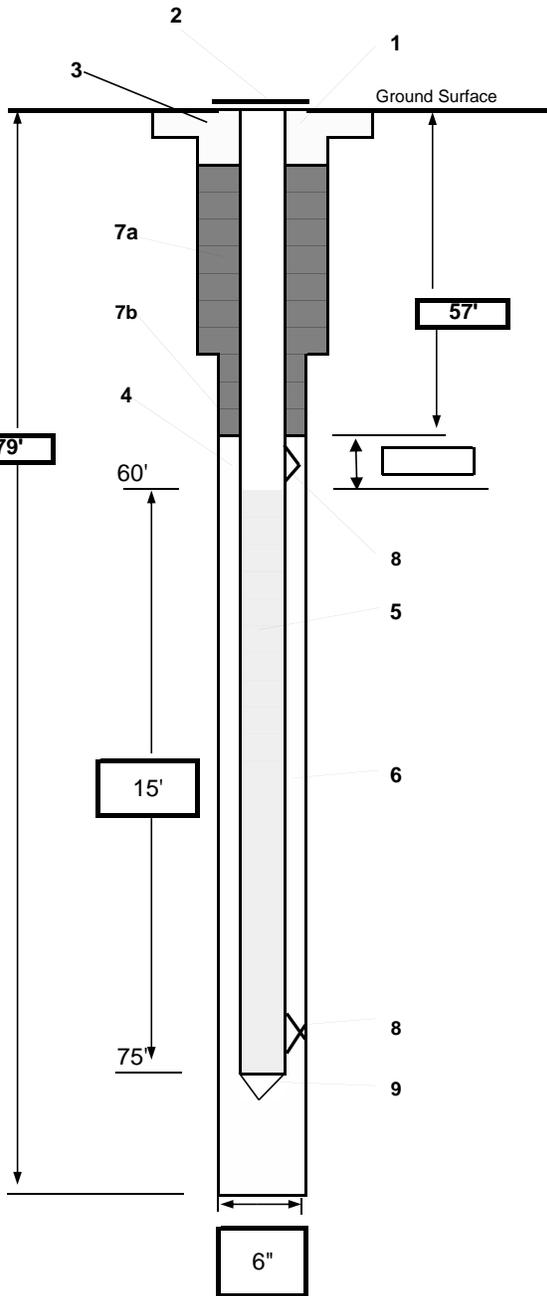
Drilling Contractor: Environmental West Exploration

Well Construction Start Time: 8/8/2019 12:45

Completion Time: 8/15/2019 14:00:00 PM

Project Number :

661508



Generalized Monitoring Well Completion Diagram

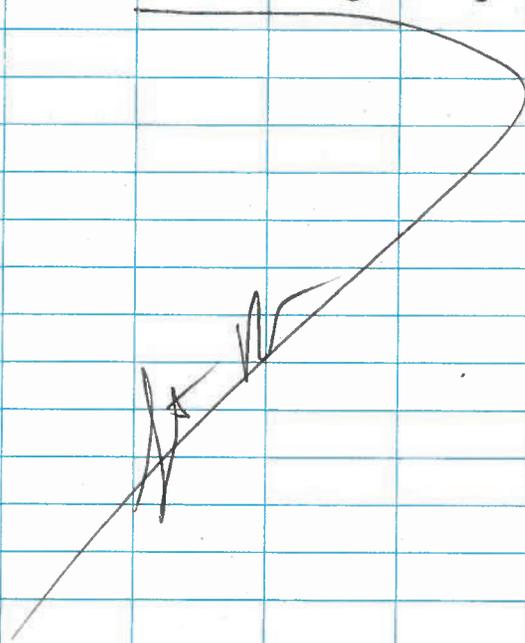
1- Surface completion	8" flush steel monument
2- Casing Flushmount	
3- Surface Completion/Pad	24" concrete pad
4- Dia./type of well casing	2" Schedule 80 PVC
5- Type/slot/size of screen	10 slot Schedule 80 PVC
6- Type screen filter	12/20 Filter Sand
7a- Type of seal - Depth	Bentonite chips- 1-38'
7b- Type of seal - Depth	Bentonite Pellets-38-57'
8- Centralizers (if applicable)	
9- Sump below screen	6" conical
Well Development:	
Note:	
Comments:	

Well Development Logs

7-22-16

Well Development Log - MW-15

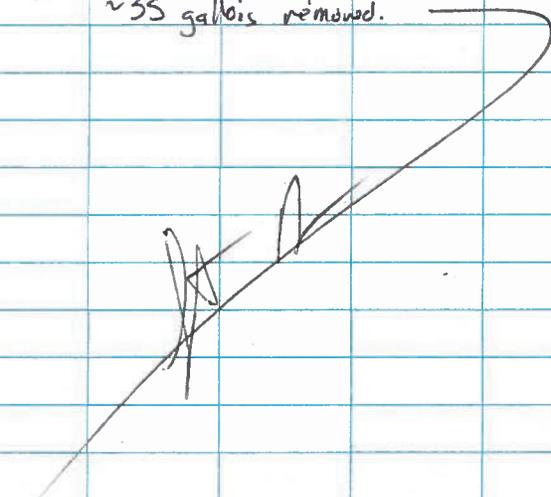
Time	DTW	Purge Rate	Total Volume	Observations
08:00				DTW measurement attempted on 7-15-16 but well screen full of thick mud.
08:00				Begin bailing to remove mud. Removed about 3 gallons of mud/water.
10:25	21.19'		TD - 23.52'	Repeated bailing five times; bailed dry each time. Allowed to recharge to 21' bss before bailing. Approximately six gallons removed. Water clearing during sixth attempt.



7-22-16

Well Development Log - MW-1d

Time	DTW	Purge Rate	Total Volume	Observations
9:45	23.63			- initial
9:50		~22/min		clear
10:00	34.0	~1 gpm		very turbid
10:10	59.0	~1 gpm		very turbid
10:34		~1 gpm		very turbid
11:10				stop pumping, water level at 86 lbs. Pumping rate inconsistent, a total of ~30 gallons removed.
11:25	66'	~1 gpm		
11:30	86'			stop pumping, water clearing ~35 gallons removed.



7-25-16

Well Development Log - MW-6

Time	DTW	Pump Rate	Volume	Observations
0800	132.68	-initial		
0815	begin	pumping - 2gpm		clear
0818	135.10	2gpm		clear
0829	135.14	2gpm		clear
0840	135.18	-stop pumping		clear
* ~ 50 gallons pumped.				



7-25-16

Well Development Log - MW-4

Time	DTW	Pump Rate	Volume	Observations
8:52	113.10	-initial		
9:12		pump not functioning		Remain to inspect, begin drilling to remove PVC pieces.
9:48		begin pumping - pump malfunction		Resume trouble shooting.
10:30		begin pumping - ~1 gpm		turbid
10:40	101.8	1gpm	~10gal	turbid
10:52	106.00	1gpm	~22gal	clearing
11:00	109.25	1gpm	~30gal	clearing
11:10	122.22	1gpm	~40gal	clearing
11:20	137.72	-stop pumping	~50gal	clear



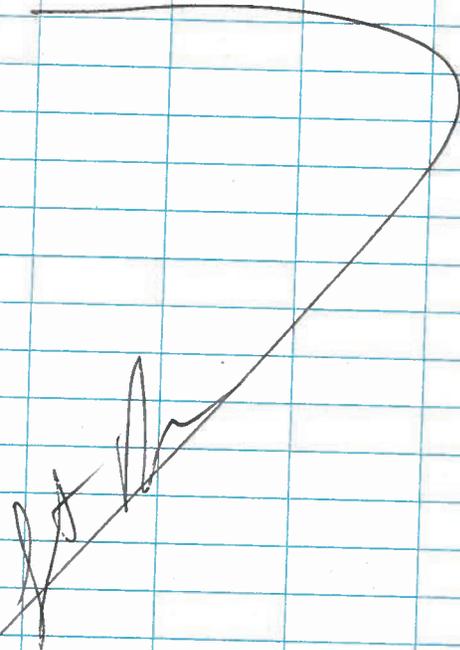
7-25-10

Time	Well	Development Log - MW-5	DTW	Pump rate	Volume	Observations
11:58		- initial	63.25			
12:05		begin pumping		~ 1 gpm	-	slightly turbid
12:15			84.10	~ 1 gpm	10 gal	turbid
12:25			86.09	~ 1 gpm	20 gal	turbid
12:35			86.78	~ 1 gpm	30 gal	clear - raise pump to 1.5 gpm
12:45		- stop pumping	86.75			clear screen



7-25-10

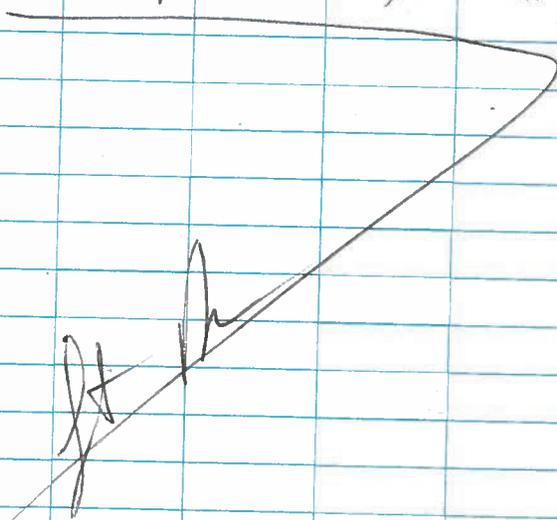
Time	Well	Development Log - SB-24	DTW	Pump rate	Volume	Observations
12:58		- initial	36.31			
13:01		begin pumping		~ 1.5 gpm		
13:03		Pumped dry				water turbid, but extremely low recovery. Pumped ~ 3 gallons



7-25-16

Well Development log - MW-1

Time	DTW	Pump Rate	Volume	Observations
13:23	36.42	- initial		
13:26	Begin	Pumping		clear/turbid
13:36	65.80	1.5 gpm	15 gal	very turbid
13:46	86.90	1.5 gpm	30 gal	turbid
13:56	92.78	1.5 gpm	45 gal	turbid
14:06	95.75	1.5 gpm	~60 gal	clearing but turbid pump stopped for 1 min with clearing
14:18	106.20	1.5 gpm		
14:20	108.65	1.5 gpm	~90 gal	mostly clear
14:36	108.84	1.5 gpm	~105 gal	clear, stop pump



7-27-16

Project: UPRR Freeman RI

Location: Freeman, WA

Task: Water Well Sampling

Weather: 62°F, clear

0715 S. Demos onsite. Prep for residential well sampling.

0730 Arrive at Arthur Randall residence. Mr. Randall signs access agreement.

0745 Collect sample Randall-1607

0800 Arrive at Roy Dawey residence. Mr. Dawey agrees to sampling his well but refuses to sign access agreement.

0815 Collect sample. Dawey-1607

0820 Arrive at school district. Kirk Lally escorts to water treatment plant

0835 Collect sample W26-1607 + MS/MSD

0905 Arrive at the Freeman Stone. Stone attendant allowed sample but the owner was not present.

0910 ~~0910~~ Collect sample Freeman Stone-1607

0920 Arrive at Reed Residence. Mr. Reed signed access agreement.

0930 Collect sample W30-1607
Collect field duplicate sample
e 11:00

PROJECT NUMBER 661508-10.03.02	WELL NUMBER MW-20U	SHEET 1 OF 1
WELL DEVELOPMENT LOG		

PROJECT: UPRR - Freeman, WA LOCATION: Freeman, WA
 DEVELOPMENT CONTRACTOR: EWE
 DEVELOPMENT METHOD AND EQUIPMENT USED: Submersible Pump - Grundfos red-fls
 START WATER LEVELS: 92.02 START: 6/22/17 - 1525 END: 6/22/17 - 1710 LOGGER: J. Freed

MAXIMUM DRAWDOWN DURING PUMPING: 14.42 ft
 RANGE AND AVERAGE DISCHARGE RATE: 1-2 gal/min Avg = 1.71 gal/min
 TOTAL QUANTITY OF WATER DISCHARGED: ~180 gal
 DISPOSITION OF DISCHARGE WATER: ~ 6' above wellhead to water table.

130-150

Water	approx Pump Setting (psig)	Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	mS/cm Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
42	~150	1530	~10 gal	106.44	0.0*	15.80	7.01	0.588	very turbid - yellowish - meter malfunction
1.16	~150	1540	~30	106.60	109	15.61	7.08	0.566	cloudy - increased flow
5.5	~150	1545	~40	112.10	--*	15.29	7.10	0.569	*flashing/malfunction cloudy. (raised pump 4' following readings)
.55	~146	1555	~50	113.65	694	15.29	7.12	0.563	cloudy (raised pump 4' following readings)
0.44	~142	1600	~70	114.09	747	15.11	7.08	0.560	cloudy (raised pump, as above)
	~138	1605	~70	113.87	170	15.32	7.08	0.559	nearly clear (raised pump, as above)
-	~134	1615	~80	113.76	358	15.23	6.98	0.551	cloudy (raised pump, as above)
-	~130	1625	~90	113.45	290	15.40	6.94	0.552	near-clear (dropping pump to bottom screen following readings)
-	~150	1635	~110	108.85	477	15.31	6.95	0.556	water becomes yellow then when pump is adjusted used for swabbing, clears to cloudy in 30 minutes
2.75	~150	1640	~120	111.61	143	15.14	6.91	0.552	slightly cloudy to nearly clear (raising pump to screen)
2.38	~140	1645	~130	113.99	135	14.89	6.89	0.550	nearly clear
0.23	~140	1650	~140	114.22	48.5	15.00	6.84	0.550	nearly clear
0.22	~140	1655	~150	114.40	20.5	14.95	6.81	0.548	clear
0.03	~140	1700	~160	114.43	9.8	14.91	6.79	0.547	clear
0.02	~140	1705	~170	114.45	7.5	14.91	6.78	0.548	clear
0.01	~140	1710	~180	114.46	5.5	14.78	6.77	0.547	clear

↑ Pump loss eff. ↓
minutes, pump to screen

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-27

Field Team: JE, ks

Date: 7/25/19

Weather/Temp: 70° , Sunny

Arrival Time: 11 15

Well Condition: Good

Initial DTW (ft btc): 66.44

Purge Method: Submersible

Purge Rate⁵: 0.8 gpm / 400 mL/min

PID reading: —

Pump Depth: mid-screen

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1130	Begin Pumping								
Low flow Begin									
1230	159.37		18.44	7.61	0.465	1502.3	4.24	130.4	
1235	155.62		17.92	7.15	0.470	1506.8	3.72	123.0	
1240	154.28		19.39	7.15	0.469	1523.4	4.36	121.1	
1245	151.29		17.73	7.12	0.449	1504.1	4.66	122.6	
1250	149.02		18.20	7.11	0.437	1215.2	4.68	123.5	
1255	148.68		18.36	7.11	0.427	668.1	4.73	124.8	
<i>← PSE</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW27-GW-072519

Sample Time: 1300

Analysis: Quarterly Groundwater Parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 30
25 gallons

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Total depth of well is greater than 200' = can't measure

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-28

Field Team: JE. KS

Date: 7/18/19

Weather/Temp: Sunny 70° windy

Arrival Time: 1230

Well Condition: good

Initial DTW (ft btc): 57.67

Purge Method: Submersible

Purge Rate⁵: 2.5 gpm (LF 250-300ml)

PID reading: ---

Pump Depth: 185 (mid-screen)

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1245	Begin Pumping								
1255	70.63		13.45	7.29	0.877	82.0	7.45	154.4	
1305	71.36		13.17	7.07	0.824	33.8	6.75	145.0	
1315	70.83		13.31	7.08	0.819	149.5	6.46	141.8	
1325	70.39		13.13	7.09	0.825	183.9	6.55	140.0	
1335	71.45		13.03	7.09	0.814	47.1	6.70	140.4	
1345	70.74		12.99	7.10	0.816	144.2	6.84	139.4	
1355	71.44		12.69	7.08	0.794	0.0	7.06	139.6	
1400									Begin LF*
1400	57.19		14.62	7.16	0.811	8.8	7.40	138.5	
1405	57.19		16.25	7.16	0.813	0.0	7.48	138.7	
1410	58.13		16.67	7.14	0.813	0.0	6.98	139.1	

Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW28-GW-071819

Sample Time: 1410

Analysis: Quarterly groundwater parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 225 gallons
Start: 928.9 x 100

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: 225 gallons purged during development and low flow

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-29

Field Team: JE, KS

Date: 7/19/19

Weather/Temp: 70° sunny

Arrival Time: 0830

Well Condition: Good

Initial DTW (ft btc): 57.12

Purge Method: Submersible Pump

Purge Rate⁵: 1 gpm / LF = 400 mL/min

PID reading: ---

Pump Depth: 130' (mid-screen)

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0845	Begin Pumping								
0850	58.20		14.65	7.56	0.834	200.1	5.37	105.4	
0900	57.31		16.17	7.40	0.984	321.5	5.50	112.4	
0910	57.59		18.39	7.51	1.038	391.8	5.34	116.4	
0920	63.92		19.43	7.30	1.101	374.2	5.42	115.8	Flow increased to 2
0930	79.47		17.56	7.24	1.110	335.4	5.15	109.1	
0940	90.56		12.35	7.14	1.093	398.2	5.29	106.9	
0950	97.12		12.45	7.10	0.938	138.3	5.84	110.8	
1000	101.16		12.71	7.14	0.898	618.2	5.39	109.6	
1010	111.98		12.63	7.15	0.903	374.2	5.56	112.5	
1020	114.32		12.72	7.13	0.867	111.8	5.74	115.1	
1030	103.94		13.25	7.14	0.872	577.3	5.93	115.2	
1040	112.09		12.80	7.12	0.851	68.1	5.96	115.8	
1045	74.07		16.60	7.14	0.855	91.7	7.63	116.5	
1050	69.25		15.07	7.12	0.857	77.6	7.82	117.2	
1055	68.42		15.20	7.15	0.863	48.0	7.40	111.7	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

low flow
↓

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW29-GW-071919

Sample Time: 1100

Analysis: Quarterly Groundwater Parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 150 gallons

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Total Depth of well: 140.58

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-30

Field Team: JE. KS

Date: 7/23/19

Weather/Temp: 80° Sunny

Arrival Time: 0900

Well Condition: Good

Initial DTW (ft btc): 57.31

Purge Method: Submersible

Purge Rate⁵: 2.75 gpm / 400 mL/min

PID reading: -

Pump Depth: 90 feet (mid-screen)

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
0910	Begin Pumping								
0935	82.90		12.65	7.51	0.370	36.4	10.02	207.5	
0945	82.91		11.83	7.13	0.365	8.6	10.62	183.9	
1000	73.59		11.96	7.11	0.359	85.6	10.38	178.2	
1015	68.21		12.56	7.10	0.348	43.4	10.76	176.6	
1025	67.82		12.67	7.11	0.351	108.9	10.12	176.0	
Begin	Low flow								
1030	67.99		14.57	7.13	0.352	106.1	10.34	174.2	
1035	59.23		14.62	7.10	0.357	34.8	10.54	173.8	
1040	58.95		14.80	7.09	0.355	40.5	9.85	172.7	
1045	58.89		14.83	7.11	0.354	31.1	10.17	171.4	
1050	58.91		14.59	7.12	0.351	55.1	10.57	170.4	
1055	58.90		14.80	7.12	0.352	36.3	10.21	169.2	
<i>[Handwritten signature]</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW30-GW-072319

Sample Time: 1045

Analysis: Quarterly Groundwater Parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 140 gallons

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Total Depth = 99.83

1/2

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-31

Field Team: J.E. KS

Date: 8/7/19

Weather/Temp: 80° sunny

Arrival Time: 910

Well Condition: good

Initial DTW (ft btc): 100.14

Purge Method: Bladder

Purge Rate⁵: 125 ml/min

PID reading: -

Pump Depth: 380 feet

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1020	Begin Pumping								
1030	102.42		16.6	7.37	374.4	89.6	10.38	204.8	
1040	111.39		16.6	7.34	367.4	69.8	10.57	234.9	
1050	115.16		15.3	7.34	372.1	121.8	10.68	250.3	
1100	119.51		17.1	7.33	366.9	157.8	10.20	253.2	Turbid
1110	122.06		15.6	7.33	358.7	170.1	9.49	255.3	
1120	126.61		15.8	7.35	358.3	814.2	11.05	262.2	
1130	132.27		15.9	7.35	370.6	704.2	8.20	269.7	
1140	134.82		21.8	7.38	266.6	540.6	6.37	266.6	
1145	133.98		22.4	7.44	371.5 376.1	707.1	6.49	220.7	
1150	134.33		18.1	7.43	367.2	781.9	6.78	226.8	
1155	135.08		21.5	7.36	354.3	957.2	8.86	254.6	
1200	134.74		25.7	7.34	350.5	1969.3	7.58	259.3	
1205	134.59		27.4	7.32	331.8	4680.7	6.70	261.3	
1210	134.42		27.1	7.33	329.4	4985.9	8.47	261.8	
1215	134.49		27.3	7.32	324.9	5933.1	7.34	261.9	↓
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW31-GW-080719

Sample Time: 1230

Analysis: Quarterly Groundwater Parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): +30 13 gallons

Field Duplicate ID: -

Field Duplicate Time: _____

Comments: Water was turbid most of purging time

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-33

Field Team: J.E.K.S

Date: 7/24/19

Weather/Temp: 70° sunny, windy

Arrival Time: 1030

Well Condition: Good

Initial DTW (ft btc): 124.54

Purge Method: Submers. bb

Purge Rate⁵: 0.3 gpm

PID reading: —

Pump Depth: 264 (mid-screen)

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1100	Begin Pumping								
						16.8			
1205	124.56		25.99	6.82	0.473	0.0	4.64	131.6	
1210	124.56		26.47	6.91	0.462	15.9	4.71	138.7	
1225	124.56		26.34	7.00	0.439	14.3	4.79	141.0	
1235	124.56		26.73	7.15	0.408	10.1	3.96	132.5	
1245	124.58		26.35	7.14	0.400	10.1	3.46	119.8	
1255	124.56		25.49	7.12	0.395	12.3	3.27	98.1	
1305	124.58		26.01	7.17	0.395	29.7	4.03	91.9	
1315	124.58		26.31	7.19	0.397	27.0	4.20	102.0	
1325	124.58		26.53	7.19	0.398	26.1	4.24	106.7	
1330	124.58		26.76	7.19	0.399	25.3	4.21	112.6	
K-E-S-P									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW 33. GW-072419

Sample Time: 1330

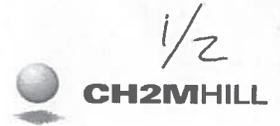
Analysis: Quarterly Groundwater Parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 7-10

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: couldn't purge at a rate faster than 0.3 gpm.
sampled after 2.5 hours of pumping. Tubing broke during
sampling. Able to ^{collect} ~~sample~~ all vials, and dissolved metals.
before pumping stopped

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-34

Field Team: JE, ks

Date: 7/23/19

Weather/Temp: 80° sunny

Arrival Time: 1130

Well Condition: good

Initial DTW (ft btc): 125.54

Purge Method: Submersible

Purge Rate⁵: 1 gpm / LF = 400 mL/min

PID reading: -

Pump Depth: _____

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1155	Begin Pumping								
1209	143.59								
1210	142.85								
1211	142.13								
1212	141.60								
1213	141.24								
1218	139.30								
1223	137.92								
1228	136.52								
1233	135.02								
1238	132.71								
1455	145.0								
1500	146.16		26.44	7.40	0.621	373.2	4.42	110.3	
1505	152.78		17.41	7.34	0.604	273.1	2.98	111.1	
1510	153.15		22.28	7.38	0.608	273.9	3.08	106.1	
1515	156.01		19.37	7.41	0.583	204.2	5.49	106.8	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: _____

Sample Time: _____

Analysis: _____

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): _____

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Total depth = 184.78
Well went dry at 1207. let recharge for ~30 minutes to 132.71', turned pump on again.

↓

2/2

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: MW-34

Field Team: J.E. KS

Date: 7/23/19

Weather/Temp: 80°, Sunny

Arrival Time: 1130

Well Condition: good

Initial DTW (ft btc): 125.34

Purge Method: submersible

Purge Rate⁵: 1 gpm / LF = 400mL/min

PID reading: -

Pump Depth: 175 (mid-screen)

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1520			19.75	7.40	0.590	226.1	5.30	106.7	
1525			19.57	7.38	0.601	220.9	4.29	103.4	
1530			17.53	7.42	0.593	264.5	4.98	101.2	
<i>K-lose</i>									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW34-GW-072319

Sample Time: 1600

Analysis: Quarterly Groundwater Parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): 40 gallons

Field Duplicate ID: _____

Field Duplicate Time: _____

Comments: Well purged dry, recharged - sampled

Groundwater Purging and Sampling Form

1/3



SITE: Freeman

Well ID: MW-35

Field Team: JE, KS

Date: 8/22/19

Weather/Temp: 70°, Cloudy

Arrival Time: 0700

Well Condition: Good

Initial DTW (ft btc): 117.44

Purge Method: Submersible

Purge Rate⁵: 0750 = 2gpm, 0807 = 4.5gpm

PID reading: ---

Pump Depth: 162'

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
750	Begin Pumping								
821	136.00		13.8	6.84	533	1.5	8.31	282.2	
0827	137.19								
0830	137.82		12.7	6.93	490.3	5.4	8.80	304.4	
0835	138.22								
0840	138.62		12.6	6.88	464.5	2.5	8.91	320.0	
0845	138.93								
0850	139.11		12.6	6.89	460.3	0.0	9.09	331.7	
0855	139.26								
0900	139.31		12.5	6.91	441.8	0.0	9.15	337.9	
0905	139.39								
0910	139.41		12.6	7.11	426.6	13.2	8.71		
0920	139.42		12.5	7.04	416.1	24.1	8.50	345.4	
0930	139.30		12.7	6.90	408.9	7.0	8.52	353.3	
0940	138.90		12.8	7.15	399.5	17.8	8.44	358.8	
0950	138.68		12.9	7.15	391.9	11.4	8.41	366.8	
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

logged surrounding wells

pick grey logs at 9:00

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW-35 - MW35-start @ 815, MW35-mid @ 1145, Sample Time: 815

Analysis: Start/mid samples = VOCs, GW sample = Quarterly MW35-GW-082219 @ 1615
Groundwater Parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 2500

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: pumped at 2gpm from 0750 to 0807, increased rate to 4.5gpm at 0807
0825 = 4.25 gpm 1145-1220 3.5 gpm 1220-1345 = 4.5 gpm
1415-1648 = 4.25 gpm 1345-1415 - rates fluctuating
 *Flow rates confirmed during each DTW/Parameter reading between 4 gpm and 5 gpm. Attempting to get a steady rate of 4.5 gpm.

Groundwater Purging and Sampling Form

2/3



SITE: Freeman

Well ID: MW-35

Field Team: J.E. KS

Date: 8/22/19

Weather/Temp: 70° cloudy

Arrival Time: 0700

Well Condition: Good

Initial DTW (ft btc): 117.44

Purge Method: Submersible

Purge Rate⁵: 4.25 gpm

PID reading: —

Pump Depth: 162

Field Parameters¹

Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
Begin Pumping									
1100	138.57		13.0	7.14	385.8	12.5	8.45	374.4	
1130	138.33		12.9	7.11	382.4	12.3	8.49	379.5	
1200	137.64		12.9	7.11	381.2	8.1	8.51	384.4	
1230	142.51		12.8	7.10	379.3	13.7	8.40	388.2	
1300	142.57		13.0	7.12	374.5	5.5	8.25	389.0	
1330	141.75		13.4	7.17	376.0	5.7	8.57	383.5	
1400	142.58		14.2	7.19	375.7	13.5	8.29	381.5	
1430	144.03		14.6	7.24	380.7	2.7	8.28	370.8	
1440	143.57		14.8	7.20	379.9	3.0	8.11	371.1	
14530	151.27		15.0	7.20	380.0	27.1	7.90	366.5	
1600	149.59		15.1	7.20	374.0	24.8	7.79	363.8	
1635	148								
1648	147.64	Pump turned off							
KESS									
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

1500

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing, total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: See page 1

Sample Time: —

Analysis: —

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank

TOTAL PURGED (GAL): —

Field Duplicate ID: —

Field Duplicate Time: —

Comments: —
—
—

Groundwater Purging and Sampling Form



SITE: Freeman

Well ID: mw-36

Field Team: JE, KS

Date: 8/14/17 8/16/17

Weather/Temp: 75°, Sunny

Arrival Time: 9:00

Well Condition: good

Initial DTW (ft btc): 20.31

Purge Method: Submersible

Purge Rate⁵: 2.5 gpm, LF at 400 ml/min

PID reading: —

Pump Depth: 65-75 (screen interval)

0.55

Field Parameters ¹									
Time	DTW ²	Purge Vol. (gal)	Temp (°C)	pH	Sp. Cond.	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Note color, odor, sheen, etc.
1000	Begin Pumping								
1045	20.54								
1050	20.54								
1055	20.54	150 gallons purged							
	Begin Low flow = 400 ml/min								
1110	20.48	1.1	16.0	7.11	440.6	7.3	9.32	254.2	
1115	20.48	1.65	17.4	6.89	440.4	6.4	9.43	257.8	
1120	20.48	2.20	16.0	6.83	442.7	18.2	9.52	265.3	
1125	20.48	2.75	15.8	6.80	446.9	39.0	9.39	271.3	
1130	20.48	3.30	15.8	6.79	447.0	39.4	9.32	274.1	
	Begin Sampling								
Stabilization Criteria ³	-	-	-	± 0.1 units	± 3%	± 10% ⁴	± 0.3 mg/L	± 10 mV	-

¹ collect field parameters in 3-5 minute intervals

² DTW: depth to water measured from top of casing; total drawdown should not exceed 0.33 ft

³ stabilization achieved once field parameters stabilize for 3 successive readings; minimum parameter subset: pH, sp. cond., and turbidity or DO

⁴ for turbidity readings > 10 NTUs

⁵ target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

Sample ID: MW36-GW-08/16/17

Sample Time: 1130

Analysis: Quarterly Groundwater Parameters

QC SAMPLE (CIRCLE): FD MS/MSD EQ Blank TOTAL PURGED (GAL): 155

Field Duplicate ID: _____ Field Duplicate Time: _____

Comments: Total depth of well = 75.61

6-7-16



PROJECT NUMBER 661508-10.02-02	WELL NUMBER MW 3	SHEET 1 OF 1
WELL DEVELOPMENT LOG		

PROJECT : _____ LOCATION : _____

DEVELOPMENT CONTRACTOR : _____

DEVELOPMENT METHOD AND EQUIPMENT USED : _____

START WATER LEVELS: 30.64 START: _____ END: _____ LOGGER: _____

TD ~ 177.75

MAXIMUM DRAWDOWN DURING PUMPING: 9:05 - 9:13 SURGE WELL W/ PUMP BY HAND ~ 10'

RANGE AND AVERAGE DISCHARGE RATE: _____

TOTAL QUANTITY OF WATER DISCHARGED: _____

DISPOSITION OF DISCHARGE WATER: _____

START

RATE: 1:05
2.5 gal

11:45
:50 21

2.5
gal

10:57:00
11:00:30 2.5 gal

10:04:00
10:06:30
2.5 gal

10:20:30
10:23:00
2.5 gal

10:37:00
10:39:30
2.5

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	DO Temperature (°C)	pH	MSC Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
9:15	0	26.17	-	-	-	-	DRO IMPACTED BY PUMP INSERTION
9:42							
9:47:40		89.20					
9:48:00		91.11					
9:49:00							TURBID. ^{GRAY} TANNISH BROWN COLOR
9:51:00		101.85					" "
9:54:30		108.79					" "
9:58:30		111.60					" "
10:04:30		113.90					CLEARING UP
10:10	-		*	13.31	5.81	2.24	TOO TURBID
10:12		114.60					
10:14:30		115.29					CLEARING
10:26		115.25	454	14.48	6.81	0.520	" "
10:35		115.22	463	16.78	7.16	0.634	
10:41							STOP ATTEMPT PULL UP PUMP - STUCK VERY STICKY.
10:57	RESTART	DTW: 32.89 (SLOWLY RISING)					



6-9-16

PROJECT NUMBER 661509-10.02.02	WELL NUMBER MW 3
SHEET 1 OF 1	
WELL DEVELOPMENT LOG	

PROJECT : _____ LOCATION : _____
 DEVELOPMENT CONTRACTOR : _____
 DEVELOPMENT METHOD AND EQUIPMENT USED : _____
 START WATER LEVELS : 31.28 START : _____ END : _____ LOGGER : _____

MAXIMUM DRAWDOWN DURING PUMPING: _____
 RANGE AND AVERAGE DISCHARGE RATE: _____
 TOTAL QUANTITY OF WATER DISCHARGED: _____
 DISPOSITION OF DISCHARGE WATER: _____

TIME
 8:58 2.5 GAL
 9:06-45 2.5 GAL
 9:15-15 2.5 GAL
 9:29-30 2.5 GAL
 9:37-45 2.5 GAL
 9:50-30 2.5 GAL
 9:59-15 2.5 GAL
 10:14-30 2.5 GAL
 10:39 2.5 GAL
 10:56-20 2.5 GAL
 11:02 2.5 GAL

1109:00
 1113:30
 2.5 GAL

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	DO Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)	
8:56	START						INITIALLY CLEAR	
8:58		39.89						
9:01		50.40					CLOUDY / TURBID	
9:04	INCREASE FLOW RATE							
9:06		63.15						
9:09		71.03						
9:10	INCREASE RATE						CLEARING GRADUALLY	
9:15			324	14.13	5.83	0.550ms		
9:17-45		87.41						
9:21	START	91.62	94.3	13.37	6.79	0.576ms	CLEARING	
9:23	STOP						POWER ISSUE	
9:27	RESUME							
9:29-30		83.41						
9:31-30		89.13	26.8	13.55	7.14	0.406ms		
9:37		97.69						
9:39-45	(VISUAL) 27 GAL	99.49	64.6	13.81	7.16	0.409ms		
9:51	TO	102.25	22.0	14.64	7.26	0.447ms		
9:52-30		103.20						
9:59-15		103.95	24.0	15.70	7.36	0.473		
10:10	55 GAL	104.76	14.3	15.15	7.44	0.482		
10:25		103.84	29.6	14.05	7.53	0.494	WT SLOWLY INCREASING	
10:29-30	OFF.	REPOSITION / SURGE						
10:36	RESUME	VERY SLOW FLOW						TURBID / CLOUDY
10:41	RESTART	INCREASED FLOW						" "

10:56	76		381	19.12	7.54	0.451	
	71.58	- STEADY					
11:14	76.32		376	16.97	7.86	0.480	

Flow	TIME	DRW	FILLED	PH	COND	DO	YRS	
26 30 1 31 00 (2-5)	1124	78.58	90 GAL	7.88	0.475	16.93	349	CLEAR
140 00 145 00 2-5 61	1139	81.38	97 GAL	8.03	0.474	16.40	283	
152 4.00 154 3.5	1150	80.82	102	8.00	0.475	17.49	124	CLEAR
	1200	81.45	109	7.99	0.465	19.99*	106	
212 00 2 17 00	1210	81.06	113	8.12	0.458	18.16	11671.6	CLEAR
	1227		121	8.14	0.453	19.99	58.7 +	

TIME	DRW	FILLED	PH	COND	DO	YRS	STATUS
1124	78.58	90 GAL	7.88	0.475	16.93	349	CLEAR
1139	81.38	97 GAL	8.03	0.474	16.40	283	
1150	80.82	102	8.00	0.475	17.49	124	CLEAR
1200	81.45	109	7.99	0.465	19.99*	106	
1210	81.06	113	8.12	0.458	18.16	11671.6	CLEAR
1227		121	8.14	0.453	19.99	58.7 +	

to POSSIBLE TURBIDITY ERROR FLUCTUATING.

	MW-6U		MW-6U		MW-6S		MW-6D	
	time (elapsed)	depth	time	depth	time	depth	time	depth
start pump	0	37.05	0	37.19	0	34.90	0	134.63
2:44pm	10	37.30	12:48/4:00	37.05	13:27	34.90	13:27	134.60
1:00	30	37.60	13:10	37.24				
1:30	1:00	37.95	13:25	37.31				
1:30	1:30	38.05						
12:44 / 3:00	3:00	38.30						
stacking pump	time (24 hour clock)							
13:02	13:11	52.36						
2gpm	13:18	57.59						
	13:25	61.60						
3:14								
remove 2nd pump								
2gpm								
13:29								
stop pumping								

13:24 Sample was collected

tornado
~~hydro~~ pump



6-7-16

PROJECT NUMBER Lele (508-10-02-02)	WELL NUMBER 5805 / MW 8	SHEET 1 OF 1
WELL DEVELOPMENT LOG		

PROJECT: UPPER FREEMAN R1 LOCATION: _____

DEVELOPMENT CONTRACTOR: _____

DEVELOPMENT METHOD AND EQUIPMENT USED: _____

START WATER LEVELS: 34.50 START: _____ END: _____ LOGGER: _____

TD 49.55 SOFT

MAXIMUM DRAWDOWN DURING PUMPING: _____

RANGE AND AVERAGE DISCHARGE RATE: _____

TOTAL QUANTITY OF WATER DISCHARGED: _____

DISPOSITION OF DISCHARGE WATER: _____

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	DO Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
1306	START						VERY TURBID - GRAY "MILKY"
130720		45.90					"SLOTT" VERY SILTY/TURBID
130830	DRY (3 GAL)						" "
1315	LET WELL SIT.						
144930	RESUME	36.11	-	-	-	-	CLEARER - STILL GRAY/CLOUDY MORE TURBID W/ TIME
145040	DRY (22 GAL - 9 GAL TOTAL)						
6/9/16							
	INITIAL DTW:	35.23					
1326	START						VERY TURBID - DRAWING DOWN FAST
1328		39.93					" CLEARING
133030		42.16					" "
1337	3.5 GAL	44.15					
1341	~3.5 GAL						LOWER PUMP - VERY TURBID
1347	DRY						
1418	RESUME	39.99					CLEARING - STILL TURBID
1422		42.27					
1427			*	* *	5.84	6.549	
1428	7 GAL	DRY					

132850
133130
~1.6 GAL

* PUMP ERROR



PROJECT NUMBER 661508	WELL NUMBER MW-105 MW-9D	SHEET 7 OF 1
WELL DEVELOPMENT LOG		

PROJECT: UPCC Freeman LOCATION: Freeman W/A
 DEVELOPMENT CONTRACTOR: Env. West Corporation
 DEVELOPMENT METHOD AND EQUIPMENT USED: Footer/silt pump - Pulsator Rig
 START WATER LEVELS: START: 2/16/17 END: 2/17/17 LOGGER: RLG

MAXIMUM DRAWDOWN DURING PUMPING: _____
 RANGE AND AVERAGE DISCHARGE RATE: _____
 TOTAL QUANTITY OF WATER DISCHARGED: 195 gallons
 DISPOSITION OF DISCHARGE WATER: 195 gallons to FENCE TANK

Screens 85'-95'

totalizer
28
start
35
46
58
70
81
92
104
118
129
131
2/17
131
137
147
157
167
177
187
188
198
209

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)	
1407	initial	31.20	792	10.6	6.8	63.2	DO = 4.88 ; ORP = 61	
1427	3	35.8	597	10.7	7.0	61.0	6.20 = 81	
1430	10	35.9	103	12.0	6.9	56.9	6.74 = 95	
1435	21	36.05	36.9	12.4	6.8	57.2	7.10 = 110	
1440	33	36.1	23.1	12.5	6.8	57.4	6.72 = 122	
1445	45	36.1	12.3	12.0	6.8	57.0	7.37 = 131	
1450	56	36.45	10.1	12.3	6.7	57.1	7.66 = 138	
1455	67	36.45	7.38	12.2	6.7	56.9	7.32 = 135	
1500	79	36.5	4.0	12.0	6.6	57.7	7.51 = 140	
1510	93	35.75	17.3	12.3	6.6	58.2	7.73 = 146	
1515	102	35.8	10.3	12.3	6.6	57.0	6.98 = 148	
	104 gal.	End Development on 2/16						
0718	104	31.20	12.516	6.8	5.7	68.4	DO = 9.92 ; ORP = 280	
0720	110	35.60	25.0	10.7	6.1	57.3	" 9.67 ; " = 258	
0725	120	35.70	19.9	11.7	6.2	57.1	" 9.58 ; " = 236	
0730	130	35.70	9.27	12.0	6.3	58.2	" 10.22 ; " = 223	
0735	140	35.75	4.93	12.2	6.4	57.9	" 10.70 ; " = 219	
0740	150	35.80	3.67	12.1	6.4	58.3	" 10.35 ; " = 221	
0745	160	35.80	7.68	12.1	6.4	56.7	" 9.55 ; " = 198	
0750	171	35.80	3.82	12.4	6.4	57.5	" 10.62 ; " = 194	
0755	181	35.95	3.29	12.3	6.4	57.0	" 10.85 ; " = 191	
0800	192	35.95	2.04	12.3	6.4	57.2	" 10.80 ; " = 192	
	195	total	End Development					

TD = 94.6
6 TOC
pump on/off
bottom

move to 25'
above the
@ 1458
- pump out
out briefly
- distribute
1503

Resume w/ pump
at 25'
off bottom

0742 - Raise
pump to top
of screen

	EW-9U	MW-9U	MW-9S	MW-9D
	W.L.	30.68	31.75	31.57
began 10:21 a.m.	—	6:00 36.92	36.70	40.68
10	39.0	16:00 38.19		
30	40.9	26:00 39.15		
60	43.5	45:00 / 11:06 a.m. 40.40		
1:30	46.5			
2:00	46.5			
2:30	47.3			
3:00	47.9			
3:30	48.35			
4:00	48.7			
7:30	49.8			
9:30	50.8			
10:30	—	reduced flow rate from 75 gpm to 55 gpm		
12:30	48.81			
25:00	49.30	steel casing may have affected reading		
39:00 / 11:00 a.m.	51.20			
43:00 / 11:04 a.m.	—	reduced flow rate from 55 gpm to 33 gpm		
recovery	50:00	51.35		
11:13 a.m.	51:00			
11:13 a.m.	51:08	47.0		
	51:17	45.0		
	51:29	44.0		
	51:36	43.0		
	51:47	42.0		
	52:04	41.0		
	52:33	40.0		
	53:27	39.20		
	54:41	39.20 39.20		
11:17 a.m.		2864.86 gallons discharged		
11:33 a.m.		36.55 final depth		
13:57 grab sample				
Pump model: M30412		4"?		
Goold's? Centripro Submersible		3HP 60HZ 230 watts, 14.3 amp		3450 rpm



PROJECT NUMBER <i>Lde1508</i>	WELL NUMBER <i>mw-135</i>	SHEET 1 OF 1
WELL DEVELOPMENT LOG		

PROJECT: *UPRR Freeman* LOCATION: *Freeman, WA*
 DEVELOPMENT CONTRACTOR: *Environmental West Exploration*
 DEVELOPMENT METHOD AND EQUIPMENT USED:
 START WATER LEVELS: START: *2/24/17 0730* END: *2/21/17 1702* LOGGER: *R McCombs*

MAXIMUM DRAWDOWN DURING PUMPING:
 RANGE AND AVERAGE DISCHARGE RATE:
 TOTAL QUANTITY OF WATER DISCHARGED: *77 gallons*
 DISPOSITION OF DISCHARGE WATER: *FRAC TANK*

Totalizer Start/End 23 gal.

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	mS/m Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
0730	1.5	266.7 END 4.9	offscale	9.2	6.2	40.8	DO = 8.70 mg/L; ORP = 150mV
0745	5	17.8	"	10.5	6.7	34.6	" 5.44 ; " -28
31 0809	13	>34	"	9.8	7.0	34.4	" 5.02 ; " 97
31.5 0905	13.5	25.0	"	10.1	7.1	36.3	" 10.57 ; " 107
36 0949	18	25.9	"	9.8	7.2	36.9	" 10.01 ; " 157
41 1100	25						
43 1409/1443	33						
51/58 1618	40						
<i>End Development on 2/20</i>							
2/21/17 58/65 0917	40	18.20/34	offscale				DO (mg/L) ORP (mV)
0921	47	>34	"	10.4	6.1	47.2	13.22 286
65/72 1125	54	16.3/>34	"	10.3	6.2	43.2	10.99 242
72/78 1248		19.8					
1251	60	>34	"	10.0	6.2	42.4	11.27 270
78/83 1403		21.5					
1406	65	>34	"	9.9	6.4	42.8	11.15 249
83/87 1504	61	23.1					
89/87 1508	69	>34	"	9.7	6.5	41.4	10.54 216
87/91 1600		24.4					
1604	73	>34	"	9.5	6.6	42.7	12.43 211
1656		25.0					
91/95 1702	77	>34	384	9.6	6.6	42.9	12.42 214
DEVELOPMENT COMPLETE							

Dark brown; no odor

light brown no odors



PROJECT NUMBER <i>Well 508</i>	WELL NUMBER <i>MW-14D</i>	SHEET 1 OF <i>3</i>
WELL DEVELOPMENT LOG		

PROJECT: *UPPER Freeman* LOCATION: *Freeman, WA*
 DEVELOPMENT CONTRACTOR: *Enviro-West Corporation*
 DEVELOPMENT METHOD AND EQUIPMENT USED: *Boyer Pump Pelston*
 START WATER LEVELS: START: *2/15/17* END: *2/15/17* LOGGER: *R. McComb*

MAXIMUM DRAWDOWN DURING PUMPING:
 RANGE AND AVERAGE DISCHARGE RATE:
 TOTAL QUANTITY OF WATER DISCHARGED: *527 gallons*
 DISPOSITION OF DISCHARGE WATER: *PERMANENT*

initial

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
0740	42	—	offscale	8.4	6.1	36.8	ORP=58 - brown - sediment
0757	1	15'	1926	4.8	6.6	36.6	" = 103
0803	10	43'	offscale	10.5	6.9	30.1	" = 26 DO = 5.68
0808	13	48'	"	11.3	7.0	30.2	" = 16 DO = 6.38
0813	21	56'	"	11.7	7.0	30.7	" = 25 4.33
0818	32	63'	"	12.1	7.0	33.4	" = 44 5.47
0823	3743	66'	"	12.4	7.0	38.1	" = 51 5.40
0828	58	67'	"	12.3	6.9	49.1	" = 71 7.38
0833	70	68'	"	12.3	7.0	52.6	" = 80 6.56
0838	79	68'	"	12.3	7.0	56.0	" = 89 7.96
0845	91	68'	"	12.1	7.1	53.0	" = 71 7.98
0850	94	51	"	11.0	7.0	57.4	" = 83 7.84
0855	105	64'	"	12.1	7.1	55.7	" = 83 7.84
0900	116	67.5	"	12.5	7.1	55.7	" = 91 7.48
0905	126	68.5	938	12.5	7.1	53.7	" = 96 7.67
0910	136	69.0	682	12.3	7.1	50.8	" = 111 7.21
0915	147	69.5	740	12.2	7.1	49.3	" = 120 7.32
0920	155	70.0	447	12.1	7.1	50.0	" = 123 7.96
0925	167	70.5	475	11.7	7.1	49.9	" = 129 8.33
0930	178	70.5	411	11.8	7.1	47.3	" = 130 7.97
0935	189	70.5	422	12.0	7.1	46.9	" = 132 7.95
0940	200	70.5	415	12.1	7.2	47.1	" = 131 7.96
0950	216	66	offscale	11.6	7.3	41.6	" = 147 7.50
0955	221	70.5	618	12.3	7.2	40.7	" = 139 7.34

*initial
pump is 1' off bottom*

moved pump to bottom to clear bottom cap.

*0855
0900
0905
0910*

moving pump to top of screen - water returns to 44 ft BTOC

water returns to 44 ft BTOC while moving pump to near top of screen.



PROJECT NUMBER 661508	WELL NUMBER MW-141	SHEET 2 OF 3
WELL DEVELOPMENT LOG		

PROJECT: UPRR Freeman LOCATION: Freeman WA
 DEVELOPMENT CONTRACTOR: Env. West Exploration
 DEVELOPMENT METHOD AND EQUIPMENT USED: Bauer Pump Pulstar
 START WATER LEVELS: START: 2/15/17 END: 2/15/17 LOGGER: RMcLain

MAXIMUM DRAWDOWN DURING PUMPING:
 RANGE AND AVERAGE DISCHARGE RATE:
 TOTAL QUANTITY OF WATER DISCHARGED: 527 gallons
 DISPOSITION OF DISCHARGE WATER: Truck Tank

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	ms/cm Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
1000	236	71.2	871	12.4	7.2	40.6	ORP = 138 ; DO = 7.86
1005	249	71.5	206	12.2	7.2	38.9	= 139 ; 7.83
1010	260	71.8	180	12.2	7.2	39.1	= 139 ; 7.81
1015	271	72.1	201	12.1	7.1	38.0	= 141 ; 7.83
1020	284	72.1	116	12.1	7.1	37.9	= 144 ; 7.81
1025	294	72.1	98.5	12.2	7.1	38.1	= 146 ; 7.38
1030	303	72.4	77.7	11.8	7.2	37.0	= 151 ; 7.72
1035	316	72.6	74.9	11.8	7.2	36.7	= 151 ; 7.56
1040	329	72.7	55.3	12.0	7.2	36.8	= 149 ; 7.50
1045	337	72.8	70.5	11.5	7.2	37.6	= 151 ; 7.60
1050	352	72.9	66.8	11.5	7.2	37.5	= 153 ; 7.83
1055	361	73.1	63.5	11.9	7.2	37.0	= 154 ; 7.68
1100	372	73.3	56.5	11.8	7.2	35.7	= 153 ; 7.57
1105	384	73.6	48.1	12.0	7.2	36.8	= 155 ; 7.66
1110	396	73.6	40.3	11.9	7.1	36.2	= 154 ; 7.67
1115	406	73.5	50.5	11.9	7.2	36.4	= 153 ; 7.61
1120	413	70.6	51.1	11.6	7.2	35.6	= 154 ; 7.61
1125	425	73.5	50.2	11.6	7.2	35.9	= 154 ; 7.59
1130	436	74.3	62.5	11.6	7.2	36.0	= 153 ; 7.63
1130	447	74.3	60.2	11.8	7.2	35.9	= 153 ; 7.61
1134	Pause	Pause	42.0	11.9	7.2	36.2	= 153
1140	448	63.0	42.9	11.9	7.2	36.2	= 153 ; 7.77
1145	460	71.9	62.1	11.9	7.2	36.2	= 153 ; 7.81
1150	471	73.4	97.8	11.8	7.2	36.3	= 152 ; 7.83

Flow rate flow stopped briefly
 Generator Run out of gas

PROJECT NUMBER 661508.10.03.02	WELL NUMBER MW-15D
SHEET 1 OF 1	
WELL DEVELOPMENT LOG	

PROJECT: UPRR - Freeman, WA LOCATION: Freeman, WA
 DEVELOPMENT CONTRACTOR: EWE
 DEVELOPMENT METHOD AND EQUIPMENT USED: Submersible Pump (Grundfos rediflo) ~ 2 gal/min
 START WATER LEVELS: 88.10 ft bwc START: 6/28/17 - 1245 END: 6/28/17 - 1430 LOGGER: J. Freed

MAXIMUM DRAWDOWN DURING PUMPING: 0.01 ft
 RANGE AND AVERAGE DISCHARGE RATE: 1-2 gal/min Avg = 1.86 gal/min
 TOTAL QUANTITY OF WATER DISCHARGED: ~195 gal
 DISPOSITION OF DISCHARGE WATER: 6' above wellhead to water tank.

NOTE - when checking initial w/b, notable pressure release occurred when well cap was removed.

	Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	mS/cm Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)	
approx. Pump setting Sr. (293)	~136	1250	~10	88.09	178	22.15	6.19	0.000	cloudy, pump on bottom of well (136)
	~136	1300	~30	88.05	114	14.60	7.37	0.385	Cloudy to slightly cloudy. Swab w/pump post readings
	~136	1310	~50	88.05	235	14.04	6.67	0.384	Slightly cloudy - moving to next 2' interval. Swab post read
	~134	1320	~70	88.05	499	14.62	6.94	0.390	Slightly cloudy
	~132	1330	~90	88.05	358	14.14	7.63	0.387	Slightly cloudy/nearly clear. Raising pump & swabbing post readings.
	~130	1335	~100	88.05	89.2	14.57	7.75	0.384	cloudy
	~130	1340	~110	88.05	39.7	15.48	7.41	0.046	nearly clear. Raise pump 2' post readings
	~128	1345	~120	88.05	158	14.52	7.61	0.366	nearly clear. Raise pump 2' & swab post read
	~126	1350	~130	88.04	322	14.27	7.59	0.381	cloudy
	~124	1355	~140	88.11	344	14.23	7.41	0.381	slightly cloudy
	~120	1400	~150	88.09	204	14.29	7.51	0.380	slightly cloudy. clapping to mid-screen
	~116	1405	~160	88.07	245	14.55	7.50	0.376	
	~126	1410	~170	88.02	355	14.17	7.42	0.379	Pump set @ mid screen. Slightly cloudy
	~126	1415	~175	88.05	83.7	14.05	7.33	0.378	Slightly cloudy/nearly clear
	~126	1420	~180	88.05	39.7	14.16	7.39	0.381	nearly clear
	~126	1425	~185	88.04	13.7	13.89	7.32	0.377	nearly clear
	~126	1430	~195	88.04	4.2	14.02	7.30	0.379	nearly clear



PROJECT NUMBER 061508	WELL NUMBER MW-16D	SHEET 1 OF 1
WELL DEVELOPMENT LOG		

90-105'
Screen
104.45'
= TD
6 TOC

PROJECT: UPPER Freeman LOCATION: Freeman Well
 DEVELOPMENT CONTRACTOR: Env. West Exploration
 DEVELOPMENT METHOD AND EQUIPMENT USED: Ball Sump + Submersible Pump, Pulsator
 START WATER LEVELS: START: 2/16/17 END: 2/16/17 LOGGER: McCombs

MAXIMUM DRAWDOWN DURING PUMPING: _____
 RANGE AND AVERAGE DISCHARGE RATE: _____
 TOTAL QUANTITY OF WATER DISCHARGED: 225g
 DISPOSITION OF DISCHARGE WATER: TRAC TANK

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
1022	initial	45.99	off scale	9.4	6.9	64.3	DO = 6.69; DEP = 193
1045	4	51.0	"	9.2	7.1	64.7	" 9.07; DEP = 175
1050	15	51.05	118	10.8	6.9	66.9	" 7.55; " 140
1055	24	51.15	70.6	11.2	6.9	66.5	" 7.86; " 129
1100	34	51.25	49.7	10.9	6.9	66.1	" 8.43; " 123
1105	44	51.3	33.1	10.9	6.9	66.0	" 8.10; " 121
1110	53	51.35	28.3	10.9	6.9	66.2	" 7.87; " 125
1115	62	51.35	35.6	10.5	7.0	66.9	" 8.82; " 132
1120	72	51.35	26.4	10.7	6.9	66.5	" 8.17; " 129
1125	81	51.35	28.0	10.6	6.9	66.7	" 8.17; " 129
1130	90	51.35	27.8	10.6	6.9	66.8	" 8.19; " 129
1140	108	51.40	35.8	10.3	6.9	67.6	" 8.82; " 131
1145	117	51.45	24.9	10.5	6.9	67.4	" 8.19; " 130
1150	127	51.50	28.9	10.5	6.9	66.7	" 8.17; " 129
1155	136	51.55	24.7	10.5	6.9	67.0	" 8.18; " 127
1200	139	51.30	305	10.4	7.0	67.1	" 8.22; " 120
1205	148	51.40	30.4	10.9	7.0	66.8	" 8.47; " 118
1210	158	51.5	23.4	10.8	7.0	68.7	" 7.73; " 121
1215	168	51.6	17.2	10.7	7.0	67.0	" 7.93; " 123
1220	178	51.65	16.9	10.9	7.0	67.0	" 8.02; " 124
1225	187	51.7	17.0	10.8	7.0	67.3	" 8.01; " 128
1235	205	51.7	7.2	10.7	7.0	67.3	7.98 132
1240	215	51.7	4.6	10.9	7.0	67.2	8.03 133
1245	225	51.7	5.0	10.9	7.0	67.1	7.99 134

Totals
39 gal
4 gal
15
24

Pump up
to 12 ft

1133 - move pump to 2' above TD

1157 - move pump to 10' above bottom

1228 - pump moved to top of screen.

End Development



PROJECT NUMBER 661508	WELL NUMBER mw-17D	SHEET 1 OF 2
WELL DEVELOPMENT LOG		

PROJECT: UPRR Freeman LOCATION: Freeman WA
 DEVELOPMENT CONTRACTOR: Environmental and Exploration
 DEVELOPMENT METHOD AND EQUIPMENT USED: Bailor, submersible pump (Grundfos Rediflo 2)
 START WATER LEVELS: 65.24 BTOC START: 1420; 4/7/17 END: 4/8/17 15:57 LOGGER: R. McCompl

MAXIMUM DRAWDOWN DURING PUMPING: 270' Pump 200' bgs (deepest capable depth)
 RANGE AND AVERAGE DISCHARGE RATE:
 TOTAL QUANTITY OF WATER DISCHARGED: 83.05 gallons
 DISPOSITION OF DISCHARGE WATER: FRAC TANK

1094
Total gals
1,000
1003
1007
1014
1021
4/8/17=1023

Time	Water Volume Discharged (gal)	Water Level (ft. BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
1437	initial	65.24	offscale	13.63	7.07	0.443	light brown/yellow - no odor - pink/flesh colored.
1540	3		offscale	15.46	8.15		116 = ORP
1604			With new pump - cleaned impellers/dirt				
1612	7	140	offscale	16.40	8.01	0.384	90 = ORP
1655	14	?	"	13.73	8.31	0.322	51 = ORP water level
1730	21	165	"	14.61	7.72	0.335	122 = ORP
Resume 4/8/17		70.7					
0730	initial	64.60					
		70.7					Bailed 3 gallons
0855	24	72	offscale	11.41	7.08	0.359	239 = ORP; 18.8 = DO
0900	32	131	"	11.71	7.38	0.357	226 11.14
0905	36	154	"	12.04	7.65	0.358	193 10.12
0912	Pump stops flowing - shut off						174 = DTW; recharge
0912	38	174	offscale	11.62	7.87	0.354	178 8.65
1030	43	103	355	11.14	7.79	0.341	162 10.84
1208	47	97					Paux Pumping - allow to recovery
1208	47	97'	24.1	10.34	7.55	0.337	138 9.59
1220	56	159	475	11.40	7.89	0.344	128 7.91
1230	60	170	530	12.64	7.91	0.346	119 7.05
1237	61.5						Pump off - Recovery
1440	61.5	91.5	305	10.81	8.18	0.353	104 12.88
1444	65.5	115	19.9	10.88	8.10	0.340	103 10.17
1447	69.3	145	55.3	11.03	8.06	0.329	103 8.82

Bailing/ sampling
 25.1 gal = 1 well volume
 1 gal in 112'
 water level unit advance below
 174 = DTW; recharge
 178 8.65
 10.84
 recovery



PROJECT NUMBER 661508	WELL NUMBER MW-17D	SHEET 9 OF 9
WELL DEVELOPMENT LOG		

PROJECT: UPLL Freeman LOCATION: Freeman WA
 DEVELOPMENT CONTRACTOR: Environmental West exp
 DEVELOPMENT METHOD AND EQUIPMENT USED: _____
 START WATER LEVELS: 65.24 BTOC START: 1:20 4/17 END: 4/17 15:57 LOGGER: Chelms
 MAXIMUM DRAWDOWN DURING PUMPING: 7170'
 RANGE AND AVERAGE DISCHARGE RATE: _____
 TOTAL QUANTITY OF WATER DISCHARGED: 83.05 gallons
 DISPOSITION OF DISCHARGE WATER: FRAC TANK

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	ms/cm Conductivity (µmhos/cm)	ORP	DO	Remarks (color, odor, sheen, sediment, etc.)	
1452	72.3	161.3	249	12.09	8.13	0.342	111	7.69		
1455	73.3	170	215	12.19	8.13	0.341	115	7.42		
1456	73.3	170	-	-	-	-			Pump off - no flow; recharging	
1542	73.3	117.5	328	12.17	8.20	0.335	111	7.68		
1545	77.1	146	31.8	12.4	8.13	0.331	116	7.92		
1548	79.0	158	89.6	12.5	8.17	0.336	116	7.98		
1551	81.0	170	168	12.36	8.19	0.338	116	7.57		
1554	83.0	170	223	12.40	8.21	0.340	114	7.86		
1557	83.05	-	-	-	-	-			Pump off	
			End Development.							

PROJECT NUMBER 661508	WELL NUMBER MW-190	SHEET 1 OF 1
WELL DEVELOPMENT LOG		

PROJECT: UPRR Freeman LOCATION: Freeman, WA
 DEVELOPMENT CONTRACTOR: Environmental West Exploration
 DEVELOPMENT METHOD AND EQUIPMENT USED: Pump truck, Granite Redi Flo 2
 START WATER LEVELS: 56.30 START: 8:08 END: LOGGER: S. Demus

MAXIMUM DRAWDOWN DURING PUMPING:
 RANGE AND AVERAGE DISCHARGE RATE:
 TOTAL QUANTITY OF WATER DISCHARGED:
 DISPOSITION OF DISCHARGE WATER:

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
8:05	-	56.30	-	-	-	-	Initial
8:08	-	-	-	-	-	-	Begin hauling & Surging
8:50	10	-	-	-	-	-	Water turbid
9:03		55.95					Begin pumping - mid screen
		58.53					20 sec
		59.10					40 sec
		59.45					60 sec
		59.66					90 sec
9:05							Pump stopped, pump tripping
9:10	Start	pump - run at		+75 gpm			Turbid
9:30		58.88					clearing = 1.0 gpm
9:35							drop to bottom.
13:16		55.57	-initial				Initial - start pumps
		58.06					30 sec 2.5 gpm
		59.25					60 sec - top screen 15' up
		60.40					90 sec
		61.30					120 sec
		61.90					150 sec
		63.60					5 minutes - water clear
		63.97					10 minutes - 2.6 gpm
		64.44					15 minutes
		64.55					20 minutes

PROJECT NUMBER 661508-10.03.02	WELL NUMBER MW-20U	SHEET 1 OF 1
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WELL DEVELOPMENT LOG

PROJECT: UPRR - Freeman, WA LOCATION: Freeman, WA
 DEVELOPMENT CONTRACTOR: EWE
 DEVELOPMENT METHOD AND EQUIPMENT USED: Submersible Pump - Grundfos red-fla
 START WATER LEVELS: 92.02 START: 6/22/11 - 1525 END: 6/22/11 - 1710 LOGGER: J. Freed

MAXIMUM DRAWDOWN DURING PUMPING: 14.42 ft
 RANGE AND AVERAGE DISCHARGE RATE: 1-2 gal/min Avg = 1.71 gal/min
 TOTAL QUANTITY OF WATER DISCHARGED: ~180 gal
 DISPOSITION OF DISCHARGE WATER: ~ 6' above wellhead to water tank.

130-110

number
 approx Pump Setting (feet)

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	mS/cm Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
1530	~ 10 gal	106.44	0.0*	15.80	7.01	0.588	very turbid - yellowish - meter malfunction
1540	~ 30	106.60	109	15.61	7.08	0.566	cloudy - increased flow
1545	~ 40	112.10	--*	15.29	7.10	0.569	flashing/malfunction cloudy. (raised pump 4' following readings)
1555	~ 50	113.65	694	15.29	7.12	0.563	cloudy (raised pump 4' following readings)
1600	~ 70	114.09	747	15.11	7.08	0.560	cloudy (raised pump, as above)
1605	~ 80	113.87	170	15.32	7.08	0.559	nearly clear (raised pump, as above)
1615	~ 100	113.76	358	15.23	6.98	0.551	cloudy (raised pump, as above)
1625	~ 900	113.45	290	15.40	6.94	0.552	near-clear/dropping pump to bottom cloudy. (Screen following readings)
1635	~ 110	108.85	477	15.31	6.95	0.556	water becomes yellow than when pump is adjusted / used for swabbing, clears to cloudy in well (raise pump to mid-screen)
1640	~ 120	111.61	143	15.14	6.91	0.552	slightly cloudy to nearly clear
1645	~ 130	113.99	135	14.89	6.89	0.550	nearly clear
1650	~ 140	114.22	48.5	15.00	6.84	0.550	nearly clear
1655	~ 150	114.40	20.5	14.95	6.81	0.548	clear
1700	~ 160	114.43	9.8	14.91	6.79	0.547	clear
1705	~ 170	114.45	7.5	14.91	6.78	0.548	clear
1710	~ 180	114.46	5.5	14.78	6.77	0.547	clear

↑ Pump losing efficiency ↓
 (minutes, pump to mid-screen)



PROJECT NUMBER 001508	WELL NUMBER MW-211	SHEET 1 OF 1
WELL DEVELOPMENT LOG		

PROJECT: UPPER Freeman LOCATION: Freeman, WA
 DEVELOPMENT CONTRACTOR: Environmental West Exploration
 DEVELOPMENT METHOD AND EQUIPMENT USED: Grundfos Redi Flow 2
 START WATER LEVELS: 63.20 START: 7-10-17 END: 7-10-17 LOGGER: S. Demers

MAXIMUM DRAWDOWN DURING PUMPING: ~17.23' *Surged well screen using submersible pump*
 RANGE AND AVERAGE DISCHARGE RATE:
 TOTAL QUANTITY OF WATER DISCHARGED: 300 gallons
 DISPOSITION OF DISCHARGE WATER: Free tank

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
9:02	Begin						
9:04		68.20	Error	16.02	6.83	1688	ORP = -237 very turbid gray, very fine rock powder
9:15		72.52	664	14.64	8.50	1480	ORP = 160
9:25	~50	74.08	1000*	14.78	8.56	1454	ORP = 124 slightly turbid - very fine rock powder
9:50		76.15	35	14.76	8.08	1404	ORP = 125
10:00	~100	76.77	113	15.03	7.92	1398	ORP = 5
10:10		77.22	70	15.20	7.81	1395	ORP = -2
10:20		77.72	50	15.15	7.73	1392	ORP = -19
10:30	~150	78.21	61	15.11	7.62	1380	ORP = -13
10:40		78.40	53	15.51	7.63	1388	ORP = -24
10:50		78.79	37	15.33	7.63	1385	ORP = -31
11:00	~200	79.04	18.8	15.57	7.60	1385	ORP = -39
11:10		79.31	32	15.63	7.63	1383	ORP = -44
11:20		79.63	26.4	15.81	7.53	1382	ORP = -44
11:30		79.94	62.3	15.94	7.52	1381	ORP = -45
11:40		80.21	22	15.48	7.43	1378	ORP = -45
11:50	~300	80.43	13.3	16.09	7.46	1379	ORP = -50
11:52	- stop pumping						

* exceeds upper limit