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**ATTACHMENT 5**

**Monitor Well Sampling Sheets and Water Levels**

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### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-1  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/13/09  
 Sampling Method: Tubing  
 Sampling Time: 1505

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Hazy  
 Ambient Temp. (F): 68

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 46.65 TOC ft  
 (from casing top as marked)  
 3) Well Depth (WD): 82.68 TOC  
 (from casing top as marked)  
 4) Height of Water Column (H) 36.03 ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft. (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = 23.49 x ((D/24) <sup>2</sup> )
CV = 3.14 ((D/2)/12 in.ft.) <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA** *low flows*

Single Casing Volume of Water In Well (VW) 23.49 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 70.47 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/13/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 0.6 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1428	—	Pump set @			78	—	—	—	—	—
1435	22.66	3605	6.91	2.4	-70.4	6.51	46.68	1	1/2	—
1438	21.73	3293	7.07	2.88	-69.8	3.53	46.68	4	1/2	yellowish
1440	21.83	3200	7.13	2.21	-69.9	2.09	46.68	5.5	1/2	light yellow
1443	21.12	3178	6.25	2.18	-67.1	1.98	46.68	9.0	1/2	no odor
1445	22.17	3180	6.24	2.18	-69.3	2.72	46.69	11.0	1/2	S
1448	22.22	3182	6.23	2.18	-66.5	2.10	46.70	12.0	1/2	
1450	22.32	3185	6.22	2.18	-68.3	1.64	46.70	13.0	1/2	
1452	22.37	3188	6.22	2.18	-73.2	1.34	46.70	14.0	1/2	
1454	22.40	3190	6.21	2.18	-75.3	1.23	46.70	15.0	1/2	
1456	22.39	3190	6.22	2.18	-77.2	1.09	46.70	16.0	1/2	
1458	22.43	3193	6.21	2.17	-79.0	0.94	46.70	17.0	1/2	
1500	22.46	3197	6.21	2.17	-79.6	0.98	46.70	18.0	1/2	

1505 - Sample Final w/L 46.70

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-2  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Tubing  
 Sampling Time: 0828

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 59

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder (Y) N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 51.22 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 86.71  
 (from casing top as marked)  
 4) Height of Water Column (H) 36.49 ft  
 (from casing top as marked)

Product Obs: Y (N)  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y (N)  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	<u>0.163</u>
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA** Low Flow

Single Casing Volume of Water in Well (VW) 19.87 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 59.6 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/14/09  
 Was Well Pumped Dry? Y (N)  
 Fe<sup>2</sup> (mg/L): 1.6 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
							<u>77 ft BT02</u>			
<u>0759</u>									<u>.7</u>	
<u>0805</u>	<u>20.45</u>	<u>8832</u>	<u>5.87</u>	<u>6.2</u>	<u>-1446</u>	<u>3.22</u>	<u>51.62</u>	<u>4</u>	<u>.7</u>	<u>Strong odors</u>
<u>0807</u>	<u>20.67</u>	<u>8897</u>	<u>5.92</u>	<u>6.30</u>	<u>-1520</u>	<u>2.42</u>	<u>51.44</u>	<u>7</u>	<u>.7</u>	<u>Yellowish</u>
<u>0810</u>	<u>20.09</u>	<u>8963</u>	<u>5.98</u>	<u>6.29</u>	<u>-1545</u>	<u>1.72</u>	<u>51.44</u>	<u>9</u>	<u>.7</u>	
<u>0813</u>	<u>21.41</u>	<u>9001</u>	<u>6.04</u>	<u>6.28</u>	<u>-1568</u>	<u>1.15</u>	<u>51.44</u>	<u>11</u>	<u>.7</u>	
<u>0816</u>	<u>21.46</u>	<u>9006</u>	<u>6.05</u>	<u>6.27</u>	<u>-1547</u>	<u>1.11</u>	<u>51.44</u>	<u>12.5</u>	<u>.7</u>	
<u>0819</u>	<u>21.50</u>	<u>9010</u>	<u>6.05</u>	<u>6.27</u>	<u>-1553</u>	<u>1.05</u>	<u>51.44</u>	<u>13.5</u>	<u>.7</u>	
<u>0838</u>	<u>Final</u>	<u>w/L</u>	<u>51.44</u>							
<u>0820</u>	<u>Sample</u>									

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-3  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/18/09  
 Sampling Method: Tubing  
 Sampling Time: 0810

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: overcast  
 Ambient Temp. (F): 69

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.20 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 71.95 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.183
<u>4</u>	<u>0.652</u>
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
	$CV = 3.14 [(D/2)/12 \text{ in. ft}]^2 \times h (7.48 \text{ gal/cu. Ft.})$

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/18/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 0.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
		<u>Start Pump</u>			<u>6</u>	<u>7.5 + BTOC</u>				
0747		<u>Start purge</u>								
0749	19.58	1225	5.76	.80	62.7	8.37	49.95	3.0	.7	clear yellow
0752	19.78	1211	5.89	.87	42.0	3.25	49.95	5.0	.7	
0755	20.13	1217	5.91	.87	34.6	1.80	50.50	7.0	.7	
0758	20.62	1229	6.00	.87	28.2	1.33	50.75	8.5	.7	
0801	20.83	1237	6.07	.87	15.6	1.09	50.95	9.5	.7	
0803	21.13	1244	6.12	.87	8.0	0.97	50.95	10.5	.7	
0805	21.17	1245	6.13	.87	6.3	0.94	50.95	11.5	.7	
0806	21.28	1248	6.17	.87	-2.6	0.85	51.02	12.5	.7	
0808	21.29	1248	6.17	.87	-4.0	0.85	51.12	13.5	.7	
0809	21.30	1249	6.17	.87	-4.1	0.84	51.12	14.0	.7	
0810	21.30	1249	6.17	.87	-4.0	0.85	51.12	15.0	.7	

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: Smells like burnt metal in ambient Air

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-4  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 05/13/09  
 Sampling Method: Tubing  
 Sampling Time: 1610

Job No: 17326064.03020  
 Sampler(s): T. Ahou/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 72

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.49 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 82.0  
 (from casing top as marked)  
 4) Height of Water Column (H) 32.51 ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA** Low Flow

Single Casing Volume of Water in Well (VW) 21.19 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 63.58 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/13/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 3.4 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.		
<u>sent pump @ 78 ft</u>												
<del>1546</del>												
1546	22.74	12042	7.01	8.21	-83.6	1.34	50.85	2.1	.7	Clear		
1549	22.60	12177	6.95	8.29	-77.4	1.09	50.00	5.0	.7	}		
1552	23.25	12289	6.93	8.27	-75.5	1.13	51.13	7.0	.7			
1555	24.00	12559	6.88	8.31	-73.8	1.09	51.28	9.0	.7			
1558	24.59	12760	6.90	8.32	-73.2	0.99	51.35	11.0	.7			
1601	24.85	12787	6.91	8.33	-73.1	0.93	51.38	12.4	.7			
		<u>Final W/L 51.38</u>										
<u>1610 Sample</u>												

**INSTRUCTIONS AND COMMENTS**  
 Purging/Sampling Remarks: sent @ 224 Hz

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-5  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/13/09  
 Sampling Method: Tubing Pump  
 Sampling Time: 1158

Job No: 17326064.03020  
 Sampler(s): T. Ahoual / Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/13  
 Weather: Sunny  
 Ambient Temp. (F): 70

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder Y N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 36.90 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 74.59  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump

Purge Date: 5/13/09

Was Well Pumped Dry? Y  N

Fe<sup>2</sup> (mg/L): 0.3

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1137		Start of Purge					Pump Set @ ~ 70'			WL - 36.98
1140	22.82	3820	7.19	2.5	-79.1	3.80	38.02	2.1	0.7	Strong odor, Shreen
1143	22.74	2950	7.07	2.0	-52.7	1.42	38.61	4.2	0.7	H
1146	23.01	2920	7.05	1.97	-43.0	1.38	38.87	6.3	0.7	Slight odor
1149	23.12	2910	7.05	1.9	-29.4	1.30	38.90	8.4	0.7	H
1152	23.37	2920	7.05	1.9	-9.3	1.30	39.10	10.5	0.7	H
1155	23.42	2930	7.05	1.9	4.8	1.29	39.40	12.6	0.7	H
1158		Purge Complete - Sample Well								1158
		Post Purge WL -					40.95			

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: Well CAP VERY LOOSE.

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-8  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Tubing / Pump  
 Sampling Time: 11:05 - 11:30

Job No: 17326064.03020  
 Sampler(s): T. Ahoua / J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/14/09  
 Weather: SUNNY  
 Ambient Temp. (F): 70

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 44.90 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 68.58 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.183
4	0.652
6	1.468
D	CV = (23.19) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/13/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 0.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1043										start of Purge - Pump Depth 64'
1047	25.01	2460	7.11	1.5	12.7	2.52	44.90	2.1	0.7	WL @ # 44.90
1050	25.69	2430	7.01	1.5	15.1	2.95	44.90	4.2	0.7	11.4
1053	25.59	2440	7.03	1.5	13.2	1.80	44.90	6.3	0.7	11.4
1056	26.13	2440	7.06	1.5	12.6	1.78	44.90	8.4	0.7	11.4
1059	26.16	2440	7.06	1.5	13.5	1.82	44.90	10.5	0.7	11.4
1102	26.46	2440	7.06	1.5	13.3	1.76	44.90	12.6	0.7	11.4
Restart 1125	25.10	2380	7.07	1.5	14.1	1.50	—	14.0	0.7	11.4
1105	JN 1130									Purge Complete Sample @ 1105 JN 1130
										Post purge WL @ 44.90

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: Pump failed right before sampling. Restarted pump using toxic leads and then sampled

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-10  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Tubing  
 Sampling Time: 1400

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/V. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 70's

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounding  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 80.72 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 73.65  
 (from casing top as marked)  
 4) Height of Water Column (H) 22.93 ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA** Low Flow

Single Casing Volume of Water in Well (VW) 14.9 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 44.85 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/14/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 3.2 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1325										Set Pump @ 69 ft BTOC
1328									.7	Purge starts @
1330	22.10	5843	6.19	4.0	-80.2	4.90	50.81	1.5	.7	
1333	22.28	5797	6.11	3.96	-83.6	2.23	50.83	6.0	.7	
1336										Power loss Reset to generator
1339	22.62	5690	6.09	3.87	-94.9	1.13	50.82	9.0	.7	
1342	22.74	5667	6.09	3.84	-95.3	1.12	50.83	11.0	.7	
1345	22.76	5655	6.09	3.84	-95.0	1.07	50.84	13.0	.7	
1348	22.78	5678	6.09	3.85	-96.9	1.03	50.84	15.0	.7	
1400										Sample Purge Complete

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-12  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Table Pump  
 Sampling Time: 1345 1415

Job No: 17326064.03020  
 Sampler(s): T. Ahoua / J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/14/09  
 Weather: SUNNY  
 Ambient Temp. (F): 75

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 50.67 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 60.58  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump 230 Hz  
 Purge Date: 5/14/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 0.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1325		start of purge.					Pump set @ 56'		NL @ 50.76	
1328	24.63	2470	6.94	1.6	21.1	2.76	50.76	2.1	0.7	Clear
1331	24.41	2460	6.86	1.6	21.5	.96	50.76	4.2	0.7	clear
1334	25.16	2490	6.84	1.6	21.3	.65	50.76	6.3	0.7	
1337	25.70	2520	6.86	1.6	20.2	.64	50.76	8.4	0.7	
1340	25.71	2510	6.85	1.6	20.9	.69	50.76	10.5	0.7	
1343	25.98	2520	6.86	1.6	21.2	.65	50.76	12.6	0.7	
1345	1415	Purge Complete ~					Sample @ 1345-1415			
		Post Purge					WL: 50.76			

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-14  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Tobing  
 Sampling Time: 1108

Job No: 17326064.03020  
 Sampler(s): J. Ahouak, Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): mid 60's

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 44.49 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 57.55 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) 13.06 ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe   N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Low Flow   
 Single Casing Volume of Water in Well (VW) 8.5 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 25.5 gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/14/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 0.0 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1038										Set pump @
1042										Purge starts
1045	21.11	923	6.16	.65	-17.4	5.92	44.49	2.0	.7	
1048	21.52	910	6.13	.63	-13.5	2.67	44.65	4.0	.7	Heavy Floating chunks
1051	22.27	903	6.13	.61	-10.4	2.63	44.65	7.0	.7	Light Floating Brown Gels like before
1054	22.43	905	6.15	.61	-13.3	1.81	44.65	9.0	.7	clearing
1057	22.42	904	6.16	.61	-14.3	1.45	44.65	10.5	.7	
1100	22.34	901	6.15	.61	-14.8	1.21	44.65	11.75	.7	
1103	22.39	900	6.14	.61	-14.5	1.11	44.65	12.75	.7	
1106	22.43	900	6.14	.61	-14.2	1.17	44.65	13.75	.7	
1108										Sampled
1110							44.65			

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-15  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/13/09  
 Sampling Method: Tabins, Pump.  
 Sampling Time: 10:35 10:00

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/13/09  
 Weather: Overcast  
 Ambient Temp. (F): 63

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.91 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 84.95 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water In Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/13/09  
 Was Well Pumped Dry? Y  N  
 Fe<sup>2</sup> (mg/L): 3.7

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
<u>1003</u>		<u>Start of Purge Pump set @ 80.</u>								
<u>1006</u>	<u>21.99</u>	<u>5160</u>	<u>6.89</u>	<u>3.5</u>	<u>-76.2</u>	<u>1.29</u>	<u>49.91</u>	<u>2.1</u>	<u>0.7</u>	
<u>1009</u>	<u>22.40</u>	<u>5310</u>	<u>6.87</u>	<u>3.6</u>	<u>-77.3</u>	<u>.84</u>	<u>49.95</u>	<u>4.2</u>	<u>0.7</u>	
<u>1012</u>	<u>23.39</u>	<u>5480</u>	<u>6.89</u>	<u>3.6</u>	<u>-80.8</u>	<u>.68</u>	<u>49.95</u>	<u>6.3</u>	<u>0.7</u>	
<u>1015</u>	<u>23.96</u>	<u>5560</u>	<u>6.92</u>	<u>3.6</u>	<u>-83.0</u>	<u>.60</u>	<u>49.95</u>	<u>8.4</u>	<u>0.7</u>	
<u>1018</u>	<u>24.46</u>	<u>5630</u>	<u>6.92</u>	<u>3.6</u>	<u>-85.4</u>	<u>.48</u>	<u>49.95</u>	<u>10.5</u>	<u>0.7</u>	
<u>1021</u>	<u>25.05</u>	<u>5690</u>	<u>6.94</u>	<u>3.7</u>	<u>-87.2</u>	<u>.42</u>	<u>49.95</u>	<u>12.6</u>	<u>0.7</u>	
<u>1024</u>	<u>25.15</u>	<u>5700</u>	<u>6.94</u>	<u>3.7</u>	<u>-87.7</u>	<u>.38</u>	<u>49.95</u>	<u>14.7</u>	<u>0.7</u>	
<u>1027</u>	<u>25.21</u>	<u>5710</u>	<u>6.94</u>	<u>3.6</u>	<u>-87.9</u>	<u>.37</u>	<u>49.95</u>	<u>16.8</u>	<u>0.7</u>	
<u>1030</u>	<u>25.31</u>	<u>5720</u>	<u>6.92</u>	<u>3.6</u>	<u>-88.2</u>	<u>.36</u>	<u>49.95</u>	<u>18.9</u>	<u>0.7</u>	
<u>1035</u>		<u>Purge Complete Sample well - 10:00</u>								
		<u>Post Purge dl. 49.91</u>								

**INSTRUCTIONS AND COMMENTS**  
 Purging/Sampling Remarks: Pump set @ 228 Hz

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW 15B  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/13/09  
 Sampling Method: Tubing, Pump  
 Sampling Time: 0900

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/13/09  
 Weather: Overcast  
 Ambient Temp. (F): 61

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened Interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.85 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 103.00  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/13/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 2.6

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
<u>0835</u>		<u>Start of Purge</u>				<u>Pump set @ 97'</u>				
<u>0838</u>	<u>21.80</u>	<u>5460</u>	<u>6.92</u>	<u>3.7</u>	<u>-93.8</u>	<u>1.20</u>	<u>49.90</u>	<u>2.1</u>	<u>0.7</u>	<u>Slight odor</u>
<u>0841</u>	<u>22.14</u>	<u>5530</u>	<u>6.90</u>	<u>3.8</u>	<u>-83.3</u>	<u>.62</u>	<u>49.90</u>	<u>4.2</u>	<u>0.7</u>	<u>11</u>
<u>0844</u>	<u>24.06</u>	<u>5820</u>	<u>6.95</u>	<u>3.8</u>	<u>-97.0</u>	<u>.40</u>	<u>49.90</u>	<u>6.3</u>	<u>0.7</u>	<u>11</u>
<u>0847</u>	<u>24.01</u>	<u>5820</u>	<u>6.94</u>	<u>3.2</u>	<u>-95.2</u>	<u>.34</u>	<u>49.90</u>	<u>8.4</u>	<u>0.7</u>	<u>11</u>
<u>0850</u>	<u>23.94</u>	<u>5820</u>	<u>6.94</u>	<u>3.2</u>	<u>-93.5</u>	<u>.34</u>	<u>49.90</u>	<u>10.5</u>	<u>0.7</u>	<u>11</u>
<u>0853</u>	<u>23.64</u>	<u>5790</u>	<u>6.93</u>	<u>3.2</u>	<u>-91.3</u>	<u>.32</u>	<u>49.90</u>	<u>12.6</u>	<u>0.7</u>	
		<u>Purge Complete Sample well - 0900</u>								

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks Pump set @ 224 Hz

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW 16  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/13/09  
 Sampling Method: Tubing  
 Sampling Time: 0845

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/13/09  
 Weather: Hazy  
 Ambient Temp. (F): 58

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder   5/13/09  
 Other: \_\_\_\_\_

Screened interval: \_\_\_\_\_

- 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
(from casing top as marked)
- 2) Depth to Water Surface (DTW) 53.73 ft  
(from casing top as marked)
- 3) Well Depth (WD): 128.24  
(from casing top as marked)
- 4) Height of Water Column (H) 74.51 ft  
(from casing top as marked)

Product Obs: Y    
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y   
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft. (gals)
<u>2</u>	<u>0.163</u>
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA** Low Flow

Single Casing Volume of Water in Well (VW) 12.14 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 36.43 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/13/09  
 Was Well Pumped Dry? Y   
 Fe<sup>2</sup> (mg/L): 0.0 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
0824	—	Set Pump @		12.4	51370C	—	—	—	—	—
0828	21.38	2863	7.86	2.16	5933	4.08	53.79	7 1/2	1.5	—
0834	21.40	2875	7.68	2.00	5851	3.31	53.79	10	1.0	—
0837	—	—	7.66	—	—	—	—	—	—	motor failed
0915	21.49	2898	7.48	2.08	552	5.87	53.78	18	1.0	—
0917	21.35	3005	7.53	2.09	566	3.80	53.78	22	1.0	—
0919	21.40	3002	7.54	2.14	564	2.41	53.78	27	1.0	—
0924	21.15	3096	6.02	2.17	-150.1	1.38	53.79	—	1.0	motor fail
0939	21.20	3126	6.01	2.19	-144.3	0.92	53.79	49	1.25	—
0942	21.42	3142	6.03	2.19	-135.5	0.80	53.79	57	1.25	—
0945	21.57	3143	6.04	2.18	-128.8	0.72	53.79	54	1.25	—
0948	21.50	3138	6.02	2.17	-131.2	0.75	53.79	5	1.25	—
0845	Sample									

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks Motor stopped Result start

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-17  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/12/09  
 Sampling Method: Tubing/Pump  
 Sampling Time: 15:45 1645

Job No: 17326064.03020  
 Sampler(s): T. Ahoua (J. Nutter)  
 Reviewer(s): \_\_\_\_\_ Date: 5/12/09  
 Weather: SUNNY  
 Ambient Temp. (F): 73

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 50.15 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 79.94 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/12/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 4.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1612										Start of Purge - Pump set @ 74'
1615	23.57	9200	6.85	0.0	-33.2	1.30	50.31	2.1	0.7	lt. grey / odor
1618	24.20	9250	6.78	0.0	-32.3	1.63	50.31	4.2	0.7	lt. grey
1621	25.35	9360	6.78	0.0	-34.9	1.49	50.31	6.3	0.7	lt. grey
1624	25.51	9020	6.85	0.0	-33.1	1.40	50.31	8.4	0.7	lt. grey
1627	24.94	8340	6.86	0.0	-33.4	1.31	50.31	10.5	0.7	lt. grey
1630	24.77	8610	6.82	0.0	-36.7	1.26	50.21	12.6	0.7	Clear / odor
1633	25.42	9010	6.81	0.0	-33.2	1.26	50.31	14.7	0.7	lt. grey
1637	26.09	9220	6.85	0.0	-35.3	1.23	50.31	16.8	0.7	lt. grey
1640	26.02	9260	6.86	0.0	-32.2	1.22	50.31	18.9	0.7	lt. grey
1643	26.02	9310	6.86	0.0	-32.1	1.23	50.31	21.0	0.7	lt. grey
										Sample Sample @ 1645
										Post Purge WL - 50.10

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: Pump @ 22.2 Hz

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW18 Job No: 17326064.03020  
 Sample No(s): \_\_\_\_\_ Sampler(s): T. Ahoua, J. Nutter  
 Sampling Date: 5/12/09 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Sampling Method: \_\_\_\_\_ Weather: Hazy  
 Sampling Time: 16:45 Ambient Temp. (F): 73

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder (Y) N  
 Other: \_\_\_\_\_  
 Screened Interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 55.85 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 127.95  
 (from casing top as marked)  
 4) Height of Water Column (H) 72.1 ft  
 (from casing top as marked)

Product Obs: Y (N)  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y (N)  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	<u>0.103</u>
4	0.852
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
	CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)

**WELL PURGE AND SAMPLING DATA**

Purge Method: 2" Grundfos submersible pump  
 Single Casing Volume of Water in Well (VW) 11.75 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 35.25 gals  
 (VW x NC = TV)

Purge Date: 5/12/09  
 Was Well Pumped Dry? Y (N)  
 Fe<sup>2</sup> (mg/L): 0.8 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1627				12.3.0	ft					
1627	22.30	4790	6.46	31	850	10.73	55.86	4.0	.7	Dark Brown
1628	22.21	4780	6.76	31	68.4	5.92	55.90	7.0	.7	
1632	22.24	4780	6.66	31	70.6	4.00	55.91	8.8	.7	
1635	22.37	4890	6.89	32	850	9.62	55.91	10.0	.7	Par Bubble
1639	22.67	4800	6.51	33	66.2	2.59	55.91	16.0	.7	
1641	22.67	4815	6.49	33	64.9	2.34	55.91	18.0	.7	
1643	22.62	4829	6.48	33	64.0	2.19	55.91	19.0	.7	
1645	22.61	4828	6.47	33	64.0	2.11	55.91	20.0	.7	
Final w/L		55.91								

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: Set at 175 ft  
& ORP and pH OFF AER pocket ON probe

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

# Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-19  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/19/09  
 Sampling Method: Pump/Tube  
 Sampling Time: 1120

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/19/09  
 Weather: Sunny  
 Ambient Temp. (F): 73

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 50.39 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 77.35 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/19/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 4.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1018										Start of Purge
1021	23.26	6541	7.11	4.3	-114.2	1.51	50.41	3	1.0	Pump set @ 73' WCL = 50.39
1024	24.11	6651	7.06	4.3	-114.6	.60	50.41	6	1.0	cloudy/slush/odor
1027	25.19	6757	7.06	4.3	-115.9	.43	50.41	9	1.0	11 11
1030	25.36	6752	7.06	4.3	-115.7	.34	50.41	12	1.0	11 11
1033	25.40	6710	7.07	4.3	-114.8	.32	50.41	15	1.0	11 11
1036	25.34	6681	7.06	4.3	-113.6	.33	50.41	18	1.0	clean/slush/odor
										11 11
Purge Complete - Sample time 1120										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW 20  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/12/09  
 Sampling Method: Tubing  
 Sampling Time: 1200

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny scattered clouds  
 Ambient Temp. (F): 70

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.71 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 108.62  
 (from casing top as marked)  
 4) Height of Water Column (H) 18.91 ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
	$CV = 3.14 [(D/2)/12 \text{ in. ft}]^2 h (7.48 \text{ gal/cu. Ft.})$

**WELL PURGE AND SAMPLING DATA**

Purge Method: 2" Grundfos submersible pump  
 Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Date: 5/12/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 0.0 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1128	24.01	709	6.50	0.0	67.1	3.19	49.72	3.0	.7	pump set at 65ft
1135	24.33	711	6.48	0.0	68.4	2.22	49.72	8.0	.7	
1138	24.03	695	6.44	0.0	67.8	1.55	49.72	11.0	.7	
1141	23.67	689	6.42	0.0	69.9	1.08	49.72	15.0	.7	
1144	23.72	681	6.41	0.0	73.6	.80	49.72	18.0	.7	
1147	24.71	677	6.41	0.0	73.0	.70	49.72	19.0	.7	
1151	24.76	675	6.43	0.0	74.2	0.108	49.72	21.0	.7	
1153	24.53	675	6.43	0.0	76.0	.61	49.72	23.0	.7	
1200	Sample									
1219	Final	W/C	49.71							

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-20B  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 05/12/09  
 Sampling Method: Tubing  
 Sampling Time: 1010

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: overcast  
 Ambient Temp. (F): 60

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder (Y) N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.37 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 89.99  
 (from casing top as marked)  
 4) Height of Water Column (H) 40.62 ft  
 (from casing top as marked)

Product Obs: Y (N)  
 Depth to Product: None  
 Method of Measurement: Interface Probe Y (N)  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	<u>0.183</u>
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
	CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft)

**WELL PURGE AND SAMPLING DATA**

Purge Method: 2" Grundfos submersible pump  
 Single Casing Volume of Water in Well (VW) 6.6 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 19.86 gals  
 Total Volume of Water to Purge (TV) 44 Liters  
 (VW x NC = TV)

Purge Date: 05/12/09  
 Was Well Pumped Dry? Y (N)  
 Fe<sup>2</sup> (mg/L): 2.2 mg/l

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
<u>0902</u>							<u>85 ft BTCL</u>			
<u>0932</u>	<u>21.35</u>	<u>768</u>	<u>6.90</u>	<u>0.0</u>	<u>115.0</u>	<u>3.37</u>	<u>49.39</u>	<u>3.5</u>	<u>.5</u>	<u>organic odour</u>
<u>0937</u>	<u>21.80</u>	<u>710</u>	<u>6.10</u>	<u>0.0</u>	<u>106.2</u>	<u>5.60</u>	<u>49.39</u>	<u>6.5</u>	<u>.5</u>	
<u>0942</u>	<u>22.60</u>	<u>772</u>	<u>6.29</u>	<u>0.0</u>	<u>104.7</u>	<u>2.22</u>	<u>49.39</u>	<u>11.5</u>	<u>.5</u>	
<u>0945</u>	<u>22.68</u>	<u>772</u>	<u>6.31</u>	<u>0.0</u>	<u>103.6</u>	<u>2.07</u>	<u>49.39</u>	<u>12.5</u>	<u>.5</u>	
<u>0948</u>	<u>22.63</u>	<u>774</u>	<u>6.34</u>	<u>0.0</u>	<u>79.7</u>	<u>1.55</u>	<u>49.40</u>	<u>16.0</u>	<u>.5</u>	
<u>0953</u>	<u>22.59</u>	<u>774</u>	<u>6.35</u>	<u>0.0</u>	<u>67.3</u>	<u>1.35</u>	<u>49.40</u>	<u>20.0</u>	<u>.5</u>	
<u>0956</u>	<u>22.69</u>	<u>773</u>	<u>6.37</u>	<u>0.0</u>	<u>63.7</u>	<u>1.15</u>	<u>49.40</u>	<u>23.0</u>	<u>.5</u>	<u>milky</u>
<u>1000</u>	<u>22.84</u>	<u>772</u>	<u>6.39</u>	<u>0.0</u>	<u>49.7</u>	<u>0.98</u>	<u>49.40</u>	<u>27.0</u>	<u>.5</u>	
<u>1004</u>	<u>22.95</u>	<u>774</u>	<u>6.41</u>	<u>0.0</u>	<u>49.5</u>	<u>1.09</u>	<u>49.40</u>	<u>28.0</u>	<u>.5</u>	<u>4 meter autoOFF Please Yellowish</u>
<u>1007</u>	<u>23.06</u>	<u>774</u>	<u>6.42</u>	<u>0.0</u>	<u>47.2</u>	<u>1.00</u>	<u>49.40</u>	<u>31.0</u>	<u>.5</u>	
<u>1008</u>	<u>Sample well</u>									
							<u>Final water level</u>	<u>PumpOFF</u>	<u>49.37</u>	

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-21  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/13/09  
 Sampling Method: Tubing  
 Sampling Time: 1200

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Hazy  
 Ambient Temp. (F): 65

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened Interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 50.35 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 74.91  
 (from casing top as marked)  
 4) Height of Water Column (H) 24.56 ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA** Low Flow

Single Casing Volume of Water in Well (VW) 16.01 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 48.0 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/13/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 2.4 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1139				70	Pt-BTDC					
1140	21.14	7900	7.42	5.5	65	1.59	50.36	3	1	yellow color
1142	21.86	8000	7.34	4.6	61	4.02	50.36	7	1	}
1144	22.01	8100	7.35	5.5	60	3.02	50.36	10	1	
1146	22.08	8116	7.36	5.5	60	2.00	50.36	12	1	
1148	22.07	8113	7.36	5.5	60	1.08	50.36	14	1	
1151	22.09	8105	7.37	5.5	60	0.73	50.36	16	1	
1153	22.11	8101	7.38	5.5	60	0.74	50.36	18	1	
1155	22.13	8098	7.38	5.5	60	0.77	50.36	20	1	
1200	Sample									
1201	Final w/c									

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW22  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/18/09  
 Sampling Method: TUBING  
 Sampling Time: 1345

Job No: 17326064.03020  
 Sampler(s): T. Ahouaf/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 85

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_

- Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 50.34 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 73.94 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	0.163
<u>4</u>	0.652
S	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump

Purge Date: 5/18/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 3.4

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
		Set Pump @			6.9	ft	BTOC			
1325	Purge	Begin			8.2	MDM				
1327	23.07	6.345	6.22	4.28	-123.6	2.63	50.34	50.34	.8	yellowish
1330	23.14	6.356	6.26	4.28	-126.9	1.78	50.34	4.0	.8	
1333	23.70	6.394	6.25	4.26	-135.5	0.96	50.34	6.0	.8	
1336	24.06	6.435	6.25	4.25	-138.9	0.79	50.34	8.0	.8	sulfur smell
1339	24.19	6.441	6.26	4.25	-138.9	0.72	50.34	10.0	.8	
1342	24.33	6.438	6.28	4.25	-139.9	0.70	50.34	12.0	.8	
1343	Purge Complete									
1345	Sample									
					Final w/L	50.34				

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: Sulfur smell

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re







### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-25  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/17/09  
 Sampling Method: Tube, Pump  
 Sampling Time: 0830

Job No: 17326064.03020  
 Sampler(s): T. Ahouald. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/17/09  
 Weather: Overcast  
 Ambient Temp. (F): 68

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder Y N  
 Other: \_\_\_\_\_  
 Screened Interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.27 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 88.92  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/17/09  
 Was Well Pumped Dry? Y (N)  
 Fe<sup>2</sup> (mg/L): 3.2

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
0754		Start		at Purge						WNL = 5 49.33
0757	21.46	4595	6.93	3.2	-132.8	1.35	49.37	30	1.0	odor/minky
0800	21.84	4615	6.90	3.1	-134.9	1.02	49.33	6	1.0	" / minky
0803	23.23	4818	6.95	3.2	-142.4	.55	49.33	9	1.0	" / minky
0806	23.68	4864	6.96	3.2	-141.8	.45	49.33	12	1.0	" / minky
0809	24.00	4894	6.97	3.2	-142.2	.36	49.33	15	1.0	Odor/clean
0812	24.06	4897	6.97	3.2	-141.3	.34	49.33	18	1.0	" "
0815	24.17	4902	6.96	3.2	-140.3	.30	49.37	21	1.0	" "
0818	24.32	4913	6.97	3.2	-139.3	.30	49.33	24	1.0	" "
0821	24.50	4928	6.97	3.2	-138.4	.25	49.33	27	1.0	" "
0824	24.59	4941	6.97	3.2	-137.9	.26	49.33	30	1.0	" "
0827	24.59	4945	6.97	3.2	-137.4	.25	49.33	33	1.0	" "
Purge Complete - Sample Time = 0830										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re





### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW27  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/19/09  
 Sampling Method: Trubing  
 Sampling Time: 1115

Job No: 17326064.03020  
 Sampler(s): T. Ahouai, Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 70 48% Humidity

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder Y N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.47 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 90.15  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	<u>0.163</u>
<u>4</u>	<u>0.652</u>
<u>6</u>	<u>1.468</u>
<u>D</u>	$CV = (23.49) \times [(D/24)^2]$
	$CV = 3.14 [(D/2)/12 \text{ in. ft}]^2 \times (7.48 \text{ gal/cu. Ft.})$

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/19/09  
 Was Well Pumped Dry? Y N  
 Fe<sup>2</sup> (mg/L): 4.8

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
		<u>Set</u>		<u>Pump @</u>	<u>85 ft</u>		<u>BTOC</u>			
<u>1020</u>	<u>Start</u>	<u>purge</u>							<u>1.0</u>	
<u>1023</u>	<u>21.96</u>	<u>4154</u>	<u>6.06</u>	<u>2.85</u>	<u>-1026</u>	<u>3.90</u>	<u>49.51</u>	<u>3.0</u>	<u>1.0</u>	
<u>1026</u>	<u>21.81</u>	<u>4993</u>	<u>6.02</u>	<u>2.93</u>	<u>-101.1</u>	<u>3.93</u>	<u>49.51</u>	<u>6.0</u>	<u>1.0</u>	
<u>1029</u>	<u>21.87</u>	<u>3867</u>	<u>6.00</u>	<u>2.18</u>	<u>-1022</u>	<u>1.44</u>	<u>49.51</u>	<u>9.0</u>	<u>1.0</u>	
<u>1032</u>	<u>22.07</u>	<u>4232</u>	<u>5.99</u>	<u>2.78</u>	<u>-1040</u>	<u>1.21</u>	<u>49.51</u>	<u>12.0</u>	<u>1.0</u>	
<u>1035</u>	<u>22.26</u>	<u>4261</u>	<u>5.98</u>	<u>2.81</u>	<u>-1040</u>	<u>0.97</u>	<u>49.51</u>	<u>15.0</u>	<u>1.0</u>	
<u>1038</u>	<u>22.35</u>	<u>4260</u>	<u>5.98</u>	<u>2.79</u>	<u>-103.7</u>	<u>0.94</u>	<u>49.51</u>	<u>17.0</u>	<u>1.0</u>	
<u>1041</u>	<u>22.36</u>	<u>4266</u>	<u>5.99</u>	<u>2.76</u>	<u>-1031</u>	<u>0.90</u>	<u>49.51</u>	<u>20.0</u>	<u>1.0</u>	
<u>1042</u>	<u>purge</u>	<u>Complete</u>								
<u>1115</u>	<u>Sample</u>									

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW28  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/19/09  
 Sampling Method: Tubing  
 Sampling Time: 0930

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/W. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 72 56% Humidity

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.58 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 113.96  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	<u>0.163</u>
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/19/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 3.4

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
		<u>Start Pump @</u>		<u>109 FT.</u>	<u>BTOL</u>					
0907								<u>1.0</u>		
0912	<u>21.53</u>	<u>7900</u>	<u>6.04</u>	<u>5.48</u>	<u>-146.8</u>	<u>3.85</u>	<u>49.59</u>	<u>3.0</u>	<u>1.0</u>	
0915	<u>21.60</u>	<u>12684</u>	<u>5.98</u>	<u>4.72</u>	<u>-151.1</u>	<u>1.66</u>	<u>49.62</u>	<u>6.0</u>	<u>1.0</u>	
0918	<u>22.13</u>	<u>12687</u>	<u>5.98</u>	<u>4.51</u>	<u>-118.6</u>	<u>0.99</u>	<u>49.63</u>	<u>9.0</u>	<u>1.0</u>	
0921	<u>22.16</u>	<u>12663</u>	<u>5.98</u>	<u>4.97</u>	<u>-117.1</u>	<u>0.96</u>	<u>49.63</u>	<u>11.0</u>	<u>1.0</u>	
0924	<u>22.19</u>	<u>12763</u>	<u>5.99</u>	<u>4.45</u>	<u>-115.7</u>	<u>0.86</u>	<u>49.63</u>	<u>14.0</u>	<u>1.0</u>	
0927	<u>22.23</u>	<u>12763</u>	<u>5.99</u>	<u>4.46</u>	<u>-116.1</u>	<u>0.88</u>	<u>49.63</u>	<u>17.0</u>	<u>1.0</u>	
0928		<u>Purge Complete</u>					<u>49.62</u>			
0930		<u>Sample</u>		<u>MW 28</u>						

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \* may be over water range High Salinity

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW 29  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/18/09  
 Sampling Method: Pump/Tube  
 Sampling Time: 1330

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/18/09  
 Weather: Sunny  
 Ambient Temp. (F): 82

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder (Y) N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.83  
 (from casing top as marked)  
 3) Well Depth (WD): 90-12  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/18/09  
 Was Well Pumped Dry? Y (N)  
 Fe<sup>2</sup> (mg/L): 4.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1303										Start of Purge. Pump set @ 86' WL 48.80
1306	23.67	6341	7.17	4.2	-147.0	1.53	48.86	3	1.0	Cloudy / below
1309	24.20	6572	7.09	4.3	-149.9	1.57	48.86	6	1.0	11 11
1312	24.56	6664	7.07	4.3	-148.0	1.45	48.86	9	1.0	11 11
1315	24.65	6707	7.07	4.3	-149.9	1.32	48.86	12	1.0	11 11
1318	24.76	6789	7.08	4.4	-150.4	1.27	48.86	15	1.0	11 11
1321	24.75	6777	7.07	4.4	-149.7	1.27	48.86	18	1.0	11 11
1324	24.81	6787	7.06	4.4	-149.1	1.25	48.86	21	1.0	11 17
Purge Complete - Sample Time 1330										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

**Monitor Well Sampling Data**

Project: Cooper Drum  
 Location No: MW-29A  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/18/09  
 Sampling Method: Pump/tube  
 Sampling Time: 1430

Job No: 17326054.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/18/09  
 Weather: Sunny  
 Ambient Temp. (F): 85

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder (Y) N  
 Other: \_\_\_\_\_

- Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.66 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 66.10  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = 23.49 \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/18/09  
 Was Well Pumped Dry? Y (M)  
 Fe<sup>2</sup> (mg/L): 1.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1404	2	Start of Purge					62"		WL	48.68
1407	24.24	3251	7.04	2.0	-105.1	1.55	48.80	3	1.0	Clear/light color
1410	24.46	2397	6.95	1.5	-100.5	.46	48.80	6	1.0	" "
1413	25.09	2465	6.94	1.6	-99.7	.31	48.80	9	1.0	" "
1416	25.33	2530	6.93	1.6	-99.1	.27	48.80	12	1.0	" "
1419	25.44	2590	6.94	1.6	-98.8	.24	48.80	15	1.0	" "
1421	25.65	2645	6.95	1.6	-98.4	.22	48.80	18	1.0	" "
1424	25.73	2674	6.94	1.6	-98.3	.22	48.80	21	1.0	" "
1427	25.54	2809	6.92	1.8	-98.3	.22	48.80	24	1.0	" "
1430	25.51	2840	6.92	1.8	-89.6	.18	48.80	27	1.0	" "
1433	25.60	2860	6.92	1.8	-87.6	.18	48.80	30	1.0	" "
Purge Complete - Sample time 1430										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re



### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-31  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/15/09  
 Sampling Method: Tube, Pump  
 Sampling Time: 0935

Job No: 17326064.03020  
 Sampler(s): T.Ahoul/J. Nutler  
 Reviewer(s): \_\_\_\_\_ Date: 5/15/09  
 Weather: Overcast  
 Ambient Temp. (F): 62

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened Interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.91 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 90.15 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
	CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
233 H2  
 Purge Date: 5/15/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 4.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
<u>0904</u>										<u>Start of Purge, Pump @ 86', -WL @ 48.91</u>
<u>0907</u>	<u>22.51</u>	<u>5850</u>	<u>6.89</u>	<u>4.1</u>	<u>-97.0</u>	<u>1.68</u>	<u>48.94</u>	<u>3</u>	<u>1.0</u>	
<u>0910</u>	<u>22.57</u>	<u>6563</u>	<u>6.91</u>	<u>4.4</u>	<u>-105.4</u>	<u>.83</u>	<u>48.94</u>	<u>6</u>	<u>1.0</u>	
<u>0913</u>	<u>22.21</u>	<u>6748</u>	<u>6.91</u>	<u>4.5</u>	<u>-106.3</u>	<u>.61</u>	<u>48.94</u>	<u>9</u>	<u>1.0</u>	
<u>0916</u>	<u>23.80</u>	<u>6843</u>	<u>6.92</u>	<u>4.5</u>	<u>-107.8</u>	<u>.48</u>	<u>48.94</u>	<u>12</u>	<u>1.0</u>	
<u>0919</u>	<u>24.65</u>	<u>6927</u>	<u>6.94</u>	<u>4.5</u>	<u>-110.5</u>	<u>.38</u>	<u>48.94</u>	<u>15</u>	<u>1.0</u>	
<u>0921</u>	<u>25.61</u>	<u>6972</u>	<u>6.96</u>	<u>4.5</u>	<u>-111.6</u>	<u>.34</u>	<u>48.94</u>	<u>18</u>	<u>1.0</u>	
<u>0924</u>	<u>25.25</u>	<u>6955</u>	<u>6.97</u>	<u>4.4</u>	<u>-111.3</u>	<u>.28</u>	<u>48.94</u>	<u>21</u>	<u>1.0</u>	
<u>0927</u>	<u>25.41</u>	<u>6939</u>	<u>6.96</u>	<u>4.4</u>	<u>-110.6</u>	<u>.28</u>	<u>48.94</u>	<u>24</u>	<u>1.0</u>	
<u>0930</u>	<u>25.36</u>	<u>6880</u>	<u>6.96</u>	<u>4.4</u>	<u>-110.1</u>	<u>.27</u>	<u>48.94</u>	<u>27</u>	<u>1.0</u>	
										<u>Purge Complete - Sample Well 0935</u>

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re...

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW 31A  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/15/09  
 Sampling Method: Tube, Pump  
 Sampling Time: 1035

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/S. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/15/09  
 Weather: Sunny  
 Ambient Temp. (F): 65

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.47 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 64.05 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	0.652
6	1.468
D	$CV = (23.49) \times \{(D/24)^2\}$
$CV = 3.14 \{(D/2)/12 \text{ in. ft}\}^2 \times h (7.48 \text{ gal/cu. Ft.})$	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
228 Hz  
 Purge Date: 5/15/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 0.6

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
<u>1014</u>										<u>Start of Purge - Pump @ 60'</u>
<u>1017</u>	<u>25.88</u>	<u>4809</u>	<u>6.93</u>	<u>2.9</u>	<u>-73.3</u>	<u>1.77</u>	<u>48.75</u>	<u>3.0</u>	<u>1.0</u>	<u>Clear</u>
<u>1020</u>	<u>24.99</u>	<u>3373</u>	<u>6.87</u>	<u>2.1</u>	<u>-67.4</u>	<u>1.09</u>	<u>48.65</u>	<u>6</u>	<u>1.0</u>	<u>''</u>
<u>1023</u>	<u>25.66</u>	<u>3276</u>	<u>6.86</u>	<u>2.1</u>	<u>-65.2</u>	<u>.95</u>	<u>48.65</u>	<u>9</u>	<u>1.0</u>	<u>''</u>
<u>1026</u>	<u>26.44</u>	<u>3294</u>	<u>6.89</u>	<u>2.0</u>	<u>-64.9</u>	<u>.95</u>	<u>48.65</u>	<u>12</u>	<u>1.0</u>	<u>''</u>
<u>1029</u>	<u>27.03</u>	<u>3321</u>	<u>6.91</u>	<u>2.0</u>	<u>-65.8</u>	<u>1.04</u>	<u>48.65</u>	<u>15</u>	<u>1.0</u>	<u>''</u>
<u>1031</u>	<u>27.25</u>	<u>3328</u>	<u>6.91</u>	<u>2.0</u>	<u>-66.0</u>	<u>1.01</u>	<u>48.65</u>	<u>18</u>	<u>1.0</u>	<u>''</u>
								<u>21</u>		
<u>Purge Complete - Sample Well 1035</u>										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW 31B  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/15/09  
 Sampling Method: Tubing  
 Sampling Time: 1050

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/N. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny; Hazy clouds  
 Ambient Temp. (F): 65

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked) 49.11  
 2) Depth to Water Surface (DTW) \_\_\_\_\_ ft  
 (from casing top as marked) 106.90  
 3) Well Depth (WD): \_\_\_\_\_ ft  
 (from casing top as marked) 57.79  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y   N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
	CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)

**WELL PURGE AND SAMPLING DATA** Low Flow

Single Casing Volume of Water in Well (VW) 37.47 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 113.03 gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/15/09  
 Was Well Pumped Dry? Y   N  
 Fe<sup>2</sup> (mg/L): 5.2

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
		<u>Salt Pump</u>				<u>103 PA</u>				
1015		<u>Start Pump</u>							<u>1.0</u>	<u>clear</u>
1019	<u>22.82</u>	<u>7809</u>	<u>6.12</u>	<u>5.31</u>	<u>-162.2</u>	<u>6.70</u>	<u>49.21</u>	<u>3.0</u>	<u>1.0</u>	<u>grey/blue TAN</u>
1022	<u>22.78</u>	<u>8018</u>	<u>6.01</u>	<u>5.44</u>	<u>-126.0</u>	<u>2.34</u>	<u>49.23</u>	<u>6.0</u>	<u>1.0</u>	
1025	<u>23.15</u>	<u>8093</u>	<u>5.98</u>	<u>5.45</u>	<u>-110.9</u>	<u>1.19</u>	<u>49.24</u>	<u>9.0</u>	<u>1.0</u>	
1028	<u>23.54</u>	<u>8154</u>	<u>5.99</u>	<u>5.45</u>	<u>-113.4</u>	<u>0.91</u>	<u>49.25</u>	<u>12.0</u>	<u>1.0</u>	
1031	<u>23.75</u>	<u>8191</u>	<u>5.99</u>	<u>5.45</u>	<u>-112.4</u>	<u>0.81</u>	<u>49.25</u>	<u>15.0</u>	<u>1.0</u>	
1034	<u>23.96</u>	<u>8217</u>	<u>6.01</u>	<u>5.44</u>	<u>-116.8</u>	<u>0.74</u>	<u>49.25</u>	<u>17.0</u>	<u>1.0</u>	
1037	<u>24.01</u>	<u>8234</u>	<u>6.01</u>	<u>5.45</u>	<u>-110.9</u>	<u>0.67</u>	<u>49.25</u>	<u>19.0</u>	<u>1.0</u>	
1040	<u>24.22</u>	<u>8262</u>	<u>6.02</u>	<u>5.45</u>	<u>-109.6</u>	<u>0.59</u>	<u>49.25</u>	<u>21.0</u>	<u>1.0</u>	
1043	<u>24.22</u>	<u>8264</u>	<u>6.02</u>	<u>5.45</u>	<u>-110.8</u>	<u>0.57</u>	<u>49.25</u>	<u>23.0</u>	<u>1.0</u>	
1046	<u>24.26</u>	<u>8267</u>	<u>6.02</u>	<u>5.44</u>	<u>-110.4</u>	<u>0.55</u>	<u>49.25</u>	<u>25.0</u>	<u>1.0</u>	
1050		<u>Purge END Sample</u>								

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re









### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-35  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: rubing  
 Sampling Time: 0825

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Wazy  
 Ambient Temp. (F): Low 60's

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder (Y) N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.98 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 104.55 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x ((D/24) <sup>2</sup> )
	CV = 3.14 ((D/2)/12 in.ft) <sup>2</sup> h (7.48 gal/cu. Ft.)

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/14/09  
 Was Well Pumped Dry? Y N  
 Fe<sup>2</sup> (mg/L): 5.2

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
		<u>sat</u>	<u>Pump @</u>	<u>99</u>	<u>FT</u>	<u>8</u>	<u>TOL</u>			
<u>0750</u>	<u>Start</u>									
<u>0755</u>	<u>21.43</u>	<u>5937</u>	<u>5.84</u>	<u>4.14</u>	<u>-96.3</u>	<u>3.81</u>	<u>49.16</u>	<u>0.0</u>	<u>1.0</u>	
<u>0758</u>	<u>21.94</u>	<u>6006</u>	<u>5.90</u>	<u>4.14</u>	<u>-92.8</u>	<u>2.57</u>	<u>49.16</u>	<u>8.5</u>	<u>1.0</u>	
<u>0801</u>	<u>22.10</u>	<u>6045</u>	<u>5.93</u>	<u>4.15</u>	<u>-100.5</u>	<u>1.94</u>	<u>49.16</u>	<u>11.0</u>	<u>1.0</u>	
<u>0803</u>										
<u>0805</u>	<u>Restart</u>									<u>Mature Fe1</u>
<u>0807</u>	<u>22.07</u>	<u>6073</u>	<u>5.97</u>	<u>4.18</u>	<u>-117.2</u>	<u>2.60</u>	<u>49.42</u>	<u>14.0</u>	<u>1.0</u>	
<u>0810</u>	<u>22.30</u>	<u>5886</u>	<u>5.95</u>	<u>4.10</u>	<u>-136.9</u>	<u>2.92</u>	<u>49.42</u>	<u>20.0</u>	<u>1.0</u>	
<u>0813</u>	<u>22.30</u>	<u>6037</u>	<u>5.95</u>	<u>4.13</u>	<u>-142.8</u>	<u>1.03</u>	<u>49.29</u>	<u>23.0</u>	<u>1.0</u>	
<u>0816</u>	<u>22.32</u>	<u>6051</u>	<u>5.95</u>	<u>4.14</u>	<u>-146.0</u>	<u>0.81</u>	<u>49.29</u>	<u>26.0</u>	<u>1.0</u>	
<u>0818</u>	<u>22.31</u>	<u>6053</u>	<u>5.95</u>	<u>4.14</u>	<u>-147.1</u>	<u>0.74</u>	<u>49.29</u>	<u>27.5</u>	<u>1.0</u>	
<u>0820</u>	<u>22.30</u>	<u>6053</u>	<u>5.95</u>	<u>4.14</u>	<u>-142.8</u>	<u>0.72</u>	<u>49.29</u>	<u>28.5</u>	<u>1.0</u>	
<u>0822</u>	<u>22.30</u>	<u>6055</u>	<u>5.95</u>	<u>4.15</u>	<u>-149.3</u>	<u>0.69</u>	<u>49.30</u>	<u>29.5</u>	<u>1.0</u>	

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW 36  
 Sample No(s): 13  
 Sampling Date: 5/15/09  
 Sampling Method: Tube - Pump  
 Sampling Time: 1306

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/15/09  
 Weather: Sunny  
 Ambient Temp. (F): 70

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.64 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 87.10 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
222 Hz  
 Purge Date: 5/15/09  
 Was Well Pumped Dry? Y  N   
 Fe<sup>2</sup> (mg/L): \_\_\_\_\_

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1233										Start of Purge, Pump Set @ 83'
1237	23.64	4650	6.96	3.1	-115.0	1.95	48.90	2.1	0.7	WL = 48.84 clear/odor
1240	24.35	4710	6.91	3.1	-114.0	1.20	49.10	4.2	0.7	clear/odor
1243	25.00	4792	6.92	3.1	-115.0	1.16	49.61	6.3	0.7	ll ll
1246	25.63	4835	6.95	3.1	-117.0	1.07	49.61	8.4	0.7	ll ll
1249	26.06	4844	6.97	3.0	-119.4	.98	49.61	10.5	0.7	ll ll
1252	26.37	4848	6.98	3.0	-119.5	.96	49.61	12.6	0.7	ll ll
1255	26.41	4851	6.98	3.0	-120.5	.89	49.61	14.7	0.7	ll ll
1257	26.60	4869	6.98	3.0	-120.7	.90	49.61	16.8	0.7	ll ll
										Purge Complete - Sample well @ 1300

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW37  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/15/09  
 Sampling Method: Tubing  
 Sampling Time: 1307

Job No: 17326064.03020  
 Sampler(s): T.Ahoul/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 68

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 46.70 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 108.75  
 (from casing top as marked)  
 4) Height of Water Column (H) 62.05 ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x ((D/24) <sup>2</sup> )
CV = 3.14 ((D/2)/12 in.) <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA** Low Flow

Single Casing Volume of Water in Well (VW) 40.45 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 121.36 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/15/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 4.2

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
							<u>10.5 ft</u>			
<u>1240</u>	<u>Start</u>								<u>1.0</u>	
<u>1242</u>	<u>27.42</u>	<u>6590</u>	<u>6.15</u>	<u>4.0</u>	<u>-1620</u>	<u>1.90</u>	<u>46.50</u>	<u>2.0</u>	<u>1.0</u>	
<u>1244</u>	<u>23.68</u>	<u>6364</u>	<u>6.03</u>	<u>4.23</u>	<u>-115.9</u>	<u>1.06</u>	<u>46.50</u>	<u>6.0</u>	<u>1.0</u>	
<u>1247</u>	<u>23.58</u>	<u>6288</u>	<u>6.00</u>	<u>4.20</u>	<u>-123.6</u>	<u>1.59</u>	<u>46.50</u>	<u>8.0</u>	<u>1.0</u>	<u>Blackish</u>
<u>1250</u>	<u>23.69</u>	<u>6242</u>	<u>6.00</u>	<u>4.16</u>	<u>-133.9</u>	<u>1.44</u>	<u>46.50</u>	<u>10.0</u>	<u>1.0</u>	
<u>1253</u>	<u>23.71</u>	<u>6228</u>	<u>6.00</u>	<u>4.14</u>	<u>-141.2</u>	<u>1.31</u>	<u>46.50</u>	<u>13.0</u>	<u>1.0</u>	
<u>1256</u>	<u>23.78</u>	<u>6236</u>	<u>6.00</u>	<u>4.14</u>	<u>-141.4</u>	<u>1.22</u>	<u>46.50</u>	<u>15.0</u>	<u>1.0</u>	
<u>1259</u>	<u>23.72</u>	<u>6233</u>	<u>6.00</u>	<u>4.15</u>	<u>-144.8</u>	<u>1.06</u>	<u>46.50</u>	<u>17.0</u>	<u>1.0</u>	
<u>1302</u>	<u>23.79</u>	<u>6236</u>	<u>6.00</u>	<u>4.14</u>	<u>-147.2</u>	<u>0.96</u>	<u>46.50</u>	<u>19.0</u>	<u>1.0</u>	
<u>1305</u>	<u>23.77</u>	<u>6240</u>	<u>6.00</u>	<u>4.15</u>	<u>-148.8</u>	<u>0.97</u>	<u>46.50</u>	<u>21.0</u>	<u>1.0</u>	
<u>1307</u>	<u>Purge Done</u>									
<u>1308</u>							<u>46.50</u>			

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MXXV-38  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/16/09  
 Sampling Method: Tubing  
 Sampling Time: 1355

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 70'S

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder    
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.19 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 66.37 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y   
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
$CV = 3.14 [(D/2)/12 \text{ in. ft}]^2 h (7.48 \text{ gal/cu. ft.})$	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/16/09  
 Was Well Pumped Dry? Y  N  
 Fe<sup>2</sup> (mg/L): 0.8

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1331							61 ft BTOC			
1333	24.61	2636	6.12	1.75	-100.6	8.55	48.29	2.0	1.0	Aerated
1336	23.23	2355	5.94	1.58	-99.7	9.05	48.30	6.0	1.0	
1339	23.31	2318	5.93	1.55	-100.1	3.42	48.30	9.0	1.0	
1342	23.44	2359	5.92	1.58	-99.1	2.99	48.30	11.0	1.0	
1345	23.52	2418	5.92	1.62	-99.1	2.73	48.30	14.0	1.0	
1348	23.54	2504	5.92	1.66	-99.6	2.61	48.30	17.0	1.0	
1350	23.55	2520	5.92	1.68	-100.0	2.55	48.30	19.0	1.0	
1351	Purge Complete									
1355	Sample									

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

MONITOR WELL NO: 29  
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### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW 29 39  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/16/09  
 Sampling Method: Tube, Pump  
 Sampling Time: 1258

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/16/09  
 Weather: Sunny  
 Ambient Temp. (F): 72

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.32 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 87.31  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.183
<u>4</u>	<u>0.852</u>
6	1.468
D	CV = (23.49) x ((D/24) <sup>2</sup> )
CV = 3.14 ((D/2)/12 in.) <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/16/09  
 Was Well Pumped Dry? Y  N  
 Fe<sup>2</sup> (mg/L): 3.8

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1233										Start of Purge, Pump set @ 83' WL = 48.38
1236	24.41	5730	6.92	3.7	-122.2	2.02	48.38	3	1.0	Clean/slight odor
1239	24.48	5697	6.82	3.7	-118.9	.71	48.38	6	1.0	R 11
1242	25.07	5777	6.81	3.7	-120.5	.48	48.38	9	1.0	R 11
1245	25.92	5855	6.85	3.7	-120.9	.33	48.38	12	1.0	Clean
1248	26.09	5865	6.86	3.7	-120.8	.28	48.38	15	1.0	Clean
1251	26.18	5869	6.87	3.7	-120.4	.28	48.38	18	1.0	Clean
1254	26.04	5852	6.88	3.7	-120.7	.26	48.38	21	1.0	Clean
										Purge Complete - Sample Well @ 1258

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW40  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/16/09  
 Sampling Method: Tubing  
 Sampling Time: 1258

Job No: 17326064.03020  
 Sampler(s): T.Ahoul/A. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 70's

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.21 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 109.91  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y  N   
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N   
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/16/09  
 Was Well Pumped Dry? Y  N   
 Fe<sup>2</sup> (mg/L): 3.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1225	Set	Pump @		105 ft		BTDC				
1234	27.77			Start purge						
1236	22.73	6863	6.10	4.64	-164.3	4.42	48.33	3.0	1.0	Clear
1239	22.56	6849	6.00	4.66	-134.9	4.56	48.33	6.0	1.0	
1242	22.94	6869	6.00	4.64	-136.6	1.17	48.40	9.0	1.0	
1245	23.07	6855	5.99	4.62	-142.5	0.90	48.41	11.0	1.0	
1248	23.10	6835	5.99	4.61	-146.5	0.86	48.41	15.0	1.0	
1251	23.08	6824	5.99	4.60	-153.0	0.78	48.41	18.0	1.0	
1253	23.07	6812	5.99	4.59	-155.5	0.73	48.41	21.0	1.0	
1255	23.13	6815	5.99	4.59	-152.7	0.70	48.41	24.0	1.0	
1258										Purge Complete and Sample
1300	w/L						48.40			

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-41  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Travis, Pump  
 Sampling Time: 1555

Job No: 17326064.03020  
 Sampler(s): T. Ahou/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/14/09  
 Weather: SUNNY  
 Ambient Temp. (F): 76

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked) 49.95  
 2) Depth to Water Surface (DTW) \_\_\_\_\_ ft  
 (from casing top as marked) 97.74  
 3) Well Depth (WD): \_\_\_\_\_ ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	0.652
6	1.468
D	CV = (23.49) x ((D/24) <sup>2</sup> )
CV = 3.14 ((D/2)/12 in.ft) <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/14/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 4.5

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1530		Start of Purge - Pump Set @ 98.93' W.L. @ 50.00'								
1533	24.01	8610	6.95	5.7	-86.2	2.05	50.03	2.1	0.7	Clear/Slight odor
1536	23.88	8610	6.87	5.7	-85.8	.89	50.03	4.2	0.7	01 11
1539	24.40	8530	6.86	5.6	-89.8	.76	50.03	6.13	0.7	01 11
1542	24.59	8420	6.86	5.5	-90.9	.69	50.03	8.4	0.7	11 11
1545	24.89	8350	6.86	5.4	-92.1	.72	50.03	10.15	0.7	11 11
1548	25.23	8310	6.87	5.3	-94.7	.69	50.03	12.6	0.7	01 11
		Purge Complete - Sample time 1555								

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-42  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Tubing  
 Sampling Time: 16:10

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 77

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.62 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 66.48  
 (from casing top as marked)  
 4) Height of Water Column (H) 16.86 ft  
 (from casing top as marked)

Product Obs: Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/14/09  
 Was Well Pumped Dry? Y  N  
 Fe<sup>2</sup> (mg/L): 1.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1339	Start	Start					62 ft	5720		
1341	24.03	1886	6.28	1.29	-108.3	0.25	49.68	2.0	1	milky grey
1344	23.99	1824	5.84	1.26	-82.2	5.82	49.68	4.0	1	slty
1347	24.33	1827	5.80	1.20	-79.5	5.80	49.68	6.0	1	
1350	24.67	1831	5.82	1.19	-79.7	5.82	49.68	9.0	1	
1353	25.02	1832	5.91	1.18	-86.5	0.77	49.68	11.0	1	
1356	25.20	1834	5.97	1.18	-89.4	0.67	49.68	13.0	1	
1359	25.31	1834	5.99	1.18	-89.8	0.62	49.68	15.0	1	
Final							49.68			
1610 Sample										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MN-43  
 Sample No(s): 0805  
 Sampling Date: 5/15/09  
 Sampling Method: Tubing + Pump  
 Sampling Time: \_\_\_\_\_

Job No: 17326064.03020  
 Sampler(s): T. Ahouak, Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/15/09  
 Weather: Overcast  
 Ambient Temp. (F): 60

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.64 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 87.00 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y  N   
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y  N   
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	0.163
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ] CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
229 Hz  
 Purge Date: 5/15/09  
 Was Well Pumped Dry? Y  N   
 Fe<sup>2</sup> (mg/L): 1.9

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
0734							<u>83'</u>			<u>WL @ 49.64</u>
0737	21.87	4418	6.93	3.0	-130.8	1.00	49.69	2.1	0.7	<u>slight BRN/odor</u>
0740	22.33	4555	6.94	3.1	-127.4	1.06	49.69	4.2	0.7	<u>" "</u>
0743	23.10	4799	6.94	3.2	-122.9	.66	49.69	6.3	0.7	<u>clean/odor</u>
0746	24.48	5127	6.96	3.3	-123.2	.49	49.69	8.4	0.7	<u>" "</u>
0749	25.52	5264	6.98	3.3	-123.6	.39	49.69	10.5	0.7	<u>" "</u>
0752	25.31	5235	6.98	3.3	-122.1	.35	49.69	12.6	0.7	<u>" "</u>
0755	25.41	5240	6.97	3.3	-119.9	.31	49.69	14.7	0.7	<u>" "</u>
0758	25.31	5233	6.97	3.3	-117.8	.28	49.69	16.8	0.7	<u>" "</u>
0801	25.47	5252	6.96	3.3	-116.0	.28	49.69	18.9	0.7	<u>" "</u>
<u>Purge Complete - Sample Well 0805</u>										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-44  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/15/09  
 Sampling Method: TUBING  
 Sampling Time: 0810

Job No: 17326064.03020 \*  
 Sampler(s): T.Ahoual/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: overcast  
 Ambient Temp. (F): 60

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 49.68 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 105.05  
 (from casing top as marked)  
 4) Height of Water Column (H) 55.97 ft  
 (from casing top as marked)

Product Obs: Y  N   
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y  N   
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2.375</u>	<u>0.163</u>
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA** Low Flow\*

Single Casing Volume of Water in Well (VW) 9.12 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 27.3 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/15/09  
 Was Well Pumped Dry? Y  N   
 Fe<sup>2</sup> (mg/L): 4.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
<u>0715</u>	—	—	—	—	—	—	<u>99 ft BTOL</u>	—	—	—
<u>0736</u>	<u>21.22</u>	<u>7181</u>	<u>5.88</u>	<u>5.03</u>	<u>-218.2</u>	<u>8.14</u>	<u>49.71</u>	<u>3.0</u>	<u>.7</u>	<u>clear</u>
<u>0739</u>	<u>21.22</u>	<u>7263</u>	<u>5.97</u>	<u>5.08</u>	<u>-202.1</u>	<u>3.13</u>	<u>49.71</u>	<u>6.0</u>	<u>.1</u>	<u>Aerated</u>
<u>0742</u>	<u>21.31</u>	<u>7286</u>	<u>6.00</u>	<u>5.09</u>	<u>-201.9</u>	<u>1.84</u>	<u>49.71</u>	<u>8.0</u>	<u>.1</u>	↓
<u>0745</u>	<u>21.47</u>	<u>7332</u>	<u>6.02</u>	<u>5.11</u>	<u>-199.5</u>	<u>1.51</u>	<u>49.71</u>	<u>10.0</u>	<u>.1</u>	
<u>0748</u>	<u>21.73</u>	<u>7388</u>	<u>6.03</u>	<u>5.11</u>	<u>-188.6</u>	<u>1.24</u>	<u>49.71</u>	<u>14.0</u>	<u>.1</u>	
<u>0751</u>	<u>22.20</u>	<u>7455</u>	<u>6.04</u>	<u>5.12</u>	<u>-170.1</u>	<u>0.99</u>	<u>49.71</u>	<u>17.0</u>	<u>.1</u>	
<u>0754</u>	<u>22.20</u>	<u>7478</u>	<u>6.04</u>	<u>5.13</u>	<u>-167.9</u>	<u>0.88</u>	<u>49.71</u>	<u>20.0</u>	<u>.1</u>	
<u>0757</u>	<u>22.19</u>	<u>7494</u>	<u>6.04</u>	<u>5.14</u>	<u>-163.1</u>	<u>0.78</u>	<u>49.71</u>	<u>23.0</u>	<u>.1</u>	
<u>0800</u>	<u>22.19</u>	<u>7491</u>	<u>6.04</u>	<u>5.14</u>	<u>-159.9</u>	<u>0.75</u>	<u>49.71</u>	<u>26.0</u>	<u>.1</u>	
<u>0802</u>	<u>22.25</u>	<u>7490</u>	<u>6.04</u>	<u>5.14</u>	<u>-160.2</u>	<u>0.72</u>	<u>49.71</u>	<u>29.0</u>	<u>.1</u>	↓
<u>0828</u>	—	—	—	—	—	—	<u>49.71</u>	—	—	—

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-45  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5-18-09  
 Sampling Method: Tubing  
 Sampling Time: 1052

Job No: 17326064.03020  
 Sampler(s): T. Ahoud/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 79 49% Humidity

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder (Y) N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.32 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 88.80  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y (N)  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y (N)  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	0.163
4	0.652
6	1.468
D	CV = (23.49) x ((D/24) <sup>2</sup> )
CV = 3.14 ((D/2)/12 in.ft) <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5-18-09  
 Was Well Pumped Dry? Y (N)  
 Fe<sup>2</sup> (mg/L): 1.6

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
				<u>Self Pump</u>			<u>85 ft</u>	<u>BTOC</u>		
1035	22.36	3068	6.27	2.12	-1387	3.76	48.38	2.0	1.0	milky grey
1039	22.34	2975	6.28	2.04	-1360	2.84	48.38	4.0	1.0	
1042	22.40	2973	6.25	2.03	-1372	2.05	48.38	6.0	1.0	
1045	22.71	3072	6.14	2.08	-1395	1.39	48.38	8.0	1.0	
1049	22.79	3079	6.15	2.11	-1409	1.37	48.38	10.0	1.0	
1051	22.81	3082	6.14	2.13	-1423	1.24	48.38	12.0	1.0	
1052	Purge Complete			Sample						
	Final w/2						48.35			

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-46  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Pump/tube  
 Sampling Time: 0950

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/16/09  
 Weather: Sunny  
 Ambient Temp. (F): 65

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 47.87 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 67.40 <sup>30</sup> 67.04 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/14/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 1.5

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
0916										Start of Purge Pump @ 63' WL 47.87
0919	23.19	3058	7.02	2.0	-122.	1.55	47.95	3	1.0	Clear/odor
0922	24.39	3138	7.00	2.0	-128.	1.85	47.95	6	1.0	" "
0925	25.33	3187	7.05	2.0	-136.4	1.67	47.95	9	1.0	" "
0928	24.75	3149	7.05	2.0	-137.1	1.51	47.95	12	1.0	" "
0931	24.75	3119	7.02	2.0	-135.4	1.39	47.95	15	1.0	" "
0934	24.66	3089	7.01	2.0	-134.8	1.34	47.95	18	1.0	" "
0937	24.68	3069	7.00	2.0	-134.9	1.30	47.95	21	1.0	" "
0940	24.80	3064	7.03	2.0	-136.0	1.26	47.95	24	1.0	" "
0943	24.86	3077	7.03	2.0	-136.9	1.26	47.94	27	1.0	" "
0947	24.59	3049	7.01	2.0	-135.8	1.25	47.94	30	1.0	" "
										JH Purge Complete - Sample time 0950

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW47  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/16/09  
 Sampling Method: Tubing  
 Sampling Time: 1045

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 65

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder Y N  
 Other: \_\_\_\_\_

- Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.72 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 87.96  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 [(D/2)/12 in.] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/16/09  
 Was Well Pumped Dry? Y N  
 Fe<sup>2</sup> (mg/L): 0.6

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
							<u>Pump set @ 83 ft</u>			
1023										
1026	<u>22.49</u>	<u>22.84</u>	<u>6.21</u>	<u>1.57</u>	<u>-233.5</u>	<u>5.12</u>	<u>48.83</u>	<u>3</u>	<u>0.7</u>	
1029	<u>22.44</u>	<u>2466</u>	<u>6.14</u>	<u>1.68</u>	<u>-240.0</u>	<u>2.77</u>	<u>48.83</u>	<u>10.0</u>	<u>1.2</u>	
1032	<u>22.49</u>	<u>2506</u>	<u>6.13</u>	<u>1.71</u>	<u>-249.2</u>	<u>2.26</u>	<u>48.83</u>	<u>14.0</u>	<u>1.2</u>	
1035	<u>22.86</u>	<u>2535</u>	<u>6.11</u>	<u>1.71</u>	<u>-247.2</u>	<u>1.79</u>	<u>48.83</u>	<u>17.5</u>	<u>1.2</u>	
1038	<u>22.97</u>	<u>2544</u>	<u>6.14</u>	<u>1.72</u>	<u>-247.7</u>	<u>1.74</u>	<u>48.83</u>	<u>22.0</u>	<u>1.2</u>	
1041	<u>23.02</u>	<u>2547</u>	<u>6.16</u>	<u>1.70</u>	<u>-248</u>	<u>1.68</u>	<u>48.83</u>	<u>25.5</u>	<u>1.2</u>	
1043	<u>23.23</u>	<u>2558</u>	<u>6.17</u>	<u>1.71</u>	<u>-249.0</u>	<u>1.76</u>	<u>48.83</u>	<u>27.0</u>	<u>1.2</u>	

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: make # 06K 1696

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re





### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-50  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/18/09  
 Sampling Method: Pump/tube  
 Sampling Time: 1045

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/K. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/18/09  
 Weather: Sunny  
 Ambient Temp. (F): 78

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 47.21 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 88.50  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV) (gals)
<u>2"</u>	<u>0.163</u>
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/18/09  
 Was Well Pumped Dry? Y  N  
 Fe<sup>2</sup> (mg/L): 1.2

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1020										Start of purge. Pump @ 84'
1023	23.88	4578	7.21	2.9	-198.4	.75	47.45	3	1.0	cloudy/stringy debris
1026	23.98	4227	7.17	2.7	-188.7	.59	47.45	6	1.0	11 11
1029	24.05	4151	7.14	2.7	-187.6	.53	47.45	9	1.0	clean/stringy debris
1032	24.09	4113	7.14	2.7	-188.2	.49	47.45	12	1.0	11 11
1035	24.20	4078	7.15	2.6	-186.6	.43	47.45	15	1.0	11 11
1038	24.17	4041	7.16	2.6	-185.1	.43	47.45	18	1.0	11 11
1041	24.18	4018	7.16	2.6	-185.1	.40	47.45	21	1.0	
										Purge Complete - Sample time 1045

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re





### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-53  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/18/09  
 Sampling Method: Tubi No  
 Sampling Time: 0935  
 Job No: 17326064.03020  
 Sampler(s): T. Ahoua/D. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 77 47% Humidity

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounding  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 47.35 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 100.14  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	<u>0.163</u>
4	0.652
6	1.468
D	CV = (23.49) x ((D/24) <sup>2</sup> )
CV = 3.14 ((D/2)/12 in.ft) <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Purge Method: 2" Grundfos submersible pump  
 Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)  
 Purge Date: 5/18/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 1.2

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
0909			9.6	FT	BT					
0910									.7	
0912	21.42	5557	6.88	3.87	-217.7	6.01	47.50	6.0	1.0	Dark grey silt
0915	21.49	5695	6.21	3.96	-219.1	3.10	47.50	9.0	1.0	Hydrocarbon sweet odor
0918	22.18	5806	6.23	3.98	-221.8	1.50	47.49	11.0	1.0	clearing
0921	22.24	5854	6.24	4.01	-220.4	1.19	47.48	14.0	1.0	
0924	22.24	5867	6.24	4.02	-220.0	1.15	47.48	17.0	1.0	
0927	22.25	5882	6.24	4.03	-219.5	1.11	47.48	21.0	1.0	
0928							47.48			
0935										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: sulfate smell

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW54  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/17/09  
 Sampling Method: Tubing  
 Sampling Time: 1:20

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny Hazy clouds  
 Ambient Temp. (F): 92.81

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 47.20 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 113.19  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft. (gals)
2	0.163
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 ((D/2)/12 in.ft) <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/17/09  
 Was Well Pumped Dry? Y  N  
 Fe<sup>2</sup> (mg/L): 4.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
<u>Set Pump @ 109 ft BTOC</u>										
<u>11:01</u>	<u>24.26</u>	<u>6008</u>	<u>6.03</u>	<u>4.3</u>	<u>-174.9</u>	<u>5.53</u>	<u>47.21</u>	<u>4.0</u>	<u>1.0</u>	<u>Brown</u>
<u>11:04</u>	<u>22.10</u>	<u>6643</u>	<u>5.87</u>	<u>4.5</u>	<u>-180.2</u>	<u>7.53</u>	<u>47.21</u>	<u>6.0</u>	<u>1.0</u>	
<u>11:07</u>	<u>22.18</u>	<u>6691</u>	<u>5.86</u>	<u>4.6</u>	<u>-180.6</u>	<u>1.37</u>	<u>47.21</u>	<u>8.0</u>	<u>1.0</u>	
<u>11:10</u>	<u>22.98</u>	<u>6801</u>	<u>5.86</u>	<u>4.6</u>	<u>-184.3</u>	<u>1.17</u>	<u>47.21</u>	<u>10.0</u>	<u>1.0</u>	<u>clearing</u>
<u>11:13</u>	<u>22.98</u>	<u>6916</u>	<u>5.86</u>	<u>4.7</u>	<u>-185.0</u>	<u>1.04</u>	<u>47.21</u>	<u>12.0</u>	<u>1.0</u>	
<u>11:16</u>	<u>22.52</u>	<u>6999</u>	<u>5.85</u>	<u>4.7</u>	<u>-185.4</u>	<u>1.01</u>	<u>47.21</u>	<u>14.0</u>	<u>1.0</u>	
<u>11:19</u>	<u>22.56</u>	<u>7063</u>	<u>5.87</u>	<u>4.8</u>	<u>-186.4</u>	<u>1.03</u>	<u>47.21</u>	<u>16.0</u>	<u>1.0</u>	
<u>11:20</u>	<u>Purge</u>	<u>Complete</u>	<u>Sample</u>							

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-55  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 8/15/09  
 Sampling Method: Tobing  
 Sampling Time: 1411

Job No: 17326064.03020  
 Sampler(s): T. Ahoua/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny  
 Ambient Temp. (F): 77

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 53.02 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 138.00  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	<u>0.163</u>
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>3</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: \_\_\_\_\_  
 Was Well Pumped Dry? Y  N   
 Fe<sup>2</sup> (mg/L): 0.6 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1350										
Sub pump @ 133 ft BTWC										
1353	24.45	2994	6.17	2.2	-198.9	5.68	53.07	2.0	1.0	
1356	22.97	3409	6.10	2.3	-194.8	4.80	—	4.0	1.0	
1359	23.40	3782	6.00	2.55	-196.1	2.98	—	6.0	1.0	milky TAN
1402	23.32	4182	5.96	2.81	-188.8	2.93	—	9.0	1.0	Sweet odor
1404	23.52	4347	5.93	2.91	-186.2	2.82	—	11.0	1.0	
1406	23.47	4426	5.94	2.95	-180.2	2.72	—	13.0	1.0	
1408	23.51	4428	5.94	2.99	-176.7	2.50	—	15.0	1.0	
1400	23.48	4429	5.94	3.01	-175.7	2.42	—	17.0	1.0	

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: MW-56  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/17/09  
 Sampling Method: Pump/tube  
 Sampling Time: 1120

Job No: 17326064.03020  
 Sampler(s): T. Ahdal/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/17/09  
 Weather: Partly Cloudy  
 Ambient Temp. (F): 80

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder Y N  
 Other: \_\_\_\_\_  
 Screened Interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 48.03 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 72.30  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
<u>2</u>	<u>0.163</u>
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/17/09  
 Was Well Pumped Dry? Y (N)  
 Fe<sup>2</sup> (mg/L): 1.0

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1049	-	Start	0.9	Purge	-	Pump	Set @ 68'			WL = 48.03
1052	24.36	2650	7.10	1.6	-108.0	.93	48.10	3	1.0	Clean/slight odor
1055	24.14	1948	7.00	1.2	-97.3	.86	48.10	6	1.0	" "
1058	24.85	2061	6.96	1.3	-97.0	.56	48.10	9	1.0	" "
1101	25.16	2120	6.98	1.3	-99.5	.48	48.10	12	1.0	" "
1104	25.16	2139	6.99	1.3	-100.0	.45	48.10	15	1.0	" "
1107	25.07	2152	6.97	1.3	-99.5	.34	48.10	18	1.0	" "
1110	25.11	2152	6.96	1.3	-99.6	.33	48.10	21	1.0	" "
1113	25.11	2166	6.97	1.3	-101.6	.24	48.10	24	1.0	" "
1116	25.16	2171	6.97	1.4	-102.3	.23	48.10	27	1.0	" "
1119	25.12	2173	6.97	1.4	-102.7	.22	48.10	30	1.0	" "
Purge Complete - Sample time 1120										

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks \_\_\_\_\_

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: EW-1  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/12/09  
 Sampling Method: Tubing, Pump  
 Sampling Time: 1445

Job No: 17326064.03020  
 Sampler(s): T. Ahoua (J. Nutter)  
 Reviewer(s): \_\_\_\_\_ Date: 5/12/09  
 Weather: SUNNY  
 Ambient Temp. (F): 72

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 50.05 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 89.95  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/12/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 2.4

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1421		Start of Purge			Purge depth @ 63 ft					Clear
1423	24.43	4790	6.60	0.00	-25.7	1.19	49.76	2.1	0.7	↓
1426	24.74	4830	6.53	0.00	-26.4	.59	49.76	4.2	0.7	
1429	24.74	4830	6.53	0.00	-26.9	.57	49.76	6.3	0.7	
1431	24.76	4830	6.54	0.00	-28.1	.52	49.76	8.4	0.7	
1434	24.87	4840	6.57	0.00	-30.0	.45	49.76	10.5	0.7	
1437	24.90	4840	6.60	0.00	-31.2	.42	49.76	12.6	0.7	
1440	24.86	4840	6.61	0.00	-32.0	.39	49.76	14.7	0.7	
		Purge Complete			Sample @ 1445					

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks  
Pump @ 226 Hz

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: EW-2  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/14/09  
 Sampling Method: Tubing, Pump  
 Sampling Time: 0840

Job No: 17326064.03020  
 Sampler(s): T. Ahouff/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/14/09  
 Weather: Overcast  
 Ambient Temp. (F): 58

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 50.00 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 82.95  
 (from casing top as marked)  
 4) Height of Water Column (H) \_\_\_\_\_ ft  
 (from casing top as marked)

Product Obs:  Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe  Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
4	0.652
<input checked="" type="radio"/> 6	1.468
D	$CV = (23.49) \times [(D/24)^2]$
CV = 3.14 ((D/2)/12 in.ft) <sup>2</sup> h (7.48 gal/cu. Ft.)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) \_\_\_\_\_ gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) \_\_\_\_\_ gals  
 Total Volume of Water to Purge (TV) \_\_\_\_\_ gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/14/09  
 Was Well Pumped Dry?  Y  N  
 Fe<sup>2</sup> (mg/L): 0.1

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Removed Flow Rate (L)	Water Level (#. bgs)	Removed Flow Rate (L/min)	Water Level (ft/min)	Observations Phys. App.	
0822		Start	of	Purge	- Pump Set	@ 63'	WL	@ 50.00				
0825	21.85	4190	7.03	2.9	-172.8	1.41	2.1	0.7	50.60		Strong odor	
0828	23.38	4380	7.11	2.9	-175.7	1.06	4.2	0.7	50.62		11 11	
0831	23.85	4440	7.12	2.9	-175.6	.91	6.3	0.7	50.62		11 11	
0834	24.37	4500	7.14	2.9	-175.3	.80	8.4	0.7	50.62		11 11	
0837	24.74	4540	7.14	2.9	-174.2	.76	10.5	0.7	50.62		11 11	
0840	25.04	4570	7.15	2.9	-173.6	.73	12.6	0.7	50.62		11 11	
0840		Purge Complete - Sample time					0840					

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks Very Strong odor at well head.

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: SYE-1  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/12/09  
 Sampling Method: \_\_\_\_\_  
 Sampling Time: 1500

Job No: 17326064.03020  
 Sampler(s): T. Ahoual/J. Nutter  
 Reviewer(s): \_\_\_\_\_ Date: \_\_\_\_\_  
 Weather: Sunny Partly clouds  
 Ambient Temp. (F): 70

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  Y  N  
 Other: \_\_\_\_\_  
 Screened interval: \_\_\_\_\_  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 37.11 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 43.26 ft  
 (from casing top as marked)  
 4) Height of Water Column (H) 6.15 ft  
 (from casing top as marked)

Product Obs: Y  N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y  N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	<u>0.652</u>
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
	CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft.)

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) 4.0 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 12.0 gals  
 (VW x NC = TC)

Purge Method: 2" Grundfos submersible pump  
 Purge Date: 5/12/09  
 Was Well Pumped Dry? Y  N   
 Fe<sup>2</sup> (mg/L): 0.8 mg/L

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1420										Set pump @ 42 ft @ 370 L
1433									.5	Black silt tank
1435	22.45	555	6.88	36	-125.7	5.52	37.81	2.0	.25	Dark Grey turbid
1438	22.46	553	6.85	36	-132.7	2.80	37.86	3.5	.25	
1440	22.34	545	6.83	36	-131.4	1.88	37.79	4.5	.25	
1442	22.45	543	6.82	35	-131.7	1.46	37.78	5.5	.25	
1444	22.44	541	6.82	35	-131.8	1.12	37.71	6.5	.25	
1446	22.46	540	6.83	35	-134.3	1.02	37.71	7.0	.25	
1448	22.49	539	6.84	35	-135.9	1.01	37.71	7.5	.25	
1450										Final w/L 37.71

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: Set at 139 Hz ; small pockets of Hydrocarbon swirls in the water Aerating with HCL and vent some foaming with HNO3 Foams in Air

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

### Monitor Well Sampling Data

Project: Cooper Drum  
 Location No: SVE-2  
 Sample No(s): \_\_\_\_\_  
 Sampling Date: 5/13/09  
 Sampling Method: Bailer  
 Sampling Time: 1500

Job No: 17326064.03020  
 Sampler(s): T. Ahouak, Nutter  
 Reviewer(s): \_\_\_\_\_ Date: 5/13/09  
 Weather: Sunny  
 Ambient Temp. (F): 75 - 2ndors

**WATER ELEVATION DATA**

Method of Measurement: Depth Sounder  N  
 Other: \_\_\_\_\_  
 Screened interval:  
 1) Well Casing Elevation (WCE) \_\_\_\_\_ ft  
 (from casing top as marked)  
 2) Depth to Water Surface (DTW) 40.17 ft  
 (from casing top as marked)  
 3) Well Depth (WD): 51.14  
 (from casing top as marked)  
 4) Height of Water Column (H) 10.97 ft  
 (from casing top as marked)

Product Obs: Y N  
 Depth to Product: \_\_\_\_\_  
 Method of Measurement: Interface Probe Y N  
 Other: \_\_\_\_\_

Well Diameter (in)	Casing Volume (CV)/ft (gals)
2	0.163
<u>4</u>	0.652
6	1.468
D	CV = (23.49) x [(D/24) <sup>2</sup> ]
CV = 3.14 [(D/2)/12 in.ft] <sup>2</sup> h (7.48 gal/cu. Ft)	

**WELL PURGE AND SAMPLING DATA**

Single Casing Volume of Water in Well (VW) 7.15 gals  
 (CV x H = VW)  
 Number of Casing Volumes to Purge (NC) 3 gals  
 Total Volume of Water to Purge (TV) 21.45 gals  
 (VW x NC = TV)

Purge Method: 2" Grundfos submersible pump Bailer  
 Purge Date: 5/13/09  
 Was Well Pumped Dry? Y   
 Fe<sup>2</sup> (mg/L): \_\_\_\_\_

Time	Temp (C)	Cond (umhos)	pH	Turbidity (NTU)	ORP (mV)	D.O. (mg/L)	Water Level (ft. bgs)	Removed (L)	Flow Rate (L/min)	Observations Phys. App.
1430										Start of Purge
1438										4 Gallons
1442										8 Gallons total
1447										12 Gallons total
1452										16 Gallons total
1500										Sample wells - per Don Gruber: No Reads taken on Fe <sup>2</sup> read. No filter on Metals
										Post Purge WL - 41.89

**INSTRUCTIONS AND COMMENTS**

Purging/Sampling Remarks: Well bailed <sup>5N</sup> nearly nearly dry. Waited for recovery to 43 ft., then sampled

Note: A complete list of containers and analyses used can be found in the associated sample log. The final row of readings should list the time sampling was completed and an estimate of the total volume of water removed. Water measurements should be re

URS CORPORATION

562 824 0018 Arnold

HYDRODATA SHEET

Project Cooper Drumm Event \_\_\_\_\_

Sampler DJ

Project No. Water Levels Datum \_\_\_\_\_

Sheet 1 of 3

WELL or LOCATION	DATE	TIME	MEASUREMENT	TOTAL DEPTH	COMMENTS
MW-12	5-19-09	1027	51.05		
MW-10		1031	50.83		
MW-8		1036	50.16		
MW-14		1041	43.98		good reading
MW-3		1054	48.19		
MW-2		1111	51.25		
EW-2		1114	50.24		
SVB-1		1117	37.20		
MW 33B		1132	49.67		
MW 3A		1133	49.84		lock
EW-1		1136	50.20		plus lock
MW 20B		1139	49.41		plus lock
MW 20		1142	49.80		lock
MW 21		1146	50.46		lock
MW-5		1149	36.89		lock
MW-4		1152	49.56		lock
MW-1		1159	46.82		lock
MW 41		1301	49.97		
MW 42B		1304	49.72		
MW 42		1306	49.78		
MW-44		1307	49.75		
MW 34		1309	48.90		
MW-35		1311	49.08		
MW-37	✓	1315	54.07		



URS CORPORATION

HYDRODATA SHEET

Project Cooper Drum

Event Water level

Sampler T. Anwar  
Water

Project No. 17326064.03020

Datum \_\_\_\_\_

Sheet 3 of 3

WELL or LOCATION	DATE	TIME	MEASUREMENT	TOTAL DEPTH	COMMENTS
MW 56	5/19/09	1304	48.02	—	
MW 52	5/19/09	1312	47.24	—	
MW 53	5/19/09	1313	47.46	—	
MW 54	5/19/09	1314	47.92	—	
MW 49	5/19/09	1316	47.09	—	
MW 50	5/19/09	1317	47.22	—	
MW 51	5/19/09	1318	47.21	—	
MW 48	5/19/09	1321	47.75	—	
MW 47	5/19/09	1322	47.80	—	
MW 46	5/19/09	1323	47.90	—	
MW 40	5/19/09	1327	48.28	—	
MW 39	5/19/09	1328	48.40	—	
MW 38	5/19/09	1329	48.27	—	
MW 55	5/19/09	1333	53.15	—	
EW-3	5/19/09	1337	48.63	—	1" Sounding post
EW-3	5/19/09	1337	48.57	—	6" Well
MW-37	5/19/09	1340	48.84	—	
MW-36	5/19/09	1342	48.72	—	
MW-45	5/19/09	1349	48.32	—	
MW-29A	5/19/09	1355	48.68	—	
MW-30	5/19/09	1356	49.51 *	—	
MW-29	5/19/09	1357	48.80 *	—	
MW-27	5/19/09	1400	49.42	—	
MW-28	5/19/09	1402	49.60 *	—	

\* From PVC

URS CORPORATION

HYDRODATA SHEET

Project Cooper Draw

Event Water Levels  
P-test

Sampler DJ

Project No. \_\_\_\_\_

Datum \_\_\_\_\_

Sheet 1 of 34

WELL or LOCATION	DATE	TIME	MEASUREMENT	TOTAL DEPTH	COMMENTS
MW-15	5/4/09		49.8490		
MW-15	5/7		49.96		
MW-15B	5/4		49.81		
MW-15B	5/7		49.86		
MW-24	5/4		49.41		✓
MW-24	5/7		49.49		
MW-25	5/4		49.21		?
MW-25	5/7		49.40		
MW-25B	5/4		49.31		✓
MW-25B	5/7		49.31		
MW-31A	5/4		48.55		✓
MW-31A	5/7		48.62		
MW-31	5/4		48.99		✓
MW-31	5/7		49.04		
MW-31B	5/4		49.25		✓
MW-31B	5/7		49.30		
MW-27	5/4		49.39		✓
MW-27	5/7		49.48		
MW-28	5/4		49.65		✓
MW-28	5/7		49.68		
MW-29A	5/4		48.69		✓
MW-29A	5/7		48.75		
MW-29	5/4		48.95		✓
MW-29	5/7		48.99		

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HYDRODATA SHEET

Project Cooper Dam

Event Water Levels

Sampler DJ

Project No. \_\_\_\_\_

Datum P-1st

Sheet 2 of 34

WELL or LOCATION	DATE	TIME	MEASUREMENT	TOTAL DEPTH	COMMENTS
MW-30	5/4		49.62 ✓		
MW-30	5/7		49.65		
MW-34	5/4		48.86 ✓		
MW-34	5/7		48.93		
MW-35	5/4		49.02 ✓		
MW-35	5/7		49.08		
MW-41	5/4		49.92 ✓		
MW-41	5/7		50.00		
MW-42	5/4		49.78 ✓		
MW-42	5/7		49.81		
MW-43	5/4		49.73 ✓		
MW-43	5/7		49.78		
MW-44	5/4		49.74 ✓		
MW-44	5/7		49.78		
MW-45	5/4		48.33 ✓		
MW-45	5/7		48.34		
MW-36	5/4		48.73 ✓		
MW-36	5/7		48.77		
MW-37	5/4		48.83 ✓		
MW-37	5/7		48.88		
EW-1 1"	5/4		48.63 ✓		
EW-1 1"					
EW-1 6"					
EW-1 6"	5/7		48.65		

URS CORPORATION

HYDRODATA SHEET

Project Copper Drawn Event Water levels Sampler DA  
P-test  
 Project No. \_\_\_\_\_ Datum \_\_\_\_\_ Sheet 3 of 4

WELL or LOCATION	DATE	TIME	MEASUREMENT	TOTAL DEPTH	COMMENTS
MW-38	5/4		48.20 ?		
MW-38	5/7		48.35		
MW-39	5/4		48.39 ✓		
MW-39	5/7		48.44		
MW-40	5/4		48.26 ✓		
MW-40	5/7		48.35		
MW-46	5/4		47.90 ✓		
MW-46	5/7		47.94		
MW-47	5/4		47.80 ✓		
MW-47	5/7		47.82		
MW-48	5/4		47.75 ✓		
MW-48	5/7		47.79		
MW-49	5/4		47.06 ✓		
MW-49	5/7		47.10		
MW-50	5/4		47.20 ✓		
MW-50	5/7		47.22		
MW-51	5/4		47.20 ✓		
MW-51	5/7		47.22		
MW-52	5/4		47.18 ✓		
MW-52	5/7		47.22		
MW-53	5/4		47.37 ?		
MW-53	5/7		47.42		
MW-54	5/4		47.80 ?		
MW-54	5/7		47.81		



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**ATTACHMENT 6**

**Recommendations for Perched Aquifer Sampling  
Technical Memorandum and**

**MW-12 Decommissioning**

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## TECHNICAL MEMORANDUM

**TO:** Eric Yunker, EPA

**FROM:** Don Gruber, URS

**Date:** September 28, 2009

**SUBJECT:** Recommendations for Perched Aquifer Sampling East of Cooper Drum Site

Results of recent (April 2009) depth-discrete groundwater sampling from four soil borings indicates that contaminated groundwater in the perched aquifer has migrated east of the primary source area (former Hard Wash Area [HWA]) on the Cooper Drum site. The groundwater is contaminated with volatile organic compounds (VOCs) and 1,4-dioxane (see sample results for SB-42 through SB-45 on Figure 1). The extent of vertical migration of the contamination from the perched aquifer may be limited to the lower Bellflower Aquiclude, which underlies the perched aquifer. The shallow Gaspur aquifer which underlies the Bellflower Aquiclude does not appear to be affected in this area. This is largely based on non-detect (ND)/low level concentrations in groundwater sampling results for MW-17 (see Figure 1), which is screened in the shallow Gaspur Aquifer.

Sample results for MW-12 (located 65 feet NE of MW-17), indicate an increasing trend for VOCs and 1,4-dioxane. MW-12 is screened from 42 to 62 feet below ground surface (bgs) which is contiguous to the bottom of the perched aquifer, the Lower Bellflower Aquiclude, and the top of the Gaspur Aquifer. Based on the MW-12 well design, results from this well cannot be identified with a specific aquifer zone. Lower water elevation in MW-12 (versus higher water elevations in the perched aquifer) is consistent with MW-17 and the shallow Gaspur Aquifer, suggesting that MW-12 may be acting as a conduit between the perched aquifer and the Gaspur Aquifer.

Similar to the contaminant migration in groundwater, soil gas concentrations may also be elevated east of the HWA. Figures 3-6 to 3-20 in the OU 2 Remedial Design (RD) report (URS, 2007) depict VOC soil gas concentrations (isocontours) in unsaturated soil underneath the HWA, and also the Drum Processing Area (DPA). Further review of individual Figures 3-6, 3-9, and 3-11 (attached) indicates that the extent of VOC soil gas concentrations at levels exceeding 1,000 parts per billion by volume (ppbv) may not be defined east of the HWA, in the general vicinity of the intersection of Coryal Street (Alley Way) and Rayo Avenue. This is represented by dashed isocontours in these figures. Considering the recent groundwater sampling results, these data suggest that soil gas contamination may also extend east of the HWA.

Based on the recent groundwater sampling results and the review of the historic soil gas data, the following actions/sampling locations are recommended to further delineate the extent of the soil and groundwater contamination east of the HWA. The recommended sampling locations are shown on Figure 2.

- Collect soil gas samples at depths of 10, 20, and 30 feet bgs from six soil boring locations. Analyze these samples for VOCs.

- Four of the soil gas borings should be adjacent to SB-42 through SB-45, a fifth boring should be located at the intersection of Corval Street and Rayo Avenue, and the sixth boring should be placed north of SB-43, where a dual completion monitor well is also recommended (Figure 2).
- Approximately 35 feet west of MW-12, install a dual completion monitor well (MW-A/B) on the east side of Rayo Avenue (Figure 2), with well screened intervals in the perched aquifer and the shallow Gaspur Aquifer, respectively.
- Approximately 100 feet northeast MW-A/B, install a dual completion monitor well (MW-C/D) along the east side of Rayo Avenue (Figure 2), with screened intervals in the perched aquifer and the Gaspur Aquifer, respectively.
- Since contamination has been confirmed to be present in the perched aquifer along the east side of Rayo Ave, destruction of MW-12 should be performed as soon as possible because this well is likely acting as a conduit for migration of the contaminants from the perched aquifer to the Gaspur Aquifer.

The proposed soil gas borings and monitor well locations will provide additional hydraulic (water level) data and analytical data for:

- Characterization of the vadose zone, perched aquifer and the Gaspur Aquifer east of the HWA,
- Evaluation of the need for expanding treatment into this area; and
- Differentiation of ugradient contamination found in shallow Gaspur Aquifer that is not associated with the Cooper Drum Plume (see results for MW-19, Figure 1). The contamination in MW-19 is considered to be related to the Jervis Webb site.

Remediation of contamination in unsaturated soil and perched aquifer directly beneath the HWA is addressed in the current remedial design (RD) for Operable Unit 2 (OU 2). As indicated above, the RD may have to be extended east of the HWA to address the recent discovery of contamination in that area. The six DPE wells (DPE-1 through DPE-6) included in the OU2 RD are shown on Figure 2.

Expanding treatment east of the HWA following further delineation of the extent of contamination may comprise the following:

- Installation of one additional extraction well (DPE-10), screened in the perched aquifer (between 30 and 45 feet bgs) and equipped with a 0.5 hp submersible pump, 60 feet southeast of DPE-3 (Figure 2). Construction of a shallow vapor extraction well, with screened interval from 10 feet bgs to 30 feet bgs, should be considered at this location if soil gas VOC concentrations are found to be greater than 1,000 ppbv.
- Installation of one additional extraction well (DPE-11), screened in the perched aquifer (between 30 and 45 feet bgs) and equipped with a 0.5 hp submersible pump, 60 feet southwest of DPE-10 (Figure 2). Construction of a vapor extraction well, with screened interval from 10

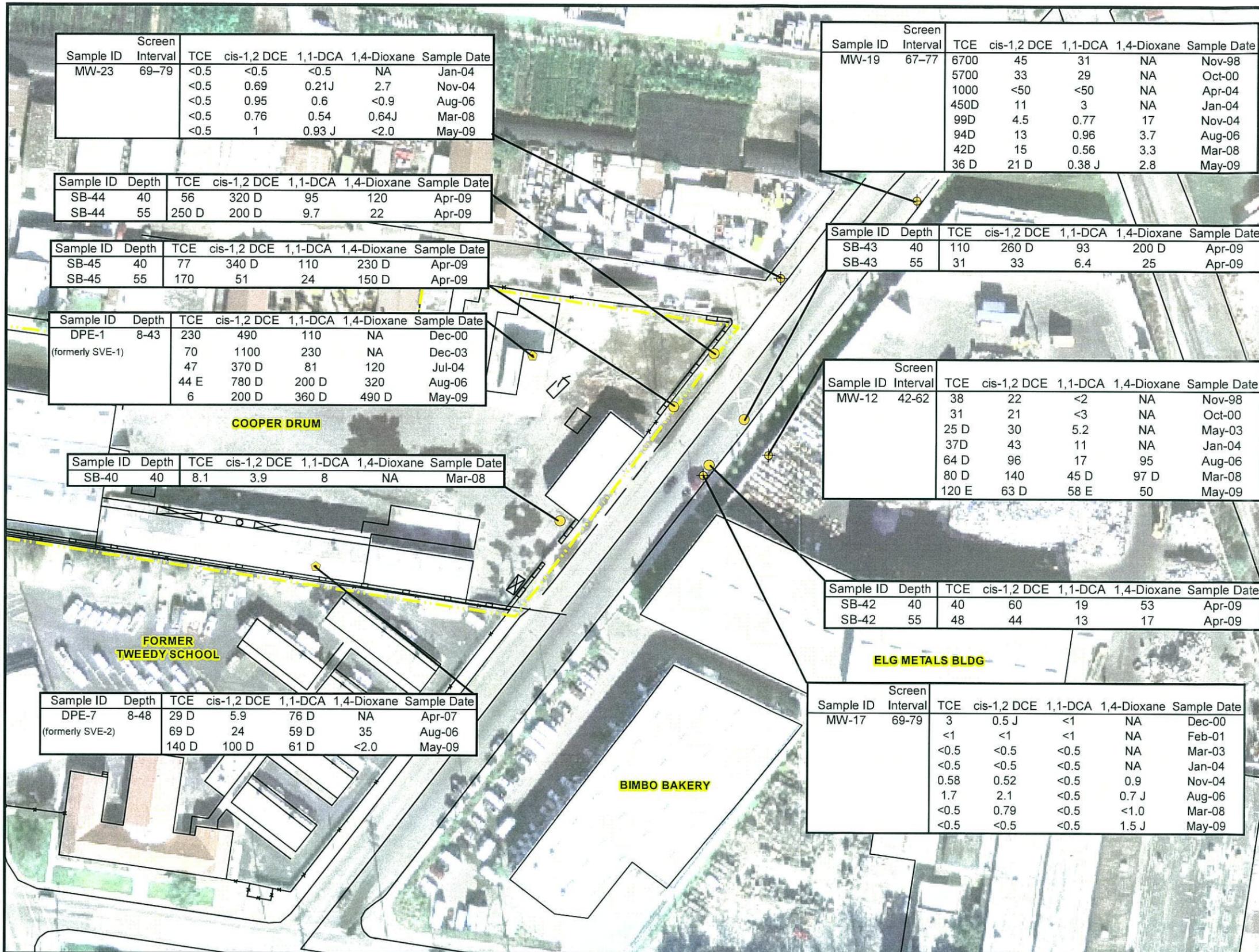
feet bgs to 30 feet bgs, should be considered at this location if soil gas VOC concentrations are found to be greater than 1,000 ppbv.

- Connection of the new DPE well(s) to the existing DPE piping manifold.

The current design flow rate for water from the perched aquifer and the vapor treatment system condensate is approximately 10 gallons per minute (gpm). Addition of the two new DPE well(s) can add between 1 to 2 gpm to this design flow rate. This represents a small increase and should not affect the treatment system design. If elevated soil gas concentrations are detected at the soil boring locations east of the Site, one or both of the new DPE wells may need to be constructed as dual completion wells, with a shallow screened interval in the vadose zone to allow for soil vapor extraction. With respect to additional soil gas extraction at the new DPE well location(s), purchase of a larger blower and Cat-Ox/scrubber system can be considered, although the system operation would preferably be adjusted so as not to exceed the basis of design and necessitate costly upgrades of the treatment system.

The cost for the additional soil gas sampling and monitor well installations is estimated to be in a range from \$37,000 to \$44,000.

The cost for installation of the two DPE wells is estimated to be in a range from \$26,000 to \$32,000. Additional cost to include two shallow vapor extraction wells with the deeper DPE wells is estimated to be in a range of \$16,000 to \$20,000.

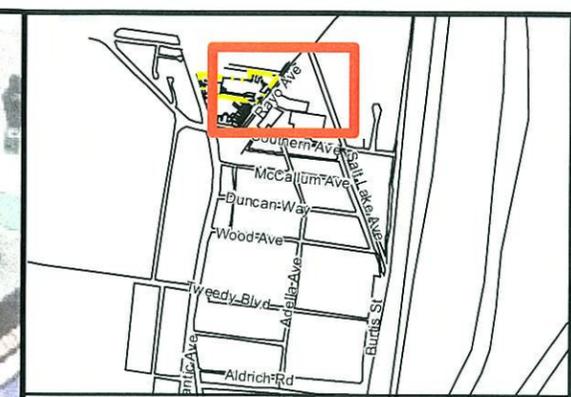
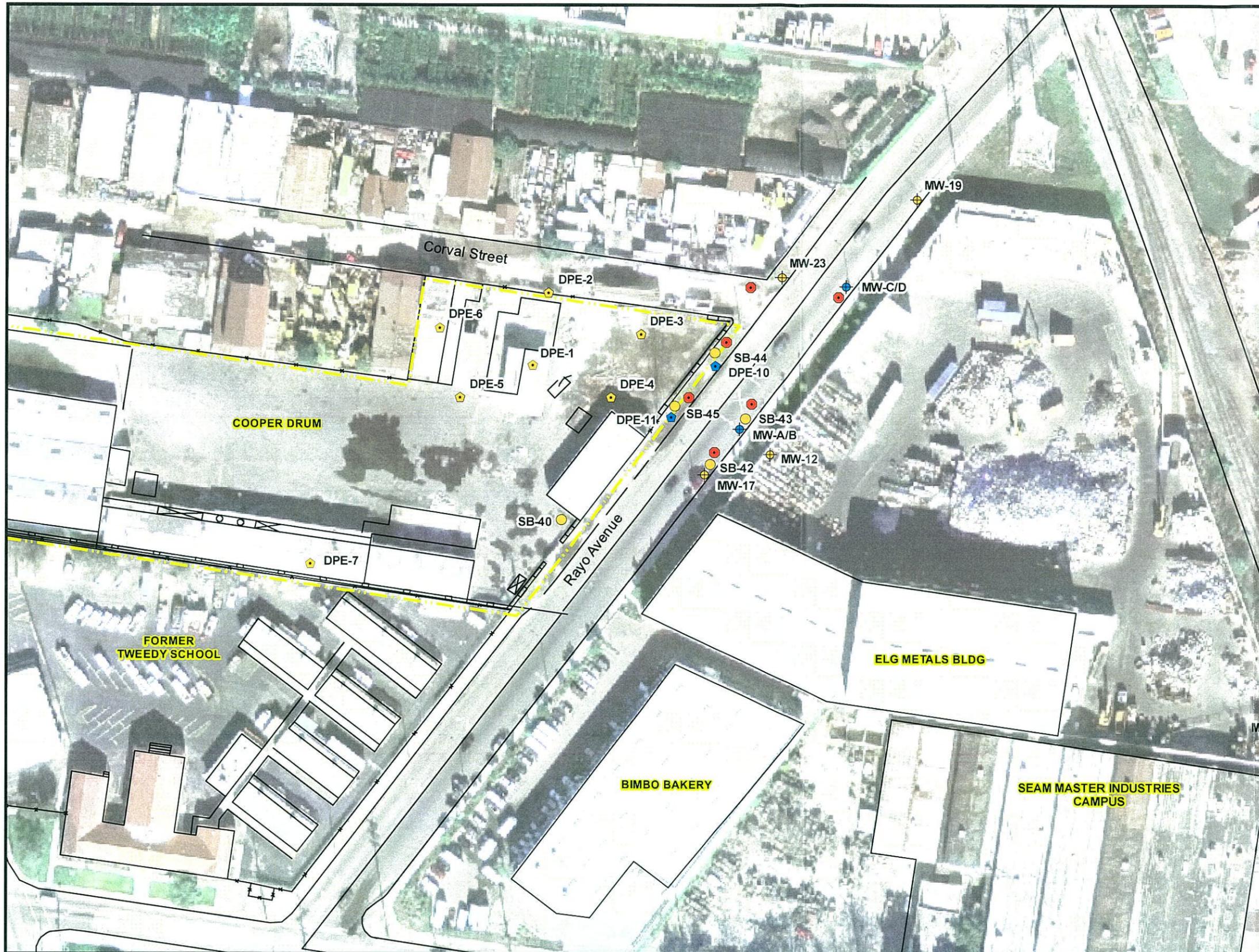


**Legend**

- Dual Phase Extraction Well
- Monitoring Well Completed in Shallow Gaspar Aquifer
- Soil Boring with Depth Discrete Groundwater Sampling
- Roads
- Property Boundary
- NA Not Analyzed
- TCE Trichloroethene
- DCE Dichloroethene
- DCA Dichloroethane

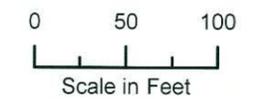
N  
  
 0 50 100  
 Scale in Feet

**Figure 1**  
**Groundwater Analytical Results**  
 Perched and Shallow Gaspar Aquifer  
 Cooper Drum Company  
 South Gate, California



**Legend**

- Dual Phase Extraction (DPE) Well
- Monitoring Well Completed in Shallow Gaspar Aquifer
- Soil Boring with Depth Discrete Groundwater Sampling
- Proposed Dual Completion Monitoring Well
- Proposed Soil Gas Boring
- Potential New DPE Well
- Roads
- Property Boundary



**Figure 2**  
**Proposed Sampling Locations**  
 Cooper Drum Company  
 South Gate, California

## TECHNICAL MEMORANDUM

**TO:** Linda Hougason, ELG Metals, Inc.

**FROM:** Don Gruber, URS

**Date:** September 11, 2009

**SUBJECT:** Results from Monitor Well MW-12 East of Cooper Drum Site on ELG Metals Site

I am sending you this memo on behalf of Eric Yunker, Project Manager, Cooper Drum Superfund Site, U.S. Environmental Protection Agency, regarding the closure of MW-12 on your property. Results of recent (April 2009) depth-discrete groundwater sampling from four soil borings indicates that contaminated groundwater in the perched aquifer has migrated east of the primary source area (former Hard Wash Area [HWA]) on the Cooper Drum site. The groundwater is contaminated with volatile organic compounds (VOCs) and 1,4-dioxane (see sample results for SB-42 through SB-45 on Figure 1). The extent of vertical migration of the contamination from the perched aquifer may be limited to the lower Bellflower Aquiclude, which underlies the perched aquifer. The shallow Gaspur aquifer which underlies the Bellflower Aquiclude does not appear to be affected in this area. This is largely based on non-detect (ND)/low level concentrations in groundwater sampling results for MW-17 (see Figure 1), which is screened in the shallow Gaspur Aquifer.

Sample results for MW-12 (located 65 feet NE of MW-17 on the ELG Metals Site), indicate an increasing trend for VOCs and 1,4-dioxane. MW-12 is screened from 42 to 62 feet below ground surface (bgs) which is contiguous to the bottom of the perched aquifer, the Lower Bellflower Aquiclude, and the top of the Gaspur Aquifer. Based on the MW-12 well design, results from this well cannot be identified with a specific aquifer zone. Lower water elevation in MW-12 (versus higher water elevations in the perched aquifer) is consistent with MW-17 and the shallow Gaspur Aquifer, suggesting that MW-12 may be acting as a conduit between the perched aquifer and the Gaspur Aquifer.

Based on the recent groundwater sampling results additional field sampling activities will be performed to further delineate the extent of the soil and groundwater contamination east of the HWA. These activities would be conducted to address the need to extend treatment into this area.

Since contamination has been confirmed to be present in the perched aquifer along the east side of Rayo Ave, destruction of MW-12 should be performed as soon as possible because this well is likely acting as a conduit for migration of the contaminants from the perched aquifer to the Gaspur Aquifer.

As we discussed EPA is requesting ELG Metals to perform this task. Note that MW-12 could be destroyed with use of a drilling rig in one day. This task should be performed by a qualified drilling contractor. In addition a well decommissioning permit will be required from LA County Department of Public Health. I have attached the requirements for this permit which are posted on their website at [http://www.lapublichealth.org/eh/docs/ep\\_dw\\_decommission\\_req.pdf](http://www.lapublichealth.org/eh/docs/ep_dw_decommission_req.pdf). The fee associated for this permit is approximately \$300 as indicated on the website. A reply back within the next week would be

very helpful for maintaining the project schedule. If you need any additional information or have any questions please contact myself at (916) 679-2049 or Eric Yunker at (415) 972-3159.

**WELL PERMIT APPLICATION - NON PRODUCTION WELLS**

DRINKING WATER PROGRAM - ENVIRONMENTAL HEALTH DIVISION  
 5050 COMMERCE DRIVE, BALDWIN PARK, CA 91706 TELE (626) 430-5420 FAX (626) 813-3016

DATE 10/13/2009

NEW WELL CONSTRUCTION     RECONSTRUCTION OR RENOVATION     DECOMMISSIONING     OTHER: \_\_\_\_\_  
 MONITORING     CATHODIC     INJECTION     EXTRACTION     HEAT EXCHANGE  
 HYDROPLUNCH     C.P.T. (For Ground Water Sampling)     OTHER: \_\_\_\_\_

Site Address 9316 Atlantic Ave    City South Gate    Zip Code \_\_\_\_\_  
 Nearest Intersection Rayo Avenue    Thomas Guide Map Book Page/Grid 705 E-4    Number of Wells in Each Parcel \_\_\_\_\_

Total Depth of Well 62    Depth of Well Casing 62 feet    Sanitary / Annular Sealing Material #3 sand, bentonite chips, volclay grout  
 Depth of Sanitary / Annular Seal 36.5 feet - 39 feet    Conductor Casing Seal Sch#40 PVC casing w/ Volclay grout seal

Owner's Name Cooper Drum Company    Telephone Number \_\_\_\_\_  
 Address 9316 Altantic Ave.    City South Gate    Zip Code \_\_\_\_\_

Driller's Name BC2 Environmental / Diego Torices    Telephone Number (714) 744 - 2990    C-57 License Number 626255  
 Address 1150 W. Trenton Ave.    City Orange    Zip Code 92867

Well Depth \_\_\_\_\_    Method of Well Assessment \_\_\_\_\_    Depth and Number of Perforations N/A  
 Type and Amount of Sealant \_\_\_\_\_    Type of Perforator n/a    Size of Perforations n/a    Method of Upper Seal Pressure Application Pressure Grout 30psi

Company URS Corporation  
 Address 2870 Gateway Oaks Drive Suite 300    City Sacramento    State CA    Zip Code 95833  
 Project Manager Don Gruber    Telephone Number (916) 718 - 3836    Fax Number (916) 679 - 2900

**ATTENTION: WORK PLAN MODIFICATIONS MAY BE REQUIRED IF WELL AND GEOLOGIC CONDITIONS ENCOUNTERED AT THE SITE INSPECTION ARE FOUND TO DIFFER FROM THE SCOPE OF WORK PRESENTED TO THIS DEPARTMENT.**  
 I hereby agree to comply in every respect with all the regulations of the County Environmental Health Division and with all ordinances and laws of the County of Los Angeles and the State of California pertaining to well construction, reconstruction, and decommissioning data deemed necessary by the County Environmental Health Division Of Los Angeles County.

Signature of Applicant: *[Signature]*    Printed Name: **Diego Torices / BC2 Env.**

**THIS PERMIT IS NOT COMPLETE UNTIL ALL OF THE FOLLOWING REQUIREMENTS ARE SIGNED OFF BY THE DEPUTY HEALTH OFFICER. WELL CONSTRUCTION OR DECOMMISSIONING CANNOT BE INITIATED WITHOUT A WORK PLAN APPROVAL FROM THIS DEPARTMENT.**

\*\*\*\*\* (DEPARTMENT USE ONLY) \*\*\*\*\*

REHS	DATE
MICHAEL TSIEBES	10/13/09
Conditions: On 10/20/09 \$201.00 out of \$327.00 was credited back (receipt # 9595) for permit # 9525A At decommission 1 monitoring well (MUL-12) by pressure grouting. Observe the work plan. Please notify me at least 48 HRS prior start of field work for inspection. (913) 351-5145	
REHS	DATE

**NOTICE**  
 This well permit approval is limited to compliance with the California Well Standards and the Los Angeles County Code and does not grant any rights to construct, reconstruct, or decommission any well. The applicant is responsible for securing all other necessary permits.

URS

Date: 11-4, 20 09

Location: 9400 RAYO AVE (SOUTH GATE)

Job No. 09-15414

LOYEE'S NAME:	Total Hours	EQUIPMENT UTILIZED	
D SUPER		RIG TYPE & NO. <i>AV7</i>	BOBCAT/FORKLIFT
LER/OPER. <i>GRIFFIN</i>		FLATBED TRUCK <i>OLD DOULY</i> /	CONCRETE SAW/CORE # OF HOLES
PER <i>TONY</i>		DECON TRAILER	ASPHALT SAW/CORE # OF HOLES
PER		GROUT PUMP/WHIRLY BIRD	DEVELOPMENT RIG
LER/OPER.		COMPRESSOR/AIR-EXC. TOOL	GENERATOR
PER		HYDRO PUNCH # OF HOLES	WATER TRAILER
PER		CONTINUOUS SAMPLER	OTHER:

DAILY ACTIVITY	
# DESCRIPTION	Hours
Travel to site/MOB	1
Travel from site/DEMOB	
Set up equip. & P.M. logs	
Drilling (hammer)	
Drilling (rotary)	
Drilling (auger)	
Drilling (coring)	
Sampling	
Well-out pipe	
Abandon hole	
Water testing	
Cleanout hole/condition	
Well construction	
Move between holes	
Decontamination	
Site clean up	
Standby with crew	
Standby without crew	
Development	
Surface completion	1.5
Scheduled maint. & repair	
Unscheduled repairs	
Project prep. (load-up/unload)	
Hard time (sched/unsched.)	
Health & Safety Mtg.	
Engine Hours Start	
Engine Hours End	
Est. Gallons Fuel/Day	
LUNCH	5
<b>Total Hours</b>	

HOLE #	1									TOTALS
PREVIOUS FOOTAGE DRILLED	61									
FOOTAGE DRILLED THIS DATE	3									
SAMPLES TAKEN THIS DATE										
SURFACE CASING	FROM	Q								
	TO	R								
PROTECTIVE CASING	FROM	E								
	TO	S								
CEMENT SEAL	FROM	U								
	TO	R								
BENT SEAL	FROM	E								
	TO									
SAND PACK	FROM	G								
	TO	R								
BLANK CASING	FROM	O								
	TO	U								
SCREEN	FROM	T								
	TO									
WATER LEVEL										

MATERIALS & SUPPLIES	
QTY.	DESCRIPTION PVC/SS/STL
	4" BLANK
	4" SCREEN
	2" BLANK
	2" SCREEN
	4" SLIP CAP/LOCKING CAP
	2" SLIP CAP/LOCKING CAP
	CENTRALIZER
	SAND 50lb./100lb
	SILICA SAND
	BENTONITE PELLETS
1	BENTONITE FRAGMENTS
1	VOLCLAY GROUT
	BENTONITE POWDER
4	READY MIX
4	QUICK SET
8	PORTLAND (47lb./94lb)
	ASPHALT PATCH
	WELL COVERS 8"/12"
	MONUMENT CASING
1	BARRELS
	WOOD PLUGS
	SAMPLE RINGS
	PLASTIC SHEETING

FORMATION DESCRIPTIONS *BRAKE OUT 36" HOLE OF CONCRETE AND BRAKE 3FT OF CONCRETE DOWN HOLE. PRESSURE GROUT 4" WELL TO 61 FT BY TERMINAL PIPE. AND PASTE HEAD. RUMBLE RD. AHEAD OF PORTLAND*

REMARKS:

ARRIVAL TIME: *7:00 AM* DEPARTURE TIME: *2:00 PM*

DRILLER SIGNATURE: *[Signature]*

DRILLER NAME: *Ed Gillan*

DRILLER'S SUMMARY:

**URS Pressure Grouting Procedures for the Destruction of Monitoring  
Well MW-12 (Located on ELG Metals site)  
Cooper Drum Superfund Site**

- Wells will be destroyed by pressure grouting by the following method:  
A neat cement grout mixture of 94 pounds of Portland Type I or II cement and 6 gallons of potable water will be used to fill and seal MW-12. The sealing grout mixture will be installed under pressure in each well through a suitably sized construction tremie (i.e., 1-inch diameter) in one continuous operation. The bottom of the construction tremie will initially be placed approximately 1 foot above the measured total depth of each well and remain submerged in grout for the remainder of the installation process.

During initial grout installation, pressure will be maintained on the grout column by using a suitable pump (i.e., piston, "P" type grout pump)

The initial grout installation will continue until surface returns from the well are of a comparable consistency with the grout being installed through the pump.

At this point, the URS onsite representative will collect a four to six ounce sample of the sealing grout in a paper container. This sample will be used to track the hydration and stabilization rate of the grout mixture.

Once the annular area of the well has been filled with the sealing grout, the construction tremie will be removed. The wellhead will be fitted with a fluid tight flange equipped with pass-through piping for the introduction of additional sealing material and a pressure gauge calibrated in pounds per square inch (psi). The pass-through piping will include a one-way check valve for the purposes of maintaining pressure on the column of grout in the well.

Grout will continue to be pumped into the well through the check valve piping until the pressure gauge on the wellhead flange registers 10 psi. The onsite URS representative will monitor the wellhead pressure gauge and additional sealing grout will be added to the well, through the check valve piping, as the pressure in the well decreases. This process will continue until the pressure on the grout column in the well ceases to decrease and/or the sample of grout collected by the site geologist indicates that the hydration and stabilization process has progressed to the point that it can no longer flow under pressure.

Experience has shown that the majority of wells will cease accepting grout before the stabilization process starts. Therefore, once the pressure on the column of grout in the well can be maintained at a constant rate of from 5 to 10 psi, the grouting process will cease.

- The project includes removal of well traffic box. The traffic box must be removed in compliance with Los Angeles County Well Standards.
- URS must verify that the volume of sealant installed equals or exceeds the volume of the casing in each well.