Click Here to Return to AR Index

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-036W02NS Page 1 of 1 Field Staff: MH

Date Sampled 2/6/01
Stick-up Height ~~1.85~~ .35 feet
Depth to Water ~~14.45~~ 13.15 feet below top of casing
Total Depth 17 feet below top of casing
Depth of Tubing (sample interval) 16 feet below top of casing

Start purge 1130
Start parameters 1415
End purge 1535
Total purge time: 4 hours, 0 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1415		400		14.58	1138	5.70	62.4	0.15	311
1420	5	400		14.59	1136	5.61	58.1	0.12	426
1425	10	400		14.32	1133	5.51	53.1	0.12	—
1430	15	400		14.17	1135	6.48	50.9	0.13	—
1435	20	400		14.14	1133	5.96	44.5	0.14	—
1440	25	400		14.06	1131	5.45	43.5	0.14	—
1445	30	400		14.13	1132	6.44	12.7	0.17	—
1450	35	400		13.91	1148	5.44	2.2	0.21	—
1455	40	400		13.90	1155	5.45	1.0	0.20	—
1500	45	400		13.90	1174	5.44	-8.9	0.20	—
1505	50	400		13.87	1170	5.44	-4.3	0.24	—
1510	55	400		13.87	1181	5.44	-15.7	0.21	—
1515	60	400		13.87	1177	5.44	-17.2	0.20	—
1520	65	400		13.86	1183	5.45	-17.9	0.21	—
1525	70	400		13.87	1185	5.44	-19.3	0.25	—
1530	75	400		13.85	1190	5.44	-19.8	0.25	—
1535	80	400		13.84	1191	5.44	-19.1	0.24	—

Comments

TUBING DID NOT REACH FULL DEPTH DUE TO FIRM RESISTANCE. PROBABLY A COLLAR. EXTREMELY SILTY THROUGHOUT PURGE. NOW STABILIZED DUE TO EXTREME SILTINESS AND TURBIDITY.

0.80
0.91

Superfund Records Center
SITE: Industriplex
BREAK: 2.3
OTHER: 25253

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-036W03 Page 1 of ___ Field Staff: LC

Date Sampled 2/8/01
Stick-up Height 2.1' feet
Depth to Water 13.36' feet below top of casing
Total Depth 36.4' feet below top of casing
Depth of Tubing (sample interval) 35.4' feet below top of casing

Start purge 1245
Start parameters 1305
End purge 1400
Total purge time: 1 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1305		400		13.52	1617.0	6.15	-41.5	0.66	100
1310	5	400		13.57	1619.0	6.13	-118.5	0.56	31
1315	10	400		13.50	1622.0	6.13	-194.3	0.45	28
1320	15	400		13.64	1620.0	6.13	-203.5	0.47	27
1325	20	400		13.60	1624.0	6.12	-223.6	0.40	20
1330	25	400		13.53	1621.0	6.10	-236.3	0.37	11
1335	30	400		13.57	1620.0	6.12	-237.1	0.36	9.7
1340	35	400		13.53	1620.0	6.11	-240.4	0.36	7.1
1345	40	400		13.45	1620.0	6.11	-242.7	0.35	5.4
1350	45	400		13.46	1619.0	6.11	-244.0	0.33	3.7
1355	50	400		13.45	1615.0	6.12	-245.1	0.32	2.8
1400	55	400		13.47	1615.0	6.11	-246.0	0.32	2.5

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-034W04 Page 1 of 1 Field Staff: MH

Date Sampled 2/8/01
Stick-up Height .95 feet
Depth to Water 12.81 feet below top of casing
Total Depth 41 feet below top of casing
Depth of Tubing (sample interval) 40 feet below top of casing

Start purge 1240
Start parameters 1310
End purge 1405
Total purge time: 1 hours, 25 minutes
Parameters Stabilized? 4

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1310	5	400		13.84	1662	6.62	-161.2	0.64	11.2
1315	10			13.34	1661	6.63	-151.1	0.67	12.1
1320	15			13.26	1660	6.63	-152.8	0.66	6.27
1325	20			13.30	1660	6.63	-152.0	0.52	6.74
1330	25			13.33	1659	6.63	-152.5	0.50	6.19
1335	30			13.32	1659	6.62	-160.6	0.46	3.84
1340	35			13.36	1659	6.63	-177.6	0.42	2.49
1345	40			13.33	1658	6.63	-177.1	0.39	3.08
1350	45			13.26	1658	6.63	-176.8	0.36	3.04
1355	50			13.21	1661	6.63	-179.7	0.32	2.41
1400	55			13.19	1662	6.64	-182.6	0.31	2.30
1405	60			13.26	1660	6.63	-175.5	0.30	2.19

Comments

COLLECTED DUPLICATE SAMPLE.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-04GW01NS Page 1 of 1 Field Staff: MH

Date Sampled 2/7/01
Stick-up Height ~~11.89~~ 2.0 feet
Depth to Water 11.89 feet below top of casing
Total Depth 15.0 feet below top of casing
Depth of Tubing (sample interval) 14.0 feet below top of casing

Start purge 910
Start parameters —
End purge 1050
Total purge time: 1 hours, 40 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

VERY LOW FLOW, HIGH TURBIDITY. SAMPLED FOR TSS, 2 VOCS, 500ml UNFILTERED UNPRESERVED METALS SAMPLE, TOTAL AS/AS SPECIES UNFILTERED AND SULFIDE/FERROUS IRON.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-046W02 Page 1 of ___ Field Staff: LC

Date Sampled 2/7/01
Stick-up Height 0.95' feet
Depth to Water 11.11' feet below top of casing
Total Depth 25.0' feet below top of casing
Depth of Tubing (sample interval) 24.0' feet below top of casing

Start purge 0905
Start parameters 0950
End purge 1045
Total purge time: 1 hours, 40 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0950		400		11.79	1744.0	6.19	10 4	0.75	11.0
0955	5	400		12.11	1758.0	6.19	-67.3	0.52	6.8
1000	10	400		12.09	1767.0	6.17	-111.2	0.42	7.4
1005	15	400		12.05	1765.0	6.18	-125.4	0.36	6.5
1010	20	400		12.20	1769.0	6.17	-143.7	0.33	5.9
1015	25	400		12.23	1771.0	6.17	-154.0	0.31	5.7
1020	30	400		12.27	1771.0	6.16	-165.3	0.30	3.1
1025	35	400		12.28	1769.0	6.16	-167.0	0.30	2.6
1030	40	400		12.18	1763.0	6.17	-174.1	0.30	1.9
1035	45	400		12.16	1761.0	6.16	-148.6	0.26	1.1
1040	50	400		12.13	1759.0	6.15	-156.0	0.26	0.90
1045	55	400		12.10	1754.0	6.16	-148.4	0.26	0.75

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-046W03 Page 1 of 1 Field Staff: MH

Date Sampled 2/14/01
Stick-up Height 1.6 feet
Depth to Water 10.9 feet below top of casing
Total Depth 34.0 feet below top of casing
Depth of Tubing (sample interval) 33.0 feet below top of casing

SULFIDE = 0.02 mg/L
FERROUS = 1.12 mg/L

Start purge 1010
Start parameters 1030
End purge 1125
Total purge time: 1 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1030		400		11.89	2049	6.46	-23.5	1.17	19.5
1035	5	400		11.90	2063	6.44	-70.0	0.72	10.4
1040	10	400		11.90	2064	6.44	-70.4	0.71	6.35
1045	15	400		11.89	2063	6.44	-72.0	0.68	6.73
1050	20	400		11.92	2065	6.45	-74.8	0.60	8.20
1055	25	400		11.88	2066	6.47	-76.7	0.57	7.32
1100	30	400		11.91	2066	6.47	-77.4	0.54	7.34
1105	35	400		11.90	2066	6.48	-77.9	0.55	5.92
1110	40	400		11.94	2065	6.48	-78.0	0.55	5.07
1115	45	400		11.97	2067	6.48	-79.2	0.53	4.61
1120	50	400		12.06	2066	6.48	-80.2	0.49	3.87
1125	55	400		12.03	2067	6.49	-81.2	0.49	3.71

Comments
Collect MS/MSD → L2-046W03MS and L2-046W03MSD

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-05GW01 Page ___ of ___ Field Staff: MH

Date Sampled 2/13/01
Stick-up Height 1.85 feet
Depth to Water 9.13 feet below top of casing
Total Depth 14.3 feet below top of casing
Depth of Tubing (sample interval) 13.3 feet below top of casing

Start purge 0935
Start parameters 1010
End purge 1050
Total purge time: 1 hours, 15 minutes
Parameters Stabilized? 4

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1010	0	55		7.09	1352	6.28	-54.7	11.41	15
1015	5			6.94	1335	6.30	-56.5	11.47	8.9
1020	10			7.11	1334	6.31	-57.0	11.46	7.8
1025	15			7.10	1335	6.31	-57.9	11.48	7.7
1030	20			7.06	1336	6.32	-58.3	11.45	9.6
1035	25			7.19	1336	6.31	-58.4	11.44	20
1040	30			7.41	1336	6.36	-59.4	11.33	7.9
1045	35			7.36	1337	6.32	-59.0	11.31	7.8
1050	40			7.47	1337	6.32	-59.1	11.30	7.3

Comments

FLOW VERY SLOW AND AERATED.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-05GW02 Page 1 of 2 Field Staff: LC

Date Sampled 2/13/2001
Stick-up Height 0.75' feet
Depth to Water 8.65' feet below top of casing
Total Depth 24.7' feet below top of casing
Depth of Tubing (sample interval) 23.7' feet below top of casing

Start purge 0920
Start parameters 0950
End purge 1135
Total purge time: 2 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0950		400		12.24	1340.0	5.99	12.5	0.51	260
0955	5	400		12.19	1346.0	5.99	-4.1	0.43	450
1000	10	400		12.09	1349.0	5.98	-16.7	0.37	320
1005	15	400		12.12	1349.0	5.98	-19.4	0.34	280
1010	20	400		12.07	1347.0	5.98	-25.9	0.33	190
1015	25	400		12.14	1347.0	5.98	-31.5	0.31	130
1020	30	400		12.21	1348.0	5.98	-33.7	0.31	120
1025	35	400		12.26	1349.0	5.98	-35.9	0.30	100
1030	40	400		12.14	1346.0	5.98	-40.2	0.29	110
1035	45	400		12.11	1345.0	5.97	-41.4	0.29	55
1040	50	400		12.08	1345.0	5.97	-42.0	0.28	36
1045	55	400		12.06	1344.0	5.98	-41.9	0.28	28
1050	60	400		12.24	1346.0	5.98	-42.1	0.28	17
1055	65	400		12.33	1343.0	5.97	-41.3	0.28	14
1100	70	400		12.44	1344.0	5.97	-42.8	0.29	8.5
1105	75	400		12.33	1345.0	5.97	-42.1	0.29	6.7
1110	80	400		12.36	1342.0	5.97	-41.7	0.29	5.3
1115	85	400		12.37	1341.0	5.97	-39.1	0.29	4.9
1120	90	400		12.37	1341.0	5.97	-37.6	0.29	7.7

Comments
Collected duplicate sample L2-05GW0299

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-05GW02 Page 2 of 2 Field Staff: LC

Date Sampled 2/13/01
Stick-up Height 0.75' feet
Depth to Water 8.65' feet below top of casing
Total Depth 24.7' feet below top of casing
Depth of Tubing (sample interval) 23.7' feet below top of casing

Start purge 0920
Start parameters 0950
End purge 1135
Total purge time: 2 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1125	95	400		12.27	1341.0	5.97	-37.9	0.28	4.7
1130	100	400		12.31	1346.0	5.97	-36.5	0.28	4.2
1135	105	400		12.30	1343.0	5.97	-38.1	0.28	4.5

Comments
Collected duplicate sample L2-05GW0299

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample L2-05GW03 Page 1 of 1 Field Staff: LC

Date Sampled 2/14/01
Stick-up Height 0.75' feet
Depth to Water 10.61' feet below top of casing
Total Depth 34.3' feet below top of casing
Depth of Tubing (sample interval) 33.3' feet below top of casing

Hach Colorimeter Test
Sulfide = 0.06 mg/L
Ferrous Iron = 0.59 mg/L

Start purge 1420
Start parameters 1445
End purge 1605
Total purge time: 1 hours, 46 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1445		400		12.20	2257	6.18	-28.1	0.81	~~52.~~ 22.7 LC
1450	5	400		12.09	2323	6.14	-33.7	0.85	35.8
1455	10	400		12.09	2328	6.13	-38.1	0.90	25.8
1500	15	400		12.03	2336	6.12	-42.8	0.79	48.5
1505	20	400		12.07	2340	6.11	-46.7	0.76	29.4
1510	25	400		12.05	2341	6.11	-50.4	0.66	19.3
1515	30	400		12.05	2347	6.11	-54.5	0.67	15.0
1520	35	400		12.02	2345	6.11	-60.0	0.73	12.5
1525	40	400		12.05	2347	6.11	-64.8	0.70	11.3
1530	45	400		12.05	2345	6.11	-70.6	0.72	12.4
1535	50	400		12.04	2347	6.10	-80.1	0.70	10.4
1540	55	400		12.04	2356	6.10	-87.2	0.60	64.9
1545	60	400		12.03	2356	6.10	-92.8	0.53	14.5
1550	65	400		12.04	2355	6.10	-97.1	0.64	8.07
1555	70	400		12.01	2356	6.10	-103.2	0.61	4.57
1600	75	400		12.03	2356	6.10	-105.1	0.62	4.79
1605	80	400		12.03	2356	6.10	-107.2	0.63	3.08

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW01R Page 1 of 1 Field Staff: LC

Date Sampled 7/27/01
Stick-up Height 2.0 feet
Depth to Water 18.16 feet below top of casing
Total Depth 26.5 feet below top of casing
Depth of Tubing (sample interval) 24.5 feet below top of casing

Sulfide: 0.05 mg/L
Ferrous Iron: 3.30 mg/L

Start purge 1010
Start parameters 1025
End purge 1055
Total purge time: — hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1025		400	2	14.98	2157	5.36	-81.8	3.91	12.5
1030	5	400		14.85	2159	5.95	-90.7	4.44	10.25
1035	10	400		14.82	2182	5.99	-92.9	4.17	10.56
1040	15	400		14.78	2188	6.00	-93.4	3.86	9.98
1045	20	400	5	14.79	2201	6.01	-92.1	3.36	11.02
1050	25	400		14.80	2217	6.01	-88.6	3.32	10.82
1055	30	400		14.78	2221	6.01	-89.4	3.10	10.23

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW01 Page 1 of 1 Field Staff: HT

Date Sampled 4/12/01
Stick-up Height 1.8 feet
Depth to Water NM feet below top of casing
Total Depth 22.0 feet below top of casing
Depth of Tubing (sample interval) 21.0 feet below top of casing

Sulfide : 0.08 mg/L
ferrous iron : 3.30 mg/L

Start purge 1000
Start parameters 1050
End purge 1120
Total purge time: 1 hours, 20 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1050		200		8.76	643	6.02	89.3	5.65	3.58
1055	5	↓		8.72	644	6.02	79.2	5.40	4.42
1100	10			8.55	661	6.02	36.0	6.37	3.50
1105	15			8.25	674	6.06	23.9	4.81	3.83
1110	20			8.22	673	6.05	22.2	4.51	3.35
1115	25			8.20	675	6.06	17.8	4.27	1.97
1120	30	↓		8.19	676	6.07	17.6	4.26	2.08

Comments
NM = not measured. M-Scope could not go down well

P1-01GW02R

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample ~~P1-02GW02~~ Page 1 of 1 Field Staff: HAT

Date Sampled 5/25/01
Stick-up Height 1' feet
Depth to Water 17.7' feet below top of casing
Total Depth 35.5' feet below top of casing
Depth of Tubing (sample interval) 34.5' feet below top of casing

Sulfide = 0.08 mg/L
ferrous iron = ~~3.30 mg/L~~ HAT 0.98 mg/L

Start purge 0905
Start parameters 0935
End purge 1055
Total purge time: 1 hours, 50 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0935	0	400		14.14	2042	6.76	-186.7	5.86	190
0940	5			13.76	2032	6.65	-251.6	2.79	50
0945	10			13.74	2033	6.666	-264.7	2.43	45
0950	15			13.76	2031	6.666	-271.8	2.09	~~45~~ 55 HAT
0955	20			13.87	2032	6.67	-279.2	1.13	40
1000	25			13.85	2031	6.666	-278.8	1.07	37
1005	30			13.70	2031	6.67	-279.5	0.85	45
1010	35			13.72	2029	6.67	-278.6	0.82	45
1015	40			13.71	2028	6.68	-276.6	0.56	70
1020	45			13.72	2028	6.68	-276.9	0.53	55
1025	50			13.79	2029	6.68	-273.6	0.43	56
1030	55			13.93	2031	6.668	-266.3	0.30	50
1035	60			13.95	2030	6.69	-264.2	0.29	45
1040	65			13.95	2030	6.69	-266.6	0.27	50
1045	70			13.96	2031	6.68	-250.1	0.24	43
1050	75			13.88	2036	6.69	-235.9	0.26	40
1055	80	↓		13.89	2035	6.69	-239.2	0.25	40

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P-016W02 Page 1 of 1 Field Staff: LC

Date Sampled 4/12/01
Stick-up Height 1.0 feet
Depth to Water 6.30 feet below top of casing
Total Depth 30.0 feet below top of casing
Depth of Tubing (sample interval) 29.5 feet below top of casing

Sulfide: 0.0 mg/L
ferrous iron: 0.76 mg/L

Start purge 1000
Start parameters 1050
End purge 1135
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1050		400		9.95	927	6.28	185.3	8.53	26.5
1055	5	400		10.03	930	6.24	158.9	8.00	57.9
1100	10	400		9.94	950	6.28	98.5	10.68	18.1
1105	15	400		9.86	962	6.27	100.6	11.90	10.43
1110	20	400		9.85	964	6.29	100.1	12.18	10.14
1115	25	400		9.84	972	6.27	103.8	12.80	6.03
1120	30	400		9.87	973	6.27	103.6	12.78	5.17
1125	35	400		9.87	980	6.27	106.2	14.01	4.84
1130	40	400		9.82	978	6.30	109.8	14.26	4.44
1135	45	400		9.80	986	6.34	109.1	15.24	4.13

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW03R Page 1 of 1 Field Staff: LC

Date Sampled 7/20/01
Stick-up Height 1.5 feet
Depth to Water 18.01 feet below top of casing
Total Depth 44.3 feet below top of casing
Depth of Tubing (sample interval) 42.3 feet below top of casing

Sulfide: 0.17 mg/L
ferrous iron: 1.04 mg/L

Start purge 0930
Start parameters 1130
End purge 1200
Total purge time: 2 hours, 30 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1130		400	5	14.78	1759	5.87	-24.2	0.12	18
1135	5	400		14.73	1751	5.80	-00.2	0.12	7.1
1140	10	400		14.70	1743	5.82	-80.8	0.21	7.8
1145	15	400		14.74	1734	5.84	-90.2	0.10	5.0
1150	20	400	X	14.76	1733	5.84	-90.1	0.10	5.8
1155	25	400		14.74	1731	5.84	-90.4	0.10	6.0
1200	30	400	10	14.71	1730	5.84	-91.3	0.09	5.5

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW03 Page 1 of 1 Field Staff: HAT

Date Sampled 4/23/01
Stick-up Height 0.9 feet
Depth to Water 16.64 feet below top of casing
Total Depth 40 feet below top of casing
Depth of Tubing (sample interval) 39 feet below top of casing

Start purge 4/23/01 905, 4/24/01 0845, 1400, 0740 4/30/01 5/7
Start parameters
End purge 1200, 0900, 1415, 1010
Total purge time: 2 hours, 55 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

much less than 50 mL/min; 4/23/01 Collected 8260, ~~NO_2, NO_3~~
4/26/01 → 1 tot Hs/Hs species unfiltered, 4/30/01 collect 1 SVOC bottle
5/7/01 → Collected NO_2, NO_3, TCL metals (unfiltered)

Did not finish suite since elected to move well location to front of building.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW04R Page 1 of 1 Field Staff: LC/AG

Date Sampled 7/27/01
Stick-up Height 1.1 feet
Depth to Water 17.66 feet below top of casing
Total Depth 54.5 feet below top of casing
Depth of Tubing (sample interval) 52.5 feet below top of casing

Sulfide: 0.02mg/L
Ferrous iron: 0.45mg/L

Start purge 1245
Start parameters 1325
End purge 1410
Total purge time: 1 hours, 25 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1325		300	6	15.51	610	7.37	3.2	1.58	38
1330	5	300		15.14	605	6.76	12.8	0.54	23
1335	10	300		15.08	600	6.48	15.0	0.39	11
1340	15	300		15.02	597	6.24	20.3	0.24	7.6
1345	20	300		15.04	598	6.13	21.2	0.17	5.8
1350	25	300		15.03	598	6.07	22.3	0.13	5.1
1355	30	300		14.97	598	6.01	23.5	0.10	4.7
1400	35	300		15.00	598	6.00	23.9	0.09	5.1
1405	40	300		14.98	598	5.98	25.1	0.09	4.8
1410	45	300		14.99	599	5.97	24.9	0.09	4.9

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW05R Page 1 of 1 Field Staff: LC

Date Sampled 8/1/01
Stick-up Height 1.5 feet
Depth to Water 18.14 feet below top of casing
Total Depth 65.0 feet below top of casing
Depth of Tubing (sample interval) 63.0 feet below top of casing

Sulfide: 0.09mg/L
ferrous iron: 3.8mg/L

Start purge 1100
Start parameters 1145
End purge 1235
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1145		400	6	15.14	567	6.14	-38.6	15.64	18
1150	5	400		14.66	542	6.24	-62.7	15.71	17
1155	10	400		14.62	539	6.28	-70.3	14.19	16
1200	15	400		14.60	539	6.32	-77.5	11.49	16
1205	20	400		14.77	539	6.36	-82.1	6.17	15
1210	25	400		14.74	540	6.36	-82.2	5.79	16
1215	30	400		14.84	537	6.37	-83.2	4.22	12
1220	35	400	5	14.84	537	6.38	-83.6	3.40	11
1225	40	400		14.88	538	6.37	-85.9	2.66	11
1230	45	400		14.88	538	6.38	-84.3	2.59	11
1235	50	400		14.90	538	6.38	-84.2	2.69	11

Comments

Collect sample and duplicate, PI-01GW05R99

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW06R2 Page 1 of 1 Field Staff: HAT/ARC

Date Sampled 2/6/02
Stick-up Height 1.1 feet
Depth to Water 21.8 feet below top of casing
Total Depth 74' feet below top of casing
Depth of Tubing (sample interval) 73' feet below top of casing

Start purge 1015, 1000
Start parameters —
End purge 1015, 1245
Total purge time: 9 hours, 45 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1215									330

Comments
TSS, Tot As/As. Spec., As (Filtered/unfiltered)

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW06NS Page 1 of 1 Field Staff: LC/HT

Date Sampled 11/6/01, 11/7/01
Stick-up Height 1.0 feet
Depth to Water — feet below top of casing
Total Depth 73.0 feet below top of casing
Depth of Tubing (sample interval) 71.0 feet below top of casing

Sulfide: 1080 mg/L
ferrous iron: 8.30 mg/L

Start purge ~~0905~~ 1430, 0900
Start parameters
End purge 1530, 1030
Total purge time: 2 hours, 30 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments
sample trace: 3hrs.
Sample collected w/ check valve

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-01GW07NS Page 1 of 1 Field Staff: HAT

Date Sampled 11/12/01
Stick-up Height ≈ 1.5 feet
Depth to Water 19.41' feet below top of casing
Total Depth 83' feet below top of casing
Depth of Tubing (sample interval) 82' feet below top of casing

Ferrous iron: >3.30 mg/L
Sulfide: >0.80 mg/L

Start purge 0900
Start parameters —
End purge 1230
Total purge time: 3 hours, 30 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

Purged dry @ 11:30; collected condensed suite; rust color; used open screen and silica sand pack, slow recharge

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-01GW08R2NS Page 1 of 1 Field Staff: HAT/ARG

Date Sampled 2/7-2/8/02
Stick-up Height 10" feet
Depth to Water 17.15 feet below top of casing
Total Depth 93' feet below top of casing
Depth of Tubing (sample interval) 92' feet below top of casing

Start purge 0830, 0915
Start parameters
End purge 1445, 1320
Total purge time: 9 hours, 20 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1320				12.72	293	7.85	7.1	7.44	380

Comments

Water did clear by end of collecting sample
collected 2-TSS, total As, diss As, tot As/As species, diss As/As species

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample DI-01GW08NS Page 1 of 1 Field Staff: LC

Date Sampled 11/13/01
Stick-up Height 0.5 feet
Depth to Water — feet below top of casing
Total Depth 93.0' feet below top of casing
Depth of Tubing (sample interval) 92.0 feet below top of casing

Sulfide: 0.47mg/L
ferrous iron: 330mg/L

Start purge 0845
Start parameters —
End purge 1200
Total purge time: 3 hours, 15 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

purged dry 3 times, sampled w/ check valve
Sampling time: 3 hours

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-02(GW)(01) Page 1 of 1 Field Staff: AG

Date Sampled 7/20/01
Stick-up Height 2.0 feet
Depth to Water 19.23 feet below top of casing
Total Depth 25.0 feet below top of casing
Depth of Tubing (sample interval) 23.0 feet below top of casing

sulfide 0.13 mg/L
ferrous iron 3.30 mg/L

Start purge 1020
Start parameters 1140
End purge 1300
Total purge time: 2 hours, 40 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH ±.1	ORP (mV) ± 10	DO (mg/L) 10%	Turbidity (NTU) 10%
1140	0	320	4.5	14.71	1575	5.80	-172.6	0.64	123
1145	5			14.81	1574	5.82	-171.9	0.46	78.8
1150	10			14.74	1577	5.83	-174.0	0.46	50.1
1155	15			14.83	1577	5.83	-176.8	0.40	40.3
1200	20			14.79	1577	5.83	-177.6	0.41	41.5
1205	25			14.86	1577	5.83	-180.2	0.37	26.4
1210	30			14.83	1576	5.84	-181.5	0.37	31.9
1215	35			14.85	1574	5.83	-182.6	0.36	29.5
1220	40			14.79	1575	5.84	-83.9	0.38	35.0
1225	45			14.89	1573	5.85	-189.1	0.35	26.9
1230	50			14.85	1576	5.84	-194.7	0.35	16.8
1235	55			14.85	1576	5.84	-190.4	0.35	17.6
1240	60			14.89	1578	5.85	-190.7	0.33	15.5
1245	65			14.84	1578	5.84	-190.3	0.35	18.6
1250	70			14.87	1579	5.83	-191.3	0.36	27.3
1255	75			14.87	1577	5.84	-190.8	0.36	28.9
1300	80		12	14.80	1578	5.85	-191.6	0.26	27.7

Comments

P1-02GW02

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample ~~P1-01GW02R~~ Page 1 of 1 Field Staff: HAT

Date Sampled 5/25/01
Stick-up Height 1' feet
Depth to Water 17.7' feet below top of casing
Total Depth 34' feet below top of casing
Depth of Tubing (sample interval) 33' feet below top of casing

Sulfide = 0.17 mg/L
ferrous iron = 2.29 mg/L

Start purge 0855
Start parameters 0945 *
End purge 1130
Total purge time: ____ hours, ____ minutes
Parameters Stabilized? Y

Purging Information

	Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
	0945		400		12.75	629	6.32	9.0	3.35	290
	0950				12.49	630	6.23	-20.8	12.35	120
	0955				12.44	630	6.22	-25.0	10.13	90
	1000				12.45	630	6.20	-45.5	5.97	60
	1005				12.45	630	6.20	-47.7	5.63	50
	1010				12.38	631	6.21	-61.1	2.82	56
*	1015				12.36	631	6.21	-68.3	1.53	34
	1110				12.67	633	6.26	-95.1	0.24	31
	1115				12.80	632	6.25	-97.9	0.14	24
	1120				12.81	633	6.25	-97.8	0.12	19
	1125				12.76	633	6.25	-97.8	0.12	20
	1130		↓		12.69	633	6.24	-98.0	0.11	20

Comments

* YSI died temporarily. Had to wait for parameter #'s until other YSI (well) was done.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-02INN03 Page 1 of 1 Field Staff: LC/AG

Date Sampled 7/20/01
Stick-up Height 1.8 feet
Depth to Water 18.09 feet below top of casing
Total Depth 46.5 feet below top of casing
Depth of Tubing (sample interval) 44.5 feet below top of casing

Sulfide 0.05 mg/L
ferrous iron: 3.30 mg/L

Start purge 1300
Start parameters 1350
End purge 1500
Total purge time: 2 hours, ____ minutes
Parameters Stabilized? yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1350	0			15.87	461	6.29	-174.6	1.13	21.0
1355	5			15.33	461	6.26	-173.6	1.09	24.1
1400	10			15.46	462	6.24	-172.7	1.11	16.5
1405	15			15.53	462	6.25	-171.4	1.19	20.6
1410	20			15.62	462	6.27	-168.5	1.10	9.08
1415	25			15.69	461	6.27	-166.7	1.14	7.31
1420	30								
1425	35			15.48	463	6.28	-159.3	1.37	25.3
1430	40			15.42	462	6.28	-160.5	1.39	12.2
1435	45			15.50	461	6.26	-160.9	1.42	10.48
1440	50			15.35	461	6.26	-161.5	1.49	8.04
1445	55			15.39	460	6.26	-161.5	1.51	9.46
1450	60			15.49	459	6.27	-160.8	1.50	11.1
1455	65			15.46	460	6.27	-157.2	1.57	11.4
1500	70		10						

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-02MW04 Page 1 of 1 Field Staff: AG

Date Sampled 1/30/01
Stick-up Height 2.0 feet
Depth to Water 16.83 feet below top of casing
Total Depth 54.5 feet below top of casing
Depth of Tubing (sample interval) 52.5 feet below top of casing

Sulfides: 0.02 mg/L
ferrous iron: 1.70 mg/L

Start purge 1045
Start parameters 1120
End purge 1220
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH +/- .1	ORP (mV) ±10	DO (mg/L) 1%	Turbidity (NTU) 1%
1120	0	400	7	14.61	1121	6.43	-35.2	1.34	121
1125	5			14.44	1119	6.46	-74.9	0.61	121
1130	10			14.41	1116	6.56	-99.8	0.51	88.1
1135	15			14.29	1117	6.64	-116.2	0.45	50.9
1140	20			14.33	1116	6.75	-129.4	0.44	45.7
1145	25			14.24	1118	6.77	-131.9	0.38	40.7
1150	30			14.36	1116	6.83	-137.4	0.33	31.9
1155	35			14.37	1117	6.87	-139.1	0.32	32.6
1200	40			14.37	1114	6.92	-141.8	0.40	26.9
1205	45			14.42	1114	6.92	-142.6	0.35	21.3
1210	50			14.38	1114	6.94	-143.7	0.31	26.5
1215	55			14.32	1116	6.95	-145.1	0.30	25.0
1220	60		15	14.31	1115	6.97	-145.8	0.33	25.6

Comments
collecting duplicate

1 hour 20 minutes sample time

1220
-1045
175

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-02GW05R2 Page 1 of 1 Field Staff: HAT/AEG

Date Sampled 2/5-2/8/02
Stick-up Height 9" feet
Depth to Water 18.25 feet below top of casing
Total Depth 74' feet below top of casing
Depth of Tubing (sample interval) 73' feet below top of casing

Start purge 1325, 0820, 0915, 0915
Start parameters
End purge 1615, 1645, 1445, 1400
Total purge time: 9 hours, 35 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1400				8.69	4.55	7.10	54	4.11	270

Comments

Water did clear @ end of sample
collected 2-TSS, total As/As species, dissolved As/As species, total As, diss. As

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-02GW05NS Page 1 of 1 Field Staff: HAT/LC

Date Sampled 11/5/01
Stick-up Height _____ feet
Depth to Water 42' feet below top of casing
Total Depth 63' feet below top of casing
Depth of Tubing (sample interval) 62' feet below top of casing

sulfide = 0.80 mg/L
ferrous iron = 3.30 mg/L

Start purge 1000
Start parameters _____
End purge 1400
Total purge time: 4 hours, — minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments
Collected condensed suite w/ check valve.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-02GWO6R2 Page 1 of 1 Field Staff: HAT/ARO

Date Sampled 2/6/02, 2/5/02
Stick-up Height _____ feet
Depth to Water 18.02 feet below top of casing
Total Depth 84' feet below top of casing
Depth of Tubing (sample interval) 83' feet below top of casing

Start purge 1325, 820
Start parameters —
End purge 1615, 1215 2:50 3:55
Total purge time: 6 hours, 45 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1215									500

Comments
Collect TSS (2), Total As/As Spec. (filtered/unfiltered), As (filtered/un)

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample ~~PI-02GW06~~ PI-02GW06NS Page 1 of 1 Field Staff: LC/HT

Date Sampled 11/6/01
Stick-up Height 1.0 feet
Depth to Water 18.69 feet below top of casing
Total Depth 74 feet below top of casing
Depth of Tubing (sample interval) 72 feet below top of casing

Ferrous Iron: 3.30mg/L
Sulfide: 0.80mg/L

Start purge 0800
Start parameters
End purge 1200
Total purge time: 4 hours, - minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

Sampled w/ check valve, extremely silty

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-02GW07NS Page 1 of 1 Field Staff: LC/HT

Date Sampled 11/8/01
Stick-up Height 1.5 feet
Depth to Water 18.41 feet below top of casing
Total Depth 83.0 feet below top of casing
Depth of Tubing (sample interval) 80.0 feet below top of casing

Sulfide: 0.18mg/L
ferrous iron: 3.30mg/L
Sampling time: 1335hrs

Start purge 0830
Start parameters —
End purge 1330
Total purge time: 4 hours, — minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments
rusty/red water, slow recharge, sampled w/ check valve

1.90
→ 95

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Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-05GW01 Page 1 of 2 Field Staff: HAT

Date Sampled 4/20/01
Stick-up Height 2.1 feet
Depth to Water 9.70 feet below top of casing
Total Depth 15.0 feet below top of casing
Depth of Tubing (sample interval) 14.0 feet below top of casing

sulfide = 0.0 mg/L
ferrous iron = 1.42 mg/L

Start purge 0840
Start parameters 0915
End purge 1120
Total purge time: 2 hours, 40 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0915	0	200		8.24	865	7.59	147.1	6.75	87.5
0920	5			8.40	903	7.10	128.2	4.90	67.0
0925	10			7.61	870	6.44	101.4	4.35	38.9
0930	15			7.68	865	6.16	90.0	4.42	27.3
0935	20			7.79	861	6.07	85.7	4.50	24.8
0940	25			7.83	863	5.98	84.7	4.86	25.5
0945	30			7.81	865	5.94	84.9	5.25	20.5
0950	35			7.89	865	5.92	86.9	5.93	26.1
~~1000~~ 0955	40			8.08	864	5.90	90.1	6.51	~~24.5~~ 24.5
1000	45			8.07	865	5.90	91.6	6.49	25.6
1005	50			8.17	865	5.88	95.6	6.92	105.0
1010	55			8.30	866	5.89	97.0	7.37	230
1015	60			8.34	866	5.90	98.4	7.23	75
1020	65			8.40	866	5.91	100.7	7.47	37
1025	70			8.44	866	6.45	102.3	7.55	28
1030	75			8.49	865	5.89	104.3	7.80	19
1035	80			8.53	865	5.89	105.8	7.89	19
1040	85	✓		8.63	865	5.89	108.3	7.97	16
1045	90			8.68	867	5.89	111.7	8.51	16

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-03GW01 Page 2 of 2 Field Staff: HAT

Date Sampled 4/20/01
Stick-up Height 2.1 feet
Depth to Water 9.70 feet below top of casing
Total Depth 15.0 feet below top of casing
Depth of Tubing (sample interval) 14.0 feet below top of casing

Start purge 0840
Start parameters 0950
End purge 1120
Total purge time: 2 hours, 40 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1050	95	200		8.64	867	5.90	112.6	8.28	19
1055	100	↓		8.62	866	5.89	114.8	8.37	15
1100	105			8.54	866	5.89	116.0	8.33	16
1105	110			8.52	868	5.91	118.1	8.55	19
1110	115			8.47	867	5.89	119.2	8.53	12
1115	120			8.41	867	5.89	120.4	8.52	12
1120	125			8.38	867	5.90	122.0	8.57	12

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-03GW02 Page 1 of ___ Field Staff: LC

Date Sampled 4/20/01
Stick-up Height 1.0 feet
Depth to Water 7.31' feet below top of casing
Total Depth 20.0 feet below top of casing
Depth of Tubing (sample interval) 2@ 19.5' feet below top of casing

sulfide: 0.01 mg/L
ferrous iron: 0.4 mg/L

Start purge 0840
Start parameters 0920
End purge 1025
Total purge time: 1 hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0920		400		9.72	1050	5.94	167.7	2.00	185
0925	5	400		9.69	1057	5.80	164.3	2.51	114
0930	10	400		9.79	1072	5.72	118.7	3.37	49.5
0935	15	400		9.83	1080	5.71	100.7	3.80	27.7
0940	20	400		9.90	1082	5.71	99.7	3.81	19.4
0945	25	400		9.98	1084	5.70	95.2	3.74	15.4
0950	30	400		10.02	1086	5.70	92.0	3.39	10.11
0955	35	400		10.00	1090	5.71	91.1	2.79	9.12
1000	40	400		10.06	1092	5.68	92.2	2.14	7.79
1005	45	400		10.08	1093	5.68	92.7	2.04	8.06
1010	50	400		10.14	1093	5.68	92.1	1.92	6.73
1015	55	400		10.19	1095	5.67	90.4	1.66	6.72
1020	60	400		10.17	1097	5.67	90.3	1.58	6.37
1025	65	400		10.18	1097	5.67	89.9	1.53	6.57

Comments
collect sample and MS/MSD

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-03GW03 Page 1 of 1 Field Staff: LC

Date Sampled 4/26/01
Stick-up Height 2.0 feet
Depth to Water — feet below top of casing
Total Depth 32.5 feet below top of casing
Depth of Tubing (sample interval) 31.5 feet below top of casing

sulfide: 0.02 mg/L
ferrous iron: 3.30 mg/L

Start purge 0910
Start parameters 0950
End purge 1020
Total purge time: 1 hours, 10 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0950		400		11.73	805	9.02	62.3	2.04	50
0955	5	400		11.47	767	7.04	17.9	0.61	21
1000	10	400		11.54	761	6.82	18.8	0.58	18
1005	15	400		11.63	756	6.69	19.6	0.53	17
1010	20	400		11.61	750	6.30	19.7	0.49	14
1015	25	400		11.61	750	6.29	19.6	0.50	14
1020	30	400		11.59	751	6.21	18.7	0.48	13

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-03GW04 Page 1 of 1 Field Staff: HAT

Date Sampled 4/26/01
Stick-up Height 2 feet
Depth to Water NM feet below top of casing
Total Depth 43 feet below top of casing
Depth of Tubing (sample interval) 42 feet below top of casing

Sulfide = 0.0 mg/L
ferrous iron = 3.3 mg/L

Start purge 0910
Start parameters 0950 HAT
End purge 1100
Total purge time: 1 hours, 50 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
HAT 1950	0	400		11.78	1241	6.94	36.4	1.01	243
0955	5			11.72	1212	6.64	-62.3	0.71	147
1000	10			11.70	1210	6.59	-69.0	0.60	152
1005	15			11.80	1211	6.56	-74.1	0.44	108.1
1010	20			11.80	1212	6.54	-76.9	0.31	78.6
1015	25			11.77	1216	6.52	-79.2	0.19	82.5
1020	30			11.75	1217	6.52	-79.8	0.18	92.8
1025	35			11.78	1218	6.51	-80.7	0.17 HAT	81.3
1030	40			11.74	1218	6.51	-80.9	0.14	60
1035	45			11.82	1219	6.51	-80.9	0.14	40
1040	50			11.86	1251	6.51	-81.0	0.20	34
1045	55			11.88	1251	6.51	-81.3	0.20	26
1050	60			11.96	1251	6.50	-81.8	0.20	20
1055	65			12.11	1252	6.51	-82.5	0.19	20
1100	70			12.12	1253	6.51	-82.6	0.19	19

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-03GW05NS Page 1 of 1 Field Staff: HAT

Date Sampled 5/16/01
Stick-up Height 2.1 feet
Depth to Water 8.0 feet below top of casing
Total Depth 52 feet below top of casing
Depth of Tubing (sample interval) 51 feet below top of casing

sulfide = 0.12 mg/L
ferrous iron = 3.30 mg/L

Start purge 0935
Start parameters 1100
End purge 1335
Total purge time: 4 hours, ____ minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1100	0	400		12.05	978	6.41	-82.8	9.71	200
1105	5	↓		11.84	975	6.35	-108.9	15.92	360
1110	10			11.78	970	6.37	-141.7	2.19	150
1115	15			11.76	972	6.37	-143.4	2.29	180
1120	20			11.76	967	6.37	-149.9	2.21	290
1125	25			11.75	968	6.37	-150.7	2.17	280
1130	30			11.78	969	6.39	-132.4	2.25	120
1135	35			11.79	970	6.38	-144.6	2.28	130
1140	40			11.78	970	6.39	-145.3	2.28	55
1145*	45	↓		11.70	966	6.39	-149.5	2.12	>1000*

Comments

* well silted up & never cleared up. Collected full suite ~~at~~ HAT after total of 4 hrs purge.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-03GW06NS Page 1 of 1 Field Staff: HAT

Date Sampled 5/16/01
Stick-up Height 1 feet
Depth to Water 7.1 feet below top of casing
Total Depth 61 feet below top of casing
Depth of Tubing (sample interval) 60 feet below top of casing

sulfide = 0.80 mg/L
ferrous iron: 3.30 mg/L

Start purge 0945
~~Start parameters~~
End purge 1030
Total purge time: ____ hours ____ minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

~~Sand~~ well much less than 50mL; water level dropped below 20'; slow recharge. Had to collect condensed suite w/ check valve

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-03GW06 Page 1 of 1 Field Staff: HAT

Date Sampled 11/12/01
Stick-up Height ≈1.8 feet
Depth to Water 62.5 feet below top of casing
Total Depth 63.0 feet below top of casing
Depth of Tubing (sample interval) 63.0 feet below top of casing

sulfide : >0.80mg/L
ferrous iron: 3.30mg/L
Sample time: 4 hrs.

Start purge 1130
Start parameters ~
End purge ~~1145~~ 1200
Total purge time: 0.5 hours, ____ minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

purged dry; collected total of 6 bottles (2 - Brooks Rand, 2 - Lancaster, 2 - EPA), 0.5' water in well, sampled w/ check valve, extremely silty, collected sample from 1300 - 1630, slow recharge through sand pack, Geosearch used open screen

(1)

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-040W01 Page 1 of 1 Field Staff: HT

Date Sampled 4/20/01
Stick-up Height 2.0 feet
Depth to Water 10.93 feet below top of casing
Total Depth 16.0 feet below top of casing
Depth of Tubing (sample interval) 15.0 feet below top of casing

Sulfide = 0.04 mg/L
ferrous iron = 2.88 mg/L

Start purge 1430
Start parameters 1515
End purge 1605
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1515	0	300		10.04	253	6.22	79.4	4.62	163
1520	5	↓		9.44	257	5.77	78.5	4.19	27.9
1525	10			9.39	258	5.60	79.6	4.48	14.7
1530	15			9.71	257	5.54	80.3	4.83	15.0
1535	20			9.59	257	5.52	81.1	4.93	9.81
1540	25			9.59	256	5.49	81.9	5.08	8.81
1545	30			9.60	256	5.48	83.3	5.29	9.14
1550	35			9.57	256	5.46	85.7	5.66	12.5
1555	40			9.61	256	5.46	86.3	5.72	10.1
1600	45			9.71	256	5.47	87.9	5.89	9.53
1605	50			9.70	256	5.45	89.0	6.16	9.50

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-046W02a Page 1 of 1 Field Staff: LC

Date Sampled 4/20/01
Stick-up Height 1.0 feet
Depth to Water 9.75 feet below top of casing
Total Depth 25.0 feet below top of casing
Depth of Tubing (sample interval) 24.0 feet below top of casing

sulfide: 0.15 mg/L
ferrous iron: 3.06 mg/L

Start purge 1430
Start parameters 1515
End purge 1600
Total purge time: 1 hours, 30 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1515		400		12.31	721	6.12	53.1	3.44	230
1520	5	400		11.68	706	5.89	26.1	5.03	36
1525	10	400		11.77	706	5.86	20.7	5.28	24
1530	15	400		11.80	707	5.90	14.5	4.73	21
1535	20	400		11.80	706	5.85	14.9	4.11	22
1540	25	400		11.83	708	5.86	11.9	3.20	33
1545	30	400		11.70	710	5.87	10.8	2.93	28
1550	35	400		11.80	708	5.87	10.6	2.75	27
1555	40	400		11.73	710	5.86	10.1	2.62	26
1600	45	400		11.72	704	5.92	5.8	2.63	28

Comments

Collect sample and duplicate, PI-046W0299

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-046GW03 Page 1 of 1 Field Staff: HAT

Date Sampled 4/24/01
Stick-up Height 2.1 feet
Depth to Water 10.48 feet below top of casing
Total Depth 35 feet below top of casing
Depth of Tubing (sample interval) 34 feet below top of casing

Sulfide = 0.00 mg/L
ferrous iron = 0.86 mg/L

Start purge 1030
Start parameters 1055
End purge 1135
Total purge time: 1 hours, 5 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1055	0	400		13.59	770	5.81	54.6	3.82	13
1100	5			13.64	769	5.81	54.2	3.82	13
1105	10			13.61	768	5.80	53.8	3.81	18
1110	15			13.65	768	5.80	54.1	3.80	15
1115	20			13.70	767	5.80	55.5	3.83	15
1120	25			13.73	767	5.79	55.7	3.81	13
1125	30			13.76	768	5.79	56.1	3.81	9.8
1130	35			13.74	768	5.79	57.9	3.81	9.4
1135	40	↓		13.78	769	5.80	58.2	3.86	9.1

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-04GW04 Page 1 of 1 Field Staff: HAT

Date Sampled 4/24/01
Stick-up Height 1 feet
Depth to Water 9.76 feet below top of casing
Total Depth 46 feet below top of casing
Depth of Tubing (sample interval) 45 feet below top of casing

sulfide = 0.02 mg/L
ferrous iron = 0.83 mg/L

Start purge 0900
Start parameters 0920
End purge 1020
Total purge time: 1 hours, 20 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0920	0	400		13.80	748	6.32	111.6	2.79	270
0925	5	↓		13.57	751	6.15	86.8	1.50	290
0930	10			13.45	756	5.88	33.3	0.95	300
0935	15			13.48	757	5.84	21.1	0.90	150
0940	20			13.58	759	5.84	15.9	0.93	95
0945	25			13.666	759	5.83	14.6	0.89	80
0950	30			13.67	760	5.83	14.5	0.93	65
0955	35			13.70	761	5.83	13.7	1.00	50
1000	40			13.74	761	5.84	12.8	1.03	50
1005	45			13.68	762	5.83	13.2	0.87	36
1010	50			13.72	762	5.84	14.3	0.86	28
1015	55			13.74	760	5.84	14.3	0.87	29
1020	60	↓		13.68	760	5.84	14.4	0.84	30

~~760~~ ~~757~~ ~~997~~

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-05GW01 Page 1 of 2 Field Staff: HT

Date Sampled 4/19/01
Stick-up Height 2.1 feet
Depth to Water 11.03 feet below top of casing
Total Depth 17.0 feet below top of casing
Depth of Tubing (sample interval) 16.0 feet below top of casing

sulfide = 0.06mg/L
ferrous iron = 3.30mg/L

Start purge 1120
Start parameters 1215
End purge 1400
Total purge time: 2 hours, 40 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)	
1215	0	200		10.22	903	9.71	138.6	1.69	~~217~~ 213	HRT
1220	5			10.15	888	8.67	107.5	1.55	23.7	
1225	10			10.11	883	8.03	106.4	1.24	11.9	
1230	15			10.05	867	6.81	115.4	0.37	15.3	
1235	20			10.12	866	6.67	115.5	0.30	12.6	
1240	25			10.16	853	6.37	112.9	0.18	11.2	
1245	30			10.21	849	6.28	111.7	0.12	12.0	
1250	35			10.24	849	6.26	111.1	0.11	12.7	
1255	40			10.20	847	6.25	110.3	0.08	13.1	
1300	45			10.17	847	6.23	110.2	0.08	11.4	
1305	50			10.16	846	6.22	109.8	0.06	12.5	
1310	55			10.20	846	6.22	109.3	0.05	12.4	
1315	60			10.18	845	6.19	108.3	0.04	13.0	
1320	65			10.18	845	6.19	108.7	0.04	12.3	
1325	70			10.22	845	6.19	107.9	0.04	14.2	
1330	75			10.23	845	6.18	107.8	0.04	11.4	
1335	80			10.11	846	6.18	107.3	0.04	10.64	
1340	85			9.94	846	6.18	107.3	0.06	10.32	
1345	90	↓		9.91	846	6.17	106.9	0.06	9.92	

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-05GW01 Page 2 of 2 Field Staff: HAT

Date Sampled 4/19/01
Stick-up Height 2.1 feet
Depth to Water 11.03 feet below top of casing
Total Depth 17.0 feet below top of casing
Depth of Tubing (sample interval) 16.0 feet below top of casing

Start purge 1120
Start parameters 1215
End purge 1400
Total purge time: 2 hours, 40 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1350	95	200		9.94	846	6.17	106.7	0.07	10.43
1355	100	↓		10.08	848	6.16	106.2	~~0.06~~ 0.07	9.09
1400	105	↓		10.09	849	6.16	106.1	0.07	10.34

HAT

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-05GW02 Page 1 of 1 Field Staff: LC

Date Sampled 4/19/01
Stick-up Height 1.0 feet
Depth to Water 11.15 feet below top of casing
Total Depth 25.0 feet below top of casing
Depth of Tubing (sample interval) 24.0 feet below top of casing

Sulfide: 0.0 mg/L
ferrous iron: 3.30 mg/L

Start purge 1120
Start parameters 1220
End purge 1300
Total purge time: 1 hours, 40 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1220		400		11.56	722	7.11	-2.7	12.88	2.57
1225	5	400		11.54	713	6.74	15.3	14.55	2.27
1230	10	400		11.47	667	6.17	70.8	16.07	1.61
1235	15	400		11.56	662	6.16	74.5	16.23	1.80
1240	20	400		11.58	661	6.12	75.1	15.84	1.47
1245	25	400		11.60	652	6.11	80.2	16.15	1.82
1250	30	400		11.52	645	6.18	82.3	9.67	2.04
1255	35	400		11.54	644	6.13	84.9	9.11	1.62
1300	40	400		11.66	642	6.11	86.7	9.99	1.64

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-05GW03 Page 1 of 1 Field Staff: HAT

Date Sampled 4/25/01
Stick-up Height 2' feet
Depth to Water NM feet below top of casing
Total Depth 31 feet below top of casing
Depth of Tubing (sample interval) 31 feet below top of casing

Sulfide = 0.13 mg/L
ferrous iron = 3.30 mg/L

Start purge 1210
Start parameters 1235
End purge 1340
Total purge time: 1 hours, 30 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1235	0	400		11.19	700	6.55	-54.3	4.52	62.3
1240	5			11.12	702	6.26	-55.8	4.80	75.2
1245	10			11.11	712	6.03	-53.3	4.01	217
1250	15			11.12	701	5.93	-52.4	2.94	127
1255	20			11.14	714	5.93	-52.4	2.21	15.5
1300	25			11.14	715	5.84	-46.5	1.63	4.40
1305	30			11.12	716	5.80	-42.9	0.93	2.65
1310	35			11.10	716	5.80	-42.4	0.83	3.02
1315	40			11.09	717	5.77	-40.4	0.60	2.98
1320	45			11.09	717	5.76	-39.2	0.54	2.89
1325	50			11.09	717	5.75	-38.3	0.49	4.55
1330	55			11.06	717	5.75	-37.3	0.41	2.97
1335	60			11.09	717	5.75	-36.6	0.38	2.90
1340	65	↓		11.09	717	5.76	-36.5	0.40	3.09
HAT 1345	~~70~~								

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-056WO4NS Page 1 of 1 Field Staff: LC

Date Sampled 4/26/01
Stick-up Height 0.9 feet
Depth to Water — feet below top of casing
Total Depth 43.5 feet below top of casing
Depth of Tubing (sample interval) 42.5 feet below top of casing

Sulfide: 0.80 mg/L
ferrous iron: 3.30 mg/L

Start purge 1210, 1130
Start parameters
End purge 1410, 1330
Total purge time: 4 hours, ____ minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

purged for 2 hours on 4/25/01. extremely silty, purged 2 hours 4/26/01
Sample too silty to run parameters after 4 hrs., collect sample PI-056WO4NS on 4/26/01

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-05GWOS Page 1 of 1 Field Staff: LC/HT

Date Sampled 4/30/01
Stick-up Height 1.0' feet
Depth to Water – feet below top of casing
Total Depth 57.0' feet below top of casing
Depth of Tubing (sample interval) 56.0' feet below top of casing

Sulfide: 0.10 mg/L
ferrous iron: 2.00 mg/L

Start purge 1215
Start parameters 1235
End purge 1325
Total purge time: 1 hours, 10 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1235		400		14.60	1099	7.23	68.7	1.71	700
1240	5	400		14.21	1099	6.48	-108.1	1.26	250
1245	10	400		14.14	1108	6.40	-111.1	0.88	220
1250	15	400		14.26	1119	6.40	-117.4	0.51	220
1255	20	400		14.28	1126	6.32	-115.6	0.32	220
1300	25	400		14.19	1133	6.30	-115.0	0.22	110
1305	30	400		14.16	1139	6.28	-114.4	0.16	100
1310	35	400		14.29	1145	6.28	-113.1	0.14	32
1315	40	400		14.26	1147	6.24	-111.9	0.12	26
1320	45	400		14.27	1149	6.25	-110.4	0.11	26
1325	50	400		14.28	1152	6.24	-109.2	0.12	27

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-06GW01 Page 1 of 1 Field Staff: HART

Date Sampled 4/13/01
Stick-up Height 2 feet
Depth to Water 9.12 feet below top of casing
Total Depth 16 feet below top of casing
Depth of Tubing (sample interval) 15 feet below top of casing

sulfide : 0.02 mg/L
ferrous iron : 0.43 mg/L

Start purge 0845
Start parameters 0900
End purge 0950
Total purge time: 1 hours, 5 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0900	0	400		7.88	3578	5.89	239.7	10.11	1.66
0905	5	↓		6.73	3626	5.86	223.0	9.72	0.95
0910	10			6.66	3633	5.88	207.9	9.82	0.85
0915	15			6.65	3648	5.92	194.2	10.28	0.90
0920	20			6.65	3666	5.90	174.2	9.99	0.75
0925	25			6.65	3676	5.90	162.6	10.03	0.55
~~0926~~ 0930	30			6.65	3688	5.91	150.6	10.11	0.80
0935	35			6.65	3701	5.91	140.7	10.08	0.40
0940	40			6.66	3710	5.91	134.4	10.11	0.60
0945	45			6.65	3719	5.92	127.3	10.30	0.25
0950	50	↓		6.67	3732	5.93	124.7	10.11	0.61

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-06GW02 Page 1 of 1 Field Staff: HAT

Date Sampled 4/13/01
Stick-up Height 1.0 feet
Depth to Water 8.15 feet below top of casing
Total Depth 22.5 feet below top of casing
Depth of Tubing (sample interval) 21.5 feet below top of casing

sulfide: 0.01 mg/L
ferrous iron = 0.25 mg/L

Start purge 1035
Start parameters 1140
End purge 1255
Total purge time: 2 hours, 20 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1140	0	400		12.25	339	6.44	110.9	3.29	14.5
1145	5	↓		11.59	333	6.32	104.6	1.28	9.09
1150	10			11.33	335	6.24	54.4	1.07	7.60
1155	15			11.33	337	6.29	49.5	1.10	8.52
1200	20			11.32	336	6.34	37.0	1.36	8.07
1205	25			11.31	337	6.28	28.5	1.18	12.5
1210	30			11.29	339	6.26	22.1	1.27	9.88
1215	35			11.30	339	6.32	11.3	1.50	5.98
1220	40			11.32	339	6.27	11.7	1.40	3.79
1225	45			11.33	339	6.27	11.2	1.40	4.65
1230	~~50~~			11.34	342	6.25	7.2	1.48	~~13.5~~ 16.5 HAT
1235	55			11.31	340	6.26	0.7	1.55	16.4
1240	60			11.37	341	6.26	0.7	1.55	11.2
1245	65			11.37	341	6.27	0.7	1.56	10.27
1250	70			11.39	342	6.26	0.8	1.62	10.00
1255	75	↓		11.39	337	6.27	0.6	1.50	10.74

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-066W03 Page 1 of 1 Field Staff: LC

Date Sampled 4/13/01
Stick-up Height 2.0 feet
Depth to Water 9.41 feet below top of casing
Total Depth 33.0 feet below top of casing
Depth of Tubing (sample interval) 32.0 feet below top of casing

Sulfide: 0.02 mg/L
ferrous iron: 0.27 mg/L

Start purge 0845
Start parameters 0905
End purge 0955
Total purge time: 1 hours, 10 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0905		400		13.17	311	7.20	143.1	3.89	78.0
0910	5	400		13.15	311	7.00	143.2	3.17	71.2
0915	10	400		13.14	305	6.24	148.3	1.80	45.2
0920	15	400		13.16	303	5.90	150.8	1.16	26.3
0925	20	400		13.18	301	5.63	152.7	0.65	14.5
0930	25	400		13.20	298	5.49	153.6	0.36	7.90
0935	30	400		13.21	297	5.35	154.9	0.15	6.14
0940	35	400		13.22	297	5.29	155.4	0.10	6.49
0945	40	400		13.21	295	5.24	156.6	0.06	2.48
0950	45	400		13.23	296	5.20	157.6	0.06	3.35
0955	50	400		13.31	296	5.15	159.3	0.06	1.55

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-06GWO4 Page 1 of 1 Field Staff: LC

Date Sampled 4/13/01
Stick-up Height 1.0 feet
Depth to Water 10.34 feet below top of casing
Total Depth 42.0 feet below top of casing
Depth of Tubing (sample interval) 41.0 feet below top of casing

Sulfide: 0.0mg/L
ferrous iron: 0.23mg/L

Start purge 1110
Start parameters 1145
End purge 1245
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1145		400		13.48	872	5.28	180.7	2.30	17.8
1150	5	400		13.38	903	5.30	154.7	0.81	9.34
1155	10	400		13.38	907	5.30	149.0	0.41	8.57
1200	15	400		13.37	910	5.30	145.1	0.15	7.77
1205	20	400		13.35	913	5.29	143.8	0.07	6.18
1210	25	400		13.36	915	5.29	143.3	0.05	8.63
1215	30	400		13.35	918	5.29	143.5	0.04	7.12
1220	35	400		13.38	920	5.29	143.4	0.04	5.98
1225	40	400		13.41	921	5.29	143.4	0.04	5.60
1230	45	400		13.40	924	5.29	143.7	0.04	13.0
1235	50	400		13.40	925	5.29	144.4	0.04	3.51
1240	55	400		13.41	925	5.29	145.3	0.04	0.81
1245	60	400		13.32	931	5.29	147.6	0.04	1.21

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-076W01 Page 1 of 1 Field Staff: LC

Date Sampled 4/18/01
Stick-up Height 2.0' feet
Depth to Water 9.65' feet below top of casing
Total Depth 16.0' feet below top of casing
Depth of Tubing (sample interval) 15.0' feet below top of casing

Sulfide: 0.00mg/L
ferrous iron: 0.42mg/L

Start purge 1345
Start parameters 1430
End purge 1500
Total purge time: 1 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1430		400		8.49	728	7.16	242.8	13.19	3.55
1435	5	400		8.48	718	7.00	226.6	13.46	1.67
1440	10	400		8.43	698	6.63	178.1	14.56	1.38
1445	15	400		8.43	691	6.50	172.0	15.25	1.99
1450	20	400		8.43	695	6.38	175.6	15.97	1.89
1455	25	400		8.45	680	6.32	179.6	16.11	2.42
1500	30	400		8.47	675	6.32	183.7	17.18	1.92

Comments
collected sample and duplicate, PI-076W0199

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample PI-07GW02 Page 1 of 1 Field Staff: HAT

Date Sampled 4/30/01
Stick-up Height 2 feet
Depth to Water Nm feet below top of casing
Total Depth 24 feet below top of casing
Depth of Tubing (sample interval) 23 feet below top of casing

sulfide = 0.01 mg/L
ferrous iron = 0.24 mg/L

Start purge 4/18/01 1350, 4/19 1230, 4/30 905
Start parameters
End purge 1620, 1300, 1035
Total purge time: 4 hours, ____ minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

Collected condensed sweep.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample P1-07GW03NS Page 1 of 1 Field Staff: LC/HAT

Date Sampled 4/30/01
Stick-up Height 1 feet
Depth to Water NM feet below top of casing
Total Depth 31.5 feet below top of casing
Depth of Tubing (sample interval) 30.5 feet below top of casing

Start purge 0900, 1015 5/7
Start parameters
End purge 1200, 1045
Total purge time: ____ hours, ____ minutes
Parameters Stabilized? ____

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

Collected 1 tot As/As species (unfiltered); much less than 50 mL/min
5/7/01 → collected VOCs, NO_2, NO_3 & TCL metals (unfiltered)

7/30/01 → purged for 1 hour (dry)
7/31/01 → sampled for TP, PO_4, + NH_3
8/1/01 → sampled for total SVOCs

8/2 - ~~sampled~~ collected 100 mL of sample in 1 hour
8/3 - completed collection of TSS, SO_4, Alk + Bicarb
8/15 - collected dissolved SVOC + DOC (complete)

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well MW5-01GW01 Date 30 OCT 00

Screen Setting 14-9 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 11.75 Measured Width W/L #3 Well Materials PVC ✓ SS. Steel

Total depth 15' / 16.80 Pump On: 910 Pump Rate: 150 mL/min

Stickup 1.70 Purge Method Pump Off: 1015 Volumes Purged

Centrifugal Sample Time: 945 Weather:

Submersible Sampled By: Diane Mosher

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
920	10				5.37	31	55	108	6.00	17.5		
925					5.42	31	45	110	5.50	17.5		
930	20				5.41	31	26	113	5.00	17.6		
935					5.41	31	16.6	116	4.82	17.6		
940					5.40	31	9.1	119	4.77	17.6	0.13	2.45
945					5.38	32	2.3	126	4.72	17.8		

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCl
TSS	plas	1	none

Sampling Personnel D Mosher

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pH ✓ 3.98

tubing - 2'

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well W5016W02 Date 30Oct00

Screen Setting 22.5-17.5 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 11.90 Measured Width W/L #3 Well Materials PVC / ST (Steel)

Total depth 24.8 Pump On: 1340 Pump Rate: 100mL min

stickup 1.67 Pump Off: 1525 Volumes Purged

Purge Method

Centrifugal Sample Time: 1455 1520 Weather: Sun 60's

Submersible Sampled By: DMasker

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate ~~(gpm)~~ (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1340-1405				Develop + Purge to turbidity lowers								
1405		100			5.80	58	450	-19	5.27	18.7		
1410					5.80	58	210	9	4.80	18.5		
1415					5.75	57	120	42	1.85	17.9		
1420					5.75	56	48	55	1.32	17.9		
1425					5.73	56	45	63	1.04	17.9		
1430					5.71	56	45	69	0.85	18.0		
1435					5.70	55	75	76	0.69	18.0		
1440					5.70	55	40	78	0.63	18.1		
1445					5.71	56	32	78	0.59	18.1		
1450					5.71	56	29	78	0.58	18.0		
1525					5.69	56	31	80	0.54	18.1	0.14	3.30

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO_3
D Metals	plas	1	HNO_3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

pH - ✓ tubing 2' from bottom

Sampling Personnel

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8/18/2000

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

01 — 1 / 1

Project/No. MA000646.0001.00002 Well WS02GW02R Date 10/10/00

Screen Setting 34-29 | Measuring Point Description TOC | Casing Diameter (inches) 1

Static Water Level 11.95 | Measured Width | Well Materials ✓ PVC / ✓ ST. Steel

Total depth 37.7 | Pump On: 1250 | Pump Rate: 200

stickup 1.91 Purge Method | Pump Off: 1410 | Volumes Purged

Centrifugal ✓ | Sample Time: 1335 | Weather:

Submersible | Sampled By: SD

Other | DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1220												
1240				≈2gal	pumped	with	check	valve				
1315		200			4.74	0.12 ⑤	43.4	139	0.76	15.59		
1320					4.73	0.12	26.5	144	0.68	15.32		
1325					4.72	0.12	24.0	148	0.65	15.04		
1330					4.72	0.12	18.1	150	0.63	14.86		
335					4.72	0.12	15.2	151	0.62	14.59		

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO_3
D Metals	plas	1	HNO_3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCl
TSS	plas	1	none

pH - 4.03

tubing 25' from bottom

Sampling Personnel

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8/18/2000

ARCADIS GERAGHTY & MILLER

oundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well W501GW03 Date 10/4/00

Screen Setting 53.5-48.5 Measuring Point Description ToC Casing Diameter (inches) 1

Static Water Level 12.65 Measured Width _____ Well Materials ✓ PVC ✓ ST. Steel

Total depth 55.8 Pump On: 1420 Pump Rate: 250

stickup 1.97 Pump Off: 1705 Volumes Purged _____

Purge Method

Centrifugal ✓ Sample Time: 1635 Weather: _____

Submersible _____ Sampled By: SD

Other _____ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
				≈2g with check valve								
1435		250					927					
1440					4.66	0.17	524	117	1.43	15.61		
1500					4.58	0.17	1021	131	0.70	15.17		
1520					4.63	0.17	796	128	0.85	15.85		
1530					4.67	0.17	762	123	0.89	16.31		
1540					4.71	0.17	696	119	0.97	16.49		
1550					4.72	0.17	579	117	0.91	15.87		
1600					4.71	0.17	405	115	0.84	15.82		
1610					4.71	0.17	135	118	0.79	15.58		
1620					4.70	0.17	61.7	120	0.77	15.53		
1625					4.71	0.17	43.7	120	0.76	15.45		
1630					4.71	0.17	36.8	120	0.75	15.46		
1635					4.70	0.17	27.7	121	0.76	15.44	0.10	3.30 Limit

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO_3
D Metals	plas	1	HNO_3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCl
TSS	plas	1	none

pH – 4.03

tubing 2.5' from bottom

Sampling Personnel

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

Project/No. MA000646.0001.00002 Well W5-02-GW-01 Date 10/12/00

Screen Setting 15-10 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 12.01 Measured Width Well Materials PVC / ✓ ST. Steel

Total depth 19.64 Pump On: 1435 Pump Rate: 100 ml/min

Stickup 1.71 Purge Method Pump Off: 1639 Volumes Purged 2.5

Centrifugal Sample Time: 1545 Weather: 70's Sunny

Submersible Sampled By: AR

Other Peristaltic DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron mg/L
1515		100			4.53	0.43	65	204	6.09	20.5		
1520					4.39	0.43	18	198	5.89	20.1		
1525					4.39	0.43	16	197	5.58	19.4		
1530					4.39	0.43	12	199	5.50	19.1		
												0.19
											0.04	

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCl
TSS	plas	1	none

Sampling Personnel

F:\stds2000\forms\LOWFLO646.xls

Pump 4.0(Tubing 2' From bottom

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well W502GW02 Date 30 Oct 00

Screen Setting 35-30 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 12.20 Measured Width 4/4 #3 Well Materials PVC / SS Steel

Total depth 36 Pump On: 1020 Pump Rate: 200 mL/min

Stickup 1.74 Purge Method Pump Off: 1140 Volumes Purged

Centrifugal Sample Time: 1130-1140 Weather:

Submersible Sampled By: Diane Mosher

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (mL)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1045							650					
1046							300					
1047							130					
1048							85					
1050					6.32	0.19	45	-11	4.42	19.1		
1056	Had to change out Masterflex tubing. It had a pinhole											
1100					6.33	0.21	39.9	-15	4.49	18.5		
1105					6.33	0.22	19.0	-18	2.81	16.8		
1110					6.31	0.22	13.7	-5	1.73	16.2		
1115					6.30	0.22	11.7	-3	1.58	16.3		
1120					6.30	0.22	7.5	-2	1.54	16.3		
1125					6.30	0.22	7.7	-2	1.52	16.3		
											0.09	2.82
					6.28	0.22	10.0	-62	5.67	17.7		
									↓			
									dropping			
									5.16			

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCl
TSS	plas	1	none

Sampling Personnel DMosher

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pH ✓ 7.02 (7.0 solution) tubing - 2'

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample W5-02GW02R Page 1 of 1 Field Staff: HAT

Date Sampled 4/6/01
Stick-up Height 2 feet
Depth to Water 6.37 feet below top of casing
Total Depth 34 feet below top of casing
Depth of Tubing (sample interval) 33 feet below top of casing

sulfide: 0.12 mg/L
ferrous iron 3.30 mg/L

Start purge 1400
Start parameters 1415
End purge 1515
Total purge time: 1 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1415	0	400		11.01	1017	6.17	84.5	1.57	300
1420	5			10.60	1086	5.78	67.8	1.04	310
1425	10			10.46	1089	5.50	58.8	0.72	140
1430	15			10.46	1088	5.45	45.6	0.58	100
1435	20			10.48	1087	5.43	41.1	0.51	70
1440	25			10.44	1088	5.41	40.4	0.41	55
1445	30			10.42	1087	5.40	39.5	0.36	39
1450	35			10.40	1087	5.40	39.5	0.33	35
1455	40			10.36	1087	5.40	39.6	0.32	32
1500	45			10.38	1087	5.39	39.7	0.30	30
1505	50			10.37	1087	5.39	39.8	0.28	28
1510	55			10.36	1087	5.39	39.7	0.29	26
1515	60			10.37	1087	5.38	40.1	0.27	24

Comments

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 of 1

Project/No. MA000646.0001.00002 Well WSO2GW03 Date 4Oct00

Screen Setting 46.5-416 Measuring Point Description TOC

Static Water Level 12.18 Measured Width W/L #3

Total depth 49.40 Pump On: 1420

stickup 1.70 Purge Method Pump Off: 1715

Centrifugal Sample Time: 1645

Submersible

Other ✓ DUP / MS / MSD

Casing Diameter (inches) 1 11

Well Materials PVC / ST (Steel)

Pump Rate: 200 ML/M

Volumes Purged

Weather: Rain 60's

Sampled By: DMosher

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1345-1420		develop - purge					700					
1435	200	200										
1440					5.94	0.26	170	19	5.49	14.9		
1445					5.87	0.26	80	24	1.51	14.7		
1450					5.86	0.26	60	25	0.64	14.6	Change out	
1500					5.85	0.26	110	20	0.26	15.1	Battery	
1510					5.89	0.26	390	19	0.10	14.3		
1520	400	100			5.85	0.26	300	23	0.11	15.0		
1530					5.89	0.26	400	17	0.13	15.5		
1540					5.88	0.26	400	14	0.13	15.6		
1550					5.89	0.26	390	12	0.15	15.9		
1600					5.90	0.26	390	9	0.17	16.0		
1610					5.91	0.26	370	6	0.19	15.9		
1615					5.90	0.25	305	6	0.19	15.9		
1620					5.90	0.25	130	16	0.23	14.1		
1625					5.89	0.26	90	18	0.09	14.1		
1630					5.89	0.26	50	19	0.09	14.0		
1635					5.89	0.26	50	19	0.10	14.0		
1640					5.89	0.26	50	19	0.09	14.0		
											0.68	3.19

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel

pH - 7.02 tubing 2' from bottom

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ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well W503GW01 Date 10/2/00

Screen Setting 1.04

Measuring Point Description ToC

Casing Diameter (inches) 1

Static Water Level 10.0-5.0 6.58

Measured Width

Well Materials ✓ PVC ✓ ST. Steel

Total depth 10.83

Pump On: 1450

Pump Rate: 275

stickup 1.04

Purge Method

Pump Off: 1600

Volumes Purged

Centrifugal ✓

Sample Time: 1525

Weather:

Submersible

Sampled By: SD

Other

DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
			≈0.5 g with check valve									
1455												
1500		275			5.49	0.10	161	13	3.12	16.08		
1505					5.85	0.10	30.5	-33	0.81	15.83		
1503					5.94	0.10	11.5	-44	0.60	15.68		
1510					5.98	0.09	8.68	-48	0.55	15.64		
1513					6.00	0.09	6.03	-49	0.52	15.64		
1518					6.02	0.09	5.13	-52	0.47	15.64		
1523					6.04	0.09	5.79	-54	0.44	15.63	0.02	3.30 4 limit

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	"	1	"
T Arsenic	amber	1	none
D Arsenic	"	1	"
Benz Tol	VOA	3	HCl
TSS	plas	1	none

Sampling Personnel pH-✓ Tubing 2' from bottom

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ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well 105-036W02 Date 30 Oct 00

Screen Setting 25-20 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 7.67 Measured Width W/L #3 Well Materials PVC / ST Steel

Total depth 26.0 Pump On: 1150 Pump Rate: 200 ml/min

0.7

Purge Method Pump Off: 1250 Volumes Purged

Centrifugal Sample Time: 1240 1250 Weather:

Submersible Sampled By: DMosher

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1148 1150	develop well						280					
1150	0						280					
1155					6.18	0.30	110	-100	3.62	16.0		
1200					6.08	0.31	80	-97	1.83	15.6		
1205					6.06	0.31	50	-96	1.37	15.0		
1210					6.05	0.32	50	-94	0.24	14.4		
1215					6.05	0.32	32.7	-94	0.16	14.5		
1220					6.05	0.32	30.2	-93	0.10	14.5		
1225					6.05	0.32	31.1	-92	0.07	14.3		
1230					6.05	0.32	31.0	-92	0.06	14.4		
1235					6.05	0.32	29.3	-91	0.06	14.6		
					6.08	0.31	25.3	-110	N/M	16.2		
1240											0.25	3.30

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	"	1	"
T Arsenic	amber	1	none
D Arsenic	"	1	"
Benz Tol	VOA	3	HCl
TSS	plas	1	none

Sampling Personnel Diane Mosher

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8/18/2000

DH ✓ 7.03 tubing - 2'

ARCADIS GERAGHTY & MILLER

roundwater Sampling Form

Project/No. MA000646.0001.00002 Well WS-03GW02R Date 10Oct 00

Screen Setting 35-30 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 8.75 Measured Width WL #3 Well Materials PVC ST. Steel

Total depth 38.2 Pump On: 1200 Pump Rate: 100

stickup 1.80 Purge Method Pump Off: 1605 Volumes Purged

Centrifugal Sample Time: 1525-1600 Weather: Snow Cloudy 44

Submersible Other ✓ DUP / MS / MSD Sampled By: Diane Mosher

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1130-1200		Develop Purge Recover										
12-1400		Pump to lower turbidity										
1400							550					
1415							260				Connect to Cell	
1430					6.16	0.47	95.5	-59	1.45	11.8		
1440					6.17	0.47	53.5	-61	1.24	11.9		
1450					6.18	0.47	33.0	-60	1.42	11.6		
1500					6.19	0.47	25.5	-59	1.19	11.7		
1510					6.19	0.47	28.3	-59	1.14	11.8		
1520					6.19	0.47	16.7	-58	1.14	11.8		
											0.19	3.30
Pump Battery Died												

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO_3
D Metals	plas	1	HNO_3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel pH - 4.00 tubing 2' from bottom

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RCADIS GERAGHTY & MILLER

Groundwater Sampling Form

Project/No. MA000646.0001.00002 Well W5-036W03 Date 5 Oct 00

Screen Setting 51-46 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 8.40 Measured Width W/L #3 Well Materials PVC ST Steel

Total depth ~~60.5~~ (52.1) Pump On: 920 Pump Rate: 200

stickup 1.6

Purge Method Pump Off: 1040 Volumes Purged

Centrifugal Sample Time: 1025 1040 Weather:

Submersible Sampled By: DMosher

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
810	Found 16' silt in well											
810-920		Develop / purge / Recover										
930	10	200					O/R					
935							800					
940							320					
945					5.92	0.83	160	-93	1.75	13.4		
950					5.93	0.83	120	-92	1.01	13.4		
955					5.93	0.84	100	-84	0.43	13.4		
1000					5.94	0.84	80	-74	0.17	13.4		
1005					5.94	0.84	60	-67	0.11	13.4		
1010					5.94	0.83	50	-64	0.10	13.4		
1015					5.94	0.83	45	-62	0.09	13.6		330
1020					5.94	0.83	45	-60	0.09	13.7		
											0.32	330

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO_3
D Metals	plas	1	HNO_3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel pH - 6.89 tubing 2' from bottom

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8/18/2000

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

(SD) W504GW01

1 of 1

Project/No. MA000646.0001.00002 Well ~~W5 03 GW-4~~ Date 10/2/00

Screen Setting 13-8 Measuring Point Description ToC Casing Diameter (inches) 1"

Static Water Level 9.91 Measured Width Well Materials ✓ PVC ST. Steel

Total depth 16.75 Pump On: 1130 Pump Rate:

Stickup 1.51 Purge Method Pump Off: 1344 Volumes Purged 2.5

Centrifugal Submersible Other Peristaltic Sample Time: 1245 Weather: Sunny 50's

DUP / MS / MSD Sampled By: AR

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide mg/L	Ferrous Iron mg/L
	Purged	0.5	gal	w/Check	valve							
1205							OR					
1210		100	100				360					
1220					4.37	0.43	55	193	6.38	19.4		
1225					4.37	0.43	24	186	6.07	19.2		
1230					4.37	0.43	40	184	5.90	19.1		
1235					4.37	0.43	25	185	5.78	19.3		
1240					4.38	0.43	14	185	5.51	19.5		
												3.3 limit
											0.17	

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel

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ph: 4.01 2' off bottom of Boring

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Groundwater Sampling Form

1 of 1

Project/No. MA000646.0001.00002 Well MW04GW02 Date 10/3/00

Screen Setting 30-25 Measuring Point Description TOC Casing Diameter (inches) 1

Static Water Level 9.82 Measured Width Well Materials ✓ PVC / ST. Steel

Total depth 31.94 Pump On: 1445 Pump Rate: 275

Stickup 1.96 Pump Off: 1525 Volumes Purged

Purge Method Sample Time: 1500 Weather:

Centrifugal ✓ Sampled By: SD

Submersible

Other DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
				≈1g with check valve								
1430		275			7.28	0.69	107.9	-157	1.04	21.38		
1435					6.81	0.57	94.8	-106	0.54	19.60		
1440					6.65	0.58	59.7	-102	0.47	17.65		
1445					6.62	0.54	55.9	-105	0.44	16.28		
1450					6.62	0.54	43.5	-104	0.44	15.69		
1455					6.62	0.54	34.2	-104	0.44	14.99		
1500					6.62	0.54	35.2	-104	0.43	14.88	0.23	3.30 Limit

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	"	1	"
T Arsenic	amber	1	none
D Arsenic	"	1	"
Benz lol	VOA	3	HCL
TSS	plas	1	none

pH - 4.65 Tubing 2.5' from bottom

Sampling Personnel

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well WS046W05 Date 5Oct 00

Screen Setting 55-50 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 12.15 Measured Width W/C #3 Well Materials PVC / ST (Steel)

Total depth 55 59.3 Pump On: 1115 Pump Rate: 100

stickup 1.60 Purge Method Pump Off: 1315 Volumes Purged

Centrifugal Sample Time: 1250-1310 Weather: Cloudy 60's

Submersible Sampled By: Dianemasker

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos (ms/cm)	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1045-1115	DEVELOP / PURGE						Recover / Lower turbidity					
1125							O/R					
1135							1100					
1145							450					
1155							310					
1200					7.13	0.65	220	-145	1.89	12.9		
1205					7.15	0.65	200	-144	0.95	12.8		
1210					7.17	0.65	130	-139	0.70	12.7		
1215					7.18	0.65	100	-138	0.49	12.7		
1230					7.18	0.65	70	-136	0.44	12.7		
1240					7.19	0.65	50	-135	0.43	12.6		
1250					7.21	0.65	50	-133	0.38	12.7		
						0.65	50	-132	0.42	12.7	0.33	2.73

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO_3
D Metals	plas	1	HNO_3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel

pH - 6.98 tubing 2' from bottom

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Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample MW5-046GWD3 Page 1 of 1 Field Staff: AG

Date Sampled 7/27/01
Stick-up Height 1.9 feet
Depth to Water 9.13 feet below top of casing
Total Depth 58.0 feet below top of casing
Depth of Tubing (sample interval) 56.0 feet below top of casing

Start purge 0930
Start parameters 1000
End purge 1045
Total purge time: 1 hours, 15 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1000	0	400	4	13.87	6314	7.13	-116.7	1.40	390
1005	5			13.48	6268	7.19	-137.8	0.24	1000
1010	10			13.39	6248	7.22	-141.6	0.13	700
1015	15			13.36	6233	7.24	-144.8	0.05	850
1020	20			13.30	6211	7.25	-146.0	0.02	850
1025	25			13.24	6206	7.25	-146.9	0.02	850
1030	30			13.27	6199	7.26	-147.3	0.01	700
1035	35			13.26	6201	7.26	-147.2	0.01	750
1040	40			13.24	6206	7.25	-146.7	0.01	700

Comments

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well W505GW01 Date 10/3/00

Screen Setting 11-6 Measuring Point Description TOC Casing Diameter (inches) 1

Static Water Level 7.82 Measured Width _____ Well Materials ✓ PVC / ✓ ST. Steel

Total depth 13.92 Pump On: 955 Pump Rate: 300

Stickup 1.91 Purge Method _____ Pump Off: 1055 Volumes Purged _____

Centrifugal ✓ Sample Time: 1030 Weather: _____

Submersible _____ Sampled By: SD

Other _____ DUP / MS / MSD _____

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
945				≈0.5	w/ check valve							
1000		300			5.72	17	16.4	-22	1.47	17.77		
1005					5.95	17	51.9	-23	0.75	17.70		
1010					6.11	17	15.3	-57	0.66	17.69		
1015					6.25	17	7.67	-85	0.60	17.68		
1020					6.28	17	6.22	-91	0.58	17.68		
1025					6.33	17	5.16	-99	0.58	17.69		
1030					6.36	17	4.44	-104	0.57	17.75	0.36	1.16
1055					6.34	17	5.11	-94	1.56	17.90		

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCl
TSS	plas	1	none

pH-4.03 tubing 2' from bottom

Sampling Personnel

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ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

Project/No. MA000646.0001.00002 Well W505GW02 Date 10/3/00

Screen Setting 33-28 Measuring Point Description ToC Casing Diameter (inches) 1

Static Water Level 9.27 Measured Width Well Materials ✓ PVC ✓ ST. Steel

Total depth 35.85 Pump On: 1220 Pump Rate: 200

stickup 2.04 Pump Off: 1355 Volumes Purged

Purge Method Sample Time: 1330 Weather:

Centrifugal ✓ Sampled By: SD

Submersible

Other DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1210				≈2g	with check valve							
1235		200			7.46	2.15	104.4	-229	0.48	16.00		
1240					7.46	2.2	89.9	-237	0.32	16.30		
1245					7.46	2.2	79.5	-241	0.29	16.11		
1250					7.46	2.2	84.4	-245	0.29	15.86		
1255					7.45	2.2	75.6	-248	0.28	15.69		
1300					7.45	2.2	69.2	-249	0.29	15.45		
1305					7.44	2.2	64.2	-250	0.29	15.96		
1310					7.44	2.2	54.9	-252	0.28	16.26		
1315					7.44	2.2	58.3	-254	0.29	16.54		
1320					7.44	2.2	47.9	-253	0.29	16.71		
1325					7.45	2.2	48.2	-258	0.28	16.69		
1330					7.45	2.2	46.7	-259	0.28	16.71	0.70 water reacted strongly with Reagent 1	3.30 Limit

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	"	1	"
T Arsenic	amber	1	none
D Arsenic	"	1	"
Benz Tol	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel SD pH-4.01 tubing 2' from bottom

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well WS-05GW02R Date 11 OCT 00

Screen Setting 35-30 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 7.65 Measured Width WL #3 Well Materials PVC / ST (Steel)

Total depth (36/36.5) Pump On: 1210 Pump Rate: 200 mL min

stickup 0.6 Purge Method Pump Off: 1515 Volumes Purged

Centrifugal Sample Time: 1450 1515 Weather:

Submersible Sampled By: DMosher

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos (ms/cm)	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1155-1210				Develop		Purge		recover				
1210-1245				Pump to		lower		turbidity			(562)	
1245					7.54	2.1	384	-212	2.91	15.6		
1300	50				7.56	2.1	311	-245	0.17	15.3		
1315					7.58	2.2	239	-256	0.10	15.2		
1330					7.58	2.2	223	-258	0.09	15.2		
1345					7.58	2.2	136	-257	0.07	15.2		
1400	110				7.59	2.2	130	-257	0.05	15.2		
1415					7.59	2.2	73.5	-256	0.05	15.5		
1430					7.58	2.2	54.4	-255	0.06	16.0		
1440					7.58	2.2	49.2	-256	0.07	15.4		
1445					7.59	2.2	37.2	-256	007	14.9	0.68	2.01
1450	150				7.58	2.2	37.9	-263	0.06	14.6	✓	
											Violent reaction to reagent	

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel

pH - 7.02 tubing 1.5 from bottom

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

Project/No. MA000646.0001.00002 Well MW5056W03 Date 10/5/00

Screen Setting 50-45 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 7.99 Measured Width Well Materials PVC / ✓ ST. Steel

Total depth 52.59 Pump On: 1410 Pump Rate: 100ml

stickup 2.5 Pump Off: 1753 Volumes Purged

Purge Method Sample Time: 1630 Weather: Raining 50's

Centrifugal Sampled By: AR

Submersible DUP / MS / MSD

Other Peristaltic

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide mg/L	Ferrous Iron mg/L
1445							481					
1500							361					
1515							247					
1530							160					
1545					6.60	1.3	98.6	-139	0.56	13.99		
1550					6.60	1.3	83.4	-142	0.57	13.36		
1555					6.61	1.3	68.6	-140	0.48	13.79		
1600					6.61	1.3	59.1	-145	0.44	13.80		
1605					6.62	1.3	51.7	-149	0.43	13.81		
1610					6.62	1.3	47.0	-149	0.40	13.99		
1615					6.63	1.3	42.0	-149	0.39	13.82		
1620					6.63	1.3	34.1	-147	0.40	13.81		
											0.35	1.61

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel

pH - 4.01

tubing 2" from bottom

F:\stds2000\forms\LOWFLO646.xls
8/18/2000

ARCADIS GERAGHTY & MILLER

roundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well W506GW01 Date 10/3/00

Screen Setting 11-6 Measuring Point Description ToC Casing Diameter (inches) 1

Static Water Level 8.29 Measured Width Well Materials PVC ✓ ST. Steel

Total depth 13.81 Pump On: 1110 Pump Rate: 300

Stickup 1.97 Purge Method Pump Off: 1205 Volumes Purged

Centrifugal ✓ Sample Time: 1140 Weather:

Submersible Sampled

Other DUP / MS / MSD By: SD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1100				≈0.5g	with check valve							
1115		300			6.07	39	24.4	-66	3.10	18.43		
1120					6.13	43	7.72	-76	0.96	18.14		
1125					6.15	44	3.96	-77	0.72	18.04		
1130					6.16	44	3.07	-77	0.60	18.05		
1135					6.18	44	2.85	-77	0.61	18.08		
1140					6.18	44	2.58	-77	0.59	18.11	0.00	3.30
1205					6.18	44	2.98	-71	1.27	18.32		Limit

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO_3
D Metals	plas	1	HNO_3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCl
TSS	plas	1	none

Sampling Personnel

pH-4.04 Tubing 2' from bottom

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 / 1

Project/No. MA000646.0001.00002 Well W5-06GW02 Date 4 Oct 00

Screen Setting 39-34 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 8.58 Measured Width W/L #3 Well Materials PVC / ST. steel

Total depth 41.8 Pump On: 845 Pump Rate: 200 mL/min

stickup 0.80 Purge Method Pump Off: 1240 Volumes Purged

Centrifugal Sample Time: 1210-1240 Weather: Sun 50's

Submersible Sampled By: DMosher

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (mL)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
745-845	Develop Purge, HIGH Clay, Silt. Well is											
overflowing over the top of well head, water is												
foamy (foaming out of the well at TOP of casing)												
915	well continues foaming at top of casing)											
935	50				7.14	0.78	O/R	-188	3.17	15.7	foaming	
950					7.32	0.81	O/R	-175	0.55	16.0	"	"
1005	80				7.33	0.81	700	-175	0.51	16.1	"	"
1020					7.33	0.81	450	-175	0.48	15.9	"	"
1035	110				7.33	0.81	310	-174	0.50	16.0	"	"
1050					7.33	0.81	220	-175	0.51	16.1	"	"
1105	140				7.33	0.81	150	-175	0.51	16.2	"	"
1120					7.33	0.79	85	-177	0.44	16.2	"	"
1135	170				7.32	0.79	60	-171	0.57	16.3	"	"
1145	180				7.32	0.79	50	-169	0.64	16.3	well stops "foaming"	
1155					7.32	0.79	35	-169	0.67	16.2		
1205	200				7.33	0.79	40	-168	0.70	16.1	Begins foaming again	
											0.31	3.30

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO_3
D Metals	plas	1	HNO_3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

pH - ✓ tubing 2' from bottom

Sampling Personnel

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Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample MW5-06GW02R Page 1 of 1 Field Staff: HAT

Date Sampled 4/11/01
Stick-up Height 2 feet
Depth to Water 6.91 feet below top of casing
Total Depth 38.5 feet below top of casing
Depth of Tubing (sample interval) 37.5 feet below top of casing

sulfide = 0.80 mg/L
ferrous iron = 1.50 mg/L

Start purge 0850
Start parameters
End purge 1005
Total purge time: 1 hours, 15 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments
H_2O is an orange/brown color. Odor to H_2O

ARCADIS GERAGHTY & MILLER

Groundwater Sampling Form

1 1

Project/No. MA000646.0001.00002 Well WS-06GW03 Date 5OCT 00

Screen Setting 59.5-54.5 Measuring Point Description TOC Casing Diameter (inches) 1"

Static Water Level 11.00 Measured Width WL#3 Well Materials ✓ PVC ✓ ST. Steel

Total depth 60.56 23 Pump On: 1420 Pump Rate: 200ml/MN

stickup 1.65

Purge Method Pump Off: 1625 Volumes Purged

Centrifugal Sample Time: 1605-1625 Weather: rain 50's

Submersible Sampled By: Diane Mosher

Other ✓ DUP / MS / MSD

Time	Minutes Elapsed	Rate (gpm) (ML)	DTW	Gallons Purged	pH	Cond. umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP. (C) (F)	Sulfide	Ferrous Iron
1345-1420			Purge Develop / recover									
1430							320					
1435					7.35	0.44	200	-141	6.48	13.4		
1440					7.35	0.42	160	-153	1.39	13.4		
1450					7.37	0.42	120	-162	0.79	13.4		
1500					7.37	0.43	110	-168	0.26	13.4		
1510					7.37	0.43	75	-167	0.35	13.5		
1520					7.37	0.43	75	-170	0.23	13.5		
1530					7.37	0.43	75	-167	0.32	13.4		
1540					7.37	0.43	70	-165	0.33	13.6		
1550					7.36	0.43	32	-162	0.33	12.9		
1555	1555				7.37	0.43	50	-162	0.31	12.9		
1600					7.37	0.42	40	-162	0.31	12.9	0.00	3.30

Constituents Sampled	Container Description	Number	Preservative
T Metals	plas	1	HNO3
D Metals	plas	1	HNO3
T Arsenic	amber	1	none
D Arsenic	amber	1	none
Benzene Toluene	VOA	3	HCL
TSS	plas	1	none

Sampling Personnel pH - 6.91 tubing 2' from bottom

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Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample WS-06GW03 Page 1 of 1 Field Staff: LC

Date Sampled 7/31/01
Stick-up Height 2.0 1.6 feet
Depth to Water 7.91 feet below top of casing
Total Depth 62.2 feet below top of casing
Depth of Tubing (sample interval) 60.2 feet below top of casing

Sulfide: 0.33mg/L
ferrous iron: 2.34mg/L

Start purge 1010
Start parameters 1050
End purge 1120
Total purge time: 1 hours, 10 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1050		300	~~30~~ 6	13.01	3930	7.47	-135.5	0.90	20.0
1055	5	300		13.0	3915	7.51	-142.4	0.77	41.4
1100	10	300		12.99	3910	7.54	-144.9	0.89	20.3
1105	15	300		12.94	3891	7.54	-145.4	0.79	22.1
1110	20	300		12.99	3912	7.56	-149.7	0.82	23.9
1115	25	300		13.01	3913	7.56	-150.0	0.84	23.0
1120	30	300		13.04	3911	7.56	-152.1	0.89	24.9

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample W5-076W01 Page 1 of 1 Field Staff: HAT

Date Sampled 3/15/01
Stick-up Height 1.8 feet
Depth to Water 5.71 feet below top of casing
Total Depth ~~53~~ 9.0 ft feet below top of casing
Depth of Tubing (sample interval) ~~52~~ 9.0 ft feet below top of casing

Sulfide = 0.04 mg/L
Ferrous iron = 3.30 mg/L

Start purge 855
Start parameters ~~1055~~ 955 HAT
End purge 1025
Total purge time: 1 hours, 30 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
955	0	200		6.16	442	6.14	-38.9	7.48	23.3
1000	5	↓		6.23	446	6.15	-38.7	7.47	13.4
1005	10			6.31	452	6.17	-38.2	7.46	8.99
1010	15			6.31	454	6.17	-38.4	7.69	9.44
1015	20			6.30	459	6.17	-38.7	7.30	9.15
1020	25			6.34	465	6.20	-39.3	7.16	9.04
1025	30	↓		6.32	469	6.19	-39.5	7.26	9.0

Comments
Duplicate taken from W5-076W01

R

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample WS-07GW02 Page 1 of 1 Field Staff: LC

Date Sampled 4/6/01
Stick-up Height 2.1' feet
Depth to Water 5.93' feet below top of casing
Total Depth 31.5' feet below top of casing
Depth of Tubing (sample interval) 30.5' feet below top of casing

sulfide: 0.0mg/L
ferrous iron: 3.30mg/L

Start purge 1400
Start parameters 1435
End purge 1530
Total purge time: 1 hours, 30 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1435		400		10.44	153	6.08	150.4	0.69	515
1440	5	400		10.28	152	6.17	127.6	0.47	567
1445	10	400		10.24	152	6.33	87.8	0.40	84.3
1450	15	400		10.25	152	6.49	49.4	0.40	111
1455	20	400		10.24	152	6.53	38.2	0.34	70.4
1500	25	400		10.24	152	6.53	28.3	0.33	49.3
1505	30	400		10.23	152	6.63	18.2	0.32	34.0
1510	35	400		10.25	152	6.68	7.0	0.42	35.6
1515	40	400		10.22	151	6.75	-7.6	0.27	212
1520	45	400		10.22	151	6.75	-9.2	0.27	84.5
1525	50	400		10.24	151	6.76	-12.9	0.26	87.3
1530	55	400		10.24	151	6.83	-19.1	0.27	80.2

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample MS-07GW03 Page 1 of 1 Field Staff: HT

Date Sampled 3/15/01
Stick-up Height 0.75 ~~2 HT~~ LC feet
Depth to Water ~~5.71~~ 12.91 LC feet below top of casing
Total Depth 53 feet below top of casing
Depth of Tubing (sample interval) 52 feet below top of casing

sulfide = 0.23 mg/L
ferrous iron = 1.77 mg/L

Start purge HT 1415
Start parameters 1435
End purge 1505
Total purge time: 0 hours, 50 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1435	0	400		11.33	1707	6.65	-2.8	3.43	140
1440	5	↓		10.81	1705	6.91	-64.9	2.13	150
1445	10			10.80	1701	7.01	-78.9	2.04	130
1450	15			10.82	1700	7.09	-84.6	1.99	85
1455	20			10.83	1699	7.15	-89.3	1.98	65
1500	25			10.81	1697	7.17	-91.1	1.98	70
1505	30	↓		10.83	1690	7.20	-91.7	1.97	65

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample MW-08GW01NS Page 1 of 1 Field Staff: LC

Date Sampled 4/4/01
Stick-up Height 0.9' feet
Depth to Water 7.23' feet below top of casing
Total Depth 9.5' feet below top of casing
Depth of Tubing (sample interval) — feet below top of casing

Sulfide: 0.80mg/L
ferrous iron: 3.30mg/L

Start purge 0915
Start parameters
End purge ~~0945~~ 1010 DC
Total purge time: ____ hours, ____ minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments
Very low flow, sampled w/ check valve, Collect condensed suite (2 VOC's, 1 As bottle, 1 Metals, 1 TSS)

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample MW-08GW02 Page 1 of 1 Field Staff: HAT

Date Sampled 4/9/01
Stick-up Height 2.1 feet
Depth to Water 8.23 feet below top of casing
Total Depth 28.0 feet below top of casing
Depth of Tubing (sample interval) 27.0 feet below top of casing

sulfide = 0.08 mg/L
ferrous iron = 3.30 mg/L

Start purge 0910
Start parameters 0935
End purge 1005
Total purge time: 0 hours, 55 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0935	0	400		11.77	476	6.30	38	0.67	60
0940	5	↓		11.76	475	6.21	38.5	0.65	50
0945	10			11.74	472	5.95	38.7	0.59	45
0950	15			11.72	471	5.83	37.8	0.54	40
0955	20			11.73	470	5.72	38.4	0.46	40
HAT ~~0971000~~	25			11.77	470	5.68	39.1	0.44	38
1005	30	↓		11.77	471	5.66	39.7	0.42	40
HAT ~~1010~~	~~35~~								

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample MS-08GW03 Page 1 of 1 Field Staff: HAT

Date Sampled 4/4/01
Stick-up Height 0.9 feet
Depth to Water ~~AAT~~ HAT 7.39 feet below top of casing
Total Depth 46.5 feet below top of casing
Depth of Tubing (sample interval) 45 feet below top of casing

Sulfide = 0.14 mg/L
ferrous iron = 3.30 mg/L

Start purge 0915
Start parameters 0935
End purge 1005
Total purge time: 0 hours, 50 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0935	0	400		11.62	401	6.23	83.8	5.89	164
0940	5	↓		11.59	400	6.04	74.3	5.81	122
0945	10			11.57	398	5.89	69.2	5.75	85.7
0950	15			11.66	398	5.79	66.2	5.73	75.2
0955	20			11.68	398	5.79	66.5	5.76	70.4
1000	25			11.66	398	5.76	67.0	5.55	74.7
1005	30	↓		11.72	397	5.76	67.3	5.52	72.0

Comments

~~NAA - not measured, water level couldn't go down.~~ HAT
MS/MSD collected

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB1-04GW01NS Page 1 of 1 Field Staff: LC/AG/HAT

Date Sampled 7/30/01, 7/31/01, 8/1/01, 8/2/01, 8/3/01, 8/15/01, 11/6/01, 11/7/01
Stick-up Height 1.5 feet
Depth to Water 11.3 feet below top of casing
Total Depth 14.0 feet below top of casing
Depth of Tubing (sample interval) 12.0 feet below top of casing

Start purge 0930, 1615
Start parameters _____
End purge 0955, 1640
Total purge time: _____ hours, _____ minutes
Parameters Stabilized? _____

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

11/6/01 purged dry

Comments

very low recharge, collect 3 VOC's on 7/30 w/ pump
7/31 - collect 1 As/As Spec. sample w/ check valve
8/1 - collected 1 Total/Dis. Met. Sample w/ check valve
8/2 - collected 1 unfiltered 8270 sample; 8/3/01 collected 1 TPO4 sample in ½ hr.
8/15 collected 1 filtered SVOC and 1 TSS/bicarb. sample time 1 hour.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sampl CB2-050GW02 Page 1 of 2 Field Staff: LC

Date Sampled 8/17/01
Stick-up Height 0.1 feet
Depth to Water 12.96 feet below top of casing
Total Depth 22.75 feet below top of casing
Depth of Tubing (sample interval) 20.75 feet below top of casing

Sulfide: 0.12 mg/L
ferrous iron: 3.30 mg/L

Start purge 0925
Start parameters 0945
End purge 1210
Total purge time: 2 hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0945		200		16.50	1760	5.94	-109.3	1.76	118
0950	5	200		16.35	1705	5.99	-144.9	1.11	—
0955	10	200		16.30	1705	6.02	-163.1	1.00	63.8
1000	15	200		16.20	1695	6.02	-159.1	0.94	42.7
1005	20	200		16.36	1687	6.01	-162.0	0.95	48.0
1010	25	200		16.27	1685	6.01	-157.7	0.92	44.6
1015	30	200		16.25	1673	6.01	-159.1	0.91	46.2
1020	35	200		15.84	1664	6.00	-165.3	1.03	112
1025	40	200	5	15.70	1665	5.99	-171.2	1.00	140
1030	45	200		15.77	1651	5.98	-178.9	0.92	85
1035	50	200		15.78	1648	5.98	-184.7	0.91	80
1040	55	200		15.72	1647	5.98	-191.9	0.91	85
1045	60	200		15.70	1646	5.97	-196.5	0.88	90
1050	65	200		15.70	1644	5.97	-219.1	0.91	90
1055	70	200		15.51	1642	5.97	-259.7	0.90	120
1100	75	200		15.53	1629	5.96	-302.5	0.88	400
1105	80	200		15.40	1627	5.96	-323.1	0.88	550
1110	85	200		15.42	1627	5.96	-326.5	0.94	480
1120	95	200		15.29	1629	5.95	-280.1	1.07	110

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB2-05GW02 Page 2 of 2 Field Staff: LC

Date Sampled 8/17/01
Stick-up Height 0.1 feet
Depth to Water 12.96 feet below top of casing
Total Depth 22.75 feet below top of casing
Depth of Tubing (sample interval) 20.75 feet below top of casing

Start purge 0925
Start parameters 0945
End purge 1210
Total purge time: 2 hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1125	100	200		15.37	1625	5.95	-275.0	1.00	110
1130	105	200		15.26	1624	5.95	-284.6	0.98	150
1135	110	200		15.23	1622	5.94	-259.2	1.00	160
1140	120	200	10	15.29	1619	5.94	-272.8	0.99	200
1145	125	200		15.25	1623	5.96	-326.8	0.95	360
1150	130	200		15.28	1624	5.95	-322.9	0.94	210
1155	135	200		15.21	1630	5.96	-305.0	0.96	140
1200	140	200		15.25	1628	5.96	-284.3	1.04	150
1205	145	200		15.26	1628	5.95	-280.3	0.98	140
1210	150	200		16.45	1624	5.95	-279.1	0.95	140

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB2-05GW03R Page 1 of 1 Field Staff: LC / CV

Date Sampled 8/17/01
Stick-up Height 0.1 feet
Depth to Water 13.09 feet below top of casing
Total Depth 31.5 feet below top of casing
Depth of Tubing (sample interval) 29.5 feet below top of casing

Sulfide: 0.08 mg/L
ferrous iron: 3.30 mg/L

Start purge 1310
Start parameters 1400
End purge 1445
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1400		300	5	15.90	1857	6.54	-44.0	0.91	130
1405	5	300		15.77	1859	6.54	-46.6	0.91	70
1410	10	300		15.73	1859	6.54	-62.4	1.03	31
1415	15	300		16.73	1859	6.60	-65.0	0.83	29
1420	20	300		15.72	1860	6.61	-70.9	0.70	22
1425	25	300		15.75	1858	6.62	-57.3	0.91	32
1430	30	300	10	15.80	1855	6.62	-55.9	0.61	40
1435	35	300		15.76	1859	6.63	-68.4	0.66	27
1440	40	300		15.74	1856	6.63	-62.8	0.62	28
1445	45	300		16.90	1859	6.63	-74.3	0.62	29

Comments

Call + Brooks + give (206) 632-6206 Findlay McKay
Airbill No Rebecca Wood

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB2-06GW02NS Page 1 of 1 Field Staff: CY

Date Sampled 8-17-01
Stick-up Height 2.0 feet
Depth to Water _____ feet below top of casing
Total Depth 14' feet below top of casing
Depth of Tubing (sample interval) 13.8' feet below top of casing

sulfide: 0.71 mg/L
ferrous iron: 3.30 mg/L

Start purge 1110
Start parameters Not able to collect
End purge 1150
Total purge time: 3 hours, 37 minutes
Parameters Stabilized? Not able to collect

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1150	40	50 mL/min	0.75	23.33°C	2084	6.79	-62.9	3.50	850

Comments
1/2" water level ~~well~~ Not able to be measured = probe will not go down. Used tubing to determine approximate depth to water = 11'; Purge until dry or ~~[illegible]~~ atleast 3 well volumes purged more then 3x volume-total purge volume about 0.75 gal. - Slight sken on water, med. [illegible] odor

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB3-03GW01 JC Page 1 of 1 Field Staff: JC

Date Sampled 7/9/01, 7/20/01
Stick-up Height 1.3 feet
Depth to Water 15.11 feet below top of casing
Total Depth 20.0 feet below top of casing
Depth of Tubing (sample interval) 18.0 feet below top of casing

Sulfide: 0.08mg/L
ferrous iron: 2.70mg/L

Start purge 1200
Start parameters —
End purge 1345-1600 JC
Total purge time: 4 hours, — minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1305		30		26.33	2394	7.51	-21.0	12.16	270
1310	6	30		28.50	2390	7.53	-14.2	12.76	263
1315	10	30		28.16	2389	7.54	-13.7	13.22	261
AT 1530 ~~1520~~	5	30		32.12	2061	7.59	17.3	11.67	489
JC 1535 ~~1525~~	10	30		32.11	2081	7.60	17.1	11.73	555
JC 1540 ~~1600-1530~~	15	30							
1555		30		22.68	1140	7.35	-88.4	9.78	140
1600		30		22.91	1509	7.43	-85.3	10.88	156
1605		30		23.17	2110	7.55	-69.8	12.63	167

Comments

Very low purge rate (<30mL/min), air in tubing is impacting parameters
1615 collect condensed suite (1830 sampling complete)
EPA collected 2L on 7/10/01 in 50min.
-Collected 1 filtered SVOC sample on 7/20/01 (40min.)

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB3-026W03 Page 1 of 1 Field Staff: LC

Date Sampled 7/8/01 7/9/01 dc
Stick-up Height 0.9 feet
Depth to Water 15.59 feet below top of casing
Total Depth 24.3 feet below top of casing
Depth of Tubing (sample interval) 22.3 feet below top of casing

Sulfide: 0.03mg/L
ferrous iron: 2.03mg/L

Start purge 0920
Start parameters 0940
End purge 1015
Total purge time: — hours, 55 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0940		400		12.65	2784	6.80	-129.7	3.64	23.1
0946	6	400		12.62	2790	6.79	-144.3	6.40	13.0
0950	10	400		12.71	2777	6.80	-128.5	6.15	9.07
0955	15	400		12.53	2785	6.80	-133.5	6.63	8.76
1000	20	400		12.55	2784	6.80	-141.7	7.72	7.93
1005	25	400		12.91	2792	6.81	-147.8	7.71	6.05
1010	30	400		12.77	2796	6.81	-152.8	7.91	6.59
1015	35	400		12.71	2785	6.81	-154.7	8.37	6.34

Comments

TetraTech NUS collected 3-1L plastic bottles to be analyzed for Bicarbonate, Anions, TDS and 3L for dup.
-collect sample at 1030

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample ~~CB3GW03~~ CB3-030W03 LC Page 1 of 1 Field Staff: LC

Date Sampled 7/16/01
Stick-up Height 1.9 feet
Depth to Water 9.17 feet below top of casing
Total Depth 33.0 feet below top of casing
Depth of Tubing (sample interval) 31.0 feet below top of casing

Sulfide: 0.74 mg/L
ferrous iron: 3.30 mg/L

Start purge 1340
Start parameters 1410
End purge 1450
Total purge time: 1 hours, 10 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1410		300		19.45	1273	6.25	-165.2	0.02	118
1415	6	300		17.43	1268	6.24	-179.9	0.02	33.6
1420	10	300		17.31	1265	6.24	-182.9	0.06	22.3
1425	15	300		17.28	1268	6.25	-186.1	0.05	26.7
1430	20	300	5	17.43	1264	6.25	-187.9	0.05	20.1
1435	25	300		17.03	1265	6.25	-191.7	0.07	23.6
1440	30	300		17.05	1261	6.25	-192.9	0.06	19.3
1445	35	300		16.99	1258	6.25	-194.5	0.06	19.1
1450	40	300	7	16.95	1260	6.25	-196.4	0.06	19.2

Comments
EPA collected 2L in 15 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB4-03GW03 Page 1 of 2 Field Staff: AG/HAT

Date Sampled 7/10/01
Stick-up Height 1.2 feet
Depth to Water 7.68 feet below top of casing
Total Depth 46.5 feet below top of casing
Depth of Tubing (sample interval) 45 feet below top of casing

Sulfide = 0.02 mg/L
ferrous iron = 1.54 mg/L

Start purge 0930
Start parameters 1020
End purge 1215
Total purge time: 2 hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) ±3%	Spec. Cond. (uS) 3%	pH ±0.1	ORP (mV) ±10	DO (mg/L) 10%	Turbidity (NTU) 10%
1020	0	300		17.11	1949	6.69	-126.9	-0.03	412
1025	5			15.73	1950	6.73	-117.9	0.01	207
1030	10			15.55	1951	6.75	-113.5	0.00	141
1035	15			15.58	1960	6.76	-108.2	0.00	101.4
1040	20			15.51	1962	6.75	-89.8	0.00	58.2
1045	25			15.57	1958	6.77	-101.8	0.01	45.5
1050	30			15.63	1959	6.78	-102.3	0.01	38.5
1055	35			15.62	1958	6.77	-102.5	0.01	25.6
1100	40			15.53	1971	6.77	-100.0	0.02	21.8
1105	45			15.58	1962	6.78	-101.4	0.00	17.6
1110	50			15.52	1968	6.78	-98.0	0.00	15.0
1115	55			15.48	1967	6.77	-99.0	0.00	11.3
1120	60			15.62	1968	6.77	-98.1	0.00	10.66
1125	65			15.60	1969	6.78	-98.6	-0.01	9.69
1130	70			15.64	1969	6.41	-26.4	-0.07	7.54
1135	75			15.76	1975	6.77	-87.9	-0.02	14.0
1140	80			15.71	1972	6.78	-94.5	-0.01	8.51
1145	85			15.65	1968	6.78	-95.9	0.00	7.74
1150	90	✓		15.76	1973	6.79	-95.8	0.00	6.08

Comments

EPA collected 2 L for 15 min

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB4-03GW03 Page 2 of 2 Field Staff: ~~AG~~/HAT

Date Sampled 7/10/01
Stick-up Height 1.2 feet
Depth to Water 7.68 feet below top of casing
Total Depth 46.5 feet below top of casing
Depth of Tubing (sample interval) 45 feet below top of casing

Start purge 0930
Start parameters 1020
End purge 1215
Total purge time: 2 hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1155	95	300		15.60	1975	6.79	-95.7	-0.01	4.64
1200	100	↓		15.62	1972	6.79	-93.0	-0.01	5.16
1205	105			15.69	1971	6.80	-96.6	-0.01	4.07
1210	110			15.64	1975	6.79	-95.7	-0.01	3.94
1215	115	↓		15.70	1985	6.78	~~-84.2~~ -88.1	-0.01	3.20
~~1220~~ HAT									

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB4-04GW01 Page 1 of 1 Field Staff: CY

Date Sampled 8/16/01
Stick-up Height 2.11 feet
Depth to Water 17.75 feet below top of casing
Total Depth 21 feet below top of casing
Depth of Tubing (sample interval) 20 feet below top of casing

Sulfide = 0.0 mg/L
ferrous iron = 3.30 mg/L

Start purge 0840
Start parameters
End purge 1210
Total purge time: 3 hours, 30 minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

pumping much less than 50 mL/min

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB4-04GW02 Page 1 of 1 Field Staff: HAT

Date Sampled 8/16/01
Stick-up Height _____ feet
Depth to Water NM feet below top of casing
Total Depth 31 feet below top of casing
Depth of Tubing (sample interval) 30 feet below top of casing

Sulfide = 0.80 mg/L
ferrous iron = 3.30 mg/L

Start purge 0930 → 1130
Start parameters _____
End purge _____
Total purge time: 3 hours, — minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments
purged till dry & then sampled recharge

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CBS-01GW01 Page 1 of 1 Field Staff: LC

Date Sampled 7/16/01
Stick-up Height 1.9 feet
Depth to Water 10.91 feet below top of casing
Total Depth 17.15 feet below top of casing
Depth of Tubing (sample interval) 15.15 feet below top of casing

Sulfide: 0.44 mg/L
ferrous iron: 3.3 mg/L

Start purge 1045
Start parameters 1125
End purge 1220
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1125		250		15.79	2553	6.19	-184.3	0.39	138
1130	5	250		16.64	2516	6.20	-192.3	0.03	90.2
1135	10	250		16.49	2524	6.24	-201.4	0.04	110
1140	15	250		16.46	2503	6.26	-203.3	0.06	47.1
1145	20	250		16.61	2523	6.28	-205.7	0.07	34.6
1150	25	250		16.14	2524	6.29	-207.5	0.08	26.9
1155	30	250		16.22	2527	6.28	-206.5	0.10	27.0
1200	35	250		16.24	2527	6.29	-206.5	0.08	28.2
1205	40	250		16.29	2532	6.28	-207.7	0.08	29.5
1210	45	250	5	16.41	2539	6.29	-211.8	0.05	23.3
1215	60	250		16.42	2530	6.29	-212.0	0.04	24.5
1220	55	250	6	16.43	2536	6.30	-213.6	0.04	22.4

Comments
EPA collected 4L in 30 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB5-02GW02 Page 1 of ___ Field Staff: HAT/AG

Date Sampled 7/9/01
Stick-up Height 0.9 feet
Depth to Water 11.04 feet below top of casing
Total Depth 21.03 feet below top of casing
Depth of Tubing (sample interval) 20.03 feet below top of casing

sulfide = 0.12 mg/L
ferrous iron = 0.37 mg/L

Start purge 0940
Start parameters 1005
End purge 1115
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH ±0.1	ORP (mV) ±10	DO (mg/L) 10%	Turbidity (NTU) 10%
1005	0	200		19.31	4549	7.43	-108.9	-0.22	155
1010	5			HAT ~~15~~ 17.04	4534	7.39	-131.7	-0.27	131
1015	10			16.72	4535	7.38	-152.6	-0.02	149
1020	15			16.89	4553	7.38	-141.2	0.08	204
1025	20			16.75	4560	7.38	-140.6	0.11	142
1030	25			16.45	4553	7.37	-144.4	0.15	120
1035	30			16.13	4575	7.36	-144.6	0.13	103.0
1040	35			16.16	4580	7.36	-147.0	0.12	87.5
1045	40			16.51	4580	7.36	-142.5	0.13	85.4
1050	45			16.70	4593	7.36	-142.9	0.26	78.5
1055	50			16.66	4592	7.36	-145.7	0.30	76.3
1100	55			16.89	4590	7.36	+139.1	0.33	79.2
1105	60			16.77	4594	7.36	-141.4	0.52	71.5
1110	65			16.75	4589	7.36	-140.2	0.52	71.3
1115	70	↓		16.54	4585	7.36	-135.2	0.48	70.0
~~1120~~	~~75~~	HAT							

Comments
EPA collected 6L

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample BS-02GW03 Page 1 of __ Field Staff: HAT/AG

Date Sampled 7/9/01
Stick-up Height 2.1 feet
Depth to Water 9.87 feet below top of casing
Total Depth ____ feet below top of casing
Depth of Tubing (sample interval) ____ feet below top of casing

Sulfide = 0.07 mg/L
ferrous ion = 3.30 mg/L

Start purge 1300
Start parameters 1315
End purge 1345
Total purge time: 0 hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH +/- 0.1	ORP (mV) +/-10	DO (mg/L) 10%	Turbidity (NTU) 10%
1315	0	300		15.90	2401	6.67	-172.4	-0.07	60.9
1320	5			15.14	2401	6.67	-173.2	-0.05	33.7
1325	10			14.46	2425	6.67	-174.7	-0.04	16.6
1330	15			14.26	2430	6.68	-178.5	-0.01	13.4
1335	20			14.28	2419	6.70	-181.2	-0.02	13.0
1340	25			14.25	2423	6.70	-183.8	-0.02	13.7
1345	30			14.26	2421	6.70	-183.9	-0.02	13.8

Comments
EPA -> 3 L

HAT

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CBS-03GW03 Page 1 of 1 Field Staff: HAT

Date Sampled 8/16/01
Stick-up Height 2.8 feet
Depth to Water 10.18 feet below top of casing
Total Depth 38' feet below top of casing
Depth of Tubing (sample interval) 37' feet below top of casing

sulfide = 0.48 mg/L
ferrous iron = 1.15 mg/L

Start purge 1230
Start parameters 1305
End purge 1400
Total purge time: 1 hours, 30 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1305	0	400		12.89	18858	7.59	8.5	0.56	50
1310	5	↓		12.91	18849	7.59	7.5	0.54	34
1315	10			12.82	18842	7.63	0.6	0.48	27
1320	15			12.84	18908	7.64	-7.7	0.41	20
1325	20			12.79	19014	7.65	-20.0	0.52	16
1330	25			12.74	19085	7.64	-26.7	0.56	16
1335	30			12.67	19211	7.65	-39.8	0.49	14
1340	35			12.56	19338	7.70	-55.8	0.55	13
1345	40			12.60	19339	7.67	-59.3	0.55	13
1350	45			12.51	19393	7.68	-65.4	0.45	13
1355	50			12.48	19456	7.68	-73.9	0.42	14
1400	55	↓		12.47	19526	7.69	-75.4	0.44	14

Comments

Odor, strong reaction (bubbles + smoke) w/ HCl & H_2SO_4 & Sulfide Reagent

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB6-036W01 Page 1 of ___ Field Staff AG

Date Sampled 7/18/01
Stick-up Height 1.8 feet
Depth to Water 12.81 feet below top of casing
Total Depth 17.09 feet below top of casing
Depth of Tubing (sample interval) 16.09 feet below top of casing

Sulfide : 0.80 mg/L
ferrous iron 0.31

Start purge 1110
Start parameters 1150
End purge 1230
Total purge time: 1 hours, 20 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH +/- 1 3% AG	ORP (mV) +/- 10	DO (mg/L) 10%	Turbidity (NTU) 10%
1150	0	210 AG		16.95	3294	7.46	-247.2	6.50	24
1155	5			16.54	5382	7.49	-254.8	6.57	21
1200	10			16.59	3407	7.48	-264.5	6.60	21
1205	15			16.51	3451	7.45	-270.1	6.80	19
1210	20			16.60	3468	7.49	-275.9	6.73	19
1215	25			16.59	3463	7.49	-278.0	6.78	23
1220	30			16.63	3460	7.50	-282.1	6.85	19
1225	35			16.67	3464	7.50	-283.6	6.89	19
1230	40		5	16.70	3452	7.50	-285.3	6.93	18

Comments

Bubbles in YSI chamber may effect parameters.
EPA collected 2 L in 15 ~~minutes~~ minutes Water has odor.
Sampled MS + MSD. 19
with regular samples and samples of MS + MSD sampling

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB6-03GWN02 Page 1 of 1 Field Staff: LC

Date Sampled 7/19/01
Stick-up Height 2.0 feet
Depth to Water 12.78 feet below top of casing
Total Depth 24.3 feet below top of casing
Depth of Tubing (sample interval) 22.3 feet below top of casing

Sulfide: 0.23mg/L
ferrous iron: 0.10mg/L

Start purge 1400
Start parameters 1535
End purge 1615
Total purge time: 2 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1535		100		18.38	13281	7.72	-451.5	0.0	181
1540	5	100		17.44	13125	7.67	-477.4	0.28	84.6
1545	10	100		17.50	13319	7.65	-488.6	0.30	32.4
1550	15	100		17.02	13305	7.64	-492.4	0.32	30.0
1555	20	100		17.23	13290	7.64	-492.9	0.26	32.8
1600	25	100		17.41	13322	7.65	-470.3	0.28	44.7
1605	30	100		17.67	13374	7.65	-465.6	0.29	34.6
1610	35	100		17.84	13457	7.66	-456.1	0.29	36.3
1615	40	100	5	17.92	13468	7.66	-455.8	0.29	35.0

Comments
EPA collected 2L in 30min.
Total sampling time = 2hrs

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB6-03GW03 Page 1 of 2 Field Staff: AG

Date Sampled 7/31/01
Stick-up Height 2 feet
Depth to Water 13.81 feet below top of casing
Total Depth 32.5 feet below top of casing
Depth of Tubing (sample interval) 32.3 feet below top of casing

Sulfide: 0.10 mg/L
ferrous iron: 0.09 mg/L

Start purge 0940
Start parameters 1005
End purge
Total purge time: ____ hours, ____ minutes
Parameters Stabilized? ____

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	3% Temperature (degrees C)	3% Spec. Cond. (uS)	+/- .1 pH	+/- 10 ORP (mV)	1% DO (mg/L)	1% Turbidity (NTU)
1005	0	400	5	15.28	6297	7.87	-210.3	0.81	100
1010	5			15.74	6328	7.86	-261.2	0.70	25
1015	10			15.62	6320	7.86	-276.2	0.58	20
1020	15			15.70	6327	7.86	-286.4	0.26	22
1025	20			15.78	6323	7.86	-289.9	0.23	7.4
1030	25			15.76	6300	7.86	-300.2	0.19	13
1035	30			15.68	6313	7.85	-296.1	0.19	13
1040	35			15.77	6297	7.85	-299.5	0.14	10
1045	40			15.70	6297	7.85	-303.7	0.20	13
1050	45			15.64	6311	7.85	-308.2	0.25	12
1055	50			15.78	6275	7.85	-310.1	0.22	7.9
1100	55			16.00	6258	7.84	-315.1	0.29	7.5
1105	60			15.91	6241	7.84	-317.3	0.24	7.6
1110	65			15.79	6252	7.84	-316.6	0.29	5.9
1115	70			15.91	6231	7.84	-314.3	0.20	6.8
1120	75			15.93	6219	7.83	-321.1	0.18	6.7
1125	80			15.74	6249	7.83	-321.8	0.11	6.4
1130	85			16.01	6210	7.82	-323.6	0.13	5.5
1135	90			16.01	6204	7.83	-323.9	0.29	5.4

Comments
EPA collected 2 L in 10 minutes

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB6-036W03 Page 2 of 2 Field Staff: AG

Date Sampled 7/13/01
Stick-up Height 2 feet
Depth to Water 13.81 feet below top of casing
Total Depth 32.5 feet below top of casing
Depth of Tubing (sample interval) 32.3 feet below top of casing

Start purge 0940
Start parameters 1005
End purge 1240
Total purge time: 3 hours, 5 minutes
Parameters Stabilized? yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1150	105	400	15	16.12	6195	7.82	-332.0	-0.11	30
1155	110			16.15	6211	7.81	-321.1	0.15	16
1200	115			16.10	6.82	7.81	-316.7	0.10	68
1205	125			16.28	6161	7.80	-312.4	0.10	6.4
1215	140			16.12	6193	7.80	-314.3	0.27	76
1220	145			16.26	6149	7.80	-317.5	0.25	7.3
1225	140 150			16.22	6171	7.80	-320.1	0.41	5.8
1240	155			16.35	6157	7.79	-318.0	0.42	5.8
1245	160			16.44	6150	7.79	-318.7	0.43	5.3

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample GS7-010W01 Page 1 of 1 Field Staff: AG

Date Sampled 7/17/01
Stick-up Height 1.4 feet
Depth to Water 4.84 feet below top of casing
Total Depth 12.2 feet below top of casing
Depth of Tubing (sample interval) 11.2 feet below top of casing

Start purge 0920
Start parameters 0950
End purge 1115
Total purge time: 1 hours, 55 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0950	0	300	4	16.86	1446	6.49	-200.0	0.07	100
0955	5			16.81	1444	6.51	-204.2	0.08	60
1000	10			16.80	1442	6.52	-204.6	0.08	37
1005	15			16.78	1440	6.54	-205.0	0.08	31
1010	20			16.77	1443	6.54	-204.5	0.06	29
1015	25			16.77	1444	6.55	-205.1	0.05	24
1020	30			16.76	1446	6.55	-205.1	0.05	23
1025	35			16.75	1446	6.56	-206.1	0.06	23
1030	40			16.75	1446	6.57	-206.6	0.05	23
1035	45			16.73	1449	6.56	-206.9	0.05	21
1040	50			16.74	1448	6.56	-206.9	0.05	19
1045	55			16.76	1450	6.57	-206.6	0.03	21
1050	60			16.76	1451	6.57	-207.2	0.03	20
1055	65			16.75	1451	6.58	-207.1	0.03	16
~~1060~~	70			16.76	1454	6.57	-206.9	0.02	16
1105 AG	75			16.74	1455 AG	6.57	-206.2	0.02	16
1110	80		11	16.81	1452	6.58	-207.0	0.02	15
1115	85								
1120	90								

Comments
EPA collected 4L in 30 minutes.
Clear on arrival

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB7-01GW03 Page 1 of ___ Field Staff: AG

Date Sampled 7/17/01
Stick-up Height 0.9 feet
Depth to Water 4.45 feet below top of casing
Total Depth ~62 feet below top of casing
Depth of Tubing (sample interval) ~61 feet below top of casing

Sulfide: 0.12 mg/L
ferrous iron: 2.48 mg/L

Start purge Waited on 1 1/2 hours then stopped started again @ 1500
Start parameters 1515
End purge ~~1610~~ 1600
Total purge time: 2 hours, ~~25~~ 15 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH +/- .1	ORP (mV) +/- 10	DO (mg/L) 10%	Turbidity (NTU) 10%
1515	0	300	7	14.00	497	5.86	-50.4	0.12	40
1520	5			13.90	488	5.68	-36.7	0.08	24
1525	10			13.85	485	5.58	-31.1	0.06	23
1530	15			13.66	484	5.51	-25.3	0.05	24
1535	20			13.73	482	5.45	-20.0	0.05	14
1540	25			13.71	482	5.43	-17.6	0.05	13
1545	30			13.71	480	5.41	-14.1	0.05	15
1550	35			13.63	481	5.38	-11.0	0.05	13
1555	40			13.55	480	5.36	-6.7	0.05	13
1600	45			13.56	477	5.35	-3.3	0.05	13
			13						

Comments
EPA collected 2 L in 10 minutes

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB7-026W01 Page 1 of 1 Field Staff: AG

Date Sampled 7/16/01
Stick-up Height 1.7 feet
Depth to Water 11.32 feet below top of casing
Total Depth 22.0 feet below top of casing
Depth of Tubing (sample interval) 20.0 feet below top of casing

Sulfide: 0.01 mg/L
ferrous iron: 5.50 mg/L

Start purge 1400
Start parameters 1430
End purge 1600
Total purge time: 2 hours, — minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1430	0	400	2	13.84	2968	5.94	-128.1	0.27	17
1435	5			13.43	2965	5.98	-131.4	0.07	45
1440	10			13.37	2966	5.98	-132.6	0.05	15
1445	15			13.45	2963	5.98	-127.8	0.17	8.0
1450	20			13.29	2963	6.01	-132.4	0.04	6.7
1455	25			13.58	2963	6.01	-133.9	0.03	6.6
1500	30			13.68	2958	6.01	-133.8	0.06	6.4
1505	35			13.59	2957	6.02	-134.3	0.04	7.1
1510	40			13.64	2962	6.01	-133.9	0.04	6.6
1515	45			13.59	2961	6.01	-134.0	0.03	7.2
1520	50			13.66	2957	6.00	-126.5	0.17	6.6
1525	55			13.62	2950	6.02	-132.1	0.03	11
1530	60			13.55	2950	6.03	-132.3	0.03	10
1535	65			13.58	2951	6.02	-132.2	0.02	9.5
1540	70			13.63	2952	6.01	-132.0	0.03	9.1
1545	75			13.72	2950	6.02	-131.9	0.03	6.8
1550	80			13.45	2951	6.01	-131.5	0.04	7.5
1555	85			13.52	2949	6.01	-131.2	0.04	6.9
1600	90			13.58	2943	6.02	-131.2	0.04	6.89 AG

Comments
Some bubbles occur in flow through cell, may effect parameters
EPA collected 2L in 10 minutes.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB7-02-GW02 Page 1 of 1 Field Staff: AG

Date Sampled 7/16/01
Stick-up Height 1.4 feet
Depth to Water 12.39 feet below top of casing
Total Depth 30.0 feet below top of casing
Depth of Tubing (sample interval) 29.0 feet below top of casing

Sulfides 0.05 mg/L
ferrous iron 3.30 mg/L

Start purge 1005
Start parameters 1150
End purge 1300
Total purge time: 2 hours, 55 minutes
Parameters Stabilized? yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	3% Temperature (degrees C)	3% Spec. Cond. (uS)	+/-.1 pH	+/-10 ORP (mV)	10% DO (mg/L)	10% Turbidity (NTU)
1150	0	300	15	13.30	1217	5.49	-64.1	0.32	200
1155	5			13.10	1224	5.53	-69.2	0.15	50
1200	10			13.07	1225	5.54	-72.0	0.08	37
1205	15			13.09	1218	5.55	-72.0	0.06	40
1210	20			13.06	1221	556	-65.9	0.10	40
1215	25			13.10	1219	5.60	-70.9	0.05	22
1220	30			13.21	1220	5.59	-71.2	0.05	11
1225	35			13.09	1219	5.60	-70.1	0.05	16
1230	40			13.13	1218	5.61	-69.5	0.05	8.8
1235	45			12.97	1217	5.61	-68.1	0.05	9.0
1240	50			13.07	1221	5.61	-62.0	0.05	6.9
1245	55			13.10	1217	5.62	-65.8	0.04	7.2
1250	60			13.11	1216	5.62	-64.6	0.04	6.6
1255	65			13.12	1215	5.61	-63.3	0.04	7.0
1300	70		23						

Comments

EPA sampled ~~it~~ AG 2 L in 10 minutes
It took a long time of purging to decrease the amount of sediment in the water.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB7-030W01 Page 1 of 2 Field Staff: AG

Date Sampled 7/25/01
Stick-up Height ~~3.51~~ 2.6 feet
Depth to Water 13.51 feet below top of casing
Total Depth 19.1 feet below top of casing
Depth of Tubing (sample interval) 18.1 feet below top of casing

Sulfide 0.80 mg/L
ferrousion: 0.21 mg/L

Start purge 0940
Start parameters 1000
End purge 1150
Total purge time: 1 hours, 50 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1000	0	360	2	15.72	2594	7.13	-191.5	6.80	37.5
1005	5			14.94	2787	7.10	-212.3	6.94	21.6
1010	10			14.90	2584	7.18	-221.3	6.97	19.9
1015	15			14.90	2585	7.20	-224.6	6.96	11.2
1020	20			14.91	2580	7.18	-225.5	7.94	15.9
1025	25			14.93	2551	7.16	-226.2	8.32	19.1
1030	30			14.97	2591	7.15	-227.3	8.43	16.0
1040	40			15.04	2582	7.22	-Pk 229.3	7.54	15.7
1045	45			15.04	2587	7.19	-228.7	8.00	13.4
1050	50			15.06	2572	7.09	-230.8	8.18	14.3
1055	55			15.07	2571	7.13	-230.4	7.73	15.7
1100	60			15.07	2579	7.15	-230.9	7.77	16.2
1105	65			15.10	2570	7.17	-231.2	8.01	18.6
1110	70			15.16	2581	7.19	-2329	7.85	16.5
1115	75			15.11	2580	7.15	-233.5	7.87	17.9
1125	85			15.16	2571	7.16	-233.3	7.40	20.6
1130	90			15.15	2570	7.16	-235.7	7.27	19.5
1135	95			15.12	2575	7.15	-234.1	7.63	27.4
1140	100			15.17	2571	7.16	-234.4	7.15	25.3
1145	105								

Comments
EPA collects 4 1/2 L in 20 minutes

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB7-036GW01 Page 2 of 2 Field Staff: AG

Date Sampled 7/25/01
Stick-up Height 2.6 feet
Depth to Water 12.51 feet below top of casing
Total Depth 19.1 feet below top of casing
Depth of Tubing (sample interval) 18.1 feet below top of casing

Start purge 0940
Start parameters 1000
End purge 1150
Total purge time: 1 hours, 50 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1150	110		11	15.17	2571	7.17	-234.9	7.2	26.7

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB7-036W02R Page 1 of 1 Field Staff: AG

Date Sampled 7/25/01
Stick-up Height 1.8 feet
Depth to Water 12.04 feet below top of casing
Total Depth 38.5 feet below top of casing
Depth of Tubing (sample interval) 32.5 feet below top of casing

sulfide 0.80 mg/L
ferrous iron 0.01 mg/L

Start purge 1250
Start parameters 1335
End purge 1405
Total purge time: 1 hours, 30 15 minutes
Parameters Stabilized? yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1335	0	360	9	14.55	3597	6.95	-284.5	0.73	16.8
1340	5			13.95	3545	6.92	-292.9	0.57	17.8
1345	10			13.89	3523	6.94	-293.1	0.61	17.3
1350	15			13.89	3522	6.96	-270.8	0.68	18.0
1355	20			13.89	3515	6.97	-293.7	0.57	16.0
~~1355~~ 1400	25			13.99	3516	6.97	-296.7	0.56	16.7
1405	30		14	13.94	3518	6.98	-300.1	0.57	17.0

Comments
EPA collected 2L in 10 minutes.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB7-036GW03 Page 1 of 1 Field Staff: AG

Date Sampled 7/25/01
Stick-up Height 1.0 feet
Depth to Water 10.95 feet below top of casing
Total Depth 53.5 feet below top of casing
Depth of Tubing (sample interval) 51.5 feet below top of casing

sulfide 0.18 mg/L
ferrous iron = 1.14 mg/L

Start purge 14:50
Start parameters 15:40
End purge 17:10
Total purge time: 2 hours, 20 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH +/-.1	ORP (mV) +/-10	DO (mg/L) 10%	Turbidity (NTU) 10%
1545	0	400	~~400~~ 19	15.33	9802	7.25	-178.9	0.57	58.6
1550	5			14.30	9822	7.26	-188.3	0.46	36.4
1555	10			14.13	9669	7.29	-200.0	0.78	35.7
1600	15			14.03	9600	7.31	-209.3	0.89	29.1
1605	20			14.06	9800	7.34	-211.7	1.12	32.7
1610	25			14.02	9470	7.35	-215.0	8.12	27.6
1615	30			14.08	9637	7.35	-218.7	3.20	30.1
1620	35			14.00	9674	7.36	-219.4	5.61	29.9
1625	40			14.06	9641	7.36	-221.4	2.58	30.9
1630	45			14.05	9731	7.36	-219.9	2.84	31.4
1635	50			14.05	9664	7.36	-222.0	2.96	30.0
1640	55			14.02	9602	7.36	-219.9	1.42	28.9
1645	60			14.06	9723	7.35	-221.6	1.94	26.7
1650	65			14.08	9760	7.35	-220.5	3.05	31.4
1655	70			14.09	9880	7.35	-218.8	1.21	32.1
~~1616~~ 1700	75			14.09	9826	7.34	-212.8	1.42	~~28.5~~ 30.2
1705	80			14.11	9789	7.34	-193.3	1.55	29.1
1710	85		15	14.03	9769	7.33	-185.7	1.53	29.4
1720	90								

Comments EPA collected 2 L in 10 minutes

ROUX ASSOCIATES, INC.
Fi BIP SOW Soil/Groundwater Investigation
Gr water Sampling Form

Sample CB8-016GW01 Page 1 of 1 Field Staff: LC

Date Sampled 7/12/01
Stick-up Height 1.6 feet
Depth to Water 14.01 feet below top of casing
Total Depth 21.7 feet below top of casing
Depth of Tubing (sample interval) 19.7 feet below top of casing

Sulfide: 0.80 mg/L
ferrous iron: 3.30 mg/L

Start purge 1040
Start parameters 1055
End purge 1125
Total purge time: — hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1055		300		13.82	912	5.73	-60.8	1.02	32.3
1100	5	300		13.65	903	5.75	-65.8	0.65	6.75
1105	10	300		13.62	901	5.75	-65.9	0.61	5.44
1110	15	300		13.63	897	5.76	-64.9	0.53	4.97
1115	20	300		13.54	895	5.75	-63.9	0.47	4.00
1120	25	300		13.49	893	5.76	-61.8	0.46	4.55
1125	30	300	5	13.49	892	5.76	-61.3	0.45	4.22

Comments

EPA collected 2L in 15 min., collected sample and duplicate

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CBS-01GW03 Page 1 of 1 Field Staff: LC

Date Sampled 7/17/01
Stick-up Height 1.9 feet
Depth to Water 14.31 feet below top of casing
Total Depth 76.5 feet below top of casing
Depth of Tubing (sample interval) 74.5 feet below top of casing

Sulfide: 0.01 mg/L
ferrous iron: 3.30 mg/L

Start purge 0945, 1430
Start parameters 1500
End purge 1045, 1545
Total purge time: 2 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1500		300	5	13.97	3269	6.04	-139.9	0.53	0.93
1505	5	300		13.90	3273	6.05	-139.4	0.46	1.63
1510	10	300		13.89	3277	6.05	-137.5	0.42	2.95
1515	15	300		13.90	3274	6.06	-135.5	0.44	4.64
1520	20	300	10	13.81	3281	6.06	-134.5	0.40	6.20
1525	25	300		13.77	3281	6.06	-132.9	0.38	5.81
1530	30	300		13.77	3280	6.06	-131.6	0.37	6.16
1535	35	300		13.79	3279	6.07	-131.1	0.37	4.55
1540	40	300		13.80	3277	6.07	-130.0	0.37	4.46
1545	45	300	12	13.79	3279	6.06	-129.7	0.37	3.02

Comments
EPA collected 2L in 15 min.

CTB-04GW02 NS
~~CTB04GW02~~ AG

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample ~~CTB-GW-04~~ CTB-04GW02 AG Page 1 of 2 Field Staff: AG

Date Sampled 7/24/01
Stick-up Height 2 feet
Depth to Water 15.36 feet below top of casing
Total Depth 42' feet below top of casing
Depth of Tubing (sample interval) 41 feet below top of casing

Start purge 1025
Start parameters 1115
End purge 1423
Total purge time: 4 hours, ____ minutes
Parameters Stabilized? No

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1115	0		2	18.62	14325	7.64	-35.9	0.93	222
1120	5			18.07	14330	7.67	-52.0	1.00	210
1126	10			19.33	14373	7.33	15.7	1.07	217
1130	15								
1135	20								
1140	25								
1145	~~30~~ 0	400	3	14.19	14543	7.16	-110.8	0.38	339
1150	5			13.97	14544	7.63	-162.6	0.08	406
1155	10			13.90	14542	7.72	-178.3	0.06	412
~~1200~~ AG	~~15~~ AG								
~~1205~~ AG	~~20~~ AG								
~~1210~~ AG	~~25~~ AG								
~~1215~~ AG	~~30~~ AG								
1315	0			15.10	14599	6.78	-9.9	0.39	229
1320	5			15.16	14728	7.61	-107.0	0.29	247
1328	10			15.09	14737	7.70	-117.5	0.25	172
1330	15			15.18	14729	7.65	-122.6	0.22	137
1335	20			15.37	14742	6.16 7.10	-26.8	0.56	141
1340	25			15.47	14752	7.65	-10[illegible].9	0.27	113

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB8-046GW02N Page 2 of 2 Field Staff: AB

Date Sampled 7/24/01
Stick-up Height 2 feet
Depth to Water 15.36 feet below top of casing
Total Depth 42 feet below top of casing
Depth of Tubing (sample interval) 41 feet below top of casing

sulfides: 0.17 mg/L
ferrous iron: 1.03 mg/L

Start purge 1025
Start parameters 1115
End purge 1425
Total purge time: 4 hours, ____ minutes
Parameters Stabilized? No

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1345	30		10	15.55	14751	7.69	-111.1	0.28	88.7
1350	35			15.62	14760	7.69	-110.5	0.35	49.5
1355	40			15.71	14775	7.72	-113.0	0.31	64.3
1400	45			15.74	14796	7.70	-112.9	0.31	54.4
1405	30								
1410	55		15	14.66	14732	7.32	-119.2	0.26	178

Comments
EPA collect 2L in 10 minutes; collected sample and duplicate CB8-046GW02NS99
sample is effervescing

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB9-01GW01 Page 1 of 1 Field Staff: LC

Date Sampled 7/10/01
Stick-up Height 1.30 feet
Depth to Water 7.51 feet below top of casing
Total Depth 14.0 feet below top of casing
Depth of Tubing (sample interval) 12.0 feet below top of casing

Sulfide: 8.80mg/L
ferrous iron: 1.08mg/L

Start purge 0915
Start parameters 0940
End purge 1010
Total purge time: — hours 55 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
0940		500		16.55	1542	6.94	-219.2	7.63	129
0945	5	300		16.33	1586	6.93	-227.5	7.50	5.23
0950	10	300		16.22	1591	6.94	-238.7	7.90	5.35
0955	15	300		16.21	1590	6.94	-249.3	8.57	4.48
1000	20	300		16.17	1592	6.94	-248.3	8.75	3.80
1005	25	300		16.15	1592	6.93	-249.9	8.70	3.64
1010	30	300		16.16	1595	6.93	-251.6	8.97	3.02

Comments
EPA collected 2L of sample

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample SG9-016GW03 Page 1 of 2 Field Staff: LC

Date Sampled 7/10/01
Stick-up Height 0.60 feet
Depth to Water 6.45 feet below top of casing
Total Depth 35.0 feet below top of casing
Depth of Tubing (sample interval) 33.5 feet below top of casing

Sulfide: 0.22 mg/L
ferrous iron: 0.58 mg/L

Start purge 1145
Start parameters 1245
End purge 1435
Total purge time: 2 hours, 50 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1245		200		14.40	5756	7.26	-191.6	9.69	76.3
1250	5	200		14.41	5733	7.27	-191.7	5.86	47.3
1255	10	200		14.40	5680	7.27	-188.9	6.76	35.5
1300	15	200		14.58	6623	7.27	-184.3	7.27	27.8
1305	20	200		14.57	5595	7.28	-186.1	13.17	33.3
1310	25	200		14.47	5566	7.28	-187.8	5.53	21.6
1315	30	200		14.45	5557	7.28	-188.0	5.43	22.0
1320	35	200		14.56	5497	7.28	-187.5	5.63	19.9
1325	40	200		14.50	5440	7.28	-187.0	8.22	15.6
1330	45	200		14.49	5437	7.28	-185.6	9.73	12.2
1335	50	200		14.61	5421	7.29	-184.7	3.51	10.92
1340	55	200		14.64	5405	7.29	-184.0	3.35	7.11
1350	60	200		14.56	5293	7.29	-181.0	5.15	10.71
1355	65	200		14.66	5265	7.29	-181.9	3.95	9.78
1400	70	200		14.72	5221	7.29	-183.0	4.88	9.18
1405	75	200		14.76	5289	7.29	-184.2	10.60	7.72
1410	80	200		14.78	5316	7.29	-181.7	10.97	8.05
1415	85	200		14.82	5268	7.29	-180.9	8.58	9.08
1420	90	200		14.85	5289	7.29	-180.7	18.34	9.33

Comments
EPA collected 2L (20 min.)
VOC's may have air bubbles, sample is effervescent in contact w/ preservative

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB9-01GW03 Page 2 of 2 Field Staff: LC

Date Sampled 7/10/01
Stick-up Height 0.60 feet
Depth to Water 6.45 feet below top of casing
Total Depth 35.0 feet below top of casing
Depth of Tubing (sample interval) 33.5 feet below top of casing

Start purge 1145
Start parameters 1245
End purge
Total purge time: ____ hours, ____ minutes
Parameters Stabilized? ____

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1430	100	200		14.80	6226	7.29	-181.0	~~20.99~~ 18.62	9.36
1435	105	200		14.87	5250	7.29	-181.2	18.26	8.42

Comments

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample: B9-02GW02 Page 1 of 1 Field Staff: AG/HAT

Date Sampled 7/10/01
Stick-up Height 2.1 feet
Depth to Water 6.0 feet below top of casing
Total Depth 29.5 feet below top of casing
Depth of Tubing (sample interval) 28.5 feet below top of casing

sulfide: 0.27mg/L
ferrous iron: 3.30mg/L

Start purge 1340
Start parameters 1355
End purge 1505
Total purge time: 1 hours, 25 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH +/-1	ORP (mV) +/-10	DO (mg/L) 10%	Turbidity (NTU) 10%	
1355 @ HRT	0	300		16.77	6866	6.00	-138.5	~~7.8~~ 0.10	17.8	
1400	5			15.96	6881	5.99	-135.9	-0.08	17.0	
1405	10			15.59	6835	5.99	-131.7	-0.08	21.8	
1410	15			15.66	6812	5.99	-130.3	-0.06	12.5	
1415	20			15.46	6814	5.99	-128.0	-0.07	27.0	
1420	25			15.74	6783	6.00	-126.4	-0.05	9.06	
1425	30			15.86	6807	6.00	-125.6	-0.06	14.2	
1430	35			15.84	6793	6.00	-124.5	-0.07	9.77	
1435	40			15.63	6777	6.00	-122.8	-0.04	10.36	
1440	45			15.67	6767	6.01	-122.0	-0.06	11.2	
1445	50			15.88	6773	6.02	-121.5	-0.05	29.2	
1450	55			16.02	6736	6.02	-120.5	-0.04	34.4	
1455	60			16.10	6711	6.02	-120.0	-0.04	15.00	
1500	65			15.94	6776	6.02	-118.7	-0.04	9.32	
1505	70	↓		16.12	6769	6.02	-118.3	-0.04	~~10.~~ 8.86	HAT
				16.23	6757	6.04	-118.3	-0.04	9.33	

Comments

EPA collected 2L for 15 ~~more~~ HAT min.
Sheen on water and oily odor.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB9-046GW01 Page 1 of 1 Field Staff: LC

Date Sampled 7/23/01
Stick-up Height 1.1 feet
Depth to Water 4.1 feet below top of casing
Total Depth 9.0 feet below top of casing
Depth of Tubing (sample interval) 7.5 feet below top of casing

Sulfide: 0.02mg/L
ferrous iron: 3.30mg/L

Start purge 1205
Start parameters 1240
End purge 1310
Total purge time: 1 hours, 5 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1240		400	5	19.72	407	5.90	-51.1	1.68	9.6
1245	5	400		19.68	408	5.91	-52.5	1.83	3.9
1250	10	400		19.66	408	5.92	-53.1	2.00	2.2
1255	15	400		19.60	407	5.92	-53.3	1.93	1.7
1300	20	400		19.68	407	6.93	-53.1	2.07	1.1
1305	25	400		19.62	407	5.93	-52.7	2.17	0.70
1310	30	400	10	19.55	408	6.93	-51.8	2.22	1.00

Comments
EPA collected 4L in 25 min

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CB9-05GW01 Page 1 of 1 Field Staff: LC

Date Sampled 7/23/01
Stick-up Height 1.1 feet
Depth to Water 4.51 feet below top of casing
Total Depth 11.0 feet below top of casing
Depth of Tubing (sample interval) 9.0 feet below top of casing

Sulfide: 0.04mg/L
ferrous iron: 3.30mg/L

Start purge 1500
Start parameters 1515
End purge 1545
Total purge time: — hours, 45 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1515		400	3	19.96	480	5.81	-34.5	1.92	28
1520	5	400		19.73	476	5.77	-38.8	1.92	13
1525	10	400		19.54	476	5.74	-43.9	2.13	5.5
1530	15	400		19.46	476	5.73	-46.0	2.20	2.9
1535	20	400		19.44	476	6.73	-47.6	2.37	1.8
1540	25	400		19.37	477	5.74	-49.1	2.50	1.8
1545	30	400	5	19.40	477	5.73	-49.4	2.57	1.4

Comments
EPA collected 2L in 15 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample ~~CE3GW~~ CE3-02GW03 Page 1 of 1 Field Staff: LC

Date Sampled 7/25/01
Stick-up Height 1.2 feet
Depth to Water 4.92 feet below top of casing
Total Depth 54.0 feet below top of casing
Depth of Tubing (sample interval) 52.0 feet below top of casing

Sulfide: 0.14 mg/L
ferrous iron: 3.30 mg/L

Start purge 1220
Start parameters 1350
End purge 1410
Total purge time: 1 hours, 50 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1340		400		13.18	789	5.70	1.2	0.21	7.1
1345	5	400	10	12.67	784	5.71	1.7	0.08	3.3
1350	10	400		12.59	787	5.74	1.0	0.05	3.2
1355	15	400		12.64	790	5.80	-5.9	0.05	4.4
1400	20	400		12.64	744	5.79	-4.4	0.03	1.7
1405	25	400		12.61	743	5.82	-5.3	0.03	2.0
1410	30	400	13	12.69	793	5.81	-4.4	0.03	0.55

Comments
EPA collected 2L in 15 min.
collect Sample and MS/MSD

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CE4-02GW01 Page 1 of 1 Field Staff: LC

Date Sampled 7/19/01
Stick-up Height 2.0 feet
Depth to Water 9.71 feet below top of casing
Total Depth 14.75 feet below top of casing
Depth of Tubing (sample interval) 12.75 feet below top of casing

Sulfide: 0.80mg/L
Ferrous iron: 3.30mg/L

Start purge 1020
Start parameters 1100
End purge 1130
Total purge time: 1 hours, 10 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1100		150		16.49	2376	6.18	-198.7	2.95	38.0
1105	5	150		16.34	2370	6.18	-189.8	2.83	14.4
1110	10	150		16.35	2368	6.18	-189.1	2.79	13.6
1115	15	150		16.36	2361	6.19	-183.6	2.56	9.95
1120	20	150		16.31	2366	6.20	-183.3	2.49	10.02
1125	25	150		16.32	2360	6.20	-183.3	2.49	10.52
1130	30	150	3	16.31	2354	6.20	-182.5	2.44	10.5

Comments
EPA collected 2L in 30 min.
Total sampling time was 2hrs.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample LF4-03GW01NS Page 1 of 1 Field Staff: AG

Date Sampled 7/19/01, 7/23/01, 7/24/01, 7/25/01
Stick-up Height 0.7 feet
Depth to Water 6.67, 5.05 feet below top of casing
Total Depth 10.0 feet below top of casing
Depth of Tubing (sample interval) 8.0 feet below top of casing

Sulfide: 0.80mg/L
ferrous iron: 3.30mg/L

Start purge AG 1410
Start parameters
End purge 1740
Total purge time: 3 hours, 30 minutes +30 total 4 hours.
Parameters Stabilized? No

7/24/01 collected metals + bicarb 0730 still need filtered (2.0hrs)

7/25/01 - collect 1 filtered svoc, 1 DOC (1.5 hrs.)

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

Worked on well for 3½ hours. Purged well dry. very slow recharge
1410 started purging at 1740 checked water level it was down to 9ft
Only purged about 2 gallons with the addition of 1 gallon of DI water
1410 began sampling @ 1125 ~~finished to~~ stopped at 1725 could not fill all bottles today.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CEM-05GWD3 Page 1 of 1 Field Staff: AG

Date Sampled 7/19/01
Stick-up Height 1.9 feet
Depth to Water 11.71 feet below top of casing
Total Depth 27.5 feet below top of casing
Depth of Tubing (sample interval) 25.5 feet below top of casing

Sulfide 0.04
iron ~ 1.30

Start purge 1015
Start parameters 1055
End purge 1135
Total purge time: ____ hours, ____ minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH +/- .1	ORP (mV) +/- 10	DO (mg/L) 10%	Turbidity (NTU) 10%
1055	0	300	7	12.86	950	5.59	110.7	0.03	65
1100	5			12.61	952	456 5.61	-121.6	0.02	23
1105	10			12.71	952	5.63	-125.8	0.01	18
~~1200~~ 1110	15			12.74	953	5.64	-127.6	0.01	10
1115	20			12.77	953	5.65	-127.7	0.01	8.9
1120	25			12.59	951	5.65	-129.6	0.00	9.6
1125	30			12.71	952	5.64	-131.1	0.00	8.7
1130	35			12.63	952	5.67	-132.5	0.00	9.0
1135	40		12	12.54	951	5.65	-133.5	0.00	9.0

Comments

EPA collected 2 L in 10 minutes
collected sample and duplicate

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CH1-04GW04R Page 1 of ___ Field Staff: LC

Date Sampled 7/18/01
Stick-up Height 1.9 feet
Depth to Water 5.10 feet below top of casing
Total Depth 40.0 feet below top of casing
Depth of Tubing (sample interval) 38.0 feet below top of casing

Sulfide: 0.80 mg/L
ferrous iron: 3.30 mg/L

Start purge 1515
Start parameters 1640
End purge 1715
Total purge time: 2 hours, ___ minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1640		300		15.41	452	7.09	-194.8	0.05	338
1645	5	300	7	15.31	451	6.90	-203.9	0.03	423
1650	10	300		15.24	450	6.84	-211.7	0.02	434
1655	15	300		15.34	450	6.85	-220.5	0.02	448
1700	20	300		15.28	450	6.85	-222.6	0.02	464
1705	25	300		15.33	450	6.85	-224.7	0.02	484
1710	30	300		15.35	450	6.86	-226.3	0.02	503
1715	35	300	10	15.40	450	6.87	-228.3	0.02	508

Comments
EPA collected 2L in 15 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CH1-046W05R Page 1 of 1 Field Staff: LC

Date Sampled 7/18/01
Stick-up Height 2.1 feet
Depth to Water 6.49 feet below top of casing
Total Depth 49.50 feet below top of casing
Depth of Tubing (sample interval) 47.50 feet below top of casing

Sulfide: 0.07mg/L
ferrous iron: 1.47mg/L

Start purge 1100
Start parameters 1205
End purge 1420
Total purge time: 3 hours, 20 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1205		400	12	15.16	1200	6.30	-119.6	0.07	235
1210	5	400		15.12	1199	6.39	-165.4	0.03	927
1215	10	400		15.20	1190	6.48	-182.1	0.02	1004
1220	15	400		15.31	1190	6.54	-192.1	0.02	—
1225	20	400		15.33	1190	6.54	-192.6	0.02	—
1230	25	400	15	15.31	1190	6.61	-201.5	0.01	—
1235	30	400		15.25	1190	6.63	-203.6	0.01	—
1300	55	400		15.52	1199	6.60	-160.2	0.02	650
1305	60	400		15.33	1199	6.60	-171.0	0.01	553
1310	65	400		15.25	1200	6.61	-176.3	0.01	537
1315	70	400		15.17	1201	6.62	-179.9	0.01	480
1320	75	400	20	15.27	1198	6.65	-188.4	0.01	383
1325	80	400		15.31	1201	6.66	-192.1	0.01	278
1330	85	400		15.08	1198	6.67	-194.3	0.01	210
1340	95	400		15.34	1198	6.68	-196.5	0.01	124
1350	105	400		15.38	1199	6.69	-195.8	0.01	101.7
1405	120	400		15.05	1198	6.72	-194.8	0.01	38.8
1410	125	400		14.94	1201	6.71	-190.4	0.00	19.2
1415	130	400	25	15.13	1197	6.73	-185.7	0.0	17.6
1420	135	400		15.14	1199	6.73	-183.4	0.0	18.8

Comments ~~1425 140 400~~
EPA collected 2L in 15 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CH2-02GW08 Page 1 of 1 Field Staff: LC

Date Sampled 7/12/01
Stick-up Height 1.0 feet
Depth to Water 4.98' feet below top of casing
Total Depth 18.5 feet below top of casing
Depth of Tubing (sample interval) 16.5 feet below top of casing

Sulfide: 0.52 mg/L
ferrous iron: 3.30 mg/L

Start purge 1400
Start parameters 1430
End purge 1555
Total purge time: 1 hours, 55 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1430		300		13.72	427	6.19	-139.4	3.41	59.6
1435	5	300		12.57	424	5.92	-279.2	1.30	123
1440	10	300	5	12.23	416	5.93	-345.6	0.84	103.3
1445	15	300		12.37	417	5.92	-366.9	1.02	163
1450	20	300		12.24	417	5.96	-393.9	0.62	240
1455	25	300		12.30	417	5.93	-409.2	0.57	234
1500	30	300		12.31	415	5.96	-415.4	0.91	223
1505	35	300		12.24	415	5.95	-415.6	0.88	327
1510	40	300		12.33	413	5.96	-415.1	0.80	436
1520	50	200		12.62	419	5.95	-394.7	0.61	149
1525	55	200		12.68	418	5.95	-390.8	0.62	93.6
1535	65	200		12.75	418	5.95	-391.6	0.61	66.7
1540	70	200		12.87	416	6.95	-390.5	0.59	55.0
1545	75	200	10	12.84	417	5.95	-390.3	0.59	58.2
1550	80	200		12.72	416	5.95	-391.5	0.56	56.0
1555	85	200		12.77	415	5.96	-393.0	0.59	54.7

Comments

EPA collected 2L. in 15 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CH2-02GW05 Page 1 of ___ Field Staff: AG

Date Sampled 7/12/01
Stick-up Height 1.2 feet
Depth to Water 6.01 feet below top of casing
Total Depth 43.0 feet below top of casing
Depth of Tubing (sample interval) 41.0 feet below top of casing

Sulfide 0.01 mg/L
ferrous iron: 2.04 mg/L

Start purge 1400
Start parameters 1420
End purge 1525
Total purge time: 1 hours, 25 minutes
Parameters Stabilized? yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1420	0	400		12.64	1645	6.03	-96.7	0.68	10
1425	5			12.55	1646	6.03	-95.1	0.71	9.8
1430	10			12.53	1621	6.02	-90.3	0.45	7.8
1435	15			12.55	1620	6.02	-89.9	0.46	9.1
1440	20			12.26	1612	6.03	-87.6	0.42	6.3
1445	25			12.38	1602	6.03	-85.5	0.44	7.1
1450	30			12.22	1590	6.03	-85.5	0.43	5.7
1455	35			12.37	1582	6.04	-85.2	0.42	4.6
1500	40			12.40	1578	6.04	-84.3	0.39	5.2
1505	45			12.44	1572	6.04	-83.9	0.44	4.6
1510	50			12.34	1570	6.04	-83.3	0.43	6.1
1515	55			12.37	1563	6.04	-82.8	0.42	4.3
1520	60			12.23	1555	6.04	-81.8	0.42	4.7
1525	65		10	12.15	1546	6.04	-81.5	0.46	4.5
1530	70								

Comments EPA sampled 2L in 10 minutes

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CH2-04GW05 Page 1 of ___ Field Staff: LC

Date Sampled 7/12/01
Stick-up Height 1.8 feet
Depth to Water 5.83 feet below top of casing
Total Depth 60.5 feet below top of casing
Depth of Tubing (sample interval) 58.5 feet below top of casing

Sulfide: 0.0 mg/L
ferrous iron: 3.30 mg/L

Start purge 0935
Start parameters 1025
End purge 1135
Total purge time: 2 hours, - minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1025		300	4	15.52	690	7.08	-168.6	3.13	92.7
1030	5	300		14.97	680	6.21	-190.8	1.20	148
1035	10	300	5	14.53	682	6.15	-196.0	0.99	120
1040	15	300		14.61	682	6.13	-214.8	0.72	53.8
1045	20	300		15.05	679	6.14	-304.4	0.77	32.4
1050	25	300		14.54	678	6.13	-371.4	0.77	22.1
1055	30	300		14.84	679	6.13	-387.8	0.75	18.5
1105	40	300		14.79	682	6.13	-365.1	0.75	16.9
1115	50	300		14.56	679	6.13	-373.8	0.75	16.0
1120	55	300		14.67	681	6.14	-350.4	0.74	11.9
1125	60	300		14.52	678	6.14	-332.1	0.69	11.6
1130	65	300		14.77	678	6.13	-330.6	0.72	11.2
1135	70	300	10	14.73	679	6.14	-335.9	0.73	11.3

Comments

EPA collected 2L in 15 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CH2D46GW06 Page 1 of ___ Field Staff: AG

Date Sampled 7/12/01
Stick-up Height 0.8 feet
Depth to Water 5.44 feet below top of casing
Total Depth 7.02 feet below top of casing
Depth of Tubing (sample interval) 6.8.2 feet below top of casing

Sulfides 0.01 mg/L
ferrous iron 3.30 mg/L

Start purge 0930
Start parameters 0955
End purge 1035
Total purge time: 1 hours, 40 5 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C) 3%	Spec. Cond. (uS) 3%	pH +/- .1	ORP (mV) +/- 10	DO (mg/L) 10%	Turbidity (NTU) 10%
0955	0	320		14.82	1209	6.66	-234.2	2.14	16
1000	5			14.72	1205	6.68	-223.7	1.69	16
1005	10			14.75	1206	6.68	-220.1	1.65	17
1010	15			14.63	1203	6.68	-217.0	1.51	17
1015	20			14.69	1205	6.68	-217.7	1.42	15
1020	25			14.60	1209	6.68	-212.2	1.32	15
1025	30			14.60	1207	6.69	-209.3	1.24	13
1030	35			14.50	1205	6.69	-203.8	1.23	13
1035	40		7	14.43	1224	6.69	-203.4	1.21	13

Comments
EPA collected 4 L in 25 minutes
Collected samples for MS + MSD

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CL2-03GW01 Page 1 of 1 Field Staff: LC

Date Sampled 7/11/01
Stick-up Height 1.7 feet
Depth to Water 13.71 feet below top of casing
Total Depth 18.5 feet below top of casing
Depth of Tubing (sample interval) 16.5 feet below top of casing

Sulfide: 0.02mg/L
ferrous iron: 1.52mg/L

Start purge 1400
Start parameters 1500
End purge 1550 1555
Total purge time: 1 hours, 50 55 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1500		200	8	18.15	1222	5.62	-12.8	5.62	58.7
1505	5	200		17.96	1228	5.60	-6.1	5.74	15.8
1510	10	200		17.71	1229	5.58	-2.1	5.87	8.83
1515	15	200		17.61	1223	5.58	-2.5	5.84	74.3
1520	20	200		17.78	1218	5.59	2.5	5.74	21.0
1525	25	200		17.76	1219	5.60	3.8	5.80	17.6
1530	30	200		17.97	1217	5.61	4.3	5.86	17.8
1535	35	200		17.73	1221	6.61	6.0	5.97	10.44
1540	40	200		17.68	1221	6.62	7.1	6.04	8.64
1545	45	200		17.65	1220	5.62	7.5	6.08	8.56
1550	50	200		17.64	1219	5.62	7.9	6.16	8.38
1555	55	200	10	17.71	1223	5.63	9.1	5.98	8.13

Comments
air bubbles in flow-thru cell, EPA collected 2L (15min.)

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CL2-036GW02 Page 1 of 1 Field Staff: LC

Date Sampled 7/11/01
Stick-up Height 0.7 feet
Depth to Water 12.75 feet below top of casing
Total Depth 28.9 feet below top of casing
Depth of Tubing (sample interval) 26.4 feet below top of casing

Sulfide: 0.04mg/L
ferrous iron: 1.54mg/L

Start purge 0930
Start parameters 1045
End purge 1155
Total purge time: 2 hours, 25 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1045		300	5	15.04	1048	5.51	-68.4	4.15	253
1650	5	300		14.84	1047	5.41	-81.1	4.55	269
1055	10	300		14.77	1046	5.46	-81.6	3.09	74.9
1100	15	300		14.75	1048	5.40	-81.5	3.14	73.8
1105	20	300		14.73	1047	5.40	-80.1	2.77	52.3
1110	25	300		14.72	1045	5.40	-81.2	3.03	71.0
1115	30	300		14.73	1046	5.40	-79.7	2.51	285
1120	35	300		14.77	1043	5.40	-70.8	2.39	29.2
1125	40	300		14.78	1043	5.40	-69.8	2.36	21.6
1130	45	300	10	14.78	1042	5.41	-71.6	2.21	15.8
1135	50	300		14.79	1041	5.41	-74.4	2.38	14.5
1140	55	300		14.85	1042	5.41	-76.8	2.40	14.7
1145	60	300		14.91	1041	5.41	-78.7	2.14	19.8
1150	65	300		14.92	1042	5.41	-76.6	2.25	20.3
1155	70	300	13	14.94	1041	5.41	-74.6	2.24	21.0

Comments
- Collect sample and duplicate CL2-03GW0299
- EPA collected 2L (15 min)

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample EL2-056GW01 Page 1 of 1 Field Staff: AG

Date Sampled 7/11/01
Stick-up Height 2.0 feet
Depth to Water 11.10 feet below top of casing
Total Depth 15.7 feet below top of casing
Depth of Tubing (sample interval) 14.7 feet below top of casing

Sulfide: 0.03 mg/L
ferrous iron: 5.30 mg/L

Start purge 1200
Start parameters
End purge ~~1610~~ 1616
Total purge time: 4 hours, 10 minutes
Parameters Stabilized? N

Purging Information

	Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
*	1555				19.06	1748	6.26	-147.4	6.88	40
*	1605			~~40~~ 20	17.38	1699	6.14	-122.7	6.55	45

Comments

EPA sample 2 L for 30 minutes
* VSI samples were collected in a beaker and sampled without flow through chamber. Samples were not able to be taken earlier due to the amount of sediment and lack of flow.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CL2-05GW03 Page 1 of 1 Field Staff: AG

Date Sampled 07/11/01
Stick-up Height 2.0 feet
Depth to Water 9.71 feet below top of casing
Total Depth 36.0 feet below top of casing
Depth of Tubing (sample interval) 34.5 feet below top of casing

sulfide: 0.10 mg/L
ferrous iron: 3.14 mg/L

Start purge 0930
Start parameters 0950
End purge 1030
Total purge time: 1 hours, ~~40~~ 0 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	3% Temperature (degrees C)	3% Spec. Cond. (uS)	+/-.1 pH	+/-10 ORP (mV)	10% DO (mg/L)	10% Turbidity (NTU)
0750	0	400 mL/min		13.95	2222	5.94	-106.7	1.36	3.01
0755	5			13.87	2220	5.94	-104.2	0.72	1.87
1000	10			13.84	2218	5.94	-102.5	0.63	1.66
1005	15			13.82	2212	5.94	-101.2	0.62	1.78
1010	20			13.82	2208	5.94	-100.6	0.52	1.71
1015	25			13.80	2210	5.94	-99.2	0.50	2.40
1020	30			13.74	2208	5.94	-98.0	0.50	2.71
1025	35			13.71	2206	5.94	-97.2	0.45	2.24
1030	40								

Comments
EPA collected 2 L in 10 minutes

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample GW6-03GW01 Page 1 of 1 Field Staff: L

Date Sampled 7/13/01
Stick-up Height 1.9 feet
Depth to Water 7.15 feet below top of casing
Total Depth 12.8 feet below top of casing
Depth of Tubing (sample interval) 10.8 feet below top of casing

Sulfide: 0.04 mg/L
ferrous iron: 3.30 mg/L

Start purge 1605
Start parameters 1620
End purge 1700
Total purge time: — hours, 55 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1620		300		13.68	929	6.01	-95.3	0.61	38.3
1625	5	300		13.83	929	6.00	-95.7	0.60	25.2
1630	10	300		13.83	930	6.01	-96.8	0.57	17.0
1635	15	300		13.78	929	6.00	-97.5	0.57	13.5
1640	20	300		13.76	928	6.00	-96.2	0.58	12.8
1645	25	300		13.71	931	6.00	-96.5	0.54	10.71
1650	30	300		13.66	932	6.01	-97.8	0.47	9.90
1655	35	300		13.68	929	6.00	-95.8	0.43	9.33
1700	40	300	5	13.68	928	6.01	-96.1	0.46	9.71

Comments
EPA collected 2L in 15 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CWS-03GW02R Page 1 of 1 Field Staff: LC

Date Sampled 7/13/01
Stick-up Height 1.8 feet
Depth to Water 7.23 feet below top of casing
Total Depth 37.5 feet below top of casing
Depth of Tubing (sample interval) 35.5 feet below top of casing

Sulfide: 0.07 mg/L
ferrous iron: 3.30 mg/L

Start purge 0945
Start parameters 1020
End purge 1120
Total purge time: 1 hours, 35 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1020		300		13.36	4269	6.10	-175.7	0.79	9.36
1025	5	300		13.29	4258	6.11	-171.6	0.35	5.97
1030	10	300		12.84	4258	6.15	-170.6	0.10	10.90
1035	15	300		12.96	4255	6.15	-169.4	0.05	10.66
1040	20	300		12.92	4249	6.15	-169.1	0.04	9.17
1045	25	300		12.92	4247	6.15	-168.3	0.04	9.10
1050	30	300		13.05	4242	6.15	-167.8	0.03	8.18
1055	35	300	6	13.07	4246	6.15	-164.8	0.10	7.27
1100	40	300		12.89	4232	6.16	-163.3	0.15	7.18
1105	45	300		13.07	4220	6.16	-158.8	0.12	6.97
1110	50	300		13.16	4224	6.15	-157.4	0.13	6.76
1115	55	300		12.93	4233	6.16	-155.8	0.13	6.38
1120	60	300	6	13.14	4201	6.16	-156.0	0.13	6.61

Comments

collect sample and duplicate, CWS-03GW02R99
EPA collected 2L in 15 min.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CWS-03GW03N Page 1 of 1 Field Staff: LC

Date Sampled 7/13/01, 7/23/01
Stick-up Height 1.8 feet
Depth to Water 7.02, 7.37 feet below top of casing
Total Depth 61.25 feet below top of casing
Depth of Tubing (sample interval) 60.0 feet below top of casing

sulfide: 0.80 mg/L
ferrous iron: 3.30 mg/L

Start purge 1345, 1015, 1650
Start parameters
End purge 1600, 1945, 1750
Total purge time: 4 hours, ____ minutes
Parameters Stabilized? N

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)

Comments

purged 5gal on 7/13, continue purge to clear well on 7/23 but could not reach a steady flow, collect condensed suite w/ pump
EPA collected 2L in 45 min on 7/23, total sample time 2 hrs.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CWS-05GW02R Page 1 of 2 Field Staff: AG

Date Sampled 7/13/01
Stick-up Height ~~32.6~~ 0.7 feet
Depth to Water 6.15 feet below top of casing
Total Depth 32.6 feet below top of casing
Depth of Tubing (sample interval) 31.6 feet below top of casing

Sulfide: 0.46 mg/L
ferrous iron: 2.13 mg/L

Start purge 0950
Start parameters 1015
End purge 1210 20
Total purge time: ~~1~~ 2 hours, ~~55~~ minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1015	0	320		13.30	17381	7.51	-248.1	0.00	12
1020	5			13.01	17755	7.54	-267.5	-0.05	11
1025	10			12.99	17845	7.53	-280.3	-0.09	11
1030	15		13.13 ~~13.02~~	~~13.02~~	17873	7.51	-287.3	-0.07	9.8
1035	20			12.97	17877	7.51	-291.1	-0.10	9.6
1040	25			12.80	17982	7.50	-295.9	-0.10	10
1045	30			13.01	18000	7.51	-297.7	-0.07	8.7
1050	35			13.08	18065	7.49	-298.8	-0.11	8.5
1055	40			13.07	18042	7.48	-301.8	-0.07	9.2
1100	45			12.87	18102	7.48	-302.8	-0.06	7.8
1105	50			13.09	18148	7.47	-303.9	-0.06	7.8
1110	55			13.19	18157	7.46	-305.2	-0.04	7.0
1115	60			13.07	18186	7.46	-305.9	-0.04	7.4
1120	65			12.82	18218	7.45	-306.7	-0.03	6.1
1125	70			12.95	18292	7.45	-307.1	-0.01	7.0
1130	75			12.62	18282	7.44	-307.6	-0.01	5.9
1135	80			12.64	18380	7.43	-309.0	-0.01	4.6
1140	85			12.77	18330	7.43	-308.6	-0.01	5.2
1145	90	↓		12.50	18398	7.43	-309.3	0.00	5.3

Comments
EPA collects 2 L in 10 minutes.

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample AG CW5-05fw02R Page 2 of 2 Field Staff: AG

Date Sampled 7/3/01
Stick-up Height 0.7 feet
Depth to Water 6.15 feet below top of casing
Total Depth 32.6 feet below top of casing
Depth of Tubing (sample interval) 31.6 feet below top of casing

Sulfide 0.46 mg/L
ferrous iron: 2.13 mg/L

Start purge 0950
Start parameters 1015
End purge 1210
Total purge time: 2 hours, 80 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1150	95	320		12.60	18374	7.42	-309.8	0.00	5.3
1155	100			12.94	18412	7.42	-309.7	0.01	5.4
1200	105			13.05	18434	7.41	-311.5	0.01	4.2
1205	110			13.10	18435	7.41	-311.3	0.01 AG	4.1
1210	115	↓	14	12.79	18462	7.41	-311.9	0.01 AG	4.2
1215	120								

Comments EPA collect 2 L in 10 minutes

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample CW6-05GW03 Page 1 of 1 Field Staff: AG

Date Sampled 7/13/01
Stick-up Height 1.60 feet
Depth to Water 7.05 feet below top of casing
Total Depth 52.35 feet below top of casing
Depth of Tubing (sample interval) 51.35 feet below top of casing

sulfide: 0.04 mg/L
ferrous iron: 3.30 mg/L

Start purge 1330
Start parameters 1355
End purge 1425
Total purge time: ____ hours, 55 minutes
Parameters Stabilized? Yes

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1355	0	210		15.61	11061	6.77	-200.0	-0.07	6.3
AG ~~1400~~ 1400	5			15.24	10952	6.76	-201.5	-0.05	6.3
1405	10			15.01	10739	6.76	-194.5	-0.02	5.4
1410	15			14.76	10548	6.76	-192.3	0.00	5.0
1415	20			14.81	10473	6.76	-194.4	0.01	4.3
1420	25			14.87	10429	6.76	-192.9	0.00	4.7
1425	30		7	14.85	10519	6.77	-187.4	0.00	4.2
1430	35								

Comments
EPA collected 2 L in 15 minutes
Sample foams

ROUX ASSOCIATES, INC.
Final GSIP SOW Soil/Groundwater Investigation
Groundwater Sampling Form

Sample C'115-086WO1 Page 1 of 1 Field Staff: L.C

Sulfide: 0.10mg/L
Ferrous Iron: 3.30mg/L

Date Sampled 7/30/01
Stick-up Height 0.1 feet
Depth to Water 16.40 feet below top of casing
Total Depth 16.0 feet below top of casing
Depth of Tubing (sample interval) 14.0 feet below top of casing

Start purge 1050
Start parameters 1230
End purge 1305
Total purge time: 2 hours, 15 minutes
Parameters Stabilized? Y

Purging Information

Time of Day	Elapsed Time (min)	Purge Rate (mL/min)	Cumulative Volume Purged (gallons)	Temperature (degrees C)	Spec. Cond. (uS)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
1230		100	3	18.03	233	5.55	18.3	23.76	8.2
1235	5	100		17.76	227	5.57	25.3	23.18	6.7
1240	10	100		17.72	222	5.53	30.9	23.55	6.6
1245	15	100		17.82	219	5.57	35.0	19.87	7.1
1250	20	100		17.82	219	5.57	37.0	17.80	6.9
1255	25	100		17.86	217	5.67	38.1	14.89	7.0
1300	30	100		17.79	217	5.58	39.5	13.82	6.4
1305	35	100	4	17.89	217	5.58	41.6	13.63	7.1

Comments
air bubbles in tubing, could not reduce pump flow enough to stop air in flow-thru cell; EPA collected 4L in 120 min.
Total sample time = 2.5 hrs.

APPENDIX B

Soil Sampling Forms

RO[illegible] ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-01

Page 1 of 1

Field Staff: HAT
Date Sampled: 5/8/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	N/A	0.0	0-24" Light brown fine → med SAND, little small gravel 24-35" Light to medium brown, fine → medium SAND	Y SO-01SS01 (0-1')
4-8	100%	N/A	0.0	0-35" Olive gray fine to medium SAND, trace coarse sand, trace silt 35-48" Dark gray fine to med. SAND, trace silt & coarse sand	N
~~8-12~~ 8-10	50%	N/A	0.6	0-3" Dark brown PEAT, wet, fibrous, some silt but mostly fine sand (PEAT @ 8') No sample taken below horizen 3"-23" Gray, fine SAND	Y SO-01SB01 (8.0'-8.3')
~~12-16~~ 10-12	50%	N/A	0.0	0-23" Gray fine SAND, wet END of BORING	N
16-20					
20-24					

RO... ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-02

Page 1 of 1

Field Staff: HAT
Date Sampled: 5/6/10

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	75%	N/A	0.0	0-6" Light gray fine SAND, trace small gravel, dry 6-32" Brown fine → medium SAND, some silt, trace med. gravel 32-36" Dark gray fine → med SAND, some organics, moist	Y SO-02SS01 (0-1') SO-02SB01
4-8	80%	N/A	0.0	0-40" Light gray fine SAND END OF BORING	N
8-12					
12-16					
16-20					
20-24					

RO... ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-03

Page 1 of 1

Field Staff: HAT
Date Sampled: 5/8/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	N/A	0.0	0-6" Dark brown SILT & fine SAND, organics 6-34" Light brown fine* → medium sand	Y SO-03SS01 (0-1')
4-8	100%	N/A	0.0	0-20" Medium brown fine* → medium SAND 21-23 Gray f→m SAND, some silt 23-48 Gray med → coarse SAND, wet	N
8-12	50%	N/A	0.0	0-24" Brown to gray med. → coarse* SAND and fine GRAVEL; wet	N
12-16	50%	N/A	0.0	0-24" Brown to gray, med → coarse* SAND, HAT ~~and fine GRAVEL, wet~~ some fine gravel (angular)	N
16-20	25%	N/A	0.0	0-12" Brown to gray, med → coarse(+) SAND, some fine gravel (angular)	N
20-24	25%	N/A	0.0	0-12" Brown to gray med → coarse(+) SAND, some fine gravel (angular) END OF BORING	N

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-03R (10' N of original)

Page 1 of 1

Field Staff: HAI
Date Sampled: 5/8/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	N/A	N/A	N/A	Did NOT DRILL	—
4-8	70%	N/A	0.0	0-4" Gray fine → med SAND 4-5" Brown f → med SAND, trace organics 5-35 Olive brown f → med SAND w/orange mottling END OF BORING	Y SO-03SB6i PEAT (4-5")
8-12					
12-16					
16-20					
20-24					

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-04

Page 1 of 1

Field Staff: HA'I
Date Sampled: 5/8/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	N/A	0.0	0-2" Brown SILT w/trace fine sand, some organics 2-8' Gray fine SAND 8-14 Light brown med → coarse+ SAND, trace fine gravel 14-35 Brown-orange wet coarse SAND and fine GRAVEL	Y SO-04SS01
4-8	65%	N/A	0.0	0-32" Brown → orange brown coarse SAND to fine GRAVEL	N
8-12	50%	N/A	0.0	0-24" Brown to orange brown med+ → coarse SAND END OF BORING	N
12-16					
16-20					
20-24					

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-05

Page 1 of 1

Field Staff: HAT
Date Sampled: 5/8/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	N/A	0.0	0-20" Light → med. brown fine → med + SAND 20-35" Gray fine → med. SAND	Y SO-033501 (0-1')
4-8	70%	N/A	0.0	0-10" Olive brown, fine+ → med. SAND, wet 10-25" Olive brown → dark gray fine+ → med SAND 25-29" Dark brown fine SAND, some organics & silt 29-34" Light gray fine+ → med. SAND END OF BORING	Y SO-033501 (PEAT)
8-12					
12-16					
16-20					
20-24					

RO[illegible] ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-06

Page 1 of 1

Field Staff: HA1
Date Sampled: 5/8/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	50%	N/A	0.0	0-2" Dark brown fine SAND, some organics 2-25" Olive to light brown fine → med. SAND, little silt	Y SO-06SS01 ~~GA~~ HA1 (0-1')
4-8	70%	N/A	0.0	0-36" Brown fine → med. SAND, little silt, wet	N
8-12	100%	N/A	0.0	0-6" Dark brown fine → med SAND, little fine gravel (angular); wet 6-48" Gray fine SAND, trace silt, very well sorted END OF BORING	N
~~12-16~~ 8-12R new boring 2' next to original location	100%	N/A	0.0	top 1.5' brown fine to med SAND, little silt (slight plasticity in zones, trace coarse gravel) wet, trace amount of fibrous material in lower part Bottom 2.5' Gray fine SAND, trace silt, wet no plasticity END OF BORING	Y SO-06SS01
16-20					
20-24					

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-07

Page 1 of 1

Field Staff: HAT/CY
Date Sampled: 5/9

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	0.0	1.9	0-3" Brown fine SAND, little silt & organics, trace fine gravel 3-36" Light brown orange mottled fine → med SAND	Y SO-07550101 SO-07550199
4-8	80%	0.0	2.7	0-40" Light brown orange mottled fine → med SAND (from 20"-40" wet)	N
8-12	80%	0.0	2.4	0-40" Light brown, fine SAND, wet	N
12-16	100%	0.0	1.4	0-48" Light brown, fine SAND, moist	N
16-20	100%	0.0	2.9	0-48" Light brown, fine SAND; ~~saturated 18-19'~~ (HAT) moist	N
20-24	100%	0.0	2.5	0-48" Light brown, fine SAND, saturated 18-19' END OF BORING → NO PEAT ENCOUNTERED	N

RO[illegible] ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-08

Page 1 of 1

Field Staff: HAT
Date Sampled: 5/8/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	N/A	0.0	0-1" Dark brown, fine SAND & SILT, some organics 1-3" Light gray, silt, trace organics 3-35" Yellow/orange brown f→m SAND wet	Y SO-085501 (0-1')
4-8	70%	N/A	0.0	0-12" Brown f→med. SAND, wet 12-16" Olive brown to gray f→med SAND, damp 16-18 Dark brown f→med SAND, some silt 18-36 Gray f→med SAND, wet 36-37 Dark brown SILT w/some organics	Y SO-085502
8-12	40%	N/A	0.0	0-20" Gray fine SAND, wet END OF BORING	N
12-16					
16-20					
20-24					

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-09

Page 1 of 1

Field Staff: HAT/CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	0.0	1.1	0-12" Dark brown fine SAND, some silt & organics 12-18' Dark brown & orange mottled fine → med SAND, trace coarse sand 18-36" Gray fine to med. SAND	Y SO-095501 (0-1') SO-095B01
4-8				END OF BORING	
8-12					
12-16					
16-20					
20-24					

RO... ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-10 (Try 1) Page 1 of 1

Field Staff: HAT / CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	65%	0.0	1.1	0-8" Dark brown, fine SAND & SILT, organics 8-32' Light brown, fine→med. SAND w/2" pockets of fine gravel @ 20-22" & 26-28"	Y SO-10SS01
4-8	50%	0.0	0.9	0-4" Light brown f→med SAND, some coarse SAND) 4-24' Light brown fine→med GRAVEL, little med→coarse SAND DRILL RIG @ ODD $ → MOVE OVER 10'	N
8-12					
12-16					
16-20					
20-24					

RO... ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-10 (2)

Page 1 of 1

Field Staff: HAT/CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	80%	0.0	8.1 8 15.9	0-6" Organics 6-14" Light brown → orange brown fine → med SAND trace coarse sand 14-17 Very dark brown f → med SAND, organics little silt	Y SO-10SB01 SO-10SB01-99
~~4-8~~				17-34 Gray f → med SAND, some med → coarse gravel END OF BORING	
8-12					
12-16					
16-20					
20-24					

RO... ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-11

Page 1 of 1

Field Staff: HAT / CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	40%	0.0	0.0	0-6" Brown fine SAND w/organics 6-20" Brown fine → med SAND, trace fine to med. gravel	Y SO-115501 SO-115501MS SO-115501MSD (0-1')
4-8	70%	0.0	7.0	0-8" Very dry brown fine SAND, little silt 8-30" Dark brown f→med SAND, trace silt, organics; wet 30-35" Dark brown silt, organics, some fine sand	Y SO-115801 SO-115801MS SO-115801MSD
8-12	60%	0.0	6.8	0-3" Dark brown, silt, organics, some fine sand 3-20" Dark brown, SILT, some fine sand, wet 20-30" Brown/Black SILT & organics, trace fine sand END OF BORING	N
12-16					
16-20					
20-24					

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-12

Page 1 of 1

Field Staff: HAT/CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	0.0	0.0	0-6" Light brown fine SAND, some med sand, dry 6-36" Yellow brown f→med SAND, little silt, little coarse sand, trace f gravel	Y SO-12SS01
4-8	50%	0.0	0.0	0-24" Yellow brown fine→med. SAND, little silt & coarse sand, fine gravel	N
8-12	50%	0.0	0.6	0-8 Dark brown med. SAND, some f & c sand, silt, wet 8-12 Gray SAND (m-c), little fine gravel, wet 12-24 Brown, m-c SAND, little fine gravel, wet	N
12-16	70%	0.0	0.0	0-34 Yellow brown med→coarse SAND, some fine gravel, little fine sand	N
16-20	40%	0.0	0.0	0-20" yellow brown med→coarse SAND, some f gravel a little f sand	N
20-24	50%	0.0	0.0	0-24" yellow brown med to coarse SAND, some fine gravel, little fine sand END OF BORING	N

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO+13

Page 1 of 1

Field Staff: HAT/CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	60%	0.0	0.0	0-30 Brown SILT & fine SAND, some med sand 30-36 Dark brown silt, some fine sand, little m-c sand 36-40 Dark yellow brown m→c SAND, some fine gravel	Y SO-13SSC1 (0-1')
4-8	100%	0.0	0.0	0-20 Yellow brown m-c sand 20-44 Dark brown SILT, little f sand & organics 44-48 Gray f→m SAND, some silt & organics	Y SO-13SB1
8-12				END OF BORING	
12-16					
16-20					
20-24					

RO... ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-14

Page 1 of 1

Field Staff: HAT/CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	40%	0.0	0.0	0-3 Brown fine SAND, organics, dry 3-9 Dark brown fine SAND, trace silt & fine gravel 9-19 Dark brown fine SAND & SILT, some med. sand 19-20 Dark brown SILT, some clay, trace fine sand low plasticity	Y SO-14SS01
4-8	60%	0.0	0.0	0-30" Dark brown SILT, some clay, trace f sand, organics, low plasticity END OF BORING	Y SO-14SB01 SO-14SB0199
8-12					
12-16					
16-20					
20-24					

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-15

Page 1 of 1

Field Staff: HAT / CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	70%	0.0	0.0	0-20" Dark brown fine SAND, trace coarse sand Dry (0-6" organics) 20-40" Brown & yellow brown mottled f-m sand little coarse sand, trace fine gravel	4 SO-15550i (0-1') SO-15550 : 99
4-8	80%	0.0	0.0	0-37 Orange & light brown mottled f → m SAND 37-38 Light brown, fine SAND & SILT, trace clay, low plasticity	N
8-12	100%	0.0	0.0	0-30 Light to dark brown f to m SAND, trace fine gravel, wet 30-48 Light brown & orange mottled, SILT, some fine sand, trace clay	N
12-16	50%	0.0	0.0	0-18 Light brown & orange mottled SILT some fine sand, trace clay saturated 18-24 Brown med → coarse SAND some fine gravel	N
16-20	100% (24/24)	0.0	0.0	0-14 Brown med → coarse SAND, some fine gravel 14-24 Yellow brown → brown fine → med SAND some coarse sand, trace fine gravel	N
20-24	80% (20/24	0.0	0.0	0-20 Yellow brown → brown, fine to med. SAND, some coarse sand, trace fine gravel END OF BORING	N

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-16

Page 1 of 1

Field Staff: HAT/CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	60%	0.0	0.0	0-12" Brown f→m SAND, some c sand, little f gravel, dry (0-4" organics) 12-30" Dark brown SILT, f-m SAND, little fine gravel	Y SO-16SSC
4-8	40%	0.0	0.0	0-12" Dark brown SILT, some f-m sand. little f gravel 12-18" Dark brown SILT, some f→m sand & little f gravel * Need to move over 5' *	N
~~8-12~~ 6-10	100%	0.0	0.0	0-24 Same as above 24-42 Dark brown SILT & f sand, some organics 42-48 Gray f-m sand, little silt END OF BORING	Y SO-16SBC (7-9')
12-16					
16-20					
20-24					

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-17

Page 1 of 1

Field Staff: HATICY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	60%	0.0	0.0	0-12" Brown, fine sand 12-30" Brown, fine → med sand, trace coarse sand	Y SO-17SS01
4-8	95%	0.0	0.0	0-45 Brown f→m SAND, trace coarse sand	N
8-12	98%	0.0	0.0	0-4 Brown f→c SAND, some f gravel 4-47 Light brown f→m SAND, trace coarse SAND	N
12-16	98%	0.0	0.0	0-47" Light brown f→m SAND, trace coarse SAND	N
16-20	50%	0.0	0.0	0-23 Light brown fine SAND, trace med. sand, wet 23-24 Light brown med. SAND, little coarse sand	N
20-24	100%	0.0	0.0	0-41 Yellow brown med. SAND w/some f→c sand 41-43 PEAT, dk brown silt & fine sand 43-48 Gray med SAND, w/some f gravel END OF BORING	Y SO-17SB01

RO... ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-18

Page 1 of 1

Field Staff: HAT / CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	60%	0.0	0.0	0-12" Brown f → med. SAND, some organics 12-13" Gray fine GRAVEL 13-24" Yellow brown, f → m SAND, some coarse sand, little coarse gravel 24-30" Dark brown fine SAND, some silt, little coarse gravel	Y SO-18SS01
4-8	75%	0.0	0.0	0-30" Light brown, fine SAND, trace med. sand 30-36" Light brown f → med SAND	N
8-12	75%	0.0	0.0	0-34 Light brown f → m SAND, damp to moist 34-36" Light brown, fine SAND, some med. sand	N
12-16	100%	0.0	0.0	0-10" Light brown fine SAND, some med sand 10-12" Dark brown, fine SAND, some med sand & fine gravel 12-48" Light brown, f-med SAND, wet	N
16-20	75%	0.0	0.0	0-36" Light brown f → med sand wet	N
20-24	75%	0.0	0.0	0-34" Light brown fine → med SAND, wet 34-36" Light brown silt END OF BORING	N

ROUX ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-19

Page 1 of

Field Staff: HAT / CY
Date Sampled: 5/9/01

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	60%	0.0	0.0	0-12" Brown f-med SAND, some organics 12-14" Brown coarse SAND & fine gravel 14-30" Light yellow brown fine → med. SAND	Y SO-19SS01 (0-1')
4-8	50%	0.0	0.0	0-24" Light brown fine → med SAND	N
8-12	100%	0.0	0.0	0-12" Light brown fine → med SAND 12-14" Dark brown SILT (PEAT LAYER) & organics 14-32" Brown f→med SAND, trace coarse sand 32-44" Brown med→coarse SAND, trace fine gravel 44-48" Light brown & orange brown SILT and FINE SAND END OF BORING	Y SO-19SB01 (9-9.2')
~~12-16~~					
~~16-20~~					
~~20-24~~					

RO... ASSOCIATES, INC.
GeoProbe Soil Investigation
Soil Boring Form

Location : SO-20

Page 1 of 1

Field Staff: HAT/CY
Date Sampled: 5/9/10

Depth (feet)	Recovery	Initial PID (ppm)	Head Space PID (ppm)	Description	Sample Collected
0-4	75%	0.0	0.0	0-12" Brown fine SAND 12-15" fine → med GRAVEL 15-36" Brown f → med SAND	Y SO-20SS01 (0-1')
4-8	60%	0.0	0.0	0-8" Brown f → med SAND 8-14" Dark brown SILT & PEAT w/organics 14-30" Brown fine → med SAND END OF BORING	Y SO-20SB01 (8.8'-9.2')
8-12					
12-16					
16-20					
20-24					

APPENDIX C

CDM Technical Memorandum

CDM

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TECHNICAL MEMORANDUM

TO: Jorge Garcia, Solutia Inc.

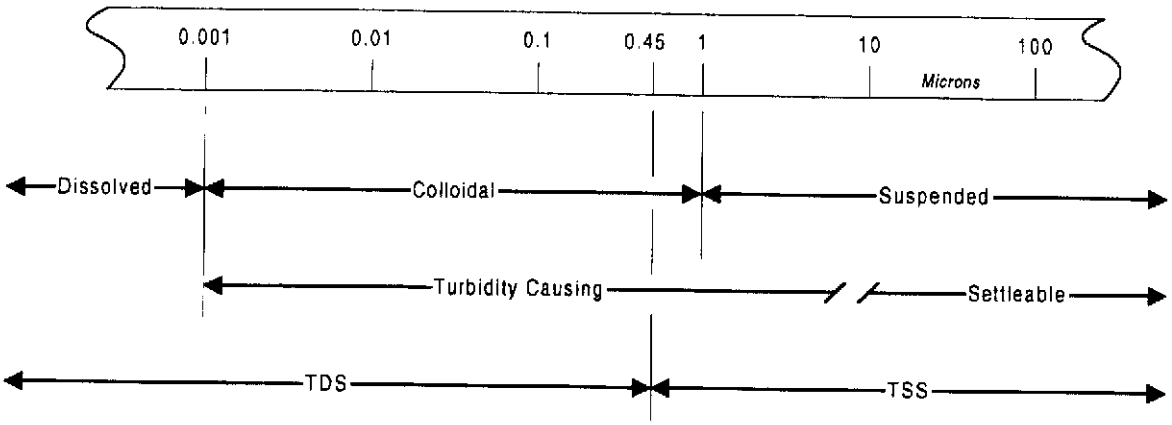
FROM: Rick Chappell, Roger Olsen, CDM/Denver

DATE: March 29, 2002

SUBJECT: *Arsenic Evaluation – Industri-Plex Site, Woburn, Massachusetts*

Introduction

This technical memorandum (TM) provides an evaluation of arsenic concentrations in groundwater samples collected from the Industri-Plex Site (Site) in Woburn, Massachusetts. The objective of the evaluation was to characterize and determine the source of the observed increase between dissolved and total arsenic (As) concentrations. Specifically, statistical evaluations were performed to test the hypothesis that the increase between dissolved and total As is actually due to the digestion/dissolution of suspended solids during the analytical procedure. That is, the increase in total concentrations is an artifact of the analytical procedure. Given the groundwater velocities and presence of fine-grained aquifer material at the site, only the dissolved portion of the As (and some colloidal sized material if present) is mobile and can migrate through the aquifer material (Kretzschmar, et al., 1997; Kretzschmar, et al., 1994). Given the hydrogeological conditions at the Site, the suspended material (which results in the high total values) is not mobile and does not migrate in the aquifer. Therefore, evaluations related to the nature and extent of the As contamination should be based on dissolved concentrations and not on total concentrations. The above discussions are visually illustrated by the following diagram.



The diagram illustrates the sizes of particles that can be found in groundwater samples. The first line below the diagram provides the theoretical or defined size of dissolved, colloidal and suspended particles. The bottom line provides the operational or analytical determined sizes of particles in groundwater samples. In practice, the samples are filtered using a 0.45 micron filter. Contamination and particles in the portion that passes through the filter is operationally called the "dissolved" fraction or "total dissolved solids" (labeled TDS on the line). Contamination and particles that do not pass through the filter is operationally called the "suspended" portion or "total suspended solids" (labeled TSS on the line). Contamination in an unfiltered sample contains both the "dissolved" and "suspended" portions. During preparation of the samples in the laboratory, the samples are digested and a portion of the suspended particles is dissolved into the aqueous phase. Therefore, the analytical results for unfiltered samples or "total" concentrations contain both the "dissolved" and portions of the "suspended" particles. As illustrated in the above diagram, the filtered sample actually contains all of the theoretical dissolved and most of the colloidal portions of the contamination. This fraction clearly contains the contamination that can migrate in the aquifer and should be used in evaluations associated with the nature and extent of contamination.

The following sections provide the results of evaluations performed to test the above hypothesis that the increased As in the total fraction is a result of digestion of the suspended particles in groundwater samples.

Data Used in the Evaluations

The data used in the evaluations include the results of all groundwater samples collected on the Site from September 2000 to February 2002. The data set consisted of a total of 392 samples which were analyzed for at least one of the constituents used in evaluations contained in this TM (TSS, As, Fe and Al). A summary of the data by constituent is provided below:

Constituent	*Count (n)*	*Minimum*	*Maximum*
TSS	375	ND(<3)	826,000
As (dissolved) (µg/L)	361	ND(<0.2)	25,474
As (total) (µg/L)	360	ND(<0.2)	23,026
Fe (dissolved) (mg/L)	271	0.0139	268
Fe (total) (mg/L)	270	0.0072	2,910
Al (dissolved) (mg/L)	91	ND(<0.01)	0.773
Al (total) (mg/L)	88	ND(<0.01)	447

The evaluations were performed on conventional As results and not the As speciation results.

Comparison of TSS grouped by Delta Arsenic

Review of the As results indicate that two types of samples are present:

- Category 1: Samples which have little or no difference between the total and dissolved concentrations.
- Category 2: Samples with significant difference between the total and dissolved concentrations.

If the difference between dissolved and total concentrations is caused by the suspended solids, then a significant difference in the Total Suspended Solids (TSS) should exist between the

category 1 and category 2 samples. This explanation was statistically tested. The methods used and the results are discussed in the following paragraphs.

Differences between dissolved and total arsenic (As) concentrations observed in groundwater samples collected at the site were calculated as follows:

$$Delta_{(As)} = Total_{(As)} - Dissolved_{(As)}$$

The resultant data were then divided into the two categories previously discussed. Category 1 was defined as the samples in which the difference in concentrations ($Delta_{(As)}$) was less than or equal to 10 µg/L and category 2 was defined as the samples in which the difference was greater than 10 µg/L. The 10 µg/L cutoff for grouping the data was selected because the analytical uncertainty is approximately 10 µg/L. A box plot comparison of natural log total suspended solids (TSS) grouped by $Delta_{(As)} > 10$ µg/L and $Delta_{(As)} \leq 10$ µg/L is provided in Figure 1. The descriptive statistics corresponding with the features of the box plots are as follows:

	Natural Log TSS (mg/L)	
Box Plot Statistic	***$Delta_{(As)} > 10$ ug/L***	***$Delta_{(As)} <= 10$ ug/L***
Maximum (end of upper whisker)	13.624	8.587
75th Percentile (top of box)	7.208	4.419
Median ("bar" symbol in box)	5.313	3.178
Mean ("plus" symbol in box)	5.473	3.278
25th Percentile (bottom of box)	3.882	1.917
Minimum (end of lower whisker)	-2.303	-2.303
Number of Cases (n)	107	255

Note that the minimum values (-2.303) are associated with the samples which have concentrations below the detection limits. As shown in Figure 1, the distribution of TSS values is clearly higher in the $Delta_{(As)} > 10$ µg/L group. Student's t-test results support a statistically significant difference in TSS between the two groups (one-tailed p-value < 0.001; complete summary provided in Attachment A). These results indicate that the source of $Delta_{(As)}$ is suspended solids, i.e., the increase between dissolved and total As is actually due to the digestion/dissolution of the suspended solids during the analytical procedure.

TSS versus Delta Arsenic, Iron and Aluminum

If suspended particles are being dissolved during the analytical digestion procedure, then increases in other elements that make up the overall composition of the suspended particles should also be observed. Such element will include silicon, iron and aluminum. The observed increase in these elemental concentrations should also be directly proportional to the increase in TSS. The database was reviewed to determine if these elements were analyzed. Results for iron and aluminum were available for evaluation. The differences between dissolved and total iron (Fe) and dissolved and total aluminum (Al) were calculated in the same manner as described above for As:

$$Delta_{(Fe)} = Total_{(Fe)} - Dissolved_{(Fe)}$$
$$Delta_{(Al)} = Total_{(Al)} - Dissolved_{(Al)}$$

Resulting Delta values plotted against TSS are provided in Figures 2, 3 and 4 for As, Fe and Al, respectively. In each case, the data indicate a positive correlation (linear relationship) between

the Delta values and TSS. These results confirm the hypothesis and indicate that the source of increased concentrations of As, Fe and Al is suspended solids due to dissolution/digestion of suspended solids during the analytical procedure.

Dissolution/Digestion Model

If the source of increased concentrations of As, Fe, and Al is from digestion of the suspended solids, then the amount of TSS, the concentrations of As, Fe and Al in the TSS and the actual portion of the TSS that is digested should be reflected in the resultant total concentrations actually measured. Calculations were performed to evaluate this assumption. For the concentrations of As, Fe and Al in the TSS, hypothetical background concentrations of As, Fe and Al in aquifer solids were determined from average background soil concentrations for the Eastern United States (Shacklette and Boerngen, 1984):

Element	*Background Soil Concentration (µg/g)*
Arsenic	7.5
Iron	25,000
Aluminum	57,000

Hypothetical contributions to the total aqueous concentrations of As, Fe and Al due to analytical dissolution/digestion of suspended solids were calculated by:

$$BG\ (\mu g/g) \times TSS\ (g/L) \times DF = BC\ (\mu g/L)$$

In this equation, BG is the background soil concentration, TSS is the total suspended solids concentration in the aqueous sample, DF is the digestion fraction (the fraction of the suspended solids that contribute to the total analytical result due to partial digestion of the suspended solids during the analytical procedure) and BC is the resultant aqueous background contribution concentration due to dissolution/digestion of the suspended solids. As shown in Figures 3 and 4, the background contributions for Fe and Al match the slopes of the Delta versus TSS data. These figures clearly illustrate that the TSS or BG concentrations could easily account for the increase in total analytical concentrations observed. This indicates that the source of Delta Fe and Al is partial dissolution of suspended solids during analysis.

In Figure 2 for As, two dissolution/digestion model lines are shown in addition to the one calculated for average Eastern U.S. soil As background (7.5 µg/g). These additional lines are: BG = 20 µg/g, representing possible hypothetical average site background As, and 100 µg/g, representing likely elevated concentrations due to adsorption of As from the groundwater onto aquifer solids at the site. The basis for the 100 µg/g concentration is that at the site As is likely adsorbed onto the surfaces of the aquifer solids, resulting in higher concentrations that are easily removed by analytical digestion. The background contribution lines for As (Figure 2) match the Delta As versus TSS slope and the 100 µg/g line provides a best-fit line through the data. This indicates that the source of Delta As is dissolution of suspended solids and adsorbed arsenic during analytical digestion.

Comparison of TSS grouped by Sampling Method

An evaluation was conducted for $Delta_{(As)}$ and TSS as a function of sampling method. The data were grouped by either check valve (bailer) or peristaltic pump method. This analysis did not include the total database but was limited to "nonstable" cases, i.e., where one or more field parameters (conductivity, pH, etc) did not stabilize during purging and prior to sample collection.

Figure 5 shows the $Delta_{(As)}$ comparison in the form of box plots. The descriptive statistics corresponding with the features of the box plots are as follows:

	Natural Log $Delta_{(As)}$ (mg/L)	
Box Plot Statistic	***Check Valve***	***Peristaltic***
Maximum (end of upper whisker)	7.769	6.854
75th Percentile (top of box)	5.165	3.888
Median ("bar" symbol in box)	3.904	2.354
Mean ("plus" symbol in box)	3.664	1.167
25th Percentile (bottom of box)	2.861	-0.689
Minimum (end of lower whisker)	-6.908	-6.908
Number of Cases (n)	27	51

Note that the minimum value represents samples with concentrations less than detection limits. Student's t-test on the natural log transformed delta values support a statistically significant difference (one-tailed p-value = 0.0017; complete summary provided in Attachment A).

Figure 6 shows similar box plots for natural log TSS. The descriptive statistics corresponding with the features of the box plots are as follows:

	Natural Log TSS (mg/L)	
Box Plot Statistic	***Check Valve***	***Peristaltic***
Maximum (end of upper whisker)	13.624	9.847
75th Percentile (top of box)	8.744	8.186
Median ("bar" symbol in box)	7.528	6.647
Mean ("plus" symbol in box)	7.457	6.656
25th Percentile (bottom of box)	5.513	5.701
Minimum (end of lower whisker)	1.099	1.099
Number of Cases (n)	25	36

Student's t-test on the natural log transformed TSS values could not support a statistically significant difference (one-tailed p-value = 0.16; complete summary provided in Attachment A).

The results shown in Figure 5 indicate that higher $Delta_{(As)}$ values result from the use of the check valve method; however, though this result is likely due to higher TSS concentrations using the check valve method, this could not be supported statistically (Figure 6) indicating that additional data would be required to confirm this result for nonstable conditions.

Resampled Well Locations

Four samples collected in the vicinity of the downgradient end of the Site in November 2001 indicated relatively high concentrations of TSS and total As. These well locations were resampled in February 2002 being careful to use methods to reduce the TSS. Dissolved and total As were analyzed in both the original sample and the resample, along with TSS, the results of which were as follows:

	P1-01-GW-06		P1-01-GW-08		P1-02-GW-05		P1-02-GW-06	
	Nov-01 RNS	Feb-02 R2NS	Nov-0 RNS1	Feb-02 R2NS	Nov-01 RNS	Feb-02 R2nS	Nov-01 RNS	Feb-02 R2NS
Arsenic (total) (ug/L)	137	<5.3	43.7	<5.3	132	<5.3	141	<5.3
Arsenic (diss) (ug/L)	<5.3	<5.3	<5.3	<5.3	7.1J	<5.3	<5.3	<5.3
TSS (mg/L)	211,000	315	2,270	194	145,000	248	542,000	479

As shown, initially elevated total As concentrations (43.7 – 141 µg/L) were reduced to below detection limit concentrations (<5.3 µg/L) as the TSS concentrations were reduced. This clearly indicates that the source of increased total As is dissolution/digestion of suspended solids during the analytical procedure.

Conclusions

The results provided in this evaluation strongly support the conclusion that dissolution/digestion of suspended solids during the analytical procedure is the source of the observed increase between dissolved and total arsenic concentrations.

References

Shacklette, H. T. and J. G. Boerngen. 1984. Elemental Concentrations in Soils and Other Surficial Materials of the Conterminous United States. U.S. Geological Survey Professional Paper 1270.

Kretzschmar, R.; K. Barmettler, D. Grolimund, Y. Yan, M. Borkovec and H. Sticher. 1997. Experimental Determination of Colloid Despositions Rates and Collisions Efficiencies in natural Porous Media. Water Resources Research, Vol. 33, No. 5, pp1129 -1137.

Kretzschmar, R.; W. P. Robarge, and A. Amoozegar. 1994. Filter Efficiency of Three Saprolites for Natural Clay and Iron Oxide Colloids. Environ. Sci. Technol., Vol. 28, pp 1907-1915.

Figure 1. Comparison of TSS for As Grouped by Delta

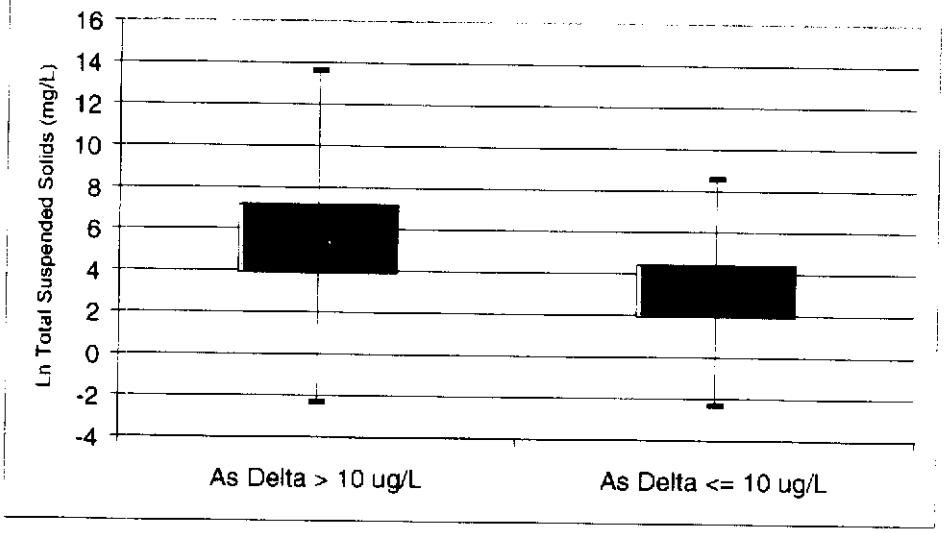
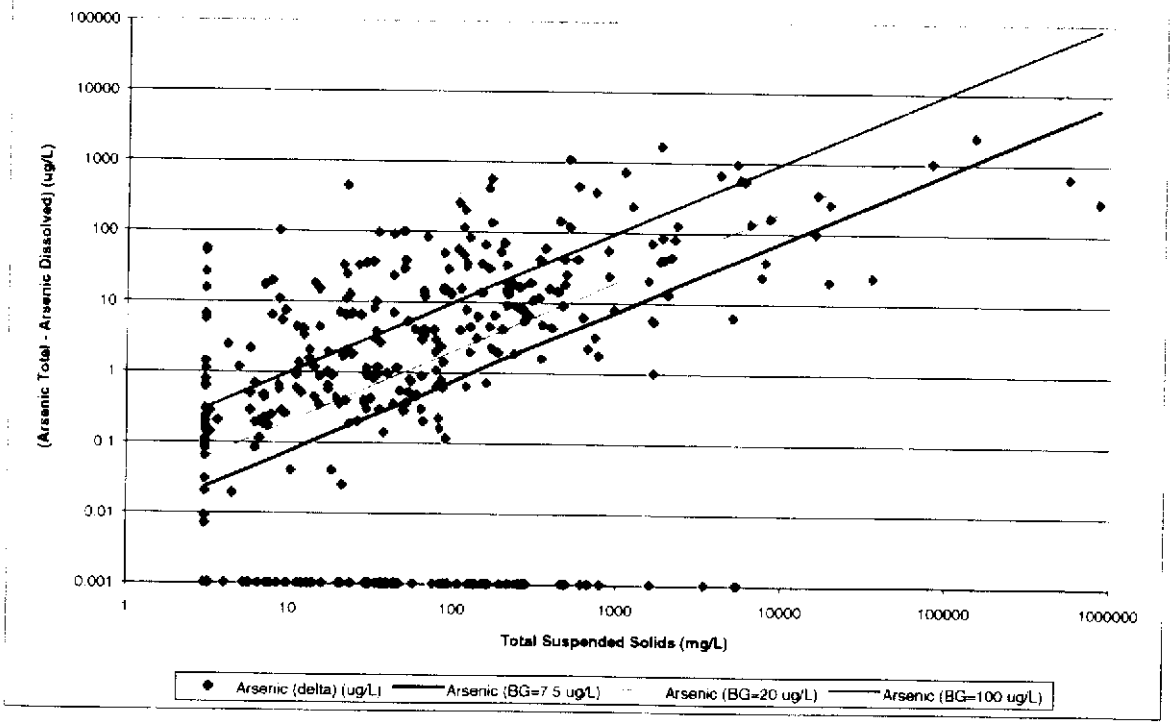


Figure 2. Arsenic vs. TSS



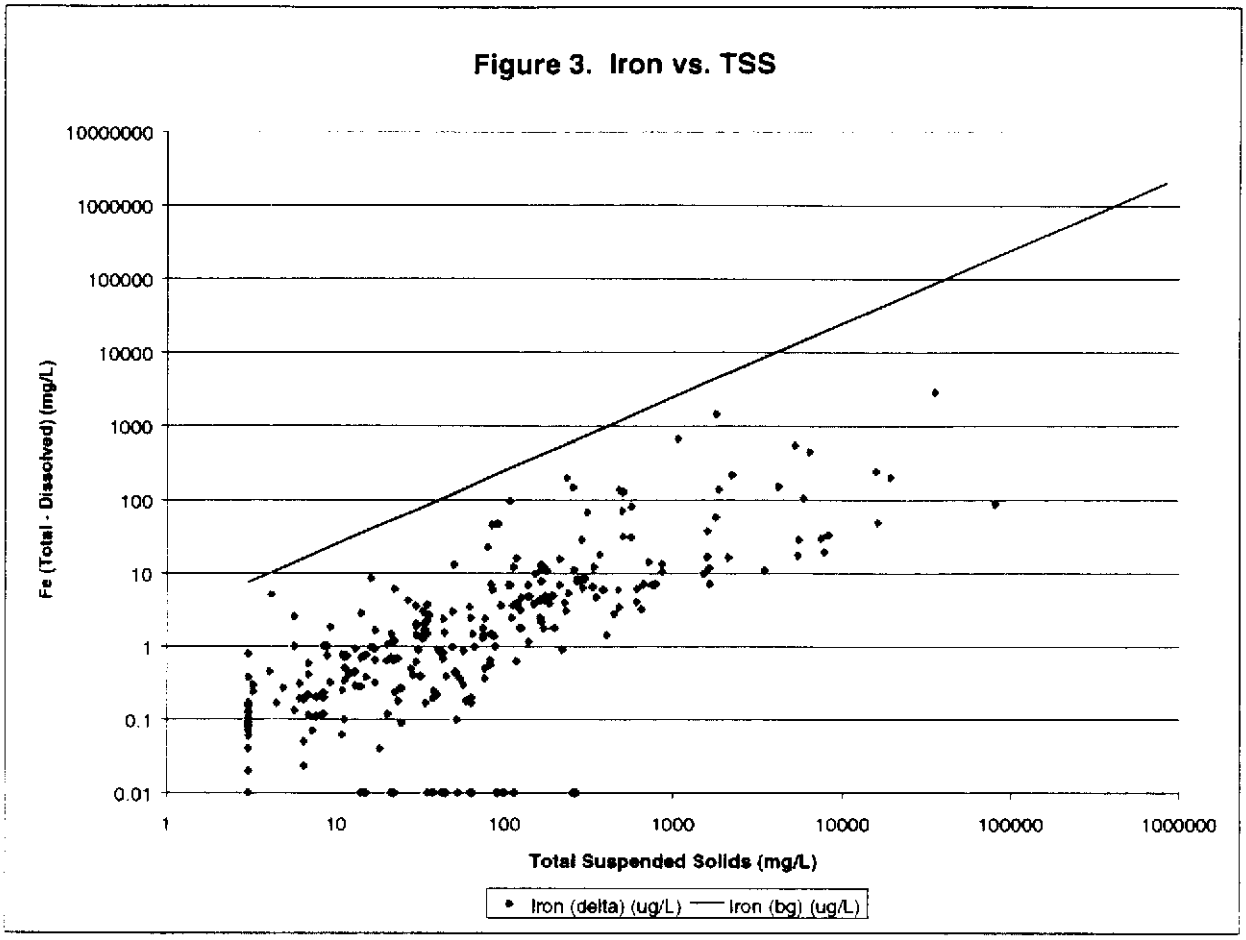


Figure 3. Iron vs. TSS
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
Fe (Total - Dissolved) (mg/L)
1
10
100
1000
10000
100000
1000000
Total Suspended Solids (mg/L)
Iron (delta) (ug/L)
Iron (bg) (ug/L)

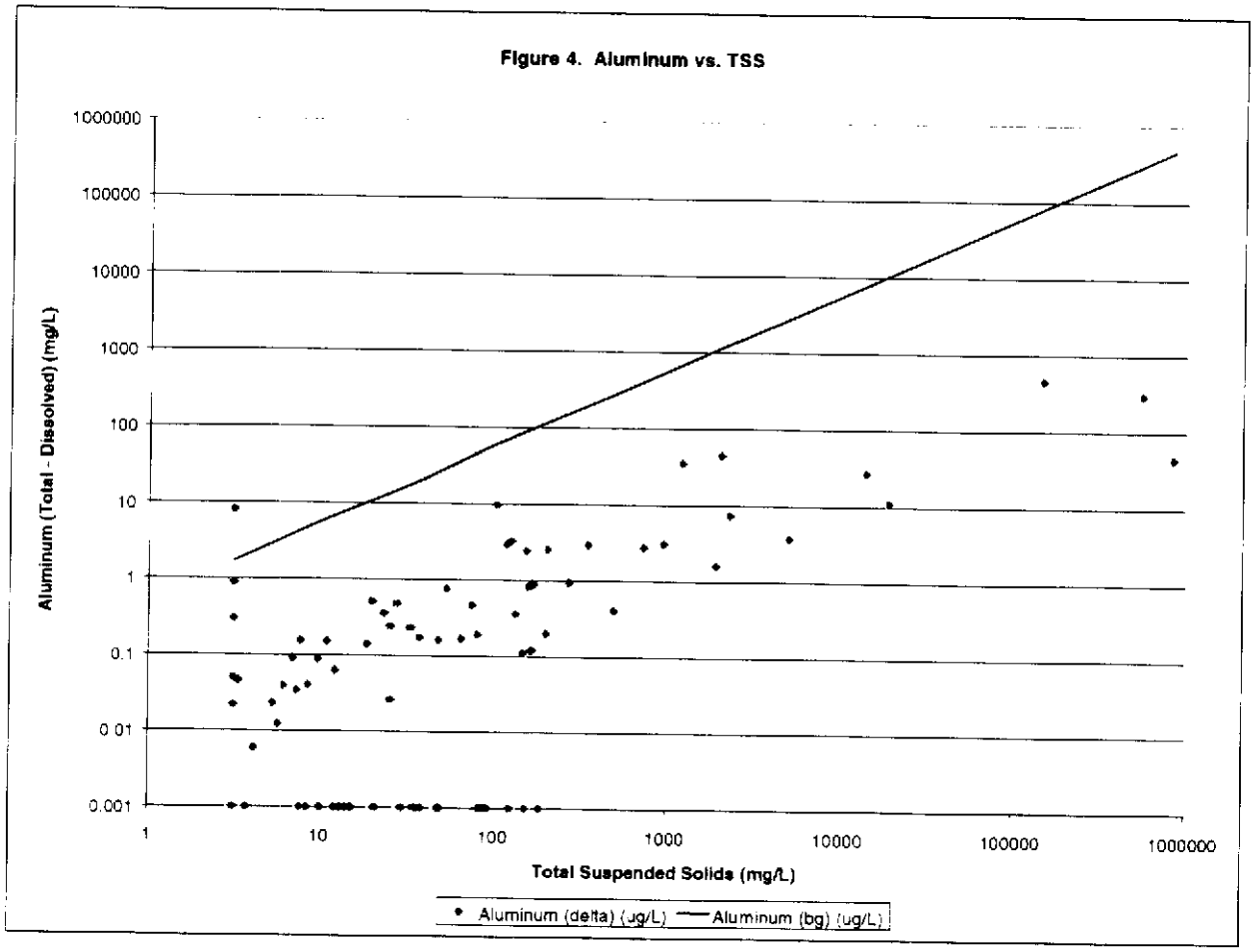


Figure 4. Aluminum vs. TSS
1000000
100000
10000
1000
100
10
1
0.1
0 01
0.001
Aluminum (Total - Dissolved) (mg/L)
1
10
100
1000
10000
100000
1000000
Total Suspended Solids (mg/L)
Aluminum (delta) (ug/L)
Aluminum (bg) (ug/L)

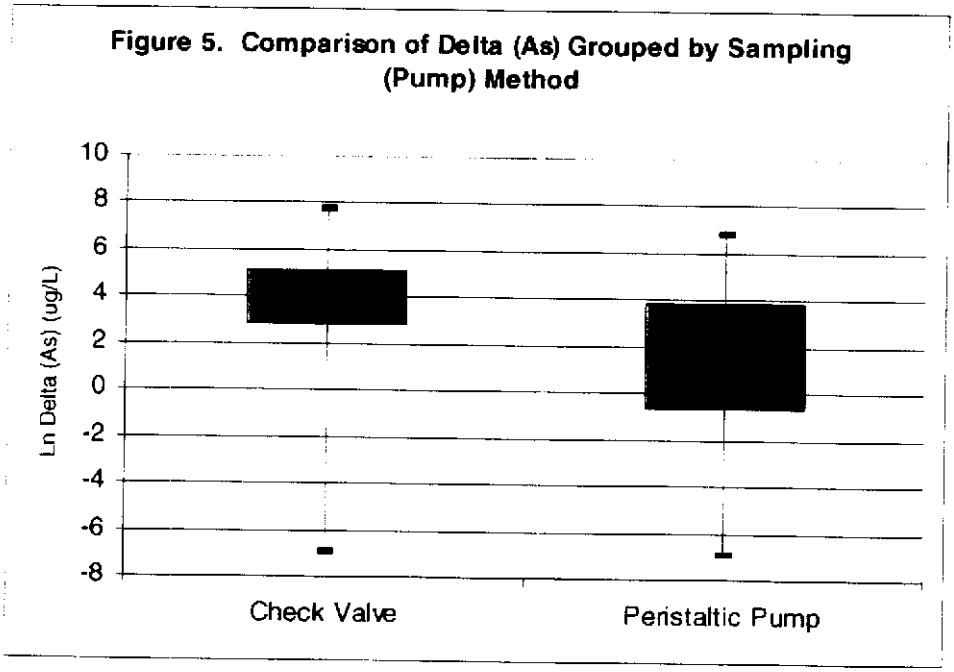


Figure 5. Comparison of Delta (As) Grouped by Sampling (Pump) Method
10
8
6
4
2
0
-2
-4
-6
-8
Ln Delta (As) (ug/L)
Check Valve
Peristaltic Pump

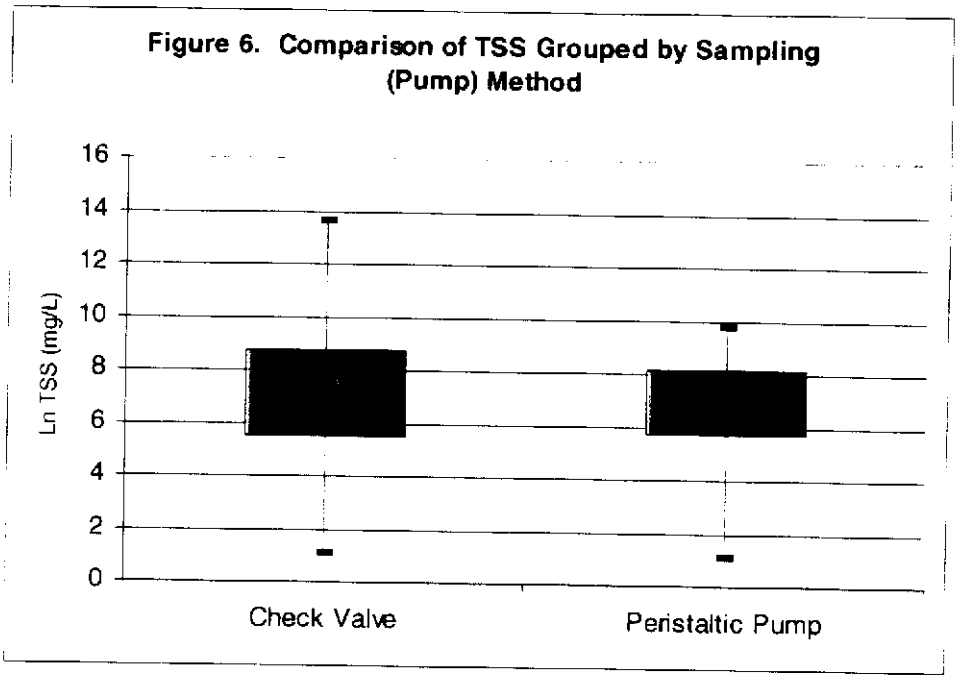


Figure 6. Comparison of TSS Grouped by Sampling (Pump) Method
16
14
12
10
8
6
4
2
0
Ln TSS (mg/L)
Check Valve
Peristaltic Pump

Attachment A

Statistical Test Results

t-Test: Two-Sample Assuming Unequal Variances
On Natural Log TSS

	As Delta > 10 ug/L	*As Delta <= 10 ug/L*
Mean	5.472798312	3.277911462
Variance	8.083129781	3.244364545
Observations	107	255
Hypothesized Mean Difference	0	
df	143	
t Stat	7.387793643	
P(T<=t) one-tail	5.69241E-12	
t Critical one-tail	1.65558049	
P(T<=t) two-tail	1.13848E-11	
t Critical two-tail	1.976691237	

t-Test: Two-Sample Assuming Unequal Variances
On Natural Log Arsenic Delta - Unstable

	Check Valve	*Peristaltic Pump*
Mean	3.664199281	1.167372158
Variance	8.507844936	18.743543
Observations	27	51
Hypothesized Mean Difference	0	
df	71	
t Stat	3.022018496	
P(T<=t) one-tail	0.001745236	
t Critical one-tail	1.666599019	
P(T<=t) two-tail	0.003490473	
t Critical two-tail	1.993944352	

t-Test: Two-Sample Assuming Unequal Variances
On Natural Log Total Suspended Solids - Unstable

	Check Valve	*Peristaltic Pump*
Mean	7.456635094	6.655937924
Variance	12.16794855	4.408036214
Observations	25	36
Hypothesized Mean Difference	0	
df	36	
t Stat	1.025891414	
P(T<=t) one-tail	0.155893508	
t Critical one-tail	1.688297289	
P(T<=t) two-tail	0.311787017	
t Critical two-tail	2.02809133	