FLORIDA DEPARTMENT OF HEALTH

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task C.24

C-HS4 Monitoring Sample Event Report No. 1

Progress Report

April 2013

4423-001

HAZEN AND SAWYER
Environmental Engineers & Scientists

In association with

SCHOOL OF MINES 1874 COLORADO

AET
Applied Environmental Technology

OTIS ENVIRONMENTAL CONSULTANTS, LLC

Florida Onsite Sewage Nitrogen Reduction Strategies Study

TASK C.24
PROGRESS REPORT

C-HS4 Monitoring
Sample Event Report No. 1

Prepared for:

Florida Department of Health
Division of Disease Control and Health Protection
Bureau of Environmental Health
Onsite Sewage Programs
4042 Bald Cypress Way Bin #A-08
Tallahassee, FL 32399-1713

FDOH Contract CORCL

April 2013

Prepared by:

HAZEN AND SAWYER
Environmental Engineers & Scientists

In Association With:

SCHOOL OF MINES 1874 COLORADO

C-HS4 Monitoring
Sample Event Report No. 1

1.0 Background

Task C of the Florida Onsite Sewage Nitrogen Reduction Strategies Study includes monitoring at field sites in Florida to evaluate nitrogen reduction in soil and groundwater, to assess groundwater impacts from various onsite wastewater systems, and to provide data for parameter estimation, verification, and validation of models developed in Task D. The Task C.5 QAPP documents the objectives, monitoring framework, sample frequency and duration, and analytical methods to be used at the field sites. The Task C.23 instrumentation report for the C-HS4 OSTDS system and plume monitoring documents the test area design, number and location of monitoring points, and preliminary field parameters from monitoring points for this Hillsborough County, Florida field site, and also includes preliminary sample collection and analyses.

2.0 Purpose

This sample event report documents data collected from the first C-HS4 monitoring and sampling event which was conducted January 14 through January 17, 2013. This monitoring event consisted of water use measurement from the household water meter, groundwater elevation measured within the standpipe piezometers, measurement of field parameters, and collection of groundwater samples and their analyses by a NELAC certified laboratory.

3.0 Materials and Methods

3.1 Project Site

The C-HS4 field site is also the B-HS2 passive nitrogen reduction system site located in Hillsborough County, FL adjacent to Eagle Lake and [redacted] Creek in a rural area. The Task B.6 installation report for the B-HS2 system documents the experimental system design which was installed in September 2012. The existing onsite sewage treatment and disposal system (OSTDS) consisted of a 1,050 gallon concrete septic tank located adjacent to the soil treatment unit which is a mounded drainfield (P.T.I.™ bundles). The new passive treatment system consists of a replacement 1,050 gallon two chamber concrete primary tank; 300 gallon concrete recirculation tank; 900 gallon concrete Stage

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1 unsaturated media filter; 300 gallon concrete pump tank; and 1,500 gallon two chamber concrete Stage 2 saturated media biofilter.

3.2 Monitoring and Sample Locations and Identification

A sampling grid for groundwater screening was developed downgradient of the soil treatment unit as depicted in Figure 1. A 10-foot by 5-foot grid spacing was staked. Transect lines A through S run east-west, roughly parallel to the groundwater flow direction and increase (higher letter identification) moving southward from the drainfield. Transect lines 0 through 10 run north-south, roughly perpendicular to the groundwater flow direction and increase moving from the west to east. Based on initial screening data, 29 monitoring locations were chosen within the grid for standpipe piezometer installation. Groundwater monitoring points were installed in September and December 2012. Two types of monitoring point were installed using either hand or drilling methods: stainless steel drivepoints and standpipe piezometers. Stainless steel drivepoints consist of 1-foot screens with polypropylene tubing extending to the ground surface. Standpipe piezometers consist of either ¾-inch or 1-inch diameter PVC with a 1-foot or 5-foot screen (0.010-inch slots) and riser extending to the ground surface (refer to the Task C QAPP and Task C.23 C-HS3 Instrumentation Report for additional detail).

Each monitoring location was assigned a unique identification indicating grid location (self explanatory), and depth below ground surface (bottom of the well screen in feet). For example E03-8 is a standpipe piezometer sampler located on the grid at E03 at 8 feet below ground surface. A schematic of the C-HS4 monitoring network is shown in Figure 1. A complete list of all installed standpipe piezometers and sample identification is included in Appendix A. A total of 51 specific monitoring locations were sampled during this first C-HS4 sampling event.

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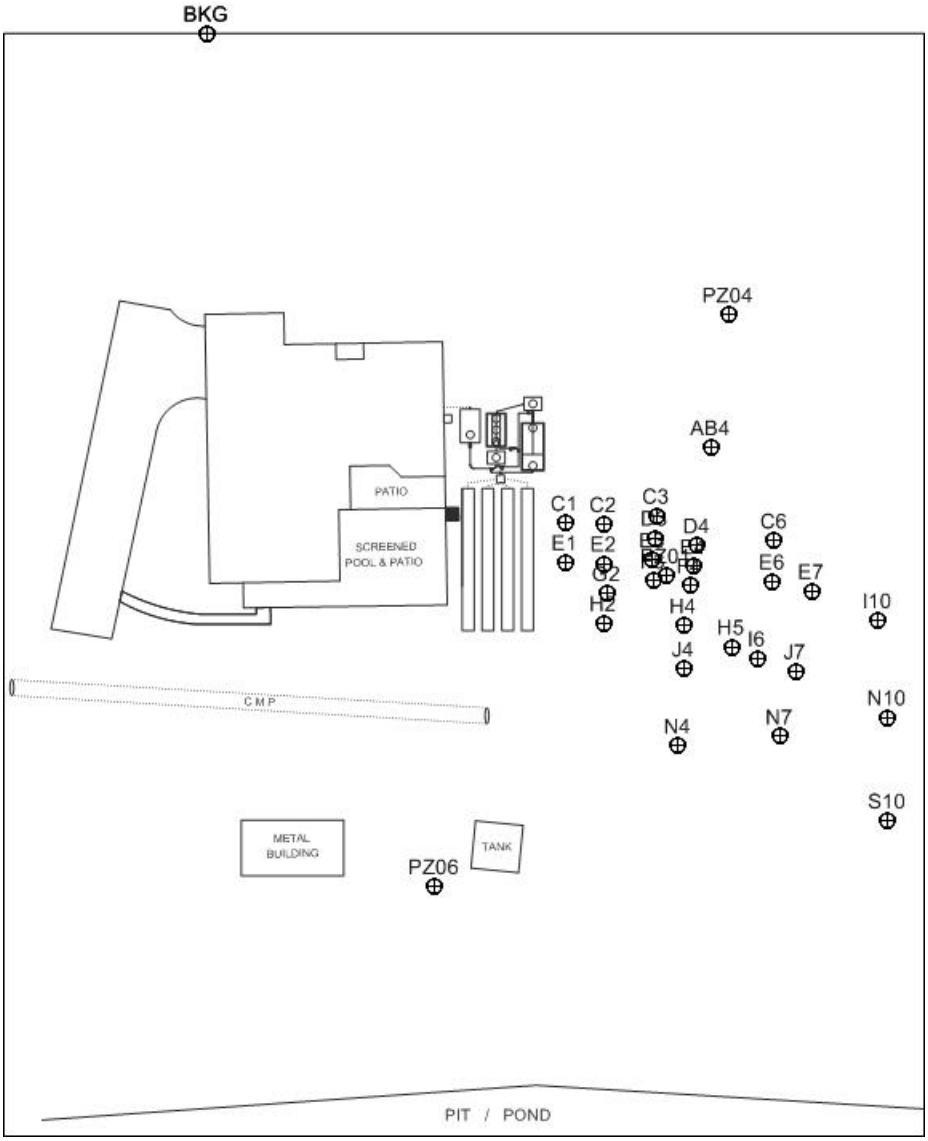

Figure 1
C-HS4 Monitoring Network

3.3 Operational Monitoring

A water meter for the home site was installed March 6, 2012. The water meter for the house site was read and recorded. A weather station (Balm in Wimauam, FL) is located approximately 10 miles from the site. Data from this weather station is available at the following website: http://fawn.ifas.ufl.edu/.

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3.4 Groundwater Elevation Measurements

Groundwater level measurements are used to determine hydraulic gradients and directions of flow. Groundwater levels were measured using a flat tape water level meter graduated in feet (measurement accuracy is 0.01 feet). The groundwater level within all the sampled standpipe piezometers was measured for this sampling event.

3.5 Water Quality Sample Collection and Analyses

Groundwater and septic tank effluent (STE) were collected January 14 through January 17, 2013 for water quality analysis. A sample was collected from the septic tank to represent the effluent delivered to the drainfield. A peristaltic pump was used to collect STE directly into the analysis-specific containers. Groundwater samples were obtained using a peristaltic pump, which was attached directly to dedicated standpipe piezometer or drivepoint tubing. Samples were collected after sufficient purging (the sample was clear and pH and conductivity readings had stabilized) had occurred. Field parameters were then recorded.

The analysis-specific containers were supplied by the analytical laboratory and contained appropriate preservatives. The analysis-specific containers were labeled, placed in coolers and transported on ice to the analytical laboratory. Each sample container was secured in packing material as appropriate to prevent damage and spills, and was recorded on chain-of-custody forms supplied by the laboratory. Chain of custody forms, provided in Appendix B, were used to document the transfer of samples from field personnel to the analytical laboratory.

In addition, field sample duplicates were collected immediately subsequent to the regular samples. The field duplicate samples taken include:

- STE
- PZ-AB4-08
- PZ-E3-08
- PZ-E7-08
- PZ-H4-15
- PZ-I10-08
- PZ-N10-08

Field parameters (pH, specific conductance, temperature (Temp), and dissolved oxygen (DO)) were measured using portable electronic probes with probe tips placed in an overflowing plastic beaker as groundwater was being pumped. All samples were analyzed by the laboratory for: total alkalinity, total Kjeldahl nitrogen (TKN-N), ammonia nitrogen (NH_3-N), nitrate/nitrite nitrogen (NO_X-N), and chloride (CL). At some of the locations, chemical oxygen demand (COD), total phosphorus (TP), anions, and cations

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were included. All analyses were performed by an independent and fully certified analytical laboratory (Southern Analytical Laboratory). Table 1 lists the analytical parameters, analytical methods, and detection limits for these analyses.

Table 1
Analytical Parameters, Method of Analysis, and Detection Limits

Analytical Parameter	Method of Analysis	Method Detection Limit (mg/L)
Total Alkalinity as $CaCO_3$	SM 2320B	2 mg/L
Chemical Oxygen Demand (COD)	EPA 410.4	10 mg/L
Total Kjeldahl Nitrogen (TKN-N)	EPA 351.2	0.05 mg/L
Ammonia Nitrogen (NH_3-N)	EPA 350.1	0.005 mg/L
Nitrate/Nitrite Nitrogen (NO_X-N)	EPA 300.0	0.02 mg/L
Total Phosphorus	SM 4500P-E	0.01 mg/L
Anions		
Fluoride	EPA 300.0	0.01 mg/L
Chloride	EPA 300.0	0.05 mg/L
Nitrate-N	EPA 300.0	0.01 mg/L
Nitrite-N	EPA 300.0	0.01 mg/L
Orthophosphate-P	EPA 300.0	0.01 mg/L
Sulfate	EPA 300.0	0.20 mg/L
Cations		
Boron	EPA 200.7	0.05 mg/L
Calcium	EPA 200.7	0.01 mg/L
Iron	EPA 200.7	0.02 mg/L
Magnesium	EPA 200.7	0.01 mg/L
Manganese	EPA 200.7	0.001 mg/L
Potassium	EPA 200.7	0.01 mg/L
Sodium	EPA 200.7	0.01 mg/L

4.0 Results

Once analytical results are obtained from the laboratory, the C-HS4 Data Summary Report No. 1 (Task C.25) will be prepared describing the results from this sampling event.

4.1 Operational Monitoring and Site Conditions

Table 2 summarizes the water meter readings and average daily water use for the residence at site C-HS4.

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Table 2
Water Meter Readings and Water Usage for C-HS4

Residence	Date Read	Meter Reading	Gallons/day
C-HS4 Residence	3/6/2012	7,790	Installed
	1/1/2013	43,240	117.8
	2/5/2013	47,741	128.6

Daily recorded meteorological data is provided in Appendix C. Table 3 provides the daily averages leading up to and during the sample event.

Table 3
Meteorological Data Daily Averages Measured January 10 through January 17, 2013

Date	Temp Avg 60 cm (°F)	Temp Avg 2m (°F)	Temp Avg 10 m (°F)	Temp Soil Avg -10 cm (°F)	Dewpoint Avg 2m (°F)	Relative Humidity Avg 2m (%)	Rain Total 2m (in)	2m Rain max over 15min (in)	10m Wind avg (mph)	ET (in/d)
10-Jan-13	72.31	72.95	72.57	69.46	66.18	81	0	0	8.71	0.07
11-Jan-13	70.52	71.21	71.02	69.29	65.09	83	0	0	7.35	0.08
12-Jan-13	70.35	71.07	71.11	69.47	64.07	80	0	0	7.04	0.07
13-Jan-13	70.18	70.88	70.89	69.71	63.93	80	0	0	5.8	0.07
14-Jan-13	67.35	68.29	68.85	69.49	61.39	81	0	0	5.08	N/A
15-Jan-13	67.81	68.47	69.11	68.84	62.15	82	0	0	4.32	0.07
16-Jan-13	68.28	69.07	69.63	69.45	61.53	80	0	0	4.27	0.07
17-Jan-13	60.71	61.24	61.49	68.12	57.81	89	0.04	0.01	8.64	0.06

4.2 Groundwater Levels

Water levels were measured at all standpipe piezometers sampled January 14 through January 17, 2013 for this sampling event as summarized in Table 4. Figure 2 illustrates the surficial groundwater contours as measured within the standpipe piezometers.

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Table 4
Standpipe Piezometer Groundwater Levels January 16, 2013

Identification	Water Table El[1] (ft)	Identification	Water Table El[1] (ft)
PZ01	11.63	PZ-F3-08	DRY
PZ02	20.07	PZ-F3-15	11.83
PZ03	DRY	PZ-F4-08	11.53
BKG-10	17.37	PZ-F4-15	11.51
BKG-15	16.54	PZ-G1	DRY
PZ04	13.04	PZ-G2-12.5	NR
PZ05	NR	PZ-H4-08	11.44
PZ06	13.12	PZ-H4-15	11.37
PZ-AB4-08	11.97	PZ-H5-11.5	11.23
PZ-AB4-15	12.01	PZ-I6-08	11.17
PZ-C1	13.87	PZ-I6-15	11.24
PZ-C2	13.43	PZ-I10-08	11.02
PZ-C3-08	12.45	PZ-I10-15	11.07
PZ-C3-15	12.12	PZ-J4-08	DRY
PZ-C6-08	11.23	PZ-J4-15	11.35
PZ-C6-15	11.23	PZ-J7-08	11.18
PZ-D3-08	12.40	PZ-J7-15	11.15
PZ-D3-15	12.34	PZ-N4-08	11.40
PZ-D4-08	11.60	PZ-N4-15	11.40
PZ-D4-15	11.48	PZ-N7-08	11.21
PZ-E1	13.71	PZ-N7-15	11.18
PZ-E2	12.78	PZ-N10-08	11.12
PZ-E3-08	12.31	PZ-N10-15	11.08
PZ-E3-15	12.24	PZ-S10-08	11.09
PZ-E4-08	11.52		
PZ-E4-15	11.45		
PZ-E5-08	11.30		
PZ-E5-15	11.28		
PZ-E6-08	11.21		
PZ-E6-15	11.23		
PZ-E7-08	11.15		
PZ-E7-15	11.19		

[1]Elevation above mean sea level based on NGVD 1929
[2]Most likely erroneous instrument reading

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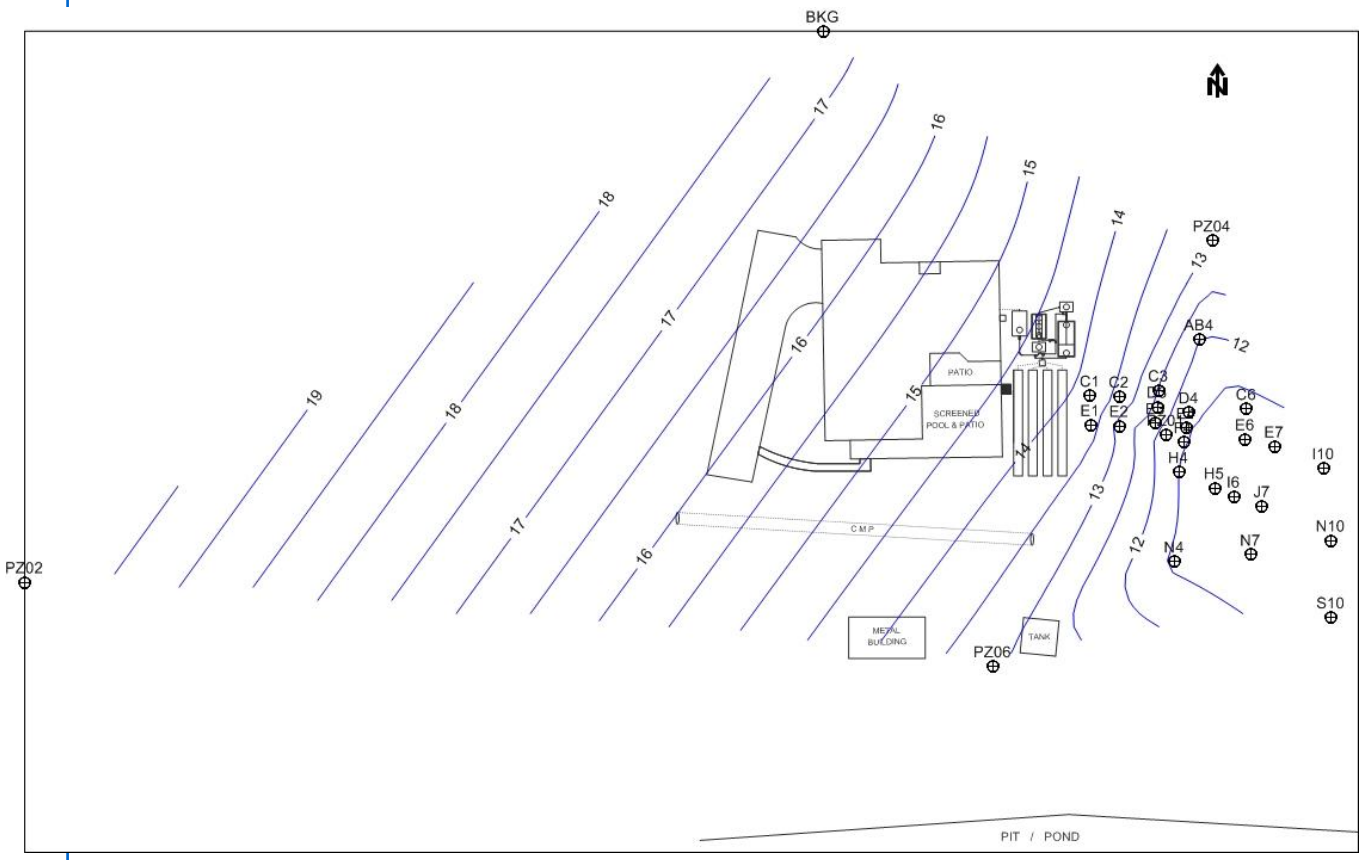

Figure 2
Surficial Groundwater Contours January 16, 2013

4.3 Water Quality

Field parameters were measured prior to sample collection and are listed in Appendix D. Once analytical results are obtained from the laboratory, C-HS4 Data Summary Report No. 1 (Task C.25) will be prepared describing the results from this sampling event.

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Appendix A: C-HS4 Sample Identification

Table A.1
Site C-HS4 Sample Identification

	Identification	Type of Monitoring Point	Top Elev[1] (feet)	Bottom Elev[1] (feet)
1	C-HS3-STE	Wastewater	N/A	N/A
2	PZ01	1" Standpipe Piezometer, 5' screen	19.08	9.48
3	PZ02	1" Standpipe Piezometer, 5' screen	28.72	16.54
4	PZ03	1" Standpipe Piezometer, 5' screen	24.85	19.00
5	PZ04	1" Standpipe Piezometer, 5' screen	18.82	13.02
6	PZ05	1" Standpipe Piezometer, 5' screen	20.79	NR
7	PZ06	1" Standpipe Piezometer, 5' screen	22.17	11.02
8	BKG-10	1" Standpipe Piezometer, 5' screen	24.60	15.22
9	BKG-15	3/4" Standpipe Piezometer, 1' screen	24.60	10.17
10	PZ-AB4-08	1" Standpipe Piezometer, 5' screen	18.65	10.27
11	PZ-AB4-15	3/4" Standpipe Piezometer, 1' screen	18.59	4.09
12	PZ-C1	1" Standpipe Piezometer, 5' screen	22.85	12.70
13	PZ-C2	1" Standpipe Piezometer, 5' screen	21.23	9.73
14	PZ-C3-08	1" Standpipe Piezometer, 5' screen	19.63	11.83
15	PZ-C3-15	3/4" Standpipe Piezometer, 1' screen	19.64	5.09
16	PZ-C6-08	1" Standpipe Piezometer, 5' screen	17.53	9.03
17	PZ-C6-15	3/4" Standpipe Piezometer, 1' screen	17.53	3.13
18	PZ-D3-08	1" Standpipe Piezometer, 5' screen	19.62	11.63
19	PZ-D3-15	3/4" Standpipe Piezometer, 1' screen	19.64	5.08
20	PZ-D4-08	1" Standpipe Piezometer, 5' screen	18.77	10.89
21	PZ-D4-15	3/4" Standpipe Piezometer, 1' screen	18.76	4.21
22	PZ-E1	1" Standpipe Piezometer, 5' screen	22.92	11.42
23	PZ-E2	1" Standpipe Piezometer, 5' screen	21.03	9.33
24	PZ-E3-08	1" Standpipe Piezometer, 5' screen	19.66	11.41
25	PZ-E3-15	3/4" Standpipe Piezometer, 1' screen	19.64	4.98
26	PZ-E4-08	1" Standpipe Piezometer, 5' screen	18.70	10.80
27	PZ-E4-15	3/4" Standpipe Piezometer, 1' screen	18.69	4.31
28	PZ-E5-08	1" Standpipe Piezometer, 5' screen	18.15	10.25
29	PZ-E5-15	3/4" Standpipe Piezometer, 1' screen	18.13	3.56
30	PZ-E6-08	1" Standpipe Piezometer, 5' screen	17.83	9.95

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Table A.1 (continued)
Site C-HS4 Sample Identification

	Identification	Type of Monitoring Point	Top Elev[1] (feet)	Bottom Elev[1] (feet)
31	PZ-E6-15	3/4" Standpipe Piezometer, 1' screen	17.85	3.45
32	PZ-E7-08	1" Standpipe Piezometer, 5' screen	17.55	8.87
33	PZ-E7-15	3/4" Standpipe Piezometer, 1' screen	17.55	3.05
34	PZ-F3-08	1" Standpipe Piezometer, 5' screen	19.54	11.59
35	PZ-F3-15	3/4" Standpipe Piezometer, 1' screen	19.55	5.05
36	PZ-F4-08	1" Standpipe Piezometer, 5' screen	18.83	11.13
37	PZ-F4-15	3/4" Standpipe Piezometer, 1' screen	18.88	4.48
38	PZ-G1	1" Standpipe Piezometer, 5' screen	20.72	12.82
39	PZ-G2-12.5	2" Standpipe Piezometer, 7.5' screen	21.03	8.88
40	PZ-H4-08	1" Standpipe Piezometer, 5' screen	19.19	10.91
41	PZ-H4-15	3/4" Standpipe Piezometer, 1' screen	19.22	4.45
42	PZ-H5-11.5	2" Standpipe Piezometer, 7.5' screen	18.58	7.86
43	PZ-I6-08	1" Standpipe Piezometer,5' screen	18.42	9.37
44	PZ-I6-15	3/4" Standpipe Piezometer, 1' screen	18.42	3.87
45	PZ-I10-08	1" Standpipe Piezometer, 5' screen	16.87	8.95
46	PZ-I10-15	3/4" Standpipe Piezometer, 1' screen	16.92	4.42
47	PZ-J4-08	1" Standpipe Piezometer, 5' screen	19.26	11.32
48	PZ-J4-15	3/4" Standpipe Piezometer, 1' screen	19.25	4.73
49	PZ-J7-08	1" Standpipe Piezometer, 5' screen	17.86	9.41
50	PZ-J7-15	3/4" Standpipe Piezometer, 1' screen	17.87	3.45
51	PZ-N4-08	1" Standpipe Piezometer, 5' screen	19.28	11.00
52	PZ-N4-15	3/4" Standpipe Piezometer, 1' screen	19.30	4.82
53	PZ-N7-08	1" Standpipe Piezometer, 5' screen	18.01	9.46
54	PZ-N7-15	3/4" Standpipe Piezometer, 1' screen	18.03	3.23
55	PZ-N10-08	1" Standpipe Piezometer, 5' screen	16.92	9.17
56	PZ-N10-15	3/4" Standpipe Piezometer, 1' screen	16.83	2.59
57	PZ-S10-08	1" Standpipe Piezometer, 5' screen	17.03	8.78
58	DP01	SST Drivepoint	19.25	
59	DP02	SST Drivepoint	19.24	
60	DP03	SST Drivepoint	19.49	
61	DP04	SST Drivepoint	19.22	
62	DP05	SST Drivepoint	19.25	
63	DP06	SST Drivepoint	19.38	

[1]Elevation above mean sea level based on NGVD 1929

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Appendix B: Chain of Custody Forms

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SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
01	STE			WW		X	1	1														
02	STE-DUP			WW		X	1	1														
03	PZ-01			GW		X			1	1												
04	PZ-02			GW		X	1	1														
05	PZ-03			GW		X	1	1														
06	BKG-10	1/14/13	1006	GW		X				1	1	1	21.6	4.76	337	6.63						
07	BKG-15		1030	GW		X			1	1			23.3	5.89	124	0.22						
08	PZ-04			GW		X	1	1														
09	PZ-05			GW		X	1	1														
10	PZ-06			GW		X	1	1														
11	PZ-AB4-08	1/14/13	1059	GW		X			1	1			23.1	6.09	331	1.80						
12	PZ-AB4-08 DUP		1104	GW		X			1	1			23.1	6.09	331	1.80						

Relinquished	Date/Time	Received	Date/Time
J. Chambers	12-26-12 12:45	Joseph Hin	12-27-12 1:00pm
	1410 1/14/13		1-14-13
J. Chambers courier		J. Chambers	1-14-13 15:25

Seal intact?	N	N/A
Samples intact upon arrival?	N	N/A
Received on ice? Temp_____	N	N/A
Proper preservatives indicated?	N	N/A
Rec'd within holding time?	N	N/A
Volatiles rec'd w/out headspace?	Y N	N/A
Proper containers used?	N	N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 121454

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
01	STE	1/17/13	1138	WW		X	1	1					23.3	7.38	1361	0.40						
02	STE-DUP		1143	WW		X	1	1					23.3	7.38	1361	0.40						
03	PZ-01		1127	GW		X			1	1			21.3	5.65	491	3.80						
04	PZ-02			GW		X	1	1														
05	PZ-03			GW		X	1	1														
06	BKG-10			GW		X				1	1	1										
07	BKG-15			GW		X			1	1												
08	PZ-04			GW		X	1	1														
09	PZ-05			GW		X	1	1														
10	PZ-06			GW		X	1	1														
11	PZ-AB4-08			GW		X			1	1												
12	PZ-AB4-08 DUP			GW		X			1	1												

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	12-26-12 12:45	Joseph Hin	12-27-12 1:00pm
Relinquished:	Date/Time: 1350 1/17/13	Received: K Neidmark	Date/Time: 1350 1/17/13
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N N/A

Samples intact upon arrival? Y N N/A

Received on ice? Temp_____ Y N N/A

Proper preservatives indicated? Y N N/A

Rec'd within holding time? Y N N/A

Volatiles rec'd w/out headspace? Y N N/A

Proper containers used? Y N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
13	PZ-AB-4-15	1/14/13	1120	GW		X	1	1					23.5	7.24	456	3.84						
14	PZ-C1			GW		X	1	1														
15	PZ-C2			GW		X	1	1														
16	PZ-C3-08	1/14/13	1150	GW		X	1	1					23.0	5.15	438	1.05						
17	PZ-C3-15		1205	GW		X	1	1					23.9	6.82	489	1.36						
18	PZ-C6-08			GW		X	1	1														
19	PZ-C6-15			GW		X	1	1														
20	PZ-D3-08	1/14/13	1224	GW		X			1	1			23.0	5.33	385	0.78						
21	PZ-D3-15		1244	GW		X			1	1			23.8	6.74	811	1.70						
22	PZ-D4-08			GW		X	1	1														
23	PZ-D4-15			GW		X	1	1														
24	PZ-E1			GW		X			1	1												

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: J. Chambers	12-26-12 13:00	[illegible]	12-27-12 1:00pm
Relinquished: [signature]	1410 1/14/13	[signature]	1-14-13
Relinquished: Courier	1/14/13	J. Chambers	1-14-13 15:25
Relinquished:		Received:	
Relinquished:		Received:	

Seal intact?	Y N N/A
Samples intact upon arrival?	Y N N/A
Received on ice? Temp_____	Y N N/A
Proper preservatives indicated?	Y N N/A
Rec'd within holding time?	Y N N/A
Volatiles rec'd w/out headspace?	Y N N/A
Proper containers used?	Y N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
13	PZ-AB-4-15			GW		X	1	1														
14	PZ-C1			GW		X	1	1														
15	PZ-C2			GW		X	1	1														
16	PZ-C3-08			GW		X	1	1														
17	PZ-C3-15			GW		X	1	1														
18	PZ-C6-08	1/15/13	1137	GW		X	1	1					22.5	4.29	649	2.35						
19	PZ-C6-15		1157	GW		X	1	1					23.2	5.77	391	1.99						
20	PZ-D3-08			GW		X			1	1												
21	PZ-D3-15			GW		X			1	1												
22	PZ-D4-08	1/15/13	1022	GW		X	1	1					21.9	5.25	510	0.70						
23	PZ-D4-15		1041	GW		X	1	1					22.0	6.87	950	1.05						
24	PZ-E1			GW		X			1	1												

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	12-26-12 13:00	[illegible]	12-27-12 1:00pm
Relinquished:	Date/Time: 1575 1/15/13	Received: K Nordmeck	Date/Time: 1/15/13 1575
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N N/A

Samples intact upon arrival? Y N N/A

Received on ice? Temp_____ Y N N/A

Proper preservatives indicated? Y N N/A

Rec'd within holding time? Y N N/A

Volatiles rec'd w/out headspace? Y N N/A

Proper containers used? Y N N/A

Instructions / Remarks:

Chain of Custody.xls
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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
13	PZ-AB-4-15			GW		X	1	1														
14	PZ-C1	1/17/13	1016	GW		X	1	1					22.6	5.69	810	4.91						
15	PZ-C2		1046	GW		X	1	1					23.0	5.89	157.3	0.30						
16	PZ-C3-08			GW		X	1	1														
17	PZ-C3-15			GW		X	1	1														
18	PZ-C6-08			GW		X	1	1														
19	PZ-C6-15			GW		X	1	1														
20	PZ-D3-08			GW		X			1	1												
21	PZ-D3-15			GW		X			1	1												
22	PZ-D4-08			GW		X	1	1														
23	PZ-D4-15			GW		X	1	1														
24	PZ-E1	1/17/13	0949	GW		X			1	1			22.6	5.70	116.6	3.57						

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	12-26-12 13:00	[illegible]	12-27-12 1:00pm
Relinquished:	Date/Time: 1350 1/17/13	Received: K Mudmach	Date/Time: 1352 1/17/13
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N (N/A)

Samples intact upon arrival? (Y) N N/A

Received on ice? Temp_____ (Y) N N/A

Proper preservatives indicated? (Y) N N/A

Rec'd within holding time? (Y) N N/A

Volatiles rec'd w/out headspace? Y N (N/A)

Proper containers used? (Y) N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
25	PZ-E2			GW		X	1	1														
26	PZ-E3-08	1/14/13	1307	GW		X			1	1			22.7	5.62	728	0.73						
27	PZ-E3-08-DUP		1312	GW		X			1	1			22.7	5.62	728	0.73						
28	PZ-E3-15		1330	GW		X			1	1			24.6	6.57	331	4.23						
29	PZ-E4-08			GW		X				1	1	1										
30	PZ-E4-15			GW		X	1	1														
31	PZ-E5-08			GW		X	1	1														
32	PZ-E5-15			GW		X	1	1														
33	PZ-E6-08			GW		X	1	1														
34	PZ-E6-15			GW		X	1	1														
35	PZ-E7-08			GW		X				1	1	1										
36	PZ-E7-08-DUP			GW		X				1	1	1										

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: J. Chambers	12-26-12 13:00	[illegible]	12-27-12 1:00pm
Relinquished: [illegible]	1410 1/14/13	[illegible]	1-14-13
Relinquished: Courier	1-14-13	J. Chambers	1-14-13 15:25
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N N/A	
Samples intact upon arrival?	Y N N/A	
Received on ice? Temp_____	Y N N/A	
Proper preservatives indicated?	Y N N/A	
Rec'd within holding time?	Y N N/A	
Volatiles rec'd w/out headspace?	Y N N/A	
Proper containers used?	Y N N/A	

Instructions / Remarks:

Chain of Custody.xls
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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
25	PZ-E2			GW		X	1	1														
26	PZ-E3-08			GW		X			1	1												
27	PZ-E3-08-DUP			GW		X			1	1												
28	PZ-E3-15			GW		X			1	1												
29	PZ-E4-08	1/15/13	0950	GW		X				1	1	1	21.6	5.29	632	0.74						
30	PZ-E4-15		1013	GW		X	1	1					22.7	6.73	517	1.62						
31	PZ-E5-08		1056	GW		X	1	1					22.6	5.01	552	0.72						
32	PZ-E5-15		1117	GW		X	1	1					23.4	6.73	820	1.15						
33	PZ-E6-08		1215	GW		X	1	1					22.5	4.99	501	2.32						
34	PZ-E6-15		1236	GW		X	1	1					23.3	5.44	380	3.05						
35	PZ-E7-08		1351	GW		X				1	1	1	22.9	4.98	398	3.18						
36	PZ-E7-08-DUP		1356	GW		X				1	1	1	22.9	4.98	398	3.18						

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: J. Chambers	12-26-12 13:00	[illegible]	12-27-12 1:00pm
Relinquished: [signature]	1515 1/15/13	Received: K Mulmark	Date/Time: 1/15/13 1515
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N N/A

Samples intact upon arrival? Y N N/A

Received on ice? Temp_____ Y N N/A

Proper preservatives indicated? Y N N/A

Rec'd within holding time? Y N N/A

Volatiles rec'd w/out headspace? Y N N/A

Proper containers used? Y N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
25	PZ-E2	1/17/13	1108	GW		X	1	1					21.7	5.90	1945	4.90						
26	PZ-E3-08			GW		X			1	1												
27	PZ-E3-08-DUP			GW		X			1	1												
28	PZ-E3-15			GW		X			1	1												
29	PZ-E4-08			GW		X				1	1	1										
30	PZ-E4-15			GW		X	1	1														
31	PZ-E5-08			GW		X	1	1														
32	PZ-E5-15			GW		X	1	1														
33	PZ-E6-08			GW		X	1	1														
34	PZ-E6-15			GW		X	1	1														
35	PZ-E7-08			GW		X				1	1	1										
36	PZ-E7-08-DUP			GW		X				1	1	1										

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	12-26-12 13:00	[illegible]	12-27-12 1:00pm
Relinquished:	Date/Time: 1350 1/17/13	Received: K Muehlmann	Date/Time: 1/17/13 1350
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N (N/A)

Samples intact upon arrival? (Y) N N/A

Received on ice? Temp_____ (Y) N N/A

Proper preservatives indicated? (Y) N N/A

Rec'd within holding time? (Y) N N/A

Volatiles rec'd w/out headspace? Y N (N/A)

Proper containers used? (Y) N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214546

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
37	PZ-E7-15	1/15/12	1316	GW		X			1	1			23.5	7.14	1740	3.93						
38	PZ-F3-08		DRY	GW		X			1	1												
39	PZ-F3-15		0850	GW		X			1	1			22.1	6.84	353	4.16						
40	PZ-F4-08		0905	GW		X				1	1	1	20.4	[illegible]	813	5.48						
41	PZ-F4-15		0932	GW		X			1	1			22.2	7.14	1287	5.08						
42	PZ-G1			GW		X	1	1														
43	PZ-G2-12.5			GW		X	1	1														
44	PZ-H4-08	1/15/13	1333	GW		X			1	1			23.0	5.21	559	4.17						
45	PZ-H4-15		1346	GW		X			1	1			23.5	7.01	858	5.61						
46	PZ-H4-15-DUP		1353	GW		X			1	1			23.5	7.01	858	5.61						
47	PZ-H5-11.5			GW		X	1	1														
48	PZ-I6-08			GW		X	1				1	1										

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: J. Chambers	12-26-12 12:00	Received: [illegible]	12/27/12 1:00pm
Relinquished:	1/15/13 1515	Received: K Melsnard	1/15/13 1515
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N N/A

Samples intact upon arrival? Y N N/A

Received on ice? Temp_____ Y N N/A

Proper preservatives indicated? Y N N/A

Rec'd within holding time? Y N N/A

Volatiles rec'd w/out headspace? Y N N/A

Proper containers used? Y N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214540

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes:
DW-Drinking Water WW-Wastewater
SW-SurfaceWater SL-Sludge SO-Soil
GW-Groundwater SA-Saline Water O-Other
R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
37	PZ-E7-15			GW		X			1	1												
38	PZ-F3-08			GW		X			1	1												
39	PZ-F3-15			GW		X			1	1												
40	PZ-F4-08			GW		X				1	1	1										
41	PZ-F4-15			GW		X			1	1												
42	PZ-G1			GW		X	1	1														
43	PZ-G2-12.5	1/16/13	1002	GW		X	1	1					22.4	4.70	570	1.40						
44	PZ-H4-08			GW		X			1	1												
45	PZ-H4-15			GW		X			1	1												
46	PZ-H4-15-DUP			GW		X			1	1												
47	PZ-H5-11.5	1/16/13	1048	GW		X	1	1					22.2	4.55	441	1.27						
48	PZ-I6-08		1110	GW		X	1				1	1	22.5	5.04	395	0.20						

Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	12-26-12 12:00	[illegible]	12/27/12 1:00pm
[signature]	1/16/13 1535	K Medmark	1/16/13 1535

Seal intact? Y N N/A
Samples intact upon arrival? Y N N/A
Received on ice? Temp_____ Y N N/A
Proper preservatives indicated? Y N N/A
Rec'd within holding time? Y N N/A
Volatiles rec'd w/out headspace? Y N N/A
Proper containers used? Y N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 121454c

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
49	PZ-I6-15	1/16/13	1133	GW		X	1	1					23.4	6.90	1849	0.18						
50	PZ-I10-08		1215	GW		X			1	1			22.9	5.29	460	0.51						
51	PZ-I10-08-DUP		1220	GW		X			1	1			22.9	5.29	460	0.51						
52	PZ-I10-15		1230	GW		X	1	1					23.1	6.83	734	0.79						
53	PZ-J4-08		1020	GW		X				1	1	1	DRY									
54	PZ-J4-15		1029	GW		X			1	1			23.0	6.47	535	0.36						
55	PZ-J7-08		1148	GW		X				1	1	1	22.8	5.07	299	0.78						
56	PZ-J7-15		1200	GW		X	1	1					23.5	5.30	415	1.06						
57	PZ-N4-08		1358	GW		X			1	1			22.9	5.67	280	4.22						
58	PZ-N4-15		1422	GW		X	1	1					23.1	6.69	726	0.38						
59	PZ-N7-08		1335	GW		X	1	1					24.4	5.96	454	1.04						
60	PZ-N7-15		1345	GW		X	1	1					23.9	5.73	259	0.31						

Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	12-26-12 13:00	[illegible]	12/27/12 1:00pm
[signature]	1/16/13 1535	K Mudmann	1/16/13 1535

Seal intact? Y N (N/A)

Samples intact upon arrival? (Y) N N/A

Received on ice? Temp_____ (Y) N N/A

Proper preservatives indicated? (Y) N N/A

Rec'd within holding time? (Y) N N/A

Volatiles rec'd w/out headspace? Y N (N/A)

Proper containers used? (Y) N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
61	PZ-N10-08	1/16/13	1306	GW		X			1	1			23.5	6.40	502	0.33						
62	PZ-N10-08-DUP		1311	GW		X			1	1			23.5	6.40	502	0.33						
63	PZ-N10-15		1245	GW		X	1	1					24.3	7.11	1573	0.82						
64	PZ-S10-08		1321	GW		X			1	1			24.0	5.31	303	0.71						
65	DP-01			GW		X			1	1												
66	DP-02			GW		X			1	1												
67	DP-03			GW		X			1	1												
68	DP-04-shallow			GW		X			1	1												
69	DP-04-deep			GW		X			1	1												
70	DP-05			GW		X			1	1												
71	DP-06			GW		X			1	1												
72	FB-DI	1/16/13	0820	R		X				1	1	1	19.3	7.65	1.43	8.60						

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: [signature]	12-26-12 1330	[signature]	12/27/12 1:00pm
Relinquished: [signature]	1/16/13 1535	K Nordmark	1/16/13 1535
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N N/A

Samples intact upon arrival? Y N N/A

Received on ice? Temp_____ Y N N/A

Proper preservatives indicated? Y N N/A

Rec'd within holding time? Y N N/A

Volatiles rec'd w/out headspace? Y N N/A

Proper containers used? Y N N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 1214542

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: Hillsborough County C-HS4 SE#2

Samplers: (Signature)

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_3	1LP, Cool NOx	1LP, Cool Total Alkalinity, NOx	250mL P, H_2SO_4 COD, TKN, NH_3, TP	1LP, Cool Total Alkalinity, NOx, F, Cl, OP, SO_4	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na	Field Temperature	Field pH	Field Conductivity	Field DO						No. of Containers (Total per each location)
73	FB-TAP	1/16/13	0815	DW		X			1	1			21.6	7.54	846	4.41						
74	EB		0825	R		X				1	1	1	18.3	7.65	1.43	8.60						

Containers Prepared/ Relinquished:	Date/Time: 12-26-12 13:15	Received:	Date/Time:
Relinquished:	Date/Time: 1535 1/16/13	Received: K Medmark	Date/Time: 1/16/13 1535
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact?	Y N	(N/A)	
Samples intact upon arrival?	(Y)	N	N/A
Received on ice? Temp_____	(Y)	N	N/A
Proper preservatives indicated?	(Y)	N	N/A
Rec'd within holding time?	(Y)	N	N/A
Volatiles rec'd w/out headspace?	Y N	(N/A)	
Proper containers used?	(Y)	N	N/A

Instructions / Remarks:

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

Appendix C: Weather Station Data

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Table C.1
Daily Recorded Meteorological Data
Wimauma, FL

Period	60cm Temp avg (F)	60cm Temp min (F)	60cm Temp max (F)	2m Temp avg (F)	2m Temp min (F)	2m Temp max (F)	10m Temp avg (F)	10m Temp min (F)	10m Temp max (F)	Tsoil avg - 10cm (F)	Tsoil min(avg) - 10cm (F)	Tsoil max(avg) - 10cm (F)	2m DewPt avg (F)	RelHum avg 2m (pct)	2m Rain tot (in)	2m Rain max over 15min (in)	SolRad avg 2m (w/m^2)	10m Wind avg (mph)	10m Wind min (mph)	10m Wind max (mph)	WDir avg 10m (deg)	ET (in)
1-Dec-12	63.76	52.12	78.49	64.86	53.65	78.67	64.80	53.65	76.96	67.11	65.68	68.45	56.95	78	0	0	145.70	7.05	1.30	19.57	47	0.07
2-Dec-12	67.54	58.41	81.30	68.27	59.29	80.94	68.03	60.04	79.74	67.79	66.65	69.21	59.85	78	0	0	154.15	6.92	0.63	24.23	64	0.07
3-Dec-12	67.51	57.58	81.52	68.30	59.20	81.25	68.53	62.22	79.03	68.58	67.57	69.93	59.80	77	0	0	130.55	6.51	1.53	19.07	73	0.07
4-Dec-12	64.89	53.33	79.57	65.89	54.73	79.21	66.86	57.88	77.38	68.08	66.56	69.44	55.92	74	0	0	157.37	6.53	1.77	16.73	93	0.06
5-Dec-12	65.88	53.82	79.86	66.80	55.71	79.11	67.10	57.90	77.20	68.13	66.58	69.53	58.81	77	0	0	129.37	5.19	0.07	15.50	68	0.06
6-Dec-12	68.13	60.06	80.62	68.79	60.67	80.29	68.76	61.41	78.28	69.19	68.04	70.56	61.71	80	0	0	135.09	5.71	0.90	16.27	73	0.07
7-Dec-12	66.10	59.81	79.43	66.70	60.75	79.09	66.84	60.73	77.56	69.35	68.38	70.70	62.37	87	0	0	117.78	5.31	0.33	13.60	59	0.06
8-Dec-12	70.14	61.65	82.47	70.50	62.37	82.02	70.01	63.37	80.96	70.03	69.01	71.40	65.92	87	0.2	0.05	107.49	4.62	0.30	13.17	106	0.07
9-Dec-12	68.80	59.23	79.83	69.43	60.80	79.20	69.39	63.55	77.95	70.63	69.24	72.19	65.97	90	0.01	0.01	138.07	3.14	0.00	46.07	343	0.06
10-Dec-12	69.98	59.27	82.63	70.65	61.03	82.74	70.49	62.85	81.45	70.08	68.83	71.15	67.87	91	0.67	0.29	74.68	6.92	0.07	22.33	172	0.07
11-Dec-12	71.01	66.13	79.14	71.51	66.67	79.18	71.13	66.61	77.94	70.80	69.89	71.89	70.01	95	0.22	0.15	70.42	4.87	0.00	15.80	190	0.06
12-Dec-12	72.19	64.65	81.50	72.71	65.35	80.91	72.37	65.91	79.56	71.39	70.25	72.61	70.02	92	0.05	0.05	89.79	4.97	0.07	16.33	197	0.06
13-Dec-12	63.81	54.64	70.11	63.92	54.97	70.57	63.35	55.04	70.16	70.91	69.53	71.76	60.22	88	0	0	108.11	8.81	2.10	20.43	10	0.05
14-Dec-12	58.71	54.30	69.13	58.77	54.34	68.77	58.30	54.07	67.06	68.61	67.87	69.46	55.72	90	0	0	116.53	7.91	2.10	16.70	29	0.05
15-Dec-12	62.96	53.94	77.52	63.67	54.45	77.34	63.87	54.66	75.83	68.22	66.96	69.87	59.49	88	0	0	116.81	5.24	0.70	13.90	69	0.06
16-Dec-12	66.67	55.81	80.85	67.48	57.47	80.55	67.86	60.12	78.87	68.30	66.67	69.96	61.95	85	0	0	136.44	4.38	0.07	15.57	122	0.06
17-Dec-12	68.21	55.76	80.56	69.08	57.83	80.80	69.15	61.48	79.27	68.90	67.37	70.34	64.11	86	0	0	139.08	5.34	0.00	18.93	185	0.06
18-Dec-12	68.34	53.82	78.67	69.04	55.38	78.71	68.72	56.26	77.22	69.73	68.90	71.08	64.93	88	0	0	129.79	6.21	0.83	21.53	274	0.06
19-Dec-12	58.20	41.67	79.09	60.13	45.81	78.12	62.03	49.78	78.04	67.20	65.50	68.86	47.66	70	0	0	169.04	3.71	0.07	13.13	79	0.05
20-Dec-12	67.50	50.25	82.13	68.27	52.77	82.08	68.27	55.65	80.53	66.88	65.10	68.76	61.84	82	0.57	0.25	145.48	9.10	1.23	23.43	172	N/A
21-Dec-12	55.83	40.08	68.54	56.44	43.38	69.33	56.05	46.74	68.79	66.71	64.47	68.72	44.50	66	0.02	0.01	168.99	10.85	1.23	28.03	321	0.05
22-Dec-12	47.51	33.93	63.70	48.47	37.27	62.96	48.70	37.36	62.01	62.81	61.54	64.36	29.88	55	0	0	174.82	5.91	0.73	18.07	343	0.04
23-Dec-12	50.14	33.11	70.39	51.17	36.01	69.04	52.34	38.82	67.96	61.24	59.34	63.05	37.26	63	0	0	140.07	3.89	0.07	23.30	50	0.04
24-Dec-12	56.86	46.42	67.15	57.96	47.93	67.69	59.29	51.67	67.12	62.39	61.25	63.54	50.82	78	0	0	64.20	3.85	0.17	14.30	147	0.05
25-Dec-12	62.23	50.79	75.07	63.26	52.25	75.20	64.05	54.37	73.90	63.04	61.39	64.69	57.23	82	0	0	97.29	5.81	0.07	18.77	147	0.06
26-Dec-12	64.62	52.95	78.57	65.18	53.73	78.76	64.95	53.74	77.49	64.66	63.64	65.98	60.46	85	0.22	0.21	81.90	10.88	0.97	31.10	237	0.07
27-Dec-12	50.15	36.85	63.41	50.86	39.90	62.58	50.73	39.80	61.12	62.72	61.12	64.33	43.86	79	0	0	167.74	4.43	0.10	12.97	344	0.04
28-Dec-12	56.32	37.73	72.30	56.80	39.21	71.94	56.66	41.64	70.83	61.62	59.59	63.55	51.27	84	0.34	0.11	114.21	5.56	0.27	14.67	98	0.05
29-Dec-12	66.04	53.82	72.68	66.58	54.48	72.95	66.20	54.46	72.39	64.95	63.57	66.38	63.20	89	0.15	0.06	77.98	11.00	2.37	25.63	262	0.06
30-Dec-12	46.57	37.51	57.13	46.79	38.15	56.64	46.45	37.88	55.09	61.84	60.55	64.11	38.16	73	0	0	160.42	8.63	1.27	22.20	25	0.04
31-Dec-12	56.39	42.12	74.32	57.05	42.56	74.05	57.36	42.60	72.95	61.11	59.14	63.41	49.97	79	0	0	156.33	5.54	0.00	17.33	88	0.05

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Table C.1 (continued)
Monthly Recorded Meteorological Data
Wimauma, FL

Period	60cm Temp avg (F)	60cm Temp min (F)	60cm Temp max (F)	2m Temp avg (F)	2m Temp min (F)	2m Temp max (F)	10m Temp avg (F)	10m Temp min (F)	10m Temp max (F)	Tsoil avg - 10cm (F)	Tsoil min(avg) - 10cm (F)	Tsoil max(avg) - 10cm (F)	2m DewPt avg (F)	RelHum avg 2m (pct)	2m Rain tot (in)	2m Rain max over 15min (in)	SolRad avg 2m (w/m^2)	10m Wind avg (mph)	10m Wind min (mph)	10m Wind max (mph)	WDir avg 10m (deg)	ET (in)
1-Jan-13	61.47	48.29	77.20	62.51	49.95	76.91	63.79	53.38	75.63	62.47	60.53	64.69	56.16	82	0	0	142.02	4.40	0.00	18.73	169	0.06
2-Jan-13	65.56	53.60	79.93	66.18	55.29	78.98	66.52	58.66	77.32	63.99	62.17	66.15	62.00	88	0	0	119.87	4.98	0.00	16.00	233	0.06
3-Jan-13	65.74	56.98	78.96	65.85	58.32	78.62	65.59	58.21	77.14	65.88	64.71	67.44	63.11	92	0.13	0.03	79.69	4.68	0.07	18.77	88	0.06
4-Jan-13	58.44	55.35	63.21	58.45	55.26	63.18	58.12	55.13	62.24	65.33	64.76	66.45	57.00	95	0.01	0.01	42.11	7.06	1.53	15.60	35	0.04
5-Jan-13	64.51	55.58	76.53	64.61	55.69	75.63	64.12	55.54	74.25	65.46	64.11	67.08	58.79	82	0	0	117.37	6.33	1.33	15.63	55	0.06
6-Jan-13	67.83	58.68	80.73	68.09	59.70	80.29	67.80	61.30	79.16	67.09	65.50	69.10	65.11	91	0.03	0.02	112.32	5.27	0.00	16.67	89	0.07
7-Jan-13	62.16	59.31	65.71	62.37	59.58	66.06	62.10	58.89	65.95	66.91	66.07	68.07	59.68	91	0	0	36.62	8.07	2.47	20.97	45	0.04
8-Jan-13	69.74	59.72	82.65	70.05	60.35	82.45	69.65	60.48	81.03	67.01	65.26	69.24	64.74	85	0.04	0.02	152.74	7.19	1.10	16.27	79	0.07
9-Jan-13	73.78	65.73	85.10	74.43	66.61	84.94	74.03	67.57	83.41	68.91	67.69	70.50	67.88	82	0	0	128.63	8.68	2.70	22.13	114	0.08
10-Jan-13	72.31	64.72	81.88	72.95	65.70	82.04	72.57	66.24	80.44	69.46	68.41	70.48	66.18	81	0	0	122.46	8.71	1.80	23.67	109	0.07
11-Jan-13	70.52	61.29	82.87	71.21	62.87	82.60	71.02	63.97	80.56	69.29	67.71	70.90	65.09	83	0	0	151.31	7.35	1.17	21.40	121	0.08
12-Jan-13	70.35	60.08	82.78	71.07	61.52	82.62	71.11	63.41	81.00	69.47	68.07	70.92	64.07	80	0	0	141.12	7.04	0.63	23.13	115	0.07
13-Jan-13	70.18	60.57	81.99	70.88	61.70	81.43	70.89	62.29	80.28	69.71	68.16	71.22	63.93	80	0	0	136.40	5.80	0.03	15.83	130	0.07
14-Jan-13	67.35	57.87	80.71	68.29	59.40	80.22	68.85	60.19	79.70	69.49	68.11	70.79	61.39	81	0	0	128.68	5.08	0.00	20.13	127	N/A
15-Jan-13	67.81	53.85	82.06	68.47	55.67	81.37	69.11	59.59	80.10	68.84	67.03	70.68	62.15	82	0	0	144.48	4.32	0.20	16.20	126	0.07
16-Jan-13	68.28	55.94	83.64	69.07	58.14	82.27	69.63	61.81	81.01	69.45	67.87	71.01	61.53	80	0	0	148.89	4.27	0.00	16.67	164	0.07
17-Jan-13	60.71	55.00	72.28	61.24	55.09	72.64	61.49	54.97	71.74	68.12	66.96	69.24	57.81	89	0.04	0.01	49.69	8.64	0.00	26.00	259	0.06
18-Jan-13	52.86	38.45	64.45	52.68	38.91	63.63	52.21	38.87	61.93	65.53	63.97	66.88	46.50	80	0.01	0.01	132.96	9.23	1.60	22.83	21	0.05
19-Jan-13	62.78	52.70	74.79	62.94	52.84	74.39	62.61	52.84	72.79	65.98	64.67	67.46	56.07	79	0	0	122.00	9.38	1.67	23.57	48	0.07
20-Jan-13	64.46	58.23	75.34	64.76	58.35	74.77	64.57	58.37	73.18	66.94	65.86	68.34	60.05	85	0	0	102.85	6.29	1.20	17.03	52	0.06
21-Jan-13	64.42	58.53	75.00	64.79	59.14	74.10	64.46	59.16	73.26	67.48	66.47	68.79	58.94	82	0	0	92.03	4.88	0.07	15.93	355	0.06
22-Jan-13	56.75	46.44	66.49	57.49	49.32	66.56	57.46	50.68	65.19	66.15	65.14	67.46	42.30	60	0	0	104.70	6.62	0.97	19.03	18	0.06
23-Jan-13	54.15	41.77	71.33	55.14	42.90	70.39	55.54	43.51	69.22	64.24	62.53	65.95	36.56	54	0	0	183.92	5.40	0.50	17.10	21	0.06
24-Jan-13	55.37	37.34	73.40	56.31	40.90	72.19	57.07	43.48	70.83	63.56	61.54	65.66	45.08	70	0	0	178.56	5.01	0.23	16.80	356	0.06
25-Jan-13	58.29	41.75	75.70	59.10	42.87	75.06	59.82	47.21	74.01	63.94	61.95	66.15	49.15	74	0	0	179.77	4.11	0.33	14.97	356	0.07
26-Jan-13	58.31	40.81	75.96	59.26	43.27	74.62	60.25	46.71	73.22	64.07	61.90	66.27	51.96	80	0	0	181.40	3.73	0.13	12.70	355	0.07
27-Jan-13	61.96	45.90	78.13	63.08	48.42	78.12	63.94	52.03	76.59	64.56	62.58	66.60	54.13	76	0	0	183.22	6.35	0.90	18.53	74	0.08
28-Jan-13	66.90	54.52	81.03	67.46	56.07	80.64	67.71	58.75	79.23	65.69	64.02	67.59	60.90	82	0	0	129.62	7.19	1.57	19.07	91	0.08
29-Jan-13	68.91	56.46	82.13	69.56	58.14	82.11	69.76	60.13	80.76	67.09	65.48	68.79	63.89	84	0	0	127.84	6.41	1.03	20.60	127	0.08
30-Jan-13	71.00	63.25	82.22	71.48	63.88	81.82	70.98	64.18	79.99	68.27	66.96	69.76	64.99	82	0	0	174.63	12.67	2.73	30.80	173	0.10
31-Jan-13	57.55	40.23	68.67	57.83	43.55	69.26	57.36	45.43	69.04	67.86	65.79	69.01	44.19	66	0.04	0.01	193.88	7.81	0.93	27.57	335	0.07

Appendix D: Field Parameter Analyses

Table D.1
Field Parameter Results
(January 14 through January 17, 2013)

Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
STE	23.3	7.38	1,361	0.4
STE-DUP	23.3	7.38	1,361	0.4
Groundwater Samples				
PZ01	21.3	5.65	491	3.8
BKG-10	21.6	4.76	334	6.6
BKG-15	23.3	5.89	124	0.2
PZ-AB4-08	23.1	6.09	331	1.8
PA-AB4-08-DUP	23.1	6.09	331	1.8
PZ-AB-4-15	23.5	7.24	456	3.8
PZ-C1	22.6	5.69	810	4.9
PZ-C2	23.0	5.89	157	0.3
PZ-C3-08	23.0	5.15	438	1.1
PZ-C3-15	23.9	6.82	489	1.4
PZ-C6-08	22.5	4.23	649	2.4
PZ-C6-15	23.2	5.77	391	2.0
PZ-D3-08	23.0	5.33	385	0.8
PZ-D3-15	23.8	6.74	811	1.7
PZ-D4-08	21.9	5.25	510	0.7
PZ-D4-15	23.0	6.87	950	1.1
PZ-E1	22.6	5.70	177	3.6
PZ-E2	21.7	5.90	195	4.9
PZ-E3-08	22.7	5.62	728	0.7
PZ-E3-08-DUP	22.7	5.62	728	0.7
PZ-E3-15	24.6	6.57	331	4.2
PZ-E4-08	21.6	5.29	632	0.7

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Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
PZ-E4-15	22.7	6.73	517	1.6
PZ-E5-08	22.6	5.01	552	0.7
PZ-E5-15	23.4	6.73	820	1.2
PZ-E6-08	22.5	4.99	501	2.3
PZ-E6-15	23.3	5.44	380	3.1
PZ-E7-08	22.9	4.98	398	3.2
PZ-E7-08-DUP	22.9	4.98	398	3.2
PZ-E7-15	23.5	7.14	1,740	3.9
PZ-F3-15	22.1	6.84	353	4.2
PZ-F4-08	20.4	5.55	813	5.5
PZ-F4-15	22.2	7.14	1,287	5.1
PZ-G2-12.5	22.4	4.70	570	1.4
PZ-H4-08	23.0	5.21	559	4.2
PZ-H4-15	23.5	7.01	858	5.6
PZ-H4-15-DUP	23.5	7.01	858	5.6
PZ-H5-11.5	22.2	4.55	441	1.3
PZ-I6-08	22.5	5.04	385	0.2
PZ-I6-15	23.4	6.90	1,849	0.2
PZ-I10-08	22.9	5.29	460	0.5
PZ-I10-08-DUP	22.9	5.29	460	0.5
PZ-I10-15	23.1	6.83	734	0.8
PZ-J4-15	23.0	6.47	585	0.4
PZ-J7-08	22.8	5.07	299	0.8
PZ-J7-15	23.5	5.30	415	1.1
PZ-N4-08	22.9	5.67	280	4.3
PZ-N4-15	23.1	6.69	726	0.4
PZ-N7-08	24.4	5.96	454	1.0
PZ-N7-15	23.9	5.73	259	0.3
PZ-N10-08	23.5	6.40	502	0.3
PZ-N10-08-DUP	23.5	6.40	502	0.3
PZ-N10-15	24.3	7.11	1,573	0.8
PZ-S10-08	24.0	5.31	303	0.7
Blanks				

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Sample Identification	Temperature (°C)	pH	Specific Conductance (µS)	Dissolved Oxygen (mg/L)
FB-DI	19.3	7.65	1	8.6
FB-TAP	21.6	7.54	846	4.4
EB	19.3	7.65	1	8.6

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