FLORIDA DEPARTMENT OF HEALTH

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task C.16

S&GW Test Facility Sample Event Report No. 3

Progress Report

October 2012

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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.16
PROGRESS REPORT

S&GW Test Facility
Sample Event Report No. 3

Prepared for:

Florida Department of Health
Division of Disease Control and Health Protection
Bureau of Environmental Health
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October 2012

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S&GW Test Facility Monitoring
Sample Event Report No. 3

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 controlled pilot-scale testing and field monitoring at the Gulf Coast Research and Education Center (GCREC) soil and groundwater (S&GW) test facility is being monitored for a range of operating conditions and to determine mechanisms critical for nitrogen reduction. The Task C.5 QAPP documents the objectives, monitoring framework, sample frequency and duration, and analytical methods to be used at the GCREC S&GW test facility.

2.0 Purpose

This sample event report documents data collected from the third S&GW test facility monitoring and sampling event conducted October 11th through October 26, 2012. The monitoring event consisted of measurement of flowrates dosed to the system, measurement of groundwater elevations within the standpipe piezometers, measurement of field parameters, and collection of unsaturated and groundwater samples and their analyses by a NELAC certified laboratory.

3.0 Materials and Methods

3.1 Project Site

The S&GW test facility is located at the University of Florida Gulf Coast Research and Education Center (GCREC) in southeast Hillsborough County, Florida. The specially designed pilot-scale test areas are representative of typical mounded onsite sewage treatment and disposal systems and enables controlled testing and evaluation of nitrogen reduction in soil and groundwater. Each test area consists of the above ground mound system to which effluent is dosed. Four test areas were established, to which either septic tank effluent (STE) or aerobic treatment unit (ATU) effluent was delivered to the mound/soil system via a pressure dosed mound with a gravel trench or a mound with

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drip dispersal system (Table 1). In addition to the mound/soil systems, two in-situ passive nitrogen reduction stacked biofilter systems (PNRS II) are being tested specifically for wastewater treatment performance (Table 1 TA5 and TA6). The source of the influent wastewater is the septic tank effluent from the existing onsite wastewater system serving the GCREC (Figure 1). As shown in Figure 1, two separate feed systems supply the test areas with water, each system supplies either STE or nitrified effluent to 3 test areas. The nitrification unit preceding three of the units shown in Figure 1 is a 500 gpd aerobic treatment unit (ATU) with a continuous air supply. Details of the design and construction of the S&GW test facility were presented previously in Task C.6, C.7, C.8, C10, C.11, C.12, A.15 and A.17 documents.

Table 1
S&GW Test Facility Test Areas

Test Area ID	Effluent Quality	Design HLR (gpd/ft^2)	Soil Treatment Unit Design
TA1	STE	0.8	pressure dosed mound[1], gravel trench
TA2	ATU effluent	0.8	pressure dosed mound[1], gravel trench
TA3	STE	0.8	mound with drip dispersal
TA4	ATU effluent	0.8	mound with drip dispersal
TA5	in situ STE effluent (Task A PNRS II)	0.8	mounded drip dispersal over denitrification media
TA6	in situ ATU effluent (Task A PNRS II)	0.8	mounded drip dispersal over denitrification media

[1]pressure dosed via drip tubing in gravel trench to maintain uniform application along trench length.

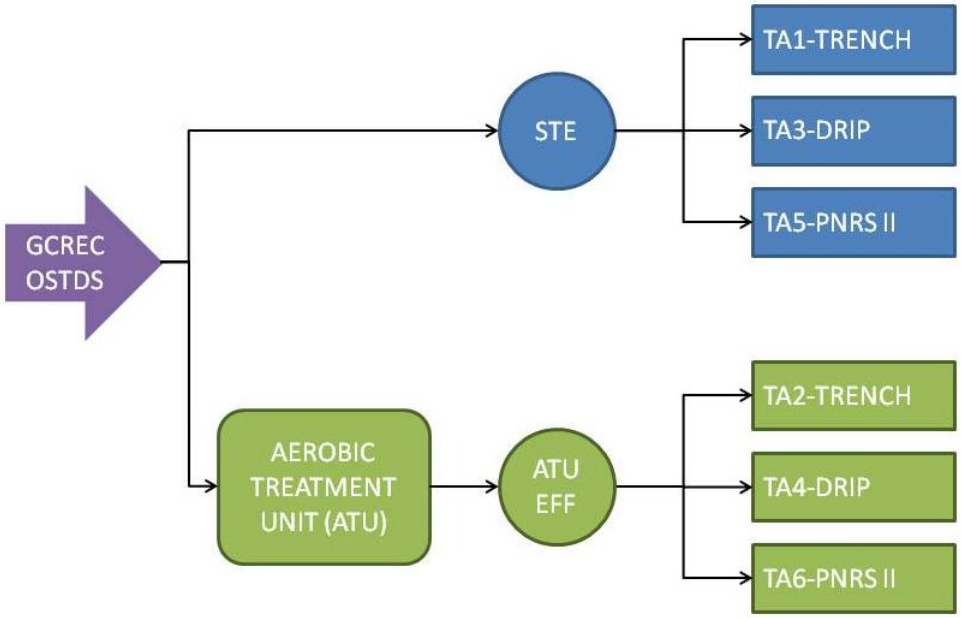

Figure 1
S&GW Test Facility System Schematic

3.2 Modifications to S&GW Test Facility

The results of previous sample events and careful observation of the S&GW test facility were used to formulate recommendations for modifications to the test systems. The modifications that were made following Sample Event No. 2 are presented in this section.

3.2.1 Adaptive Monitoring

Sample events No. 1 and 2 shallow piezometer NOX results indicate that the test area plumes appear to be confined in a southwesterly direction from the center of each of the test areas. However, to better capture the eastern boundary of the plumes, additional shallow piezometers (PZ41 through PZ53) were installed prior to this sample event as depicted in Appendix A, Figures A.1 and A.2.

3.3 Monitoring and Sampling Locations and Identification

Each test area is monitored for operational conditions, unsaturated and saturated nitrogen concentrations, soil properties, groundwater properties, and weather conditions. The PNRS II systems are monitored primarily for wastewater treatment performance, especially related to nitrogen reduction, and are not monitored as intensely for soil and groundwater parameters.

3.3.1 Unsaturated Zone Monitoring

The test areas are equipped with varying levels of unsaturated and shallow saturated zone monitoring instrumentation. The instrumentation includes suction lysimeters, stainless steel pan lysimeters, soil moisture probes, and tensiometers located at various depths below the bottom of the gravel or below the drip emitters. A complete list of all installed monitoring devices and associated sample identification is included in Appendix A.

3.3.2 Saturated Monitoring

Saturated zone monitoring will include groundwater quality, depth of groundwater table, and gradient (i.e. water level contours). A sampling network for groundwater screening was developed for each of the test areas. The general direction of groundwater flow is from the northeast to the southwest. Transect lines A through U are parallel to the northern edge of the mound and increase (higher letter identification) moving southward from the mound. Transect lines 0 through 20 (numbered from east to west) are perpendicular to the northern edge of the mound. Groundwater monitoring points were installed in November 2011, March 2012, and May 2012. Standpipe piezometers were installed using either hand or drilling methods. Standpipe piezometers consist of either ¾-in., 1-in., or 2-in. diameter PVC with 1-ft, 2.5-ft, 5-ft, or 10-ft long 0.010 slot PVC screens and PVC riser extending to the ground surface (refer to the Task C QAPP and Task C.10/C.11/C.12 Progress Report for additional detail).

3.3.3 Sample Locations and Identification

Each monitoring location has been assigned a unique identification indicating the type of monitoring point (LY = lysimeter, PZ = standpipe piezometer, T = tensiometer, SM = soil moisture, OBS = observation port, etc.), grid location (self explanatory), and depth below ground surface (bottom of the well in feet; bottom of lysimeter in inches). For example TA1-PZ-11-J4 is a test area 1, standpipe piezometer sampler located 11' below natural ground surface on the grid at J4. Detailed schematics of the STE systems and ATU effluent systems are provided in Appendix A. Figure 2 depicts a typical schematic of the test area instrumentation. Figure 3 shows a photograph of the instrumented test area 3 with installed ¾-in. diameter PVC standpipe piezometers downgradient of the test area. A complete list of all installed monitoring devices is included in Appendix A.

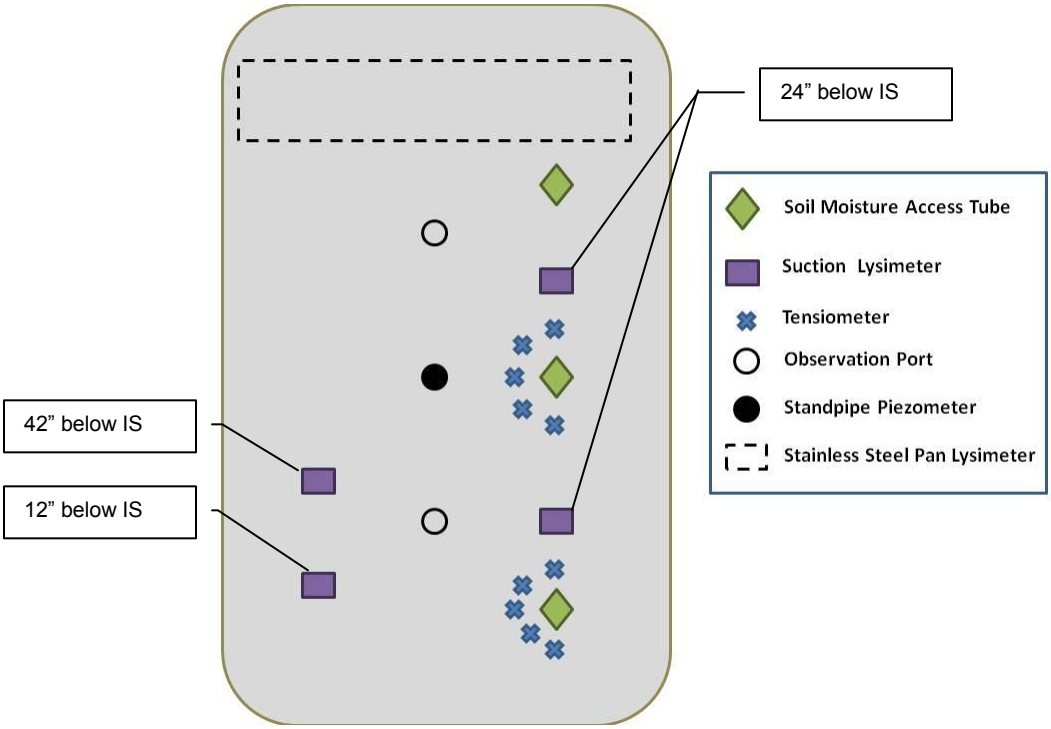

Figure 2
Typical Instrumentation of Test Area, Top View (example Test Area 3)

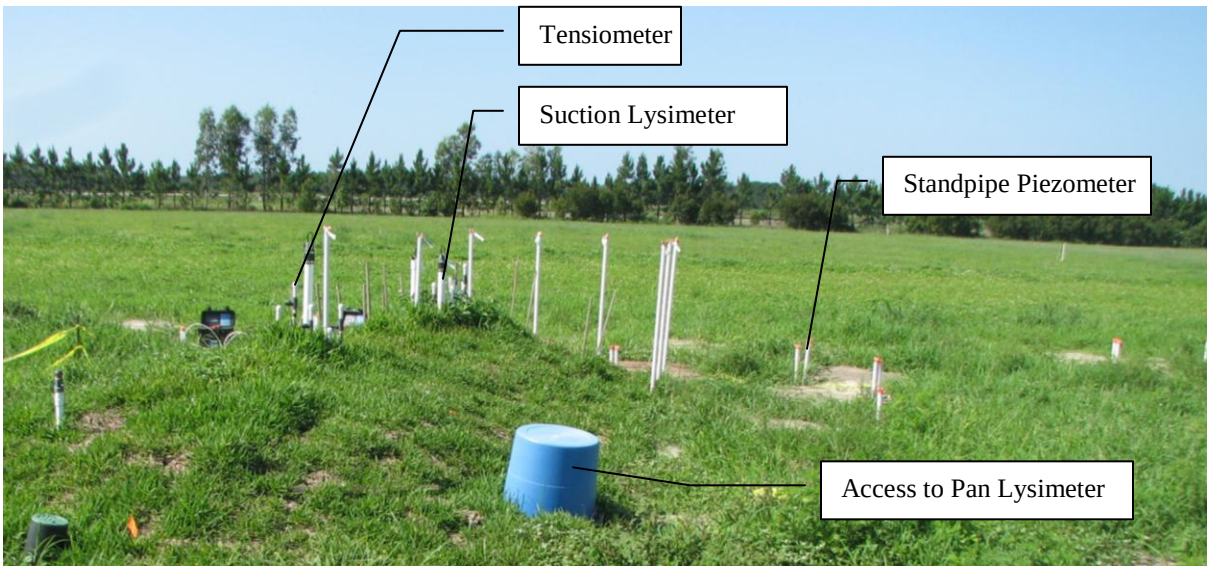

Figure 3
Photo of Instrumented Test Area 3

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3.4 Operational Monitoring

Operational monitoring conditions include effluent quality, calculation of the hydraulic loading rate to the soil, and ponding on the soil infiltrative surface or at the fill/natural soil interface.

3.4.1 Flow Monitoring

The feed and return flows were measured, recorded, and adjusted as necessary to maintain flow rates consistent with the experimental design following the sample event. In each of the two drip dispersal systems the wastewater flow is measured via two flow meters; one (1) flow meter located on the feed line to the three test areas, and; one (1) flow meter located on the return line to the dose tank. The flow meters were installed in November 2011. Table 2 summarizes the recorded wastewater flow data since start-up occurred May 9, 2012. The drip lines are automatically scoured (field flushed) every 25 dosing cycles. The field flush volume bypasses the return flow meter but not the feed flow meter; therefore the field flush volume must be accounted for when determining the dosed volume (Table 2).

The target dose volume to each of the test areas is 32 gallons per day which equates to 96 gallons per day for each drip dispersal system. The total recorded flow for the STE (8.1%) and ATU effluent (2.8%) systems were within the 15% operational target that is considered acceptable.

Table 2
S&GW Test Facility Measured Wastewater Flow Data

	Flow Meter Totalized Feed to Mounds (gallons)	Flow Meter Totalized Return from Mounds (gallons)	Number of Field Flush Occurrences for time period (#)	Average Recorded Flow (gpd)	RE% Measured/ Target (%)	Average Recorded Flow since start-up (gpd)
STE System						
5/9/12 2:35 PM	13,733.08	5,188.14				
6/18/12 3:10 PM	20,987.62	8,620.71	9[1]	93.36	-2.8%	
7/18/12 9:42 AM	25,535.66	10,270.72	7[1]	95.11	-0.9%	94.10
8/20/12 2:15 PM	30,410.69	11,466.12	8[1]	108.58	13.1%	98.77
10/12/12 12:17 PM	36,657.27	12,105.76	12[1]	103.80	8.1%	100.48
ATU Effluent System						
5/9/12 3:22 PM	38,415.90	33,861.96				
6/18/12 3:05 PM	63,382.59	53,711.43	9[2]	121.15	26.2%	
7/18/12 9:35 AM	78,364.51	65,072.22	7[2]	114.51	19.3%	118.32
8/3/12 10:45 AM	86,970.09	71,635.06	4[2]	119.73	24.7%	118.58
August 3, 2012 at 11:00 am: Revised dose cycle time to 11.66 minutes from 15 minutes						
8/20/12 2:33 PM	94,220.74	77,093.73	5[3]	95.61	-0.4%	
10/12/12 12:42 PM	115,503.15	92,789.06	12[3]	98.70	2.8%	109.30

[1]STE system additional field flush cycle volume is 9.5 gallons
[2]ATU system additional field flush cycle volume is 30.3 gallons
[3]ATU system additional field flush cycle volume following dose cycle time revision is 24.6 gallons

3.4.2 Meteorological Monitoring

A weather station is located at the GCREC facility with weather conditions recorded every minute and stored on a private website. Table 3 provides the recorded meteorological data daily averages leading up to and during the sample event. Appendix B provides a summary table of the average daily recorded meteorological data since the previous sample event.

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Table 3
Meteorological Data Daily Averages Measured October 8 through October 26, 2012

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)	Wind Speed Avg 10m (mph)	ET (in)
8-Oct-12	75.55	76.06	75.80	79.57	73.24	92	0	3.80	0.10
9-Oct-12	75.96	76.39	76.06	79.73	72.92	90	0	4.60	0.12
10-Oct-12	74.78	75.46	75.28	79.65	69.25	82	0	5.55	0.12
11-Oct-12	72.18	72.96	73.11	78.50	66.84	83	0	6.40	0.12
12-Oct-12	72.70	73.43	73.18	78.04	64.75	76	0	7.06	0.12
13-Oct-12	73.40	74.08	73.81	77.57	65.87	77	0	8.79	0.12
14-Oct-12	75.57	76.37	76.36	77.98	69.50	81	0	7.32	0.12
15-Oct-12	76.20	76.63	76.22	78.67	71.64	86	0	5.19	0.11
16-Oct-12	73.95	74.81	74.81	78.43	68.66	83	0	4.09	0.11
17-Oct-12	71.19	71.88	72.12	77.80	68.80	90	0	3.11	0.07
18-Oct-12	75.14	75.58	75.38	77.89	70.54	86	0	4.05	0.12
19-Oct-12	74.60	75.24	75.27	78.03	69.37	84	0	3.78	0.11
20-Oct-12	72.64	73.49	73.31	78.12	62.20	70	0	5.56	0.11
21-Oct-12	67.09	68.28	68.67	75.96	55.86	68	0	6.50	0.10
22-Oct-12	70.98	71.66	71.52	75.60	63.25	76	0	8.97	0.11
23-Oct-12	70.98	71.68	71.61	75.52	65.56	82	0	7.79	0.09
24-Oct-12	74.46	75.11	74.73	75.87	67.88	80	0	9.85	0.11
25-Oct-12	73.91	74.51	74.08	76.21	70.30	87	0	8.94	0.08
26-Oct-12	75.68	76.28	75.85	76.32	67.29	75	0	12.77	0.11

3.4.3 Soil Moisture Monitoring

In situ soil tension and soil moisture measurements are collected for model development in Task D. Soil moisture tension is monitored in two test areas (TA1 and TA3) in two locations (center and south side of the mound). Tensiometers are installed at 5 depths as specified in Appendix C. Tensiometers have a ceramic cup and tube assembly equipped with a pressure transducer. The pressure transducer allows for precise measurement of the soil water potential. The tensiometers are automated to enable recording of soil moisture tension at 15 minute intervals to evaluate short-term changes in soil moisture status associated with wastewater dosing events. The daily averages since the previous sample event are presented in Appendix C. Figures C.1 and C.2 display the 15 minute interval data for soil tension, rainfall and dose during this monitoring event for

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TA1 and TA3, respectively. The recorded tensiometer data provides a relative difference comparison between locations but is not a true value.

Soil moisture is measured through Sentek™ sensor access tubes. Volumetric soil moisture content is measured by responses to changes in the dielectric constant of the soil. Soil moisture content was collected periodically (Appendix D). No ponding was observed within the test area observation ports.

3.5 Soil Characteristics

During the instrumentation of the S&GW test facility, soil cores were collected at two locations; MM (located between TA2 and TA5) and TT (north of the tracer test area). At location MM a continuous soil core was collected to the confining Hawthorn clay layer. The shallow soil cores will provide information on vadose zone properties, and the deep soil core will provide a general idea of the soil properties within the saturated zone. The information will be used when determining appropriate parameters to be used in model development. In addition, a test pit was dug south of the S&GW test facility and east of the GCREC mound into the spodic layer approximately 6 feet below ground surface (Figure 4).

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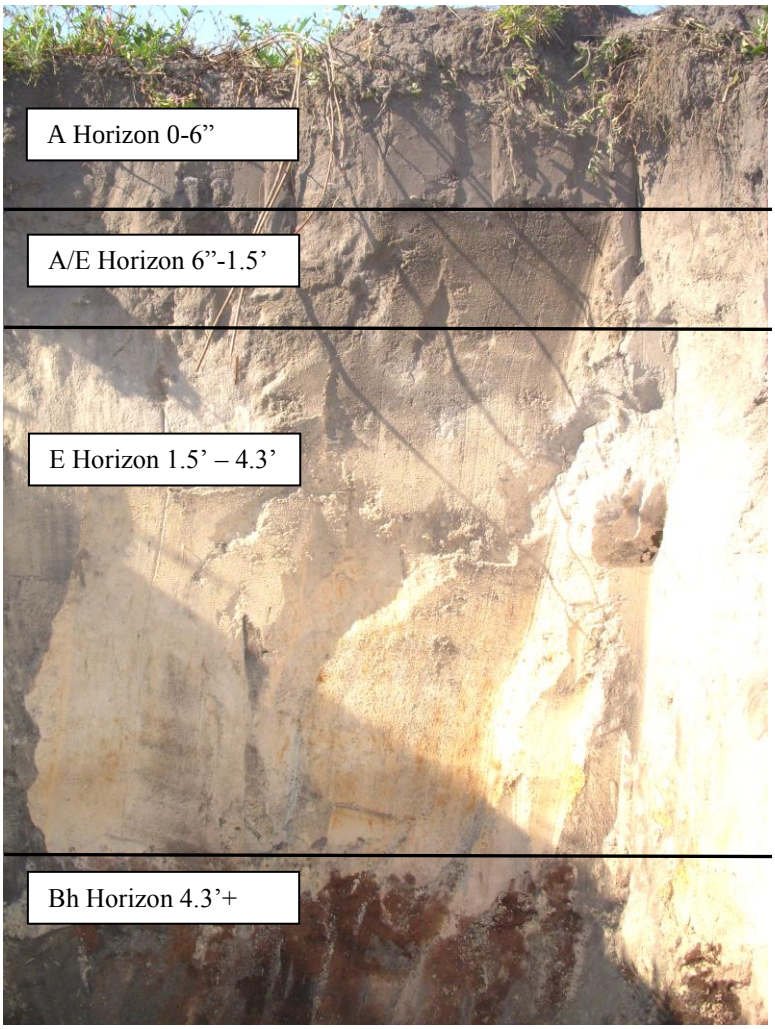

Figure 4
Photograph of Test Pit Soil Profile

3.6 Groundwater Elevation Measurements

Groundwater level measurements are used to determine hydraulic gradients and direction of groundwater flow. Groundwater levels were measured by inserting into monitoring wells a hand-cranked steel tape graduated in feet, to the nearest 0.01 ft. These measurements are then converted to groundwater surface elevations by using the surveyed elevation of the top of the monitor well casing.

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3.7 Water Quality Sample Collection and Analyses

Septic tank effluent, ATU effluent, groundwater, and soil moisture samples were collected October 15, 2012 through October 26, 2012 for water quality analysis. A peristaltic pump was used to collect STE and ATU effluent by placing the suction inlet tubing in the mid section of the clear liquid phase in the effluent holding tanks. Similarly, sample was collected from the PNRS II Tank 1, which supplies STE to the S&GW test facility nitrification unit and STE dose tank. The effluent was directed into the analysis-specific containers supplied by the analytical laboratory. Field parameters (temperature (Temp), pH, specific conductance (SC), oxidation-reduction potential (ORP) and dissolved oxygen (DO)) were measured using portable electronic probes with probe tips placed directly into the tanks.

Groundwater samples were obtained using a peristaltic pump and dedicated standpipe piezometer tubing. Prior to groundwater sample collection, the piezometer was micropurged using low-flow purging and sampling methods. Micropurging continued until water quality indicators (temp, pH, SC, DO and turbidity) were stabilized (three consecutive measurements within the limits). Groundwater sample was then collected into the analysis-specific containers.

Soil moisture samples from the suction lysimeters were also collected using a peristaltic pump and dedicated tubing. The tubing routed the samples directly into analysis-specific containers after sufficient flushing of the tubing had occurred. Field parameters (Temp, pH, SC, ORP, DO) were then recorded in an external reservoir.

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, provided in Appendix E, supplied by the laboratory.

In addition, equipment blank, field blank, and field sample duplicates were taken. The equipment blank was collected by pumping deionized water (provided by the laboratory) through the cleaned pump tubing. These samples were then analyzed for the same parameters as the GW samples. One field blank was collected by filling sample containers with deionized water that had been transported from the laboratory into the field along with other sample containers. The field sample duplicates were collected immediately subsequent to the regular samples.

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All samples were analyzed by the laboratory for chloride, total Kjeldahl nitrogen (TKN-N), ammonia nitrogen (NH_3-N), and nitrate/nitrite nitrogen (NO_X-N). Additionally, for the effluent samples and some of the water samples total alkalinity, carbonaceous biochemical oxygen demand ($CBOD_5$), total phosphorus (TP), total solids (TS), total suspended solids (TSS), fecal coliform (fecal), anions and cations were included. In addition, chemical oxygen demand (COD) and dissolved organic carbon (DOC) were included at some of the water sample locations. For the two in-situ passive nitrogen reduction mounded systems (TA5 and TA6) samples, sulfate and hydrogen sulfide were also included. All analyses were performed by an independent and fully NELAC certified analytical laboratory (Southern Analytical Laboratory). Table 4 lists the analytical parameters, analytical methods, and detection limits for these analyses.

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Table 4
Analytical Parameters, Method of Analysis, and Detection Limits

Analytical Parameter	Method of Analysis	Laboratory 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
Carbonaceous Biological Oxygen Demand ($CBOD_5$)	SM 5210B	2 mg/L
Total Solids (TS)	EPA 160.3	0.01% by wt
Total Suspended Solids (TSS)	SM 2540D	1 mg/L
Total Organic Carbon (TOC)	SM 5310B	0.5 mg/L
Dissolved Organic Carbon (DOC)	SM 5310B	0.5 mg/L
Fecal Coliform (fecal)	SM 9222D	2 ct/100 mL
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
Hydrogen Sulfide (unionized)	SM 4550SF	0.01 mg/L
Sulfide	SM 4500SF	0.01 mg/L

4.0 Results

Once analytical results are obtained from the laboratory, S&GW Test Facility Data Summary Report No. 3 (Task C17) will be prepared describing the results from this sampling event.

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4.1 Groundwater Flow and Gradient

Water levels were measured during the sample event as summarized in Table 5. Figure 5 illustrates the surficial groundwater contours as derived from measurements within the standpipe piezometers on October 11, 2012, representative of the third sample event. By continued monitoring of the groundwater elevations, a clearer picture of the gradient at the site will be gained.

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Table 5
Standpipe Piezometer Groundwater Level Measured

Identification/ Location	Water Table Elevation[1] (ft)	Identification/ Location	Water Table Elevation[1] (ft)
	October 11, 2012		October 11, 2012
TA1-PZ-11-EF2	125.96	TA2-PZ-16-N7	125.23
TA1-PZ-11-J4	125.88	TA2-PZ-09-I7	125.39
TA1-PZ-11-K4	125.90	TA2-PZ-16-I7	125.34
TA1-PZ-11-L2	125.86	TA2-PZ-09-L8	125.31
TA1-PZ-11-L3	125.86	TA2-PZ-16-L8	125.26
TA1-PZ-11-L4	125.86	TA2-PZ-09-TU19	125.02
TA1-PZ-11-L5	125.87	TA2-PZ-16-TU19	125.01
TA1-PZ-09-N3	125.84	TA2-PZ-09-TU21	125.01
TA1-PZ-16-N3	125.81	TA2-PZ-16-TU21	125.00
TA1-PZ-09-O7	125.82	TA3-PZ-11-EF2	125.78
TA1-PZ-16-O7	125.81	TA3-PZ-11-I2	125.72
TA1-PZ-09-M9	125.86	TA3-PZ-10-J5	125.69
TA1-PZ-16-M9	125.82	TA3-PZ-10-K5	125.65
TA1-PZ-09-I7	125.93	TA3-PZ-11-L2	125.65
TA1-PZ-16-I7	126.01	TA3-PZ-11-L3	125.65
TA1-PZ-09-RS16	125.67	TA3-PZ-11-L4	125.65
TA1-PZ-16-RS16	125.68	TA3-PZ-10-L5	125.63
TA1-PZ-09-RS18	125.64	TA3-PZ-09-N3	125.66
TA1-PZ-16-RS18	125.64	TA3-PZ-16-N3	125.65
TA2-PZ-10-EF2	125.41	TA3-PZ-09-O7	125.80
TA2-PZ-10-H5	125.35	TA3-PZ-16-O7	125.77
TA2-PZ-10-J5	125.30	TA3-PZ-09-I7	125.72
TA2-PZ-10-K5	125.27	TA3-PZ-16-I7	125.74
TA2-PZ-10-L2	125.29	TA3-PZ-09-M9	125.66
TA2-PZ-10-L3	125.28	TA3-PZ-16-M9	125.65
TA2-PZ-10-L4	125.27	TA4-PZ-11-EF2	125.22
TA2-PZ-10-L5	125.27	TA4-PZ-10-H5	125.13
TA2-PZ-10-L6	125.27	TA4-PZ-10-J5	125.08
TA2-PZ-09-M4	125.28	TA4-PZ-10-K5	125.05
TA2-PZ-16-M4	125.29	TA4-PZ-11-L2	125.06
TA2-PZ-09-N7	125.25	TA4-PZ-11-L3	125.05

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Table 5 (continued)
Standpipe Piezometer Groundwater Level Measured

Identification/ Location	Water Table Elevation[1] (ft)	Identification/ Location	Water Table Elevation[1] (ft)
	October 11, 2012		October 11, 2012
TA4-PZ-11-L4	125.06	PZ01-BKG-09	126.83
TA4-PZ-11-L5	125.05	PZ04-BKG-09	125.07
TA4-PZ-11-L6	125.05	PZ24-BKG-26	125.08
TA4-PZ-09-M4	125.07	PZ29-BKG-09	125.76
TA4-PZ-16-M4	125.03	PZ30-BKG-16	125.73
TA4-PZ-16-N7	125.03	PZ31-BKG-26	125.74
TA4-PZ-09-I7	125.12	PZ32-BKG-09	126.12
TA4-PZ-16-I7	125.07	PZ33-BKG-16	126.13
TA4-PZ-09-L8	125.07	PZ34-BKG-26	126.13
TA4-PZ-16-L8	125.05	PZ35-BKG-09	125.19
TA4-PZ-09-TU14	124.91	PZ36-BKG-16	125.16
TA4-PZ-16-TU14	124.87	PZ37-BKG-26	125.12
TA4-PZ-09-TU16	124.85	PZ38-BKG-09	123.57
TA4-PZ-16-TU16	124.84	PZ39-BKG-16	123.49
TA5-PZ-I	125.53	PZ40-BKG-26	123.51
TA6-PZ-I	124.53		

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

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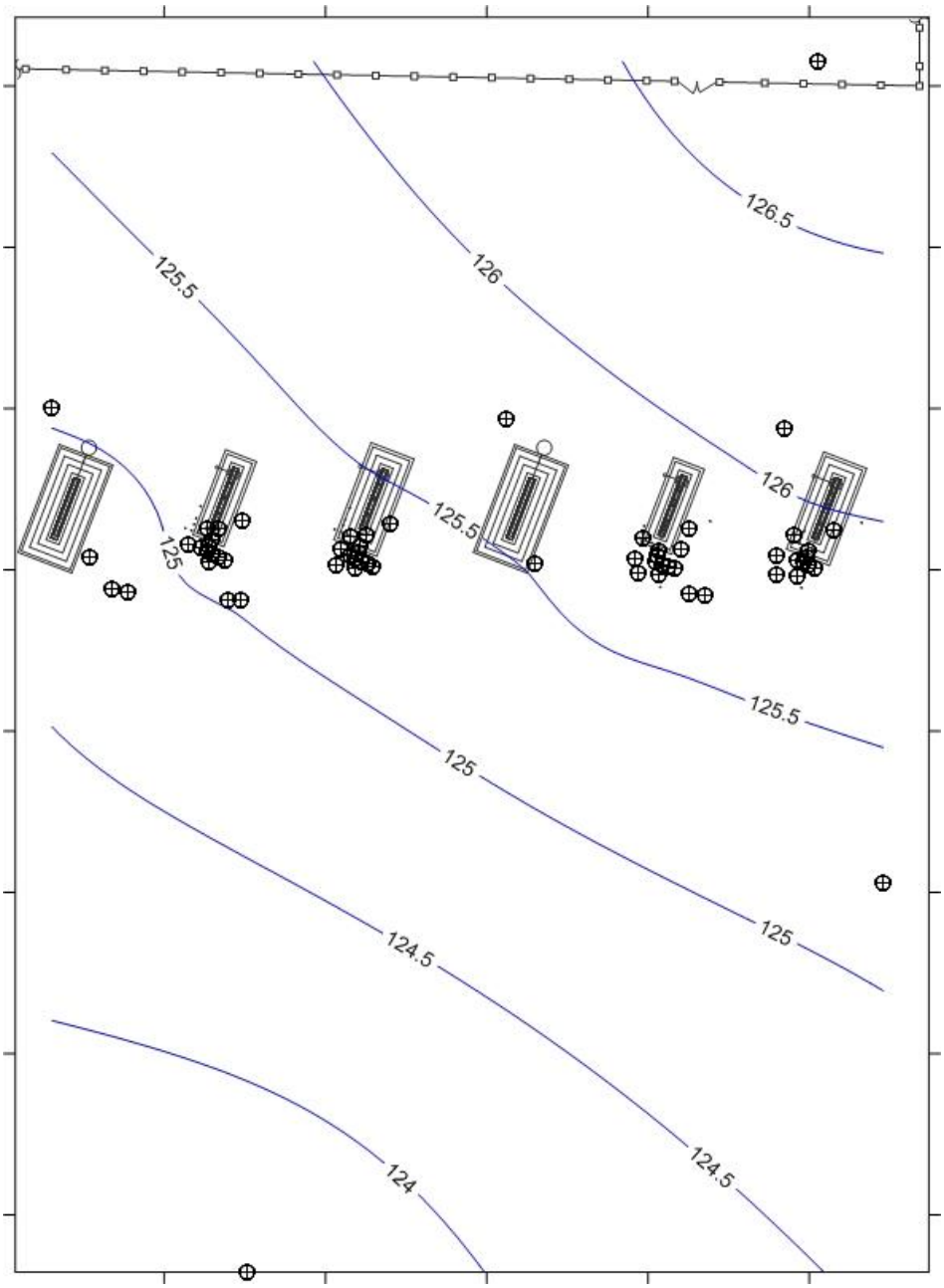

Figure 5
Surficial Groundwater Contours (Elev. ft above MSL)
October 11, 2012, representative of SE No. 3
⊕ denotes piezometers

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4.2 Water Quality Analyses

4.2.1 Field Parameters

Field parameters (temperature, pH, dissolved oxygen (DO), and specific conductivity) were measured at all the sampling locations during the October 2012 sampling event. The complete field parameter data set is included in Appendix F.

5.0 Summary

This Sample Event Report (C.16) provides documentation of the third S&GW test facility sample event which was conducted October 11 through October 26, 2012. Once laboratory analyses are complete, the Data Summary Report (C.17) for this event will be prepared to summarize the results of the sampling and data collection from the monitoring described herein.

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Appendix A: S&GW Test Facility Sample Identification

Table A.1
S&GW Test Facility Sample Identification

ID #	Sample Identification	Test Area	Grid Location	Northing	Easting	Elev NGVD 29	Notes
1	TA1-PAN-12-N	TA1	North				2' x 3.3' SST pan lysimeter
2	TA1-OBS-N	TA1	North	1244816.74	582859.20	132.50	4"D observation port with slots
3	TA1-OBS-S	TA1	South	1244807.75	582855.08	132.88	4"D observation port without slots
4	TA1-SM-39-N	TA1	North	1244817.38	582860.13	130.27	2"D soil moisture tube with 6" casing
5	TA1-SM-39-C	TA1	Center	1244812.80	582858.09	130.23	2"D soil moisture tube with 6" casing
6	TA1-SM-39-S	TA1	South	1244803.79	582854.15	130.24	2"D soil moisture tube with 6" casing
7	TA1-SM-BKG-S	TA1	South	1244778.23	582851.49	128.69	2"D soil moisture tube with 6" casing
8	TA1-SM-BKG-E	TA1	East	1244814.73	582868.76	129.29	2"D soil moisture tube with 6" casing
9	TA1-PZ-11-EF2	TA1	EF2	1244812.14	582857.35	133.59	1"D standpipe piezometer, 5' screen
10	TA1-LY-24-C	TA1	Center	1244811.87	582857.75	133.69	2"D suction lysimeter, 9" cup
11	TA1-LY-12-S	TA1	South	1244804.42	582853.25	132.60	2"D suction lysimeter, 9" cup
12	TA1-LY-24-S	TA1	South	1244804.42	582854.46	134.14	2"D suction lysimeter, 9" cup
13	TA1-LY-42-S	TA1	South	1244805.37	582853.79	132.66	2"D suction lysimeter, 9" cup
14	TA1-T-6-C	TA1	Center	1244813.56	582858.66	132.34	tensiometer
15	TA1-T-12-C	TA1	Center	1244813.75	582858.12	132.34	tensiometer
16	TA1-T-24-C	TA1	Center	1244813.77	582857.64	132.33	tensiometer
17	TA1-T-36-C	TA1	Center	1244813.80	582857.36	132.36	tensiometer
18	TA1-T-42-C	TA1	Center	1244813.34	582857.00	132.88	tensiometer
19	TA1-T-6-S	TA1	South	1244804.28	582853.77	132.32	tensiometer
20	TA1-T-12-S	TA1	South	1244803.87	582852.93	132.35	tensiometer
21	TA1-T-24-S	TA1	South	1244803.71	582852.77	132.36	tensiometer
22	TA1-T-36-S	TA1	South	1244803.49	582852.89	132.38	tensiometer
23	TA1-T-42-S	TA1	South	1244803.01	582853.26	132.80	tensiometer
24	TA1-PZ-11-J4	TA1	J4	1244805.79	582849.87	133.57	1"D standpipe piezometer, 5' screen
25	TA1-PZ-11-K4	TA1	K4	1244803.97	582849.03	133.58	1"D standpipe piezometer, 5' screen
26	TA1-PZ-11-L2	TA1	L2	1244800.25	582851.77	133.57	1"D standpipe piezometer, 5' screen
27	TA1-PZ-11-L3	TA1	L3	1244801.20	582849.94	133.57	1"D standpipe piezometer, 5' screen
28	TA1-PZ-11-L4	TA1	L4	1244802.21	582848.15	133.57	1"D standpipe piezometer, 5' screen
29	TA1-PZ-11-L5	TA1	L5	1244803.08	582846.26	133.57	1"D standpipe piezometer, 5' screen

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Table A.1
S&GW Test Facility Sample Identification

ID #	Sample Identification	Test Area	Grid Location	Northing	Easting	Elev NGVD 29	Notes
30	TA1-PZ-09-N3	TA1	N3	1244798.01	582846.48	130.43	1"D standpipe piezometer, 5' screen
31	TA1-PZ-16-N3	TA1	N3	1244798.02	582846.37	130.44	1"D standpipe piezometer, 2.5' screen
32	TA1-PZ-09-O7	TA1	O7	1244798.67	582839.96	130.08	1"D standpipe piezometer, 5' screen
33	TA1-PZ-16-O7	TA1	O7	1244799.11	582839.97	130.30	1"D standpipe piezometer, 2.5' screen
34	TA1-PZ-09-M9	TA1	M9	1244804.22	582839.66	130.60	1"D standpipe piezometer, 5' screen
35	TA1-PZ-16-M9	TA1	M9	1244804.35	582839.62	130.64	1"D standpipe piezometer, 2.5' screen
36	TA1-PZ-09-I7	TA1	I7	1244810.91	582845.19	130.27	1"D standpipe piezometer, 5' screen
37	TA1-PZ-16-I7	TA1	I7	1244810.78	582845.02	130.33	1"D standpipe piezometer, 2.5' screen
38	TA1-PZ-09-RS16	TA1	RS16	1244792.19	582817.42	129.65	1"D standpipe piezometer, 5' screen
39	TA1-PZ-16-RS16	TA1	RS16	1244792.14	582817.50	129.72	1"D standpipe piezometer, 2.5' screen
40	TA1-PZ-09-RS18	TA1	RS18	1244792.34	582812.82	130.25	1"D standpipe piezometer, 5' screen
41	TA1-PZ-16-RS18	TA1	RS18	1244792.43	582812.72	130.25	1"D standpipe piezometer, 2.5' screen
42	TA2-PAN-12-N	TA2	North				2' x 3.3' SST pan lysimeter
43	TA2-OBS-N	TA2	North	1244818.77	582722.04	131.67	4"D observation port with slots
44	TA2-OBS-S	TA2	South	1244809.76	582718.30	132.27	4"D observation port without slots
45	TA2-SM-39-C	TA2	Center	1244814.95	582721.02	129.80	2"D soil moisture tube with 6" casing
46	TA2-PZ-10-EF2	TA2	EF2	1244814.23	582720.22	133.90	1"D standpipe piezometer, 5' screen
47	TA2-LY-24-C	TA2	Center	1244814.09	582720.59	132.60	2"D suction lysimeter, 9" cup
48	TA2-LY-12-S	TA2	South	1244806.60	582716.48	132.02	2"D suction lysimeter, 9" cup
49	TA2-LY-24-S	TA2	South	1244806.64	582717.52	132.62	2"D suction lysimeter, 9" cup
50	TA2-LY-42-S	TA2	South	1244807.39	582716.98	133.11	2"D suction lysimeter, 9" cup
51	TA2-PZ-10-H5	TA2	H5	1244810.74	582712.43	133.76	1"D standpipe piezometer, 5' screen
52	TA2-PZ-10-J5	TA2	J5	1244807.11	582710.94	133.73	1"D standpipe piezometer, 5' screen
53	TA2-PZ-10-K5	TA2	K5	1244805.14	582710.05	133.74	1"D standpipe piezometer, 5' screen
54	TA2-PZ-10-L2	TA2	L2	1244801.12	582714.87	133.74	1"D standpipe piezometer, 5' screen
55	TA2-PZ-10-L3	TA2	L3	1244801.83	582713.03	133.73	1"D standpipe piezometer, 5' screen
56	TA2-PZ-10-L4	TA2	L4	1244802.60	582711.25	133.52	1"D standpipe piezometer, 5' screen
57	TA2-PZ-10-L5	TA2	L5	1244803.37	582709.39	133.73	1"D standpipe piezometer, 5' screen
58	TA2-PZ-10-L6	TA2	L6	1244804.19	582707.50	133.72	1"D standpipe piezometer, 5' screen
59	TA2-PZ-09-M4	TA2	M4	1244800.19	582709.27	129.51	1"D standpipe piezometer, 5' screen

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Table A.1
S&GW Test Facility Sample Identification

ID #	Sample Identification	Test Area	Grid Location	Northing	Easting	Elev NGVD 29	Notes
60	TA2-PZ-16-M4	TA2	M4	1244800.27	582709.49	129.50	1"D standpipe piezometer, 2.5' screen
61	TA2-PZ-09-N7	TA2	N7	1244801.15	582703.29	129.36	1"D standpipe piezometer, 5' screen
62	TA2-PZ-16-N7	TA2	N7	1244801.21	582703.43	129.37	1"D standpipe piezometer, 2.5' screen
63	TA2-PZ-09-I7	TA2	I7	1244810.20	582707.91	129.10	1"D standpipe piezometer, 5' screen
64	TA2-PZ-16-I7	TA2	I7	1244810.37	582707.66	129.52	1"D standpipe piezometer, 2.5' screen
65	TA2-PZ-09-L8	TA2	L8	1244806.27	582704.93	129.28	1"D standpipe piezometer, 5' screen
66	TA2-PZ-16-L8	TA2	L8	1244806.33	582704.81	129.27	1"D standpipe piezometer, 2.5' screen
67	TA2-PZ-09-TU19	TA2	TU19	1244790.44	582673.66	128.68	1"D standpipe piezometer, 5' screen
68	TA2-PZ-16-TU19	TA2	TU19	1244790.49	582673.49	128.62	1"D standpipe piezometer, 2.5' screen
69	TA2-PZ-09-TU21	TA2	TU21	1244790.32	582669.75	128.58	1"D standpipe piezometer, 5' screen
70	TA2-PZ-16-TU21	TA2	TU21	1244790.60	582669.40	128.98	1"D standpipe piezometer, 2.5' screen
71	TA3-PAN-12-N	TA3	North				2' x 3.3' SST pan lysimeter
72	TA3-OBS-N	TA3	North	1244817.49	582814.57	131.20	4"D observation port with slots
73	TA3-OBS-S	TA3	South	1244808.15	582811.07	131.11	4"D observation port without slots
74	TA3-SM-39-N	TA3	North	1244817.96	582815.53	130.59	2"D soil moisture tube with 6" casing
75	TA3-SM-39-C	TA3	Center	1244813.53	582813.63	130.60	2"D soil moisture tube with 6" casing
76	TA3-SM-39-S	TA3	South	1244804.15	582809.89	130.57	2"D soil moisture tube with 6" casing
77	TA3-SM-BKG-S	TA3	South	1244795.29	582807.19	129.32	2"D soil moisture tube with 6" casing
78	TA3-SM-BKG-E	TA3	East				2"D soil moisture tube with 6" casing
79	TA3-LY-24-C	TA3	Center	1244812.47	582813.21	133.45	2"D suction lysimeter, 9" cup
80	TA3-LY-12-S	TA3	South	1244804.97	582809.16	132.24	2"D suction lysimeter, 9" cup
81	TA3-LY-24-S	TA3	South	1244804.93	582810.17	132.90	2"D suction lysimeter, 9" cup
82	TA3-LY-42-S	TA3	South	1244805.73	582809.79	132.98	2"D suction lysimeter, 9" cup
83	TA3-T-6-C	TA3	Center	1244814.37	582813.76	132.19	tensiometer
84	TA3-T-12-C	TA3	Center	1244814.50	582813.46	132.70	tensiometer
85	TA3-T-24-C	TA3	Center	1244814.56	582813.15	132.23	tensiometer
86	TA3-T-36-C	TA3	Center	1244814.31	582812.76	131.70	tensiometer
87	TA3-T-42-C	TA3	Center	1244813.89	582812.49	132.20	tensiometer
88	TA3-T-6-S	TA3	South	1244805.33	582809.71	132.19	tensiometer
89	TA3-T-12-S	TA3	South	1244804.36	582809.00	132.69	tensiometer

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Table A.1
S&GW Test Facility Sample Identification

ID #	Sample Identification	Test Area	Grid Location	Northing	Easting	Elev NGVD 29	Notes
90	TA3-T-24-S	TA3	South	1244803.69	582808.77	132.22	tensiometer
91	TA3-T-36-S	TA3	South	1244803.59	582808.72	131.71	tensiometer
92	TA3-T-42-S	TA3	South	1244803.27	582809.06	132.21	tensiometer
93	TA3-PZ-11-EF2	TA3	EF2	1244812.64	582812.80	133.82	1"D standpipe piezometer, 5' screen
94	TA3-PZ-11-I2	TA3	I2	1244806.39	582810.24	133.54	1"D standpipe piezometer, 5' screen
95	TA3-PZ-10-J5	TA3	J5	1244806.06	582803.49	133.49	1"D standpipe piezometer, 5' screen
96	TA3-PZ-10-K5	TA3	K5	1244804.12	582802.85	133.49	1"D standpipe piezometer, 5' screen
97	TA3-PZ-11-L2	TA3	L2	1244800.38	582808.17	133.51	1"D standpipe piezometer, 5' screen
98	TA3-PZ-11-L3	TA3	L3	1244800.93	582806.21	133.51	1"D standpipe piezometer, 5' screen
99	TA3-PZ-11-L4	TA3	L4	1244801.63	582804.23	133.50	1"D standpipe piezometer, 5' screen
100	TA3-PZ-10-L5	TA3	L5	1244802.21	582802.23	133.49	1"D standpipe piezometer, 5' screen
101	TA3-PZ-09-N3	TA3	N3	1244798.56	582803.29	129.88	1"D standpipe piezometer, 5' screen
102	TA3-PZ-16-N3	TA3	N3	1244798.87	582803.18	129.89	1"D standpipe piezometer, 2.5' screen
103	TA3-PZ-09-O7	TA3	O7	1244798.85	582797.09	130.06	1"D standpipe piezometer, 5' screen
104	TA3-PZ-16-O7	TA3	O7	1244798.94	582796.81	130.26	1"D standpipe piezometer, 2.5' screen
105	TA3-PZ-09-I7	TA3	I7	1244809.85	582798.46	130.06	1"D standpipe piezometer, 5' screen
106	TA3-PZ-16-I7	TA3	I7	1244810.00	582798.53	130.06	1"D standpipe piezometer, 2.5' screen
107	TA3-PZ-09-M9	TA3	M9	1244803.45	582796.14	130.18	1"D standpipe piezometer, 5' screen
108	TA3-PZ-16-M9	TA3	M9	1244803.44	582796.02	130.12	1"D standpipe piezometer, 2.5' screen
109	TA3-PZ-09-ST14	TA3	ST14	1244790.15	582780.80	129.88	1"D standpipe piezometer, 5' screen
110	TA3-PZ-16-ST14	TA3	ST14	1244790.27	582780.68	129.81	1"D standpipe piezometer, 2.5' screen
111	TA3-PZ-09-ST16	TA3	ST16	1244790.74	582776.81	129.54	1"D standpipe piezometer, 5' screen
112	TA3-PZ-16-ST16	TA3	ST16	1244790.24	582776.71	130.00	1"D standpipe piezometer, 2.5' screen
113	TA4-PAN-12-N	TA4	North				2' x 3.3' SST pan lysimeter
114	TA4-OBS-N	TA4	North	1244819.86	582676.19	129.91	4"D observation port with slots
115	TA4-OBS-S	TA4	South	1244810.58	582672.01	129.85	4"D observation port without slots
116	TA4-SM-39-C	TA4	Center	1244815.85	582674.87	129.25	2"D soil moisture tube with 6" casing
117	TA4-LY-24-C	TA4	Center	1244814.82	582674.46	132.10	2"D suction lysimeter, 9" cup
118	TA4-LY-12-S	TA4	South	1244807.65	582670.18	130.89	2"D suction lysimeter, 9" cup
119	TA4-LY-24-S	TA4	South	1244807.45	582671.38	132.75	2"D suction lysimeter, 9" cup

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Table A.1
S&GW Test Facility Sample Identification

ID #	Sample Identification	Test Area	Grid Location	Northing	Easting	Elev NGVD 29	Notes
120	TA4-LY-42-S	TA4	South	1244808.40	582670.62	132.57	2"D suction lysimeter, 9" cup
121	TA4-PZ-11-EF2	TA4	EF2	1244815.06	582674.02	132.53	1"D standpipe piezometer, 5' screen
122	TA4-PZ-10-H5	TA4	H5	1244812.91	582666.75	132.48	1"D standpipe piezometer, 5' screen
123	TA4-PZ-10-J5	TA4	J5	1244809.21	582664.90	132.47	1"D standpipe piezometer, 5' screen
124	TA4-PZ-10-K5	TA4	K5	1244807.45	582664.07	132.47	1"D standpipe piezometer, 5' screen
125	TA4-PZ-11-L2	TA4	L2	1244803.06	582668.66	132.47	1"D standpipe piezometer, 5' screen
126	TA4-PZ-11-L3	TA4	L3	1244804.02	582666.85	132.48	1"D standpipe piezometer, 5' screen
127	TA4-PZ-11-L4	TA4	L4	1244804.79	582665.10	132.46	1"D standpipe piezometer, 5' screen
128	TA4-PZ-11-L5	TA4	L5	1244805.65	582663.28	132.46	1"D standpipe piezometer, 5' screen
129	TA4-PZ-11-L6	TA4	L6	1244806.56	582661.46	132.46	1"D standpipe piezometer, 5' screen
130	TA4-PZ-09-M4	TA4	M4	1244802.46	582663.97	128.96	1"D standpipe piezometer, 5' screen
131	TA4-PZ-16-M4	TA4	M4	1244802.29	582664.28	129.54	1"D standpipe piezometer, 5' screen
132	TA4-PZ-09-N7	TA4	N7	1244807.44	582664.14	132.47	1"D standpipe piezometer, 5' screen
133	TA4-PZ-16-N7	TA4	N7	1244803.91	582657.76	128.94	1"D standpipe piezometer, 5' screen
134	TA4-PZ-09-I7	TA4	I7	1244812.68	582663.21	128.83	1"D standpipe piezometer, 5' screen
135	TA4-PZ-16-I7	TA4	I7	1244812.80	582663.08	129.25	1"D standpipe piezometer, 5' screen
136	TA4-PZ-09-L8	TA4	L8	1244807.67	582657.70	128.63	1"D standpipe piezometer, 5' screen
137	TA4-PZ-16-L8	TA4	L8	1244807.84	582657.44	128.92	1"D standpipe piezometer, 5' screen
138	TA4-PZ-09-TU14	TA4	TU14	1244793.10	582638.92	128.32	1"D standpipe piezometer, 5' screen
139	TA4-PZ-16-TU14	TA4	TU14	1244792.96	582639.30	129.06	1"D standpipe piezometer, 5' screen
140	TA4-PZ-09-TU16	TA4	TU16	1244794.18	582633.89	128.57	1"D standpipe piezometer, 5' screen
141	TA4-PZ-16-TU16	TA4	TU16	1244793.99	582634.17	128.70	1"D standpipe piezometer, 5' screen
142	TA5-OBS-I	TA5	Center	1244812.47	582770.36	132.52	4"D observation port, for infiltrator system
143	TA5-OBS-N	TA5	North	1244817.64	582767.53	132.87	3"D observation port connected to collection pipe at bottom of sloped liner
144	TA5-OBS-S	TA5	South	1244810.89	582764.74	132.91	3"D observation port connected to collection pipe at bottom of sloped liner
145	TA5-PZ-I	TA5	South	1244802.11	582764.97	133.23	1"D standpipe piezometer, 5' screen south of infiltrator
146	TA5-LY-C	TA5	Center	1244814.05	582766.03	133.15	2"D suction lysimeter, 9" cup at mixture and sand interface
147	TA5-LINER-SP	TA5	North	1244827.69	582771.40	131.20	3"D sample port
148	TA5-CLEANOUT	TA5	North	1244829.07	582772.03	131.60	4"D clean-out

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Table A.1
S&GW Test Facility Sample Identification

ID #	Sample Identification	Test Area	Grid Location	Northing	Easting	Elev NGVD 29	Notes
149	TA5-Denite Tank	TA5	North	1244831.25	582772.19	129.90	
150	TA6-OBS-I	TA6	Center	1244814.51	582630.94	131.40	4"D observation port, for infiltrator system
151	TA6-OBS-N	TA6	North	1244819.57	582628.85	131.94	3"D observation port connected to collection pipe at bottom of sloped liner
152	TA6-OBS-S	TA6	South	1244812.49	582625.84	132.28	3"D observation port connected to collection pipe at bottom of sloped liner
153	TA6-PZ-I	TA6	South	1244804.06	582626.81	133.43	1"D standpipe piezometer, 5' screen south of infiltrator
154	TA6-LY-C	TA6	Center	1244815.99	582627.26	132.41	2"D suction lysimeter, 9" cup at mix-ture and sand interface
155	TA6-LINER-SP	TA6	North	1244829.10	582632.72	130.89	3"D sample port
156	TA6-CLEANOUT	TA6	North	1244830.50	582633.21	130.48	4"D clean-out
157	TA6-Denite Tank	TA6	North	1244832.30	582633.85	128.98	
158	PZ01-BKG-09	BKG		1244957.50	582852.42	131.28	1.25”D standpipe piezometer, 5’ screen
159	LY01-BKG-24	BKG		1244957.82	582856.59	131.60	2"D suction lysimeter, 9" cup
160	LY02-BKG-42	BKG		1244960.88	582857.29	132.03	2"D suction lysimeter, 9" cup
161	BKG-SM-N	BKG		1244959.90	582854.52	130.62	2"D soil moisture tube with 6" casing
162	PZ04-BKG-09	BKG		1244850.25	582615.24	129.45	1.25”D standpipe piezometer, 5’ screen
163	PZ24-BKG-26	BKG		1244854.09	582614.74	132.38	2”D standpipe piezometer, 5’ screen
164	PZ29-BKG-09	BKG		1244846.58	582755.86	130.93	¾”D standpipe piezometer, 5’ screen
165	PZ30-BKG-16	BKG		1244845.66	582758.17	132.29	1"D standpipe piezometer, 5' screen
166	PZ31-BKG-26	BKG		1244845.87	582757.80	128.99	1"D standpipe piezometer, 5' screen
167	PZ32-BKG-09	BKG		1244843.82	582842.31	133.51	1"D standpipe piezometer, 5' screen
168	PZ33-BKG-16	BKG		1244844.30	582845.33	132.84	1"D standpipe piezometer, 5' screen
169	PZ34-BKG-26	BKG		1244843.73	582845.24	130.45	1"D standpipe piezometer, 5' screen
170	PZ35-BKG-09	BKG		1244702.71	582872.85	129.18	1"D standpipe piezometer, 5' screen
171	PZ36-BKG-16	BKG		1244702.63	582873.08	131.84	1"D standpipe piezometer, 5' screen
172	PZ37-BKG-26	BKG		1244702.80	582872.92	128.31	1"D standpipe piezometer, 5' screen
173	PZ38-BKG-09	BKG		1244582.29	582675.83	126.66	1"D standpipe piezometer, 5' screen
174	PZ39-BKG-16	BKG		1244582.30	582675.42	129.60	1"D standpipe piezometer, 5' screen
175	PZ40-BKG-26	BKG		1244582.13	582675.66	126.10	1"D standpipe piezometer, 5' screen
176	STE Pump Tank			1244840.78	582676.05	129.10	STE effluent dose tank

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Table A.1
S&GW Test Facility Sample Identification

ID #	Sample Identification	Test Area	Grid Location	Northing	Easting	Elev NGVD 29	Notes
177	ATU Clarifier			1244841.16	582671.78	129.12	
178	ATU Eff Pump Tank			1244840.54	582681.28	129.16	Nitrified effluent dose tank
179	GCREC Pump Station						GCREC mound lift station
180	PNRS II STE-Tank 1						PNRS II Tank 1
181	PZ41	TA1				132.29	1"D standpipe piezometer, 5' screen
182	PZ42	TA1				132.99	1"D standpipe piezometer, 5' screen
183	PZ43	TA1				131.34	1"D standpipe piezometer, 5' screen
184	PZ44	TA3				131.82	1"D standpipe piezometer, 5' screen
185	PZ45	TA3				132.48	1"D standpipe piezometer, 5' screen
186	PZ46	TA1				131.81	1"D standpipe piezometer, 5' screen
187	PZ47	TA1				131.78	1"D standpipe piezometer, 5' screen
188	PZ48	TA1				129.70	1"D standpipe piezometer, 5' screen
189	PZ49	TA2				131.91	1"D standpipe piezometer, 5' screen
190	PZ50	TA2				131.76	1"D standpipe piezometer, 5' screen
191	PZ51	TA4				131.90	1"D standpipe piezometer, 5' screen
192	PZ52	TA4				131.69	1"D standpipe piezometer, 5' screen
193	PZ53	TA4				131.57	1"D standpipe piezometer, 5' screen

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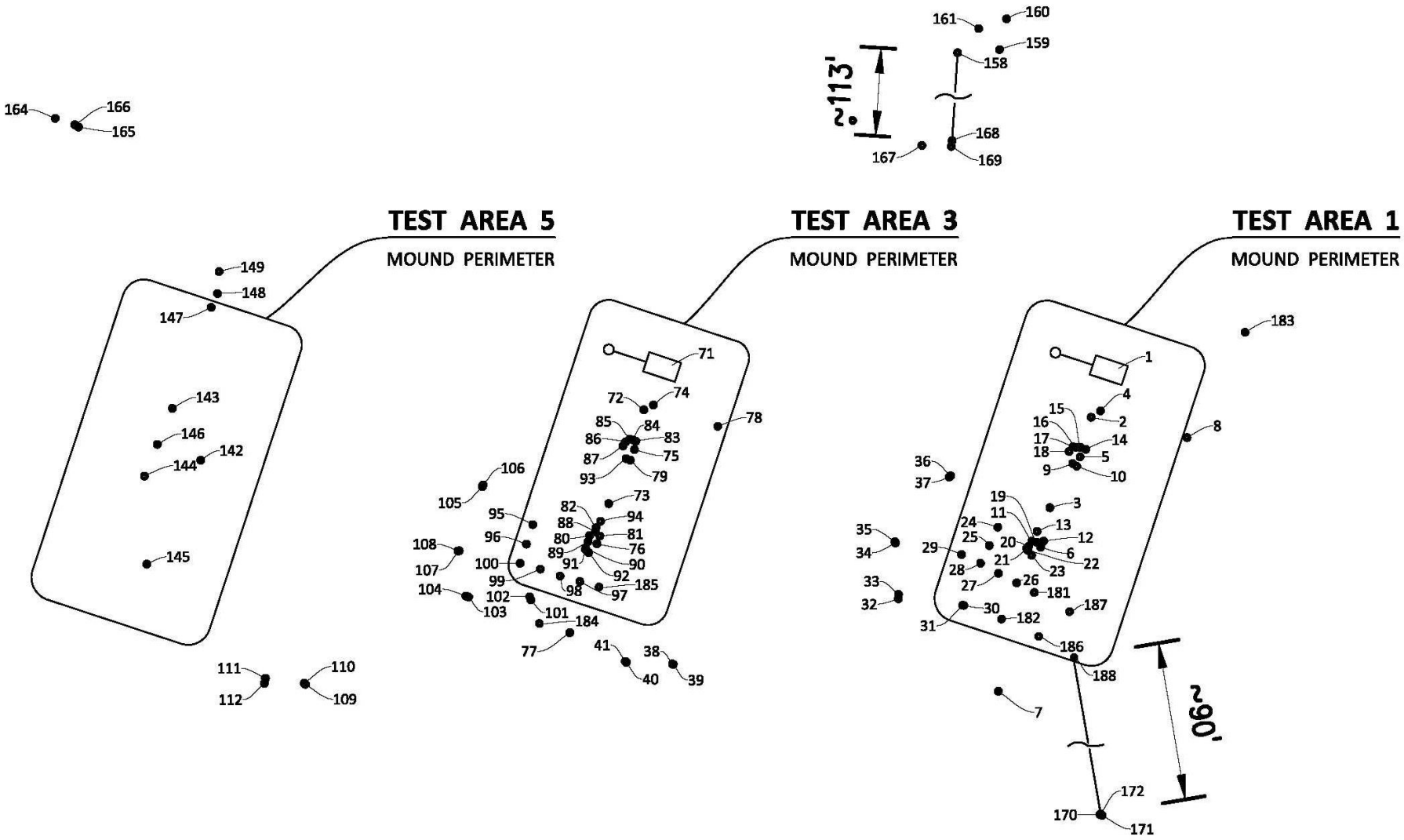

Figure A.1
S&GW Test Facility System Schematic of TA1, TA3, and TA5 (STE System)
[1]Location identification corresponds to Table A.1 ID #

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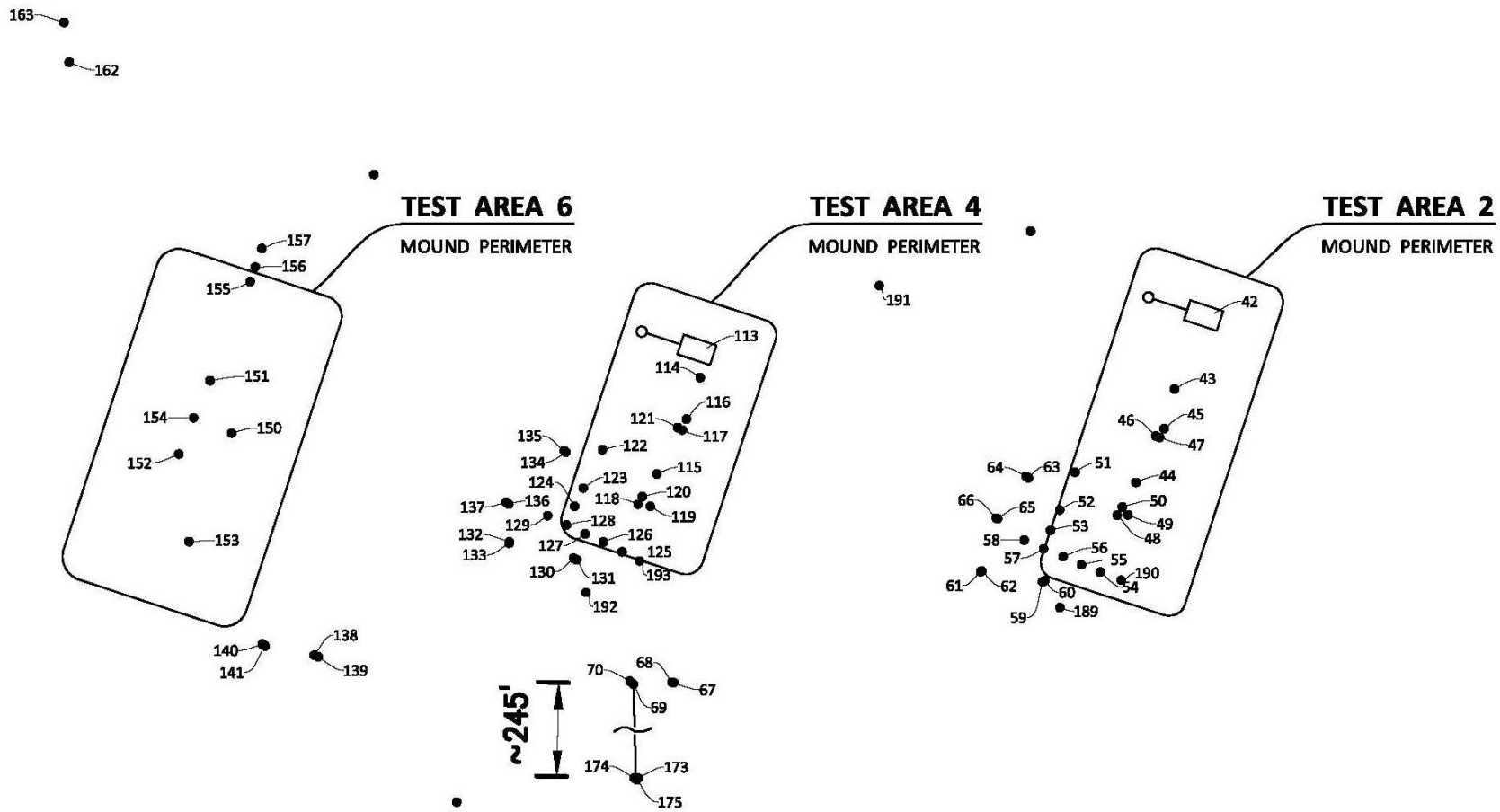

Figure A.2
S&GW Test Facility System Schematic of TA2, TA4, and TA6 (ATU Effluent System)
[1]Location identification corresponds to Table A.1 ID #

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Appendix B: GCREC Weather Station Data

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Table B.1
Daily Recorded Meteorological Data

Period	60cm Temp avg (°F)	60cm Temp min (°F)	60cm Temp max (°F)	Tsoil avg – 10cm (°F)	Tsoil Min (avg) – 10cm (°F)	Tsoil Max (avg) – 10cm (°F)	2m DewPt avg (°F)	Relative Humidity avg 2m (%)	2m Rain total (in)	2m Rain max over 15min (in)	10m Wind avg (mph)	10m Wind min (mph)	10m Wind max (mph)	ET avg (in)
28-Aug-12	81.01	75.54	89.69	80.93	79.47	82.74	77.45	88	0.22	0.13	11.76	3.47	27.43	0.16
29-Aug-12	79.71	72.41	88.95	81.67	80.22	83.26	75.87	88	0.03	0.01	7.55	0.00	22.97	0.15
30-Aug-12	80.55	73.09	93.60	82.28	80.51	84.67	75.03	84	0.51	0.28	4.49	0.00	25.77	0.17
31-Aug-12	81.31	72.79	91.74	82.64	80.92	84.42	75.68	84	0	0	5.20	0.10	17.43	0.17
1-Sep-12	80.36	72.19	91.71	82.95	81.28	84.79	73.86	81	0	0	5.97	0.37	17.40	0.18
2-Sep-12	78.68	67.24	89.33	82.59	80.78	84.31	70.78	77	0	0	5.04	0.20	18.50	0.17
3-Sep-12	79.01	66.34	91.80	82.35	80.42	84.13	71.38	78	0	0	3.67	0.07	14.47	0.16
4-Sep-12	79.25	67.57	93.13	82.93	80.65	85.21	72.12	80	0	0	3.87	0.00	16.77	0.16
5-Sep-12	79.06	69.46	91.17	83.36	81.19	85.71	73.37	84	0	0	5.54	0.27	18.17	0.17
6-Sep-12	76.74	69.84	88.63	82.93	81.72	83.71	73.08	88	0	0	5.62	0.07	25.07	0.12
7-Sep-12	78.97	70.00	90.16	83.05	80.96	85.50	73.79	85	0	0	5.21	0.10	20.30	0.17
8-Sep-12	79.73	69.48	90.14	83.40	81.34	85.46	73.55	82	0	0	6.99	0.63	20.37	0.17
9-Sep-12	76.44	72.28	82.81	81.70	80.26	83.70	75.58	95	0.91	0.41	5.85	0.07	23.83	0.06
10-Sep-12	79.05	72.10	89.29	81.62	79.95	83.59	75.69	90	0	0	3.40	0.00	12.67	0.13
11-Sep-12	78.05	71.33	89.13	81.97	80.47	83.79	73.66	86	0.08	0.08	8.44	1.73	22.43	0.15
12-Sep-12	77.19	69.78	86.76	81.39	79.86	82.76	71.76	83	0.01	0.01	9.40	2.27	29.10	0.14
13-Sep-12	77.97	71.38	89.80	81.53	80.04	83.03	73.14	85	0	0	7.84	1.70	22.10	0.14
14-Sep-12	78.08	71.35	88.77	81.93	80.37	83.62	73.96	87	0.02	0.02	8.01	1.80	24.50	0.15
15-Sep-12	77.13	71.82	89.01	82.22	80.85	83.68	73.39	88	0	0	7.00	2.33	22.90	0.14
16-Sep-12	76.73	70.95	90.18	82.21	80.89	84.09	73.15	89	0.35	0.05	5.89	0.20	24.80	0.13
17-Sep-12	77.69	70.30	89.47	81.77	80.13	83.82	73.84	89	0.62	0.46	7.27	1.73	19.30	0.15
18-Sep-12	75.77	71.62	86.86	81.07	80.31	82.20	74.70	95	0.72	0.37	7.89	0.33	27.90	0.10
19-Sep-12	78.20	70.79	86.74	81.02	79.25	82.74	74.82	88	0.01	0.01	4.76	0.33	19.23	0.13

Table B.1 (continued)
Daily Recorded Meteorological Data

Period	60cm Temp avg (°F)	60cm Temp min (°F)	60cm Temp max (°F)	Tsoil avg – 10cm (°F)	Tsoil Min (avg) – 10cm (°F)	Tsoil Max (avg) – 10cm (°F)	2m DewPt avg (°F)	Relative Humidity avg 2m (%)	2m Rain total (in)	2m Rain max over 15min (in)	10m Wind avg (mph)	10m Wind min (mph)	10m Wind max (mph)	ET avg (in)
20-Sep-12	78.16	72.73	87.98	81.34	80.17	82.62	74.84	89	0	0	3.04	0.00	13.53	0.10
21-Sep-12	76.52	70.90	86.45	81.20	80.04	82.38	73.05	89	0	0	4.89	0.00	26.40	0.11
22-Sep-12	76.78	70.77	87.51	81.21	79.88	82.71	73.21	89	0.27	0.07	4.09	0.17	11.73	0.11
23-Sep-12	79.01	68.23	90.82	81.26	79.41	83.12	71.22	79	0.01	0.01	4.23	0.00	13.13	0.16
24-Sep-12	73.61	67.01	83.93	80.43	79.43	81.55	63.59	71	0	0	5.61	0.43	16.50	0.11
25-Sep-12	73.34	63.93	85.75	79.61	78.01	81.30	66.85	79	0	0	4.30	0.30	10.17	0.12
26-Sep-12	76.40	65.75	89.62	80.36	78.51	82.51	71.47	86	0	0	3.95	0.00	24.40	0.13
27-Sep-12	77.38	68.79	90.59	81.09	79.47	82.89	72.40	84	0.02	0.01	4.27	0.03	16.53	0.13
28-Sep-12	78.02	69.35	90.86	81.06	79.52	82.56	72.70	85	0.08	0.03	4.98	0.33	17.43	0.14
29-Sep-12	78.50	69.37	90.66	81.42	79.65	83.28	73.65	86	0	0	4.52	0.07	13.60	0.13
30-Sep-12	76.38	68.68	89.47	81.34	80.06	83.30	73.73	90	1	0.49	3.64	0.00	30.00	0.12
1-Oct-12	78.19	71.02	88.21	80.62	79.23	82.26	74.58	88	0	0	6.73	0.33	20.93	0.13
2-Oct-12	77.06	72.00	84.96	80.74	79.70	82.09	75.16	93	0.37	0.26	6.98	0.07	21.33	0.10
3-Oct-12	75.72	72.19	88.21	80.40	79.45	81.46	74.67	95	0.49	0.2	5.45	0.07	20.27	0.09
4-Oct-12	75.98	69.75	91.92	79.93	78.73	82.76	73.63	93	1.86	0.7	5.65	0.10	43.20	0.12
5-Oct-12	76.85	69.42	91.38	79.41	77.90	82.36	73.48	90	0.6	0.43	5.51	0.00	28.73	0.14
6-Oct-12	77.03	69.93	90.10	79.17	77.54	81.09	73.72	90	0	0	3.72	0.03	26.20	0.12
7-Oct-12	75.49	68.63	87.98	79.53	78.28	80.87	72.42	89	0	0	4.28	0.07	20.83	0.11
8-Oct-12	75.55	68.65	86.88	79.57	78.28	81.01	73.24	92	0	0	3.80	0.20	12.60	0.10
9-Oct-12	75.96	67.55	86.68	79.73	78.17	81.37	72.92	90	0	0	4.60	0.03	12.60	0.12
10-Oct-12	74.78	66.36	86.36	79.65	78.35	81.00	69.25	82	0	0	5.55	0.63	15.50	0.12

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Table B.1 (continued)
Daily Recorded Meteorological Data

Period	60cm Temp avg (°F)	60cm Temp min (°F)	60cm Temp max (°F)	Tsoil avg – 10cm (°F)	Tsoil Min (avg) – 10cm (°F)	Tsoil Max (avg) – 10cm (°F)	2m DewPt avg (°F)	Relative Humidity avg 2m (%)	2m Rain total (in)	2m Rain max over 15min (in)	10m Wind avg (mph)	10m Wind min (mph)	10m Wind max (mph)	ET avg (in)
11-Oct-12	72.18	61.84	84.34	78.50	76.91	80.01	66.84	83	0	0	6.40	1.13	18.33	0.12
12-Oct-12	72.70	62.71	84.67	78.04	76.59	79.52	64.75	76	0	0	7.06	2.13	18.43	0.12
13-Oct-12	73.40	62.98	84.78	77.57	76.21	78.89	65.87	77	0	0	8.79	2.17	25.33	0.12
14-Oct-12	75.57	66.65	86.92	77.98	76.59	79.43	69.50	81	0	0	7.32	1.87	25.37	0.12
15-Oct-12	76.20	69.37	87.31	78.67	77.27	80.33	71.64	86	0	0	5.19	0.27	21.27	0.11
16-Oct-12	73.95	64.09	85.87	78.43	76.95	79.83	68.66	83	0	0	4.09	0.10	13.10	0.11
17-Oct-12	71.19	64.83	81.09	77.80	76.82	78.78	68.80	90	0	0	3.11	0.00	9.33	0.07
18-Oct-12	75.14	65.30	88.34	77.89	76.15	79.86	70.54	86	0	0	4.05	0.00	15.83	0.12
19-Oct-12	74.60	61.93	86.54	78.03	76.21	79.68	69.37	84	0	0	3.78	0.00	14.37	0.11
20-Oct-12	72.64	58.30	84.13	78.12	77.11	79.47	62.20	70	0	0	5.56	0.07	17.43	0.11
21-Oct-12	67.09	54.57	81.30	75.96	74.55	77.18	55.86	68	0	0	6.50	0.77	18.20	0.10
22-Oct-12	70.98	61.05	84.13	75.60	74.28	76.91	63.25	76	0	0	8.97	2.23	23.40	0.11
23-Oct-12	70.98	62.44	81.52	75.52	74.39	76.46	65.56	82	0	0	7.79	1.87	20.90	0.09
24-Oct-12	74.46	64.99	85.71	75.87	74.73	77.23	67.88	80	0	0	9.85	2.17	27.47	0.11
25-Oct-12	73.91	68.86	82.74	76.21	75.43	77.05	70.30	87	0	0	8.94	2.03	25.83	0.08
26-Oct-12	75.68	70.50	84.96	76.32	75.65	77.09	67.29	75	0	0	12.77	3.83	30.97	0.11

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Appendix C: S&GW Test Facility Tensiometer Data

Table C.1
S&GW Test Facility Test Area 3
Daily Average Tensiometer Data (mbar)

	TA3-Center					TA3-South				
Depth below IS:	6"	12"	24"	36"	42"	6"	12"	24"	36"	42"
Date	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar
08/28/12	154.259	142.153	141.322	141.797	143.933	143.221	145.595	144.764	145.120	145.358
08/29/12	145.951	135.150	136.456	136.100	137.643	136.812	138.236	137.643	136.693	137.999
08/30/12	151.648	146.544	144.527	143.696	145.358	143.221	146.782	143.577	146.188	143.458
08/31/12	103.341	100.611	97.288	97.882	96.695	97.169	97.051	97.051	96.932	96.101
09/01/12	78.060	73.075	73.431	70.345	72.363	70.345	71.888	70.820	70.464	71.176
09/02/12	54.916	53.254	52.186	50.287	51.830	49.100	51.711	48.625	51.236	48.388
09/03/12	34.976	35.213	32.958	33.433	32.721	32.246	32.721	31.178	32.602	30.347
09/04/12	27.024	27.024	23.582	26.193	22.869	25.243	22.751	24.294	22.869	22.869
09/05/12	31.178	29.397	27.736	29.041	26.074	28.804	25.243	28.448	25.006	27.380
09/06/12	41.029	37.231	37.824	35.807	36.875	34.976	36.044	34.857	35.094	34.501
09/07/12	65.004	60.257	60.613	59.426	58.476	59.070	57.171	59.189	55.984	58.714
09/08/12	73.313	72.363	69.989	70.227	69.277	68.921	69.040	68.209	68.565	67.141
09/09/12	61.562	59.901	59.307	58.120	58.476	57.290	58.002	56.696	57.171	56.221
09/10/12	200.074	193.427	192.121	190.222	189.748	189.866	188.561	190.460	187.255	190.104
09/11/12	149.393	143.221	142.746	142.153	142.034	143.815	142.509	144.883	141.322	145.239
09/12/12	98.238	95.270	93.609	93.490	92.184	93.134	91.591	92.897	90.997	92.540
09/13/12	60.019	60.257	57.646	58.358	57.171	57.171	57.052	56.103	56.696	55.034
09/14/12	84.232	81.977	81.028	79.722	79.959	78.772	79.485	78.416	78.891	77.942
09/15/12	83.401	81.146	80.197	79.010	79.128	78.060	78.535	77.704	77.704	77.229
09/16/12	93.846	90.404	90.048	88.268	88.742	87.793	88.149	87.793	87.318	87.555
09/17/12	104.291	100.493	100.374	98.356	98.712	97.763	98.119	97.644	96.932	97.525
09/18/12	99.662	96.576	94.677	93.727	93.846	93.134	93.965	92.897	93.371	92.540
09/19/12	134.082	129.928	126.486	126.604	125.536	126.367	125.655	126.486	125.180	126.130
09/20/12	135.981	131.352	129.809	130.640	130.521	132.183	132.183	132.895	130.996	133.251
09/21/12	93.134	91.828	89.455	88.386	88.980	86.725	89.217	86.131	88.742	85.656
09/22/12	79.010	74.618	75.212	73.194	73.194	72.838	72.007	73.075	70.820	72.838
09/23/12	85.419	80.197	81.146	78.654	79.128	78.179	77.704	78.298	76.399	78.298
09/24/12	75.686	73.194	71.651	71.414	70.345	70.701	69.871	70.583	69.396	70.108
09/25/12	24.294	20.496	23.225	19.309	22.632	18.953	21.920	19.190	20.614	19.665
09/26/12	33.314	33.433	30.347	33.077	28.923	32.483	28.448	31.771	28.567	30.228
09/27/12	57.646	54.678	54.678	53.254	53.491	52.305	52.779	52.186	52.067	51.948
09/28/12	47.676	46.726	44.827	45.302	43.759	44.352	43.165	43.521	42.809	42.572
09/29/12	55.272	51.948	52.779	49.931	51.948	48.863	51.236	48.625	50.168	48.506
09/30/12	69.040	66.903	64.886	65.598	63.343	64.886	62.749	64.530	62.393	63.699
10/01/12	62.393	59.070	58.239	58.239	55.984	57.646	54.678	57.527	53.729	56.696
10/02/12	89.336	85.419	84.707	83.164	83.520	82.452	83.045	82.452	82.333	82.452
10/03/12	113.905	108.801	108.445	106.071	107.495	105.359	107.614	105.715	106.546	105.715
10/04/12	154.734	147.731	148.206	144.764	147.731	144.645	148.443	145.951	147.257	146.426
10/05/12	140.966	135.388	135.031	133.607	135.150	134.082	136.100	134.913	135.031	135.388
10/06/12	98.119	94.914	91.947	92.897	91.354	92.540	91.591	92.303	91.354	92.066
10/07/12	82.570	78.654	77.823	76.280	77.467	75.686	77.467	75.568	76.755	75.805

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Table C.1 (continued)
S&GW Test Facility Test Area 3
Daily Average Tensiometer Data (mbar)

	TA3-Center					TA3-South				
Depth below IS:	6"	12"	24"	36"	42"	6"	12"	24"	36"	42"
Date	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar
10/08/12	81.028	81.028	77.229	78.179	76.636	76.517	76.992	75.449	76.873	74.381
10/09/12	82.452	78.891	79.010	76.636	77.942	75.330	77.467	75.212	76.399	75.093
10/10/12	69.159	67.497	66.073	65.479	65.242	64.292	65.123	63.699	64.530	63.105
10/11/12	58.002	56.577	54.797	55.390	53.610	54.322	53.135	53.848	52.779	53.017
10/12/12	42.216	42.097	39.367	41.148	38.418	40.198	38.062	39.367	38.062	38.180
10/13/12	37.231	38.180	35.332	36.637	34.976	35.332	35.094	34.382	35.213	33.195
10/14/12	19.783	16.816	17.647	16.341	16.579	16.104	15.867	16.223	14.917	16.104
10/15/12	28.685	29.635	25.837	28.685	25.125	27.854	25.125	26.786	25.362	25.362
10/16/12	55.034	49.337	52.186	47.557	50.880	47.201	49.931	47.557	48.150	48.150
10/17/12	39.249	38.062	36.756	36.756	36.163	36.044	35.688	35.451	35.213	34.738
10/18/12	35.094	32.127	32.483	30.822	31.296	29.991	30.466	29.753	29.516	29.279
10/19/12	68.209	65.598	63.936	63.817	62.868	63.105	62.393	62.749	61.800	62.037
10/20/12	43.284	40.317	40.079	39.249	38.774	38.655	37.943	38.418	36.994	38.062
10/21/12	NAN	NAN	NAN	NAN	NAN	NAN	NAN	NAN	NAN	NAN
10/22/12	NAN	NAN	NAN	NAN	NAN	NAN	NAN	NAN	NAN	NAN
10/23/12	NAN	NAN	16.579	17.410	16.223	16.460	15.867	15.511	15.748	14.680
10/24/12	38.418	36.994	35.094	35.688	33.908	34.857	33.314	34.145	32.958	33.195
10/25/12	55.272	51.711	51.711	50.168	50.406	49.575	49.575	49.456	48.625	49.219
10/26/12	72.363	67.022	68.209	64.886	67.022	63.817	65.954	63.817	64.411	63.936

NAN (not-a-number) indicates an exceptional occurrence in datalogger function or processing occurred (an invalid measurement).

NR indicates no reading occurred.

EM indicates an equipment malfunction occurred. We are in the process of troubleshooting the problem.

NEG indicates negative soil tensiometer readings were recorded which is being investigated

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Table C.2
S&GW Test Facility Test Area 1
Daily Average Tensiometer Data (mbar)

	TA1-Center					TA1-South				
Depth below IS:	6"	12"	24"	36"	42"	6"	12"	24"	36"	42"
Date	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar
08/28/12	148.443	140.254	149.749	147.138	147.019	146.544	NEG	NEG	NEG	NEG
08/29/12	137.287	134.557	139.304	138.355	137.049	137.287	NEG	NEG	NEG	NEG
08/30/12	146.544	143.102	146.663	145.358	145.714	146.070	NEG	NEG	NEG	NEG
08/31/12	97.407	95.508	97.644	96.101	97.882	96.339	NEG	NEG	NEG	NEG
09/01/12	70.464	71.295	70.227	71.888	70.108	72.007	NEG	NEG	NEG	NEG
09/02/12	50.643	48.625	49.693	49.100	48.981	49.931	NEG	NEG	NEG	NEG
09/03/12	32.365	29.872	32.009	29.991	31.415	30.228	NEG	NEG	NEG	NEG
09/04/12	23.225	21.683	23.582	20.970	23.700	20.496	NEG	NEG	NEG	NEG
09/05/12	25.243	26.074	25.599	25.006	25.955	23.938	NEG	NEG	NEG	NEG
09/06/12	34.145	34.382	33.433	34.264	32.958	34.145	NEG	NEG	NEG	NEG
09/07/12	55.509	58.002	55.509	57.052	55.865	55.865	NEG	NEG	NEG	NAN
09/08/12	68.446	66.666	68.209	66.666	67.853	66.785	NEG	NEG	NEG	NEG
09/09/12	56.577	56.103	55.984	55.984	55.509	55.984	NEG	NEG	NEG	NEG
09/10/12	187.611	189.035	187.967	189.391	188.798	188.798	NEG	NEG	NEG	NEG
09/11/12	142.509	143.933	143.577	145.001	144.527	144.171	NEG	NEG	NEG	NEG
09/12/12	91.472	91.710	91.472	91.591	92.066	91.116	NEG	NEG	NEG	NEG
09/13/12	56.577	54.322	56.221	54.085	55.747	54.204	NEG	NEG	NEG	NEG
09/14/12	78.535	77.704	78.060	77.823	77.704	78.060	NEG	NEG	NEG	NEG
09/15/12	77.348	76.873	76.873	76.873	76.636	76.873	NEG	NEG	NEG	NEG
09/16/12	86.962	87.318	86.725	87.437	86.725	87.318	NEG	NEG	NEG	NEG
09/17/12	96.576	97.288	96.101	97.169	96.101	97.051	NEG	NEG	NEG	NEG
09/18/12	93.490	92.184	93.490	92.778	93.371	93.015	NEG	NEG	NEG	NEG
09/19/12	126.248	124.824	126.961	125.655	127.198	125.655	NEG	NEG	NEG	NEG
09/20/12	133.251	132.183	134.438	133.489	134.319	132.895	NEG	NEG	NEG	NEG
09/21/12	88.505	85.538	87.793	86.369	87.081	87.199	NEG	NEG	NEG	NAN
09/22/12	70.345	72.363	70.227	71.888	70.464	71.295	NEG	NEG	NEG	NEG
09/23/12	75.686	77.942	75.330	77.586	75.686	76.992	NEG	NEG	NEG	NEG
09/24/12	69.515	69.396	69.633	69.277	69.752	68.921	NEG	NEG	NEG	NEG
09/25/12	19.190	20.377	18.003	20.614	17.291	20.733	NEG	NEG	NEG	NEG
09/26/12	28.923	28.804	29.516	27.617	29.872	26.549	NEG	NEG	NEG	NEG
09/27/12	51.474	51.592	50.999	51.592	50.762	51.355	NEG	NEG	NEG	NEG
09/28/12	42.572	41.741	42.453	41.266	42.216	40.910	NEG	NEG	NEG	NEG
09/29/12	48.981	48.863	47.913	49.100	47.201	49.337	NEG	NEG	NEG	NEG
09/30/12	62.512	62.631	62.631	62.037	63.105	61.444	NEG	NEG	NEG	NEG
10/01/12	53.491	55.390	53.610	54.204	54.085	52.898	NEG	NEG	NEG	NEG
10/02/12	82.214	82.214	81.977	82.570	82.096	82.689	NEG	NEG	NEG	NEG
10/03/12	106.308	105.715	105.834	106.665	105.596	107.021	NEG	NEG	NEG	NEG
10/04/12	146.900	146.900	146.900	148.562	146.544	149.037	NEG	NEG	NEG	NEG
10/05/12	135.625	135.031	135.981	136.337	135.862	136.456	NEG	NEG	NEG	NAN
10/06/12	92.303	90.523	93.015	91.354	93.015	91.235	NEG	NEG	NEG	NEG
10/07/12	76.755	75.330	76.399	76.517	76.043	76.755	NEG	NEG	NEG	NEG

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Table C.2 (continued)
S&GW Test Facility Test Area 1
Daily Average Tensiometer Data (mbar)

	TA1-Center					TA1-South				
Depth below IS:	6"	12"	24"	36"	42"	6"	12"	24"	36"	42"
Date	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar
10/08/12	77.229	73.669	76.755	73.787	76.399	74.618	NEG	NEG	NEG	NEG
10/09/12	75.686	75.093	74.856	75.686	74.262	75.805	NEG	NEG	NEG	NEG
10/10/12	64.292	62.749	63.699	62.987	63.224	63.224	NEG	NEG	NEG	NEG
10/11/12	52.779	52.186	52.661	51.830	52.661	51.474	NEG	NEG	NEG	NEG
10/12/12	38.299	37.112	38.299	36.281	38.299	36.044	NEG	NAN	NEG	NAN
10/13/12	35.332	32.483	34.976	32.365	34.264	32.483	NEG	NEG	NEG	NAN
10/14/12	14.324	15.867	13.968	15.392	13.968	14.799	NEG	NEG	NEG	NAN
10/15/12	25.955	24.056	26.193	23.225	26.193	22.751	NEG	NEG	NEG	NAN
10/16/12	46.726	48.625	45.421	48.981	45.064	48.863	NEG	NEG	NEG	NAN
10/17/12	34.857	34.264	34.501	33.908	34.264	33.670	NEG	NEG	NEG	NAN
10/18/12	28.567	28.923	27.854	28.567	27.380	28.092	NEG	NEG	NEG	NAN
10/19/12	61.800	61.444	61.681	61.325	61.800	61.088	NEG	NAN	NAN	NAN
10/20/12	36.519	37.468	36.163	36.875	36.044	36.163	NEG	NAN	NEG	NEG
10/21/12	NAN	NAN	NAN	NAN	NAN	NAN	NEG	NAN	NEG	NEG
10/22/12	NAN	NAN	NAN	NAN	NAN	NAN	NEG	NAN	NEG	NEG
10/23/12	15.392	13.968	15.155	13.730	14.680	13.493	NEG	NAN	NEG	NEG
10/24/12	32.839	32.246	32.602	31.534	32.483	31.059	NEG	NAN	NEG	NAN
10/25/12	48.032	48.981	47.676	48.744	47.557	48.269	NEG	NAN	NEG	NEG
10/26/12	63.224	64.055	62.275	64.292	61.681	64.174	NEG	NEG	NEG	NEG

NAN (not-a-number) indicates an exceptional occurrence in datalogger function or processing occurred (an invalid measurement).

NR indicates no reading occurred.

EM indicates an equipment malfunction occurred. We are in the process of troubleshooting the problem.

NEG indicates negative soil tensiometer readings were recorded which is being investigated

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Figure C.1
TA1 S&GW Test Facility
Soil Tension (mbar), Rainfall (inches) and Dose
15 Minute Interval

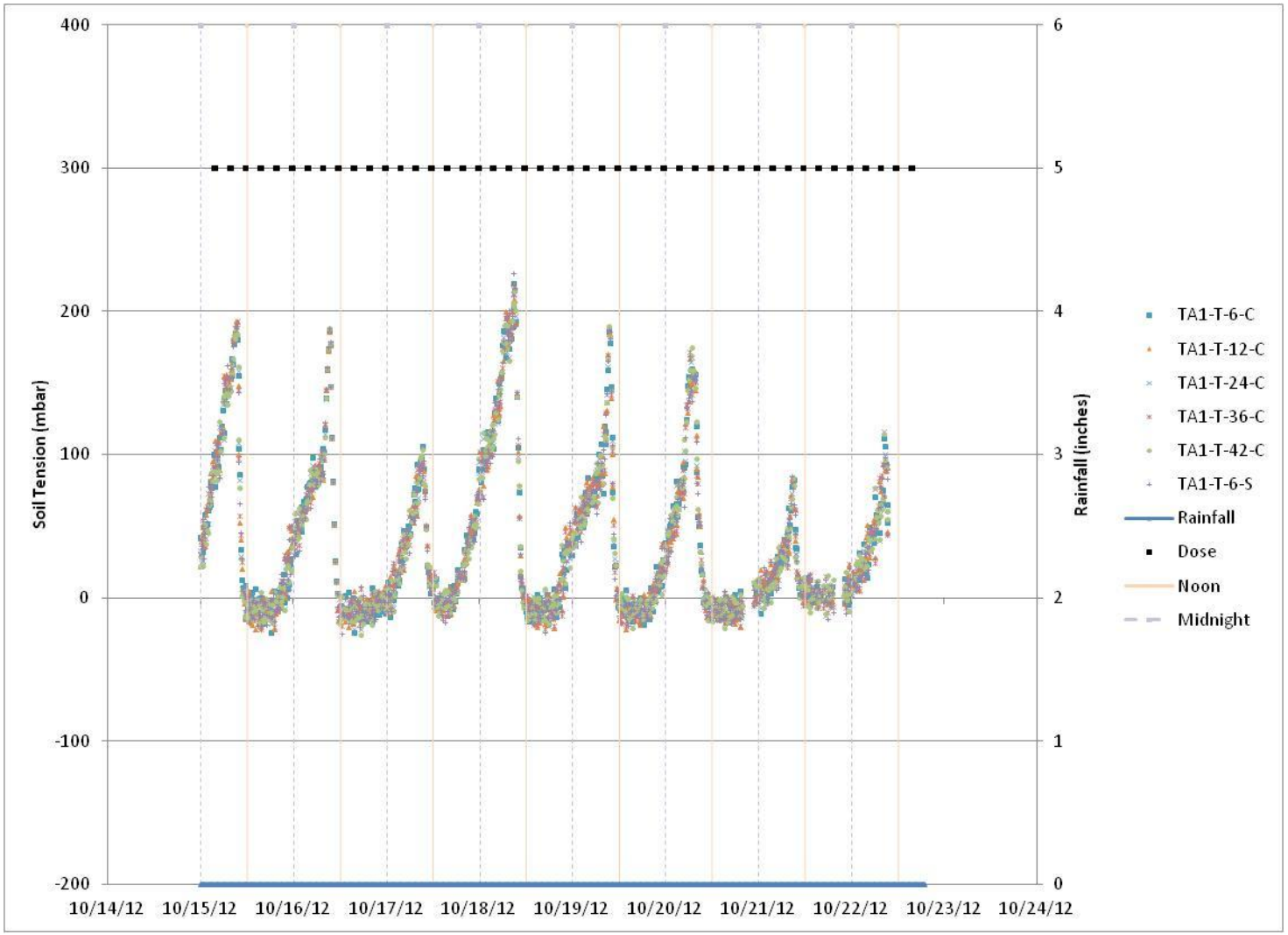

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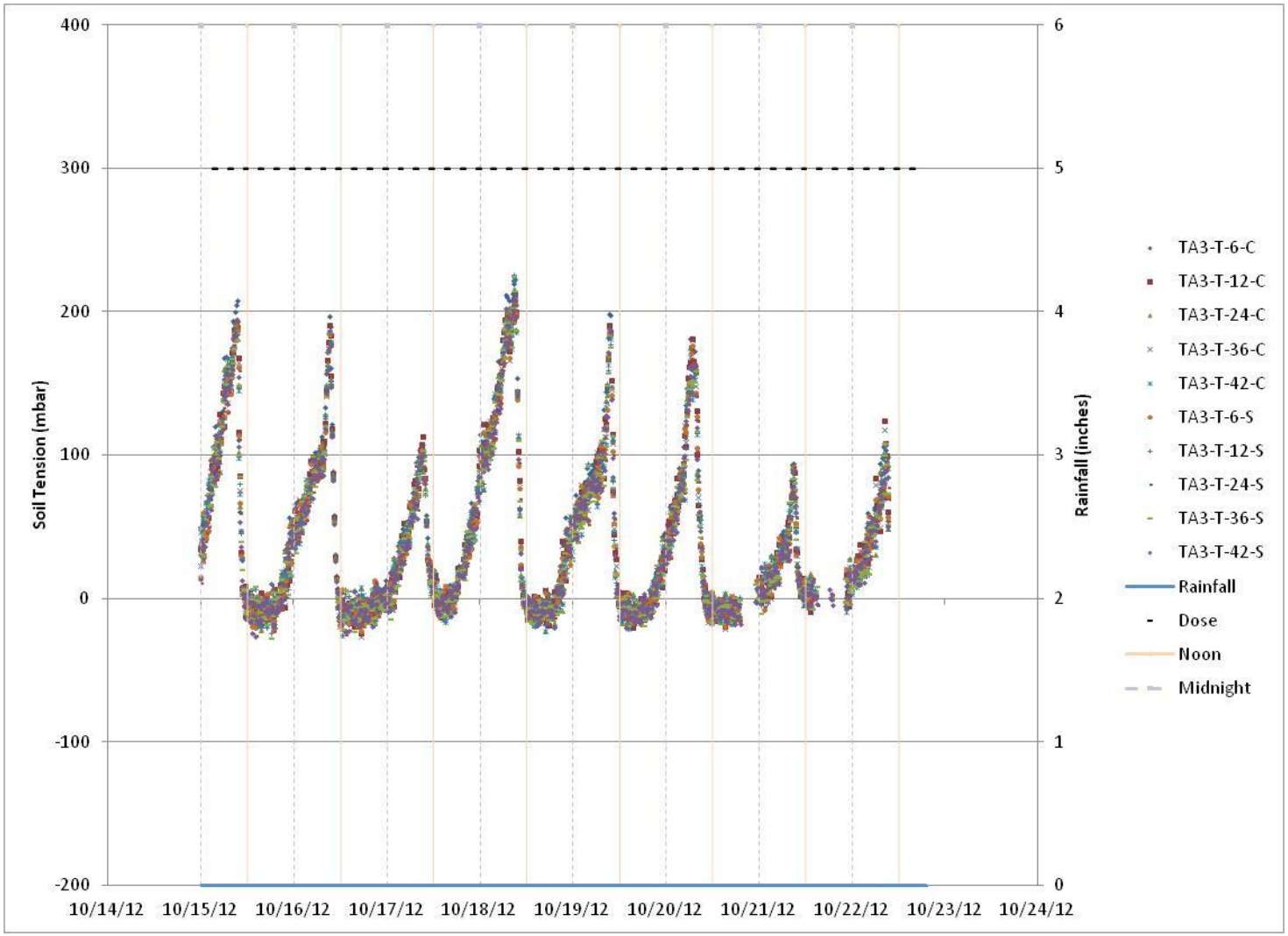
Figure C.2
TA3 S&GW Test Facility
Soil Tension (mbar), Rainfall (inches) and Dose
15 Minute Interval



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Appendix D: S&GW Test Facility Soil Moisture Data

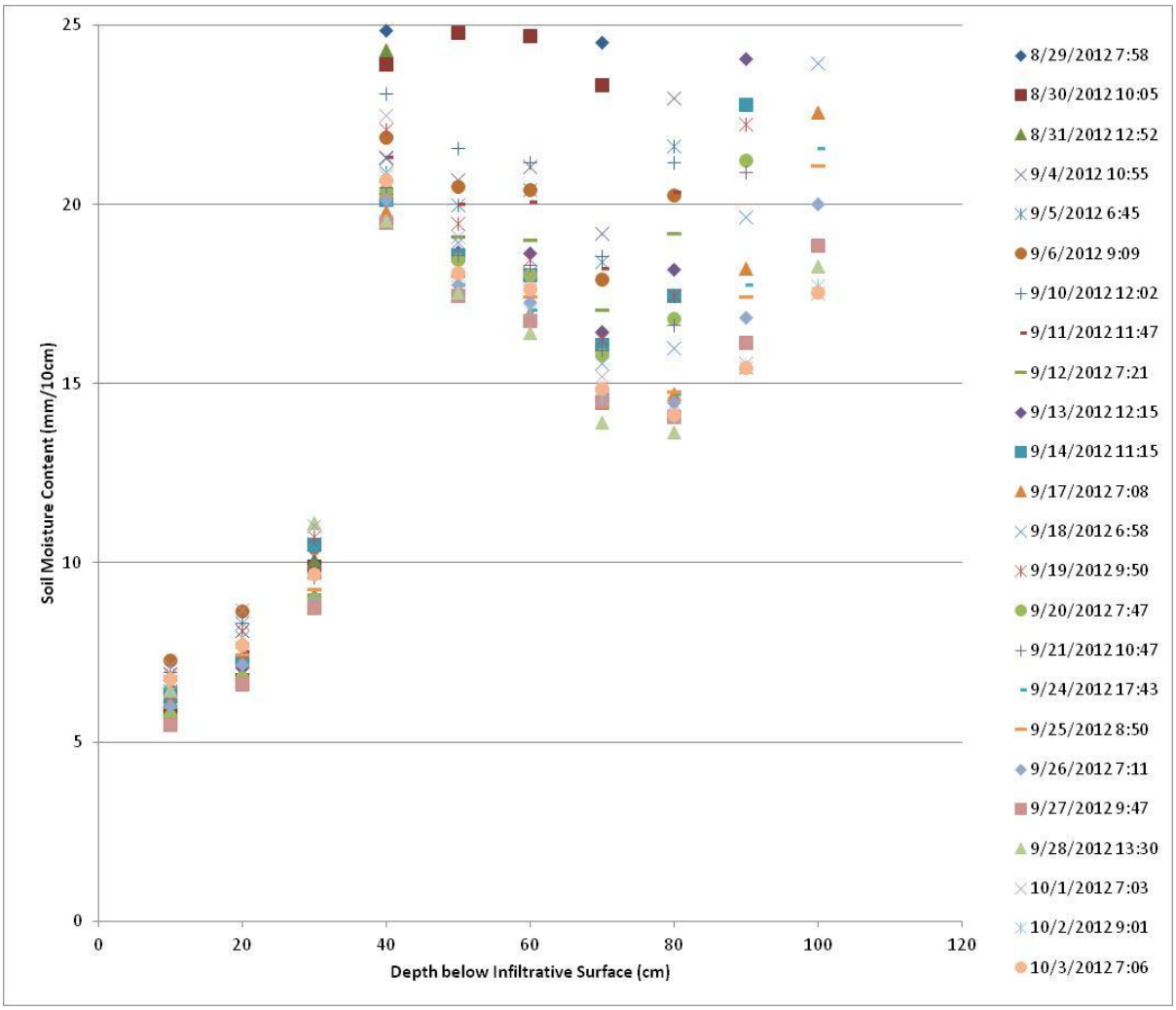

Figure D.1

Soil Moisture Test Area 1 North

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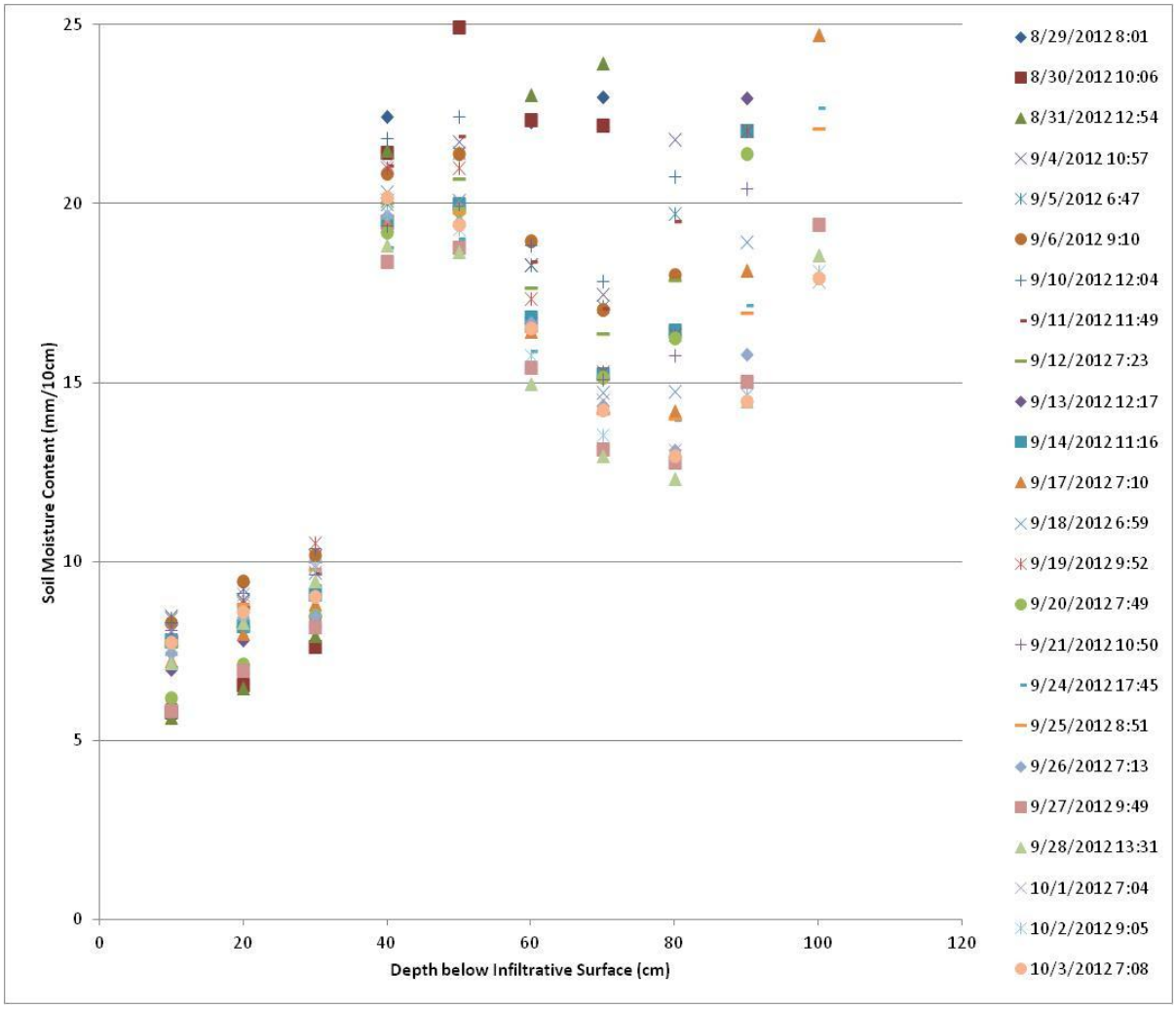

Figure D.2
Soil Moisture Test Area 1 Center

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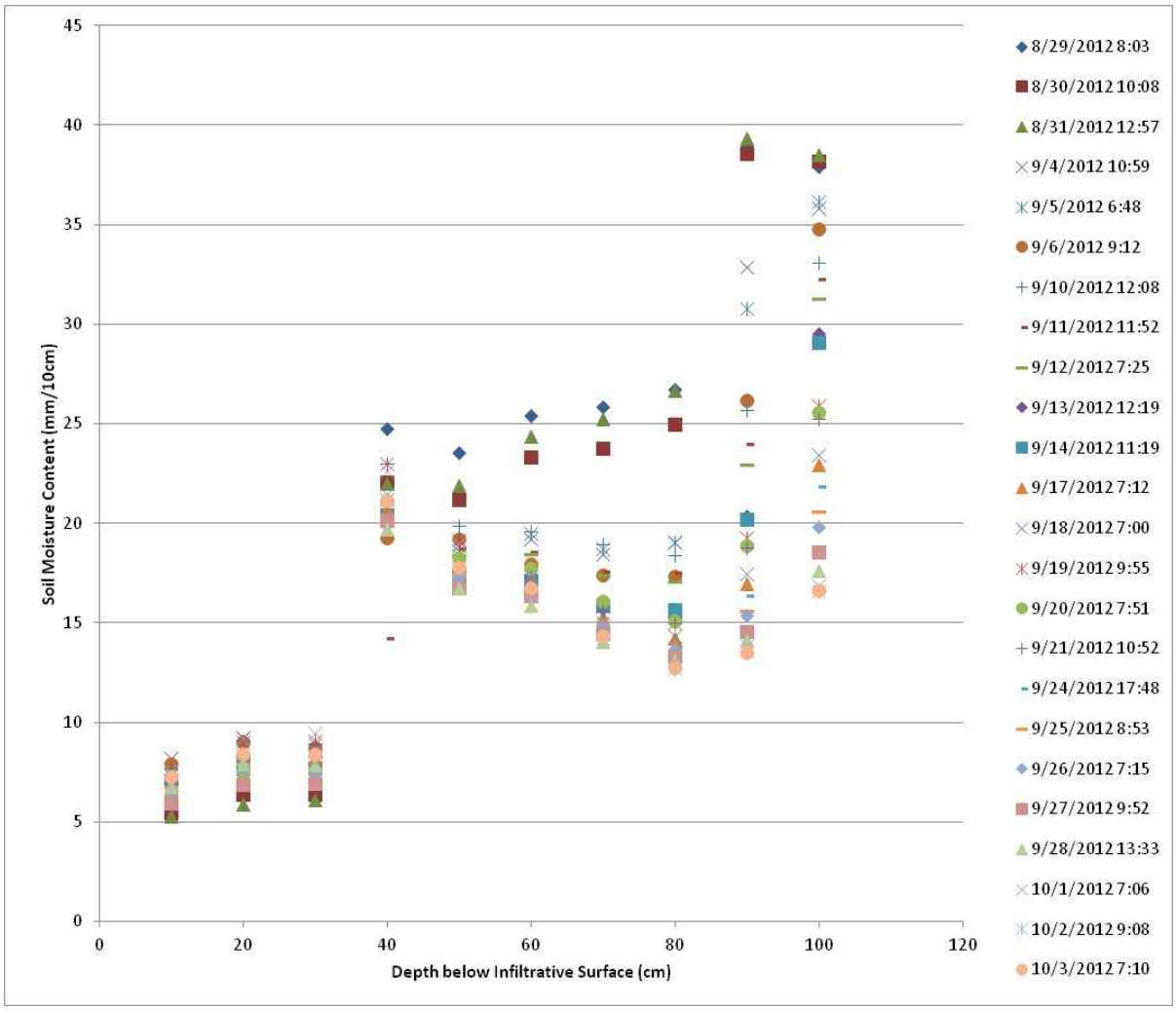

Figure D.3
Soil Moisture Test Area 1 South

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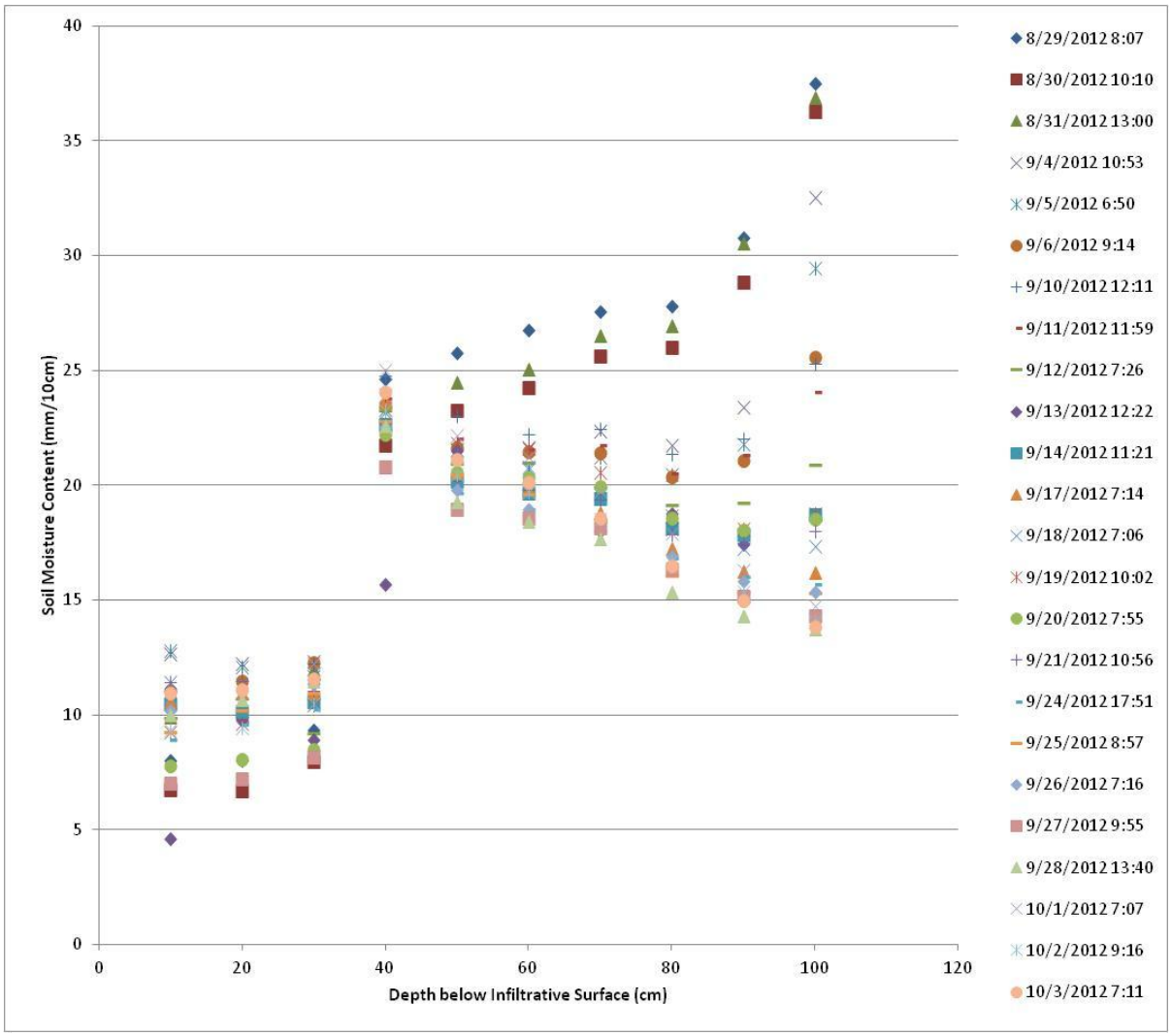

Figure D.4
Soil Moisture Test Area 3 North

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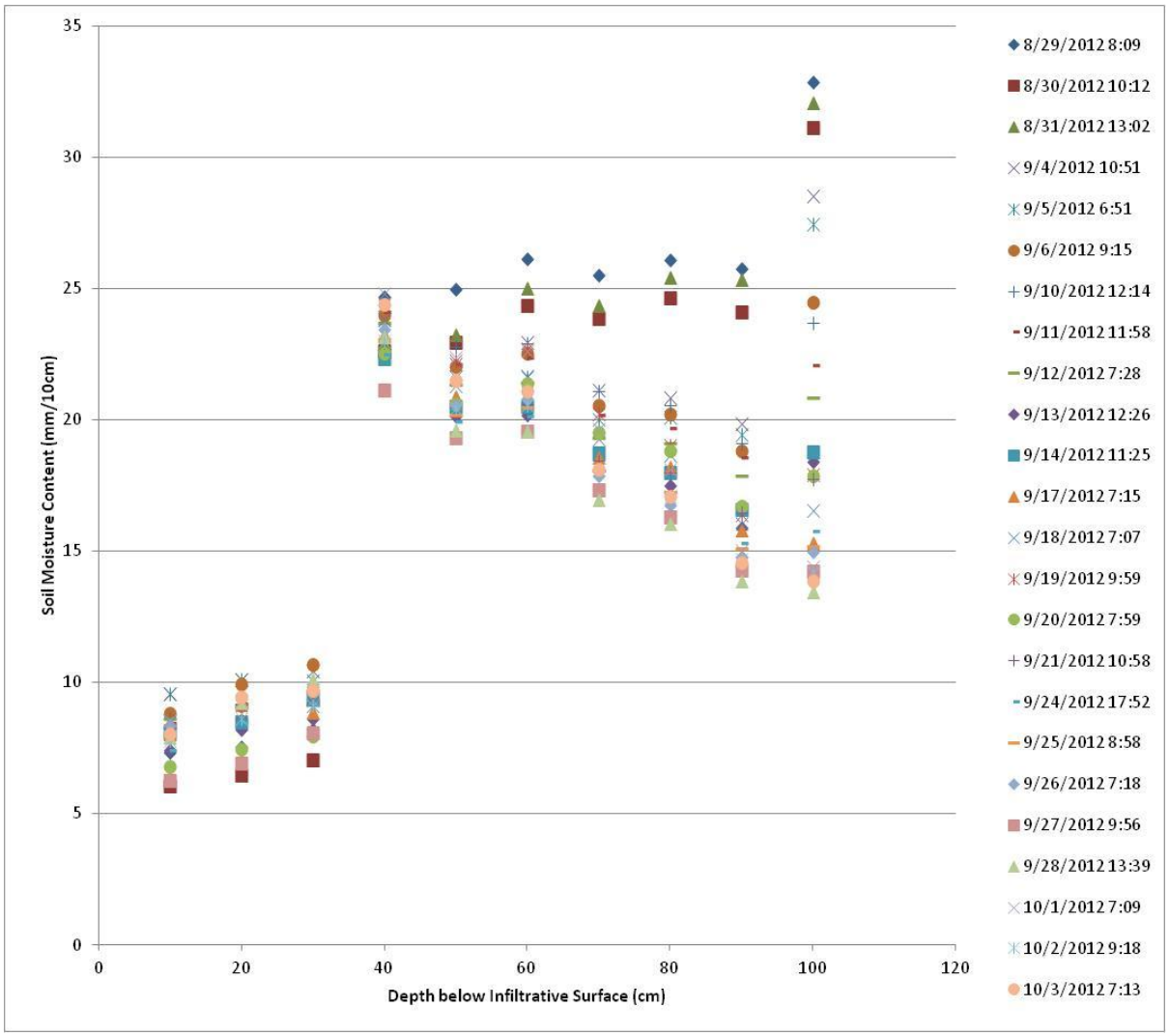

Figure D.5
Soil Moisture Test Area 3 Center

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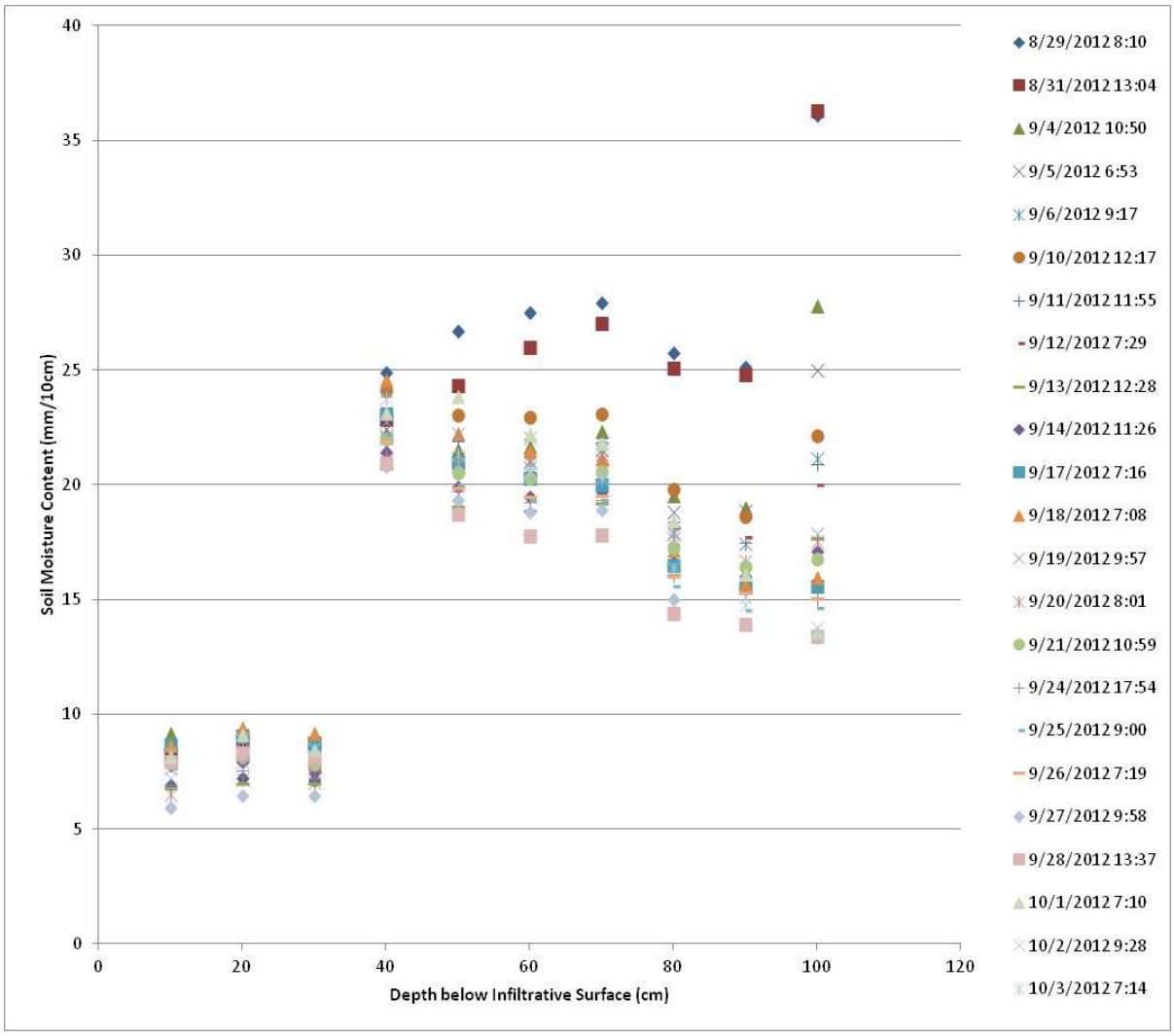

Figure D.6
Soil Moisture Test Area 3 South

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Appendix E: 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

1211968

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: SS&GW Test Facility SE #3 (STE & NO3)

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_4, TP	1LP, Cool Nox, Cl, Alkalinity, CBOD, TS, TSS	125mL P, $Na_2S_2O_3$ F-C-MF	1LP, Cool NOx, Cl, SO_4, Alkalinity, CBOD, TS, TSS	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl, CBOD, TS, TSS	1LP, Cool NOx, Cl, SO_4, Alkalinity, CBOD, TS, TSS, F, OP	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	PNRS II STE-Tank 1	10/26/12	08:58	WW		X	1	1	2										7.01	25.6	1115	.53
02	STE Pump Tank	10/26/12	0943	WW		X	1		2	1									7.56	26.8	983	.96
03	STE Pump Tank DUP	10/26/12	0947	WW		X	1		2	1									7.56	26.8	983	.96
04	NO3 Clarifier	10/26/12	0907	WW		X					1	1							7.46	25.9	693	1.56
05	NO3 Pump Tank	10/26/12	0921	WW		X	1		2				1	1					7.46	25.9	667	1.88
06	NO3 Pump Tank DUP	10/26/12	0926	WW		X	1		2				1	1					7.46	25.9	667	1.88

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
JBowling	1700 10/25/12		10-26-12 05:48
	10-26-12 1110		10-26-12 1110

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

1211969

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA1)

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 Lab Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	TA1-PAN-12-N not sampled			GW		X	1	1														
02	TA1-PZ-11-EF2 not sampled			GW		X	1	1														
03	TA1-LY-24-C	10/15/12	1405	GW		X	1	1											6.1	33.1	781	6.3
04	TA1-LY-12-S		1415	GW		X	1	1											6.7	31.9	866	6.4
05	TA1-LY-24-S		1420	GW		X			1	1									6.2	32.7	734	5.8
06	TA1-LY-42-S		1435	GW		X			1	1									5.6	30.9	816	5.5
07	TA1-PZ-11-J4	10/16/12	1127	GW		X			1	1												
08	TA1-PZ-11-K4	↓	1135	GW		X			1	1												
09	TA1-PZ-11-L2 not sampled			GW		X			1		1	1	2	1								
10	TA1-PZ-11-L2 DUP ↓			GW		X			1		1	1	2	1								
11	TA1-PZ-11-L3	10/16/12	1355	GW		X			1	1												
12	TA1-PZ-11-L3 DUP	↓	1355	GW		X			1	1												

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: J. Chambers	10-12-12 10:00	Received:	1000 101212
Relinquished:	1530 101612	Received: K Muldmach	1530 10/16/12
Relinquished:		Received:	
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:

KW 10/19/12

1211969

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

1211969

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA1)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
13	TA1-PZ-11-L4 not sampled			GW		X			1	1												
14	TA1-PZ-11-L5	10/10/12	1218	GW		X			1	1												
15	TA1-PZ-09-N3		1243	GW		X			1		1	1	2	1								
16	TA1-PZ-09-N3 DUP		1243	GW		X			1		1	1	2	1								
17	TA1-PZ-16-N3		1335	GW		X	1	1														
18	TA1-PZ-09-O7		1025	GW		X			1	1												
19	TA1-PZ-16-O7		1059	GW		X			1	1												
20	TA1-PZ-09-M9		0915	GW		X	1	1														
21	TA1-PZ-16-M9		0950	GW		X	1	1														
22	TA1-PZ-09-I7		0810	GW		X	1	1														
23	TA1-PZ-16-I7		0850	GW		X	1	1														
24	TA1-PZ-09-RS16	10/7/12	1240	GW		X	1	1														

Containers Prepared/ Relinquished	Date/Time	Received	Date/Time
J. Chambers	10-12-12 11:10		1110 10/12/12
	1425 10/7/12	K Andrewich	1425 10/10/12

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:

10/10/12

1211969

Chain of Custody.xls
Rev.Date 11/18/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211969

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA1)

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

Lab Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
25	TA1-PZ-16-RS16	10/9/12	1715	GW		X	1	1											5.9	26.4	322.1	0.13
26	TA1-PZ-09-RS18		1130	GW		X	1	1											5.4	24.5	700.5	0.55
27	TA1-PZ-16-RS18		1215	GW		X	1	1											5.7	26.3	347.4	0.14

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	10-12-12 11:10		1110 10/12/12
Relinquished:	Date/Time: 1425 10/12/12	Received: K Nudmark	Date/Time: 10/12/12 1425
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:

KW 10/10/12

1211969

Chain of Custody.xls
Rev.Date 11/15/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2219

1211971

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA2)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	TA2-PAN-12-N not sampled			GW		X	1	1														
02	TA2-PZ-10-EF2	101612	0910	GW		X			1		1	1	2	1					5.2	25.9	189.1	3.34
03	TA2-LY-24-C	101512	1150	GW		X	1	1											6.6	30.1	509	6.0
04	TA2-LY-12-S		1200	GW		X	1	1											6.8	29.5	616	6.6
05	TA2-LY-24-S		1210	GW		X			1	1									6.4	29.9	510	4.7
06	TA2-LY-42-S		1240	GW		X			1		1	1		1					5.7	28.5	433	4.5
07	TA2-PZ-10-H5	101612	0900	GW		X			1	1									4.9	26.0	306.1	1.66
08	TA2-PZ-10-J5		1040	GW		X			1	1									5.06	26.9	364.7	2.94
09	TA2-PZ-10-J5 DUP		1045	GW		X			1	1									5.06	26.9	364.7	2.94
10	TA2-PZ-10-K5		1220	GW		X			1	1									4.99	27.5	441.8	3.34
11	TA2-PZ-10-L2		0955	GW		X			1	1									4.4	26.7	264.5	0.99
12	TA2-PZ-10-L3		1010	GW		X			1	1									4.4	26.7	3003	1.45

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ J. Chambers	10-12-12 11:10		1110 10/12/12
	1530 101612		1530 10-16-12

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:

1211971

Chain of Custody.xls
Rev.Date 11/18/01

Chain of Custody

1211971

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA2)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
13	TA2-PZ-10-L4	10/6/12	1109	GW		X			1		1	1	2	1					9.6	27.2	450.5	2.41
14	TA2-PZ-10-L5		1134	GW		X			1	1									9.4	27.2	410.0	1.50
15	TA2-PZ-10-L5 DUP		1139	GW		X			1	1									9.4	27.2	410.0	1.50
16	TA2-PZ-10-L6		1203	GW		X			1	1									9.6	27.0	437.2	1.37
17	TA2-PZ-09-M4		1035	GW		X			1	1	1	1	2	1					5.3	27.1	372.7	1.01
18	TA2-PZ-16-M4		1052	GW		X	1	1											5.3	26.5	212.0	0.34
19	TA2-PZ-09-N7		0930	GW		X			1	1									5.5	26.6	[illegible]	0.33
20	TA2-PZ-09-N7 DUP		0925	GW		X			1	1									5.5	26.6	429.2	0.35
21	TA2-PZ-16-N7		0936	GW		X	1	1											5.3	26.2	212.3	0.27
22	TA2-PZ-09-I7		0930	GW		X	1	1											5.8	26.4	269.1	0.78
23	TA2-PZ-16-I7		1015	GW		X	1	1											5.7	26.4	205.1	0.18
24	TA2-PZ-09-L8		1120	GW		X	1	1											5.6	26.5	[illegible]	0.17

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	10-12-12 11:10		1110 10/12/12
Relinquished:	Date/Time: 1530 10/6/12	Received:	Date/Time:
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:

454.5 2.75

1211971

Chain of Custody.xls
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Chain of Custody

1211971

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA2)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4, TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4, TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
25	TA2-PZ-16-L8	10/6/12	1155	GW		X	1	1											5.6	26.7	208.2	0.17
26	TA2-PZ-09-TU19		0835	GW		X	1	1											4.7	26.3	187.9	0.20
27	TA2-PZ-16-TU19		0854	GW		X	1	1											5.3	25.9	194.8	0.24
28	TA2-PZ-09-TU21		0759	GW		X	1	1											4.6	26.0	170.5	0.36
29	TA2-PZ-16-TU21		0817	GW		X	1	1											5.2	25.9	185.6	0.25

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chandler	10-12-12 11:10		1110 10/12/12
	1530 10/16/12		1530 10-16-12

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:

1211971

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Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2219

1211976

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA3)

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

Lab Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	TA3-PAN-12-N not sampled			GW		X	1	1														
02	TA3-LY-24-C	101512	1100	GW		X	1	1														
03	TA3-LY-12-S		1110	GW		X			1	1									6.3	29.5	704	6.36
04	TA3-LY-12-S DUP		1115	GW		X			1	1									6.9	30.1	589	6.8
05	TA3-LY-24-S		1120	GW		X			1		1	1		1					6.9	30.1	581	6.8
06	TA3-LY-42-S		1135	GW		X	1	1											6.3	32.2	6.86	6.3
07	TA3-PZ-11-EF2 not sampled			GW		X			1	1									5.6	27.8	712	5.3
08	TA3-PZ-11-I2			GW		X			1		1	1	2	1								
09	TA3-PZ-10-J5			GW		X	1	1														
10	TA3-PZ-10-J5 DUP			GW		X	1	1														
11	TA3-PZ-10-K5			GW		X			1	1												
12	TA3-PZ-11-L2	101212	0855	GW		X			1		1	1	2	1					5.4	26.0	617	2.15

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	10-12-12 11:35		1135 10/12/12
Relinquished:	Date/Time: 1530 10/16/12	Received: K Mudmant	Date/Time: 10/16/12 1530
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:

1211976

Chain of Custody

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

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211976

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA3)

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

Lab Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
13	TA3-PZ-11-L3	10/9/12	0926	GW		X			1		1	1	2	1					5.1	26.3	582	1.29
14	TA3-PZ-11-L4 not sampled			GW		X			1	1												
15	TA3-PZ-10-L5			GW		X			1	1												
16	TA3-PZ-09-N3	10/9/12	1010	GW		X			1	1									6.7	26.8	571	0.49
17	TA2-PZ-16-N3		1040	GW		X			1	1									5.8	26.1	333	0.15
18	TA3-PZ-09-O7		0811	GW		X	1	1											6.1	25.9	399.2	0.34
19	TA3-PZ-16-O7		0831	GW		X	1	1											5.3	25.8	315.0	0.15
20	TA3-PZ-09-I7	10/6/12	1350	GW		X	1	1											7.0	27.9	689	3.83
21	TA3-PZ-16-I7		1425	GW		X	1	1											5.7	26.9	296	0.30
22	TA3-PZ-09-M9	10/7/12	0750	GW		X	1	1											6.4	25.8	366.8	1.76
23	TA3-PZ-16-M9		0825	GW		X	1	1											5.7	25.9	288	0.24
24	TA3-PZ-09-ST14	~~10/10/12~~	0735	GW		X	1	1											4.6	25.9	184.0	0.40

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	10-12-12 11:35		1135 10/12/12
	1530 10/16/12		1530 10/16/12

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:

1211976

Chain of Custody

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

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211976

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: SSGW Test Facility SE #3 (TA3)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
25	TA3-PZ-16-ST14	10/9/12	0750	GW		X	1	1											5.2	25.7	288.2	0.43
26	TA3-PZ-09-ST16	10/6/12	1346	GW		X	1	1														
27	TA3-PZ-16-ST16	/	1406	GW		X	1	1											5.5	27.1	243.4	0.50
																			5.2	26.3	266.0	0.16

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	10-12-12 11:35		1135 10/12/12
Relinquished:	Date/Time: 1530 10/16/12	Received: K Malmenk	Date/Time: 1530 10/16/12
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:

1211976

Chain of Custody

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

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2219

1211976

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA3)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	TA3-PAN-12-N			GW		X	1	1														
02	TA3-LY-24-C	101512	1100	GW		X	1	1														
03	TA3-LY-12-S		1110	GW		X			1	1									6.3	29.5	704	6.30
04	TA3-LY-12-S DUP		1115	GW		X			1	1									6.9	30.1	589	6.8
05	TA3-LY-24-S		1120	GW		X			1		1	1		1					6.9	30.1	589	6.8
06	TA3-LY-42-S		1135	GW		X	1	1											6.3	32.2	6.86	6.3
07	TA3-PZ-11-EF2			GW		X			1	1									5.6	27.8	712	5.3
08	TA3-PZ-11-I2			GW		X			1		1	1	2	1								
09	TA3-PZ-10-J5			GW		X	1	1														
10	TA3-PZ-10-J5 DUP			GW		X	1	1														
11	TA3-PZ-10-K5			GW		X			1	1												
12	TA3-PZ-11-L2			GW		X			1		1	1	2	1								

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: Q Chambers	10-12-12 11:35		1135 10/12/12
Relinquished:	1530 10/16/12	Received: K Nudimeuh	1530 10/16/12
Relinquished:		Received:	
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:

1211976

Chain of Custody.xls
Rev.Date 11/1/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211976

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA3)

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_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
13	TA3-PZ-11-L3			GW		X			1		1	1	2	1								
14	TA3-PZ-11-L4			GW		X			1	1												
15	TA3-PZ-10-L5			GW		X			1	1												
16	TA3-PZ-09-N3			GW		X			1	1												
17	TA2-PZ-16-N3			GW		X			1	1												
18	TA3-PZ-09-O7			GW		X	1	1														
19	TA3-PZ-16-O7			GW		X	1	1														
20	TA3-PZ-09-I7	10/16/12	1350	GW		X	1	1											7.0	27.9	689	3.83
21	TA3-PZ-16-I7		1425	GW		X	1	1											5.7	26.9	2906	0.30
22	TA3-PZ-09-M9			GW		X	1	1														
23	TA3-PZ-16-M9			GW		X	1	1														
24	TA3-PZ-09-ST14	~~10/16/12~~		GW		X	1	1														

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	10-12-12 11:35		1135 10/12/12
	1530 10/16/12	K Muelment	1530 10/16/12

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:

1211976

Chain of Custody

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

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211976

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA3)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
25	TA3-PZ-16-ST14			GW		X	1	1														
26	TA3-PZ-09-ST16	10/4/12	1346	GW		X	1	1														
27	TA3-PZ-16-ST16		1406	GW		X	1	1														
																			5.5	27.1	2934	0.50
																			5.2	26.3	266.0	0.16

Containers Prepared/ Relinquished	Date/Time	Received	Date/Time
J. Chambers	10-12-12 11:35		1135 10/12/12
Relinquished:	1570 10/4/12	Received: K Nordmeyer	10/16/12 1530
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:

1211976

Chain of Custody

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SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211978

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA4)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLeV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	TA4-PAN-12-N not sampled			GW		X	1	1														
02	TA4-LY-24-C	10/15/12	0935	GW		X			1	1									6.4	26.2	4.01	4.7
03	TA4-LY-12-S W 10/15/12		0950	GW		X			1		1	1		1					6.8	26.6	3.47	7.6
04	~~TA4-LY-12-S-DUP~~ TA2-LY-42.5-DUP		~~0955~~ 1245	GW		X			1		1	1		1								
05	TA4-LY-24-S		1005	GW		X	1	1											6.4	26.4	527	6.6
06	TA4-LY-42-S		1020	GW		X	1	1											6.1	26.9	617	5.7
07	TA4-PZ-11-EF2		1200	GW		X			1	1									3.90	27.2	188.5	1.42
08	TA4-PZ-10-H5		1233	GW		X			1	1									3.97	27.4	178.6	1.21
09	TA4-PZ-10-J5		1218	GW		X			1	1									3.96	27.6	283.9	2.16
10	TA4-PZ-10-K5		1144	GW		X			1		1	1	2	1					4.3	27.4	334.2	1.25
11	TA4-PZ-11-L2		1224	GW		X			1		1	1	2	1					4.9	27.2	244.7	0.92
12	TA4-PZ-11-L3		1240	GW		X			1	1									4.4	27.5	256.8	0.92

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished: J. Chamberlain	10-12-12 10:30		1030 10/12/12
Relinquished:	1540 10/15/12	Received: K Mudmeuk	10/15/12 1540
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:

1211978

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Chain of Custody

1211978

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA4)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
13	TA4-PZ-11-L4	101512	1330	GW		X			1		1	1	2	1					9.4	27.4	337.6	1.57
14	TA4-PZ-11-L5		1346	GW		X			1	1									9.3	27.1	340.6	0.94
15	TA4-PZ-11-L6		1401	GW		X			1	1									9.3	27.1	330.6	0.70
16	TA4-PZ-09-M4		1300	GW		X			1	1									6.3	27.3	518	0.65
17	TA4-PZ-16-M4		1316	GW		X	1	1											5.2	26.7	225.7	0.17
18	TA4-PZ-09-N7		1056	GW		X			1	1									5.2	27.4	259.1	1.93
19	TA4-PZ-16-N7		1114	GW		X	1	1											5.1	26.7	271.0	0.12
20	TA4-PZ-09-I7		1302	GW		X	1	1											4.95	27.9	252.2	0.99
21	TA4-PZ-16-I7		1342	GW		X	1	1											4.68	26.6	213.9	0.18
22	TA4-PZ-09-L8		1147	GW		X	1	1											6.2	27.2	294.4	0.45
23	TA4-PZ-16-L8		1205	GW		X	1	1											5.1	26.6	271.7	0.19
24	TA4-PZ-09-TU14		1019	GW		X	1	1											4.6	27.0	187.0	0.69

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Champeau	10-12-12 11:00		1100 10/12/12
Relinquished:	Date/Time: 1540 10/15/12	Received: K Mudmann	Date/Time: 10/15/12 1540
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:

1211978

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211978

Client Name: Hazen and Sawyer	Contact / Phone:
Project Name / Location: S&GW Test Facility SE #3 (TA4)	
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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
25	TA4-PZ-15-TU14	10/5/12	1037	GW		X	1	1											5.1	26.6	205.8	0.19
26	TA4-PZ-09-TU16		0940	GW		X	1	1											5.3	27.0	189.5	0.63
27	TA4-PZ-16-TU16		0959	GW		X	1	1											5.2	26.4	241.9	0.19

Containers Prepared/ Relinquished	Date/Time	Received	Date/Time
J. Chambers	10-12-12 11:00		1100 10/12/12
	1540 10/15/12	K Muldmark	1540 10/15/12

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:

1211978

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Rev.Date 11/19/01

Chain of Custody

1211979

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Client Name: Hazen and Sawyer
Contact / Phone:
Project Name / Location: S&GW Test Facility SE #3 (TA5)
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

Lab Use Only	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, SO_4, Alkalinity, CBOD, TSS	1LP, NaOH, Zn Acetate H_2S	125mL P, $Na_2S_2O_3$ FC-MF								Field pH	Field Temperature	Field Conductivity	Field DO
01	TA5-PZ-1 not sampled			GW		X	1	1	1	2											
02	TA5-PZ-1 Dup not sampled			GW		X	1	1	1	2											
03	TA5-LY-C	10/5/12	1310	GW		X	1	1	1	2								5.8	30.7	1663	6.2
04	TA5-LINER-SP not sampled			GW		X	1	1	1	2											
05	TA5-Denite Tank	10/16/12	1345	GW		X	1	1	1	2								7.2	27.9	1082	0.10
06	TA5-Denite Tank DUP	/	1350	GW		X	1	1	1	2								7.2	27.9	1082	0.10

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
B Bowling	10/12/12 1330		1330 10/12/12
	1530 10/16/12	Mudmeard	10/16/12 1530

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:

1211979

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Chain of Custody

1211981

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA6)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4, TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, SO_4, Alkalinity, CBOD, TSS	1LP, NaOH, Zn Acetate H_2S	125mL P, $Na_2S_2O_3$ FC-MF								Field pH	Field Temperature	Field Conductivity	Field DO
01	TA6-PZ-1	10/7/12	1200	GW		X	1	1	1	2								5.9	27.0	329.8	0.62
02	TA6-PZ-1 DUP		1211	GW		X	1	1	1	2								5.9	27.0	329.8	0.62
03	TA6-LY-C	10/5/12	1330	GW		X	1	1	1	2								6.1	30.9	403	5.9
04	TA6-LINER-SP not sampled	10/7/12	1215	GW		X	1	1	1	2											
05	TA6-Denite Tank		1225	GW		X	1	1	1	2								6.5	26.0	544	0.90

Containers Prepared/ Relinquished	Date/Time	Received	Date/Time
J. Chambers	10-12-12 13:20		1320 10/2/12
	1530 10/6/12		1530 10-16-12
	1520 10-16-12		1530 10/6/12
	1425 10/7/12		1425 10-17-12

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:

1211981

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

1211983

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (BKG)

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

Lab Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	PZ01-BKG-09	10/16/12	1955	GW		X	1	1											4.7	29.1	53.0	3.4
02	LY01-BKG-24	10/15/12	0915	GW		X	1	1											6.3	26.8	107	6.7
03	LY02-BKG-42	10/16/12	1510	GW		X	1	1											6.7	32.6	512	5.7
04	PZ04-BKG-09	10/16/12	0935	GW		X	1	1											5.5	26.5	105.3	2.6
05	PZ05-BKG-09	10/17/12	0907	GW		X	1	1											5.3	25.9	46.4	0.24
06	PZ24-BKG-26		1141	GW		X			1	1									5.1	25.4	283.1	0.46
07	PZ24-BKG-26 DUP		1146	GW		X			1	1									5.1	25.4	283.1	0.46
08	PZ29-BKG09	10/16/12	10:05	GW		X			1	1									4.9	26.9	214.4	1.1
09	PZ30-BKG-16	10/16/12	10:46	GW		X			1	1									5.6	26.7	288	2.4
10	PZ31-BKG-26	10/16/12	11:10	GW		X			1	1									5.1	26.3	325	3.7
11	PZ31-BKG-26 DUP	10/16/12	11:12	GW		X			1	1									5.1	26.3	325	3.7
12	PZ32-BKG09	10/16/12	11:35	GW		X			1	1									4.5	27.6	163	3.1

Relinquished:	Date/Time:	Received:	Date/Time:
Containers Prepared/ Relinquished: J. Chambers	10-12-12 11:55	[signature]	1155 10/12/12
Relinquished: [signature]	1520 10/16/12	[signature]	
Relinquished: [signature]			
Relinquished:	1425 10-17-12		
Relinquished:			

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:

1211983

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211983

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (BKG)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
13	PZ33-BKG-16	10/16/12	12:01	GW		X			1	1									5.1	27.2	342	1.5
14	PZ34-BKG-26	10/16/12	13:05	GW		X			1	1									5.6	26.8	316	2.8
15	PZ35-BKG09	10/17/12	0929	GW		X	1			1									6.6	26.1	472.9	1.57
16	PZ36-BKG-16		0946	GW		X	1			1									5.1	26.0	321.2	0.17
17	PZ37-BKG-26		1007	GW		X			1	1									5.0	25.4	331.3	0.12
18	PZ38-BKG09		1032	GW		X	1			1									5.9	26.0	396.2	0.24
19	PZ39-BKG-16		1048	GW		X	1			1									5.8	25.6	226.0	0.18
20	PZ40-BKG-26		1113	GW		X	1			1									5.2	24.5	305.6	0.12

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
G. Chambers	10-12-12 11:55		1150 10/12/12
Relinquished:	Date/Time: 1530 10/12/12	Received:	Date/Time:
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:

1211983

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211985

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (PZ41-50)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	PZ-41	10/16/12	1550	GW		X	1	1														
02	PZ-42	↓	1610	GW		X	1	1														
03	PZ-43	↓	1327	GW		X	1	1														
04	PZ-44 not sampled			GW		X	1	1														
05	PZ-45			GW		X	1	1														
06	PZ-46			GW		X	1	1														
07	PZ-47			GW		X	1	1														
08	PZ-48			GW		X	1	1														
09	PZ-49			GW		X	1	1														
10	PZ-50			GW		X	1	1														

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time: 1530 10/16/12	Received: K Nudmark	Date/Time: 10/16/12 1530
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:

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

1211987

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (FB & EB)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	FB - Tap	10/5/12	0910	DW		X	1			1									6.8	25.7	410.6	4.61
02	FB - DI		0900	R		X	1			1									8.2	23.6	2.3	3.63
03	EB		0905	R		X			1		1	1	2	1					8.2	23.6	2.3	3.63

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
Bowling	1200 10/12/12		1200 10/12/12
	1540 10/5/12	K Mudmach	1540 10/15/12

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:

1211987

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Rev.Date 11/19/01

Chain of Custody

1212351

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2219

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: SEGW Test Facility SE #3 (TA5)

Samplers: (Signature) [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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, SO_4, Alkalinity, CBOD, TSS	1LP, NaOH, Zn Acetate H_2S	125mL P, $Na_2S_2O_3$ FC-MF	nitrate nitrite							Field pH	Field Temperature	Field Conductivity	Field DO
01	TA5-PZ-1	10/25/12	11:38	GW		X	1	1	1	2								4.43	27.1	376.4	0.44
02	TA5-PZ-1 Dup	10/25/12	11:45	GW		X	1	1	1	2								"	"	"	"
03	PZ40-846-26	10/25/12	12:52	GW		X					1							3.62	25.3	313.3	0.18

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
[signature]	10-22-12 12:15	[signature]	10-25-12 06:03
[signature]	10-25-12 14:40	[signature]	1440 10-25-12
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:

1212351

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Rev.Date 11/19/01

Chain of Custody

1212352

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1944 fax 813-855-2218

Client Name: Hazen and Sewyer
Contact / Phone:
Project Name / Location: S&GW Test Facility SS #3 (TA3)
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

Lab Sample	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
01	TA3-PZ-11-EF2	10/23/12	1450 ~~1400~~	GW		X			1	1									4.81	26.7	336.6	0.44
02	TA3-PZ-11-I2	10/23/12	14:18	GW		X			1		1	1	2	1					4.56	26.6	376.6	0.80
03	TA3-PZ-10-J5	10/23/12	13:50	GW		X	1	1											4.33	26.8	331.1	1.03
04	TA3-PZ-10-J5 DUP	10/23/12	13:55	GW		X	1	1											4.33	26.8	321.1	1.03
05	TA3-PZ-10-K5	10/23/12	13:20	GW		X			1	1									4.36	26.7	369.6	0.51

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
D. Chambers	10-22-12 12:10		10-23-12 07:10
	10-23-12 16:45		16:45 10-23-12
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:

1212352

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Rev.Date 11/19/01

Chain of Custody

1212352

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: SA GW Test Facility SE #3 (TA3)

Samplers: (Signature) [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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
																			4.39	27.1	494	.71
06	TA3-PZ-11-L4	10/23/12	13:00	GW		X			1	1									4.42	27.1	424	.31
07	TA3-PZ-10-L5	10/23/12	12:40	GW		X			1	1												

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
[signature]	10-22-12 12:10	10-23-12 0710	[signature]
Relinquished: [signature]	Date/Time: 10-23-12 1645	Received: [signature]	Date/Time: 1645 10-23-12
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:

1212352

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Chain of Custody

1212355

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Client Name: Hazen and Sawyer
Contact / Phone:
Project Name / Location: S&GW Test Facility SE #3 (TA1)
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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
																			4.45	26.6	225.1	1.26
01	TA1-PZ-11-EF2	10/23/12	10:05	GW		X	1	1														
02	TA1-PZ-11-L2	10/23/12	1055	GW		X			1		1	1	2	1					4.52	27.4	713	2.04
03	TA1-PZ-11-L2 DUP	10/23/12	1100	GW		X			1		1	1	2	1					4.52	27.4	713	2.04

Relinquished	Date/Time	Received	Date/Time
Containers Prepared/ Relinquished:	10-22-12 12:10		10-23-12 0710
	10-23-12 1645		1045 10-23-12

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:

1212355

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Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

1212355

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: SJ GW Test Facility SE #3 (TA1)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4	1LP, Cool NOx, Cl	250mL P, H_2SO_4 TKN, NH_4, COD, TP	1LP, Cool NOx, Cl, Alkalinity	1LP, Cool NOx, Cl, Alkalinity, F, OP, SO_4	250mLaG, Cool DOC	40mLaV, HCl TOC	250mL P, HNO_3 B, Ca, Fe, Mg, Mn, K, Na					Field pH	Field Temperature	Field Conductivity	Field DO
D4	TA1-PZ-11-L4	10/23/12	1035	GW		X			1	1									4.81	26.9	252.3	1.04

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
J. Chambers	10-23-12 12:15	J. Dell	10/23/12 0710
J. Dell	10-23-12 1645	[illegible]	1645 10-23-12
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N N/A (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:

1212355

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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. 12125226

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: ~~Hillsborough County C-H34 SE#1~~ S & GW SE# 3

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	1LP, Cool Cl	250mL P, H_2SO_4 TKN, NOx, NH3					Field Temperature	Field pH	Field Conductivity	Field DO					
01	PZ-51	10/25/12	10:10	GW		X	1	1				26.1	~~5.59~~ 25.1	5.59	111.6	3.65					
02	PZ-52	10/25/12	09:37	GW		X							25.6	5.91	531	5.04					
03	PZ-53	10/25/12	09:35	GW		X							26.0	5.27	135.2	2.67					
				GW		X															
				GW		X															
				GW		X															
				GW		X															
				GW		X															
				GW		X															
				GW		X															
				GW		X															
				GW		X															

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
Bowling	1530 8/28/12	UPS	
Relinquished: UPS	Date/Time:	Received:	Date/Time: 08/29/12 13:00pm
Relinquished:	Date/Time: 12:00pm 10/23/12	Received:	Date/Time: 10/23/12 12:00
Relinquished:	Date/Time: 10/25/12 14:48	Received:	Date/Time: 1448 10-25-12
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:

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SOUTHERN ANALYTICAL LABORATORIES, INC.

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

1212537

Client Name: Hazen and Sawyer

Contact / Phone:

Project Name / Location: S&GW Test Facility SE #3 (TA5)

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

	Sample Description	Date	Time	Matrix	Composite	Grab	250mL P, H_2SO_4 TKN, NH_4, ~~COD, TP~~	1LP, Cool NOx, ~~Cl, SO_4, Alkalinity, CBOD, TSS~~	~~1LP, NaOH, Zn-Acetate H_2S~~	~~125mL P, $Na_2S_2O_3$ FC-MF~~									Field pH	Field Temperature	Field Conductivity	Field DO
01	TA5-LINER-SP	10-25-12	1130	GW		X	1	1	1	1												

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received: J Harmile	Date/Time: 1448 10-25-12
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:

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Chain of Custody

Appendix F: Field Parameter Analyses

Table F.1
S&GW Test Facility Field Parameter Results
(October 15 through October 26, 2012)

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (µS)	DO (mg/L)
Effluent samples					
PNRS II STE - Tank 1	10/26/12 8:58	25.6	7.0	1,115	0.5
STE Pump Tank	10/26/12 9:43	26.8	7.6	983	1.0
STE Pump Tank - DUP	10/26/12 9:47	26.8	7.6	983	1.0
NO3 Clarifier	10/26/12 9:07	25.9	7.5	643	1.6
NO3 Pump Tank	10/26/12 9:21	25.9	7.5	667	1.9
NO3 Pump Tank - DUP	10/26/12 9:26	25.9	7.5	667	1.9
Soil moisture samples					
TA1-LY-12-S	10/15/12 14:15	31.9	6.7	866	6.4
TA1-LY-24-C	10/15/12 14:05	33.1	6.1	781	6.3
TA1-LY-24-S	10/15/12 14:20	32.7	6.2	734	5.8
TA1-LY-42-S	10/15/12 14:35	30.9	5.6	816	5.5
TA2-LY-12-S	10/15/12 12:00	29.5	6.8	616	6.6
TA2-LY-24-C	10/15/12 11:50	30.1	6.6	509	6.0
TA2-LY-24-S	10/15/12 12:10	29.9	6.4	510	4.7
TA2-LY-42-S	10/15/12 12:40	28.5	5.7	433	4.5
TA3-LY-12-S	10/15/12 11:10	30.1	6.9	589	6.8
TA3-LY-12-S DUP	10/15/12 11:15	30.1	6.9	589	6.8
TA3-LY-24-C	10/15/12 11:00	29.5	6.3	704	6.4
TA3-LY-24-S	10/15/12 11:20	30.2	6.3	616	6.3
TA3-LY-42-S	10/15/12 11:35	27.8	5.6	712	5.3
TA4-LY-12-S	10/15/12 9:50	26.6	6.8	364	7.6
TA4-LY-12-S-DUP	10/15/12 9:55	26.6	6.8	364	7.6
TA4-LY-24-C	10/15/12 9:35	26.2	6.4	461	4.7
TA4-LY-24-S	10/15/12 10:05	26.4	6.4	527	6.6
TA4-LY-42-S	10/15/12 10:20	26.9	6.1	617	5.7
LY01-BKG-24	10/15/12 9:15	26.8	6.3	107	6.7
LY02-BKG-42	10/16/12 15:10	32.6	6.7	512	5.7

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Table F.1
S&GW Test Facility Field Parameter Results
(October 15 through October 26, 2012)

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (µS)	DO (mg/L)
Groundwater samples					
TA1-PZ-11-EF2	10/23/12 10:05	26.6	4.4	225	1.3
TA1-PZ-11-J4	10/18/12 11:27	27.6	4.7	233	1.1
TA1-PZ-11-K4	10/18/12 11:55	27.8	4.7	231	1.3
TA1-PZ-11-L2	10/23/12 10:55	27.4	4.5	713	2.0
TA1-PZ-11-L2 DUP	10/23/12 11:00	27.4	4.5	713	2.0
TA1-PZ-11-L3	10/18/12 13:55	27.7	4.8	406	2.0
TA1-PZ-11-L3 DUP	10/18/12 13:55	27.7	4.8	406	2.0
TA1-PZ-11-L4	10/23/12 10:35	26.9	4.8	252	1.0
TA1-PZ-11-L5	10/18/12 12:18	27.8	4.9	253	1.5
TA1-PZ-09-N3	10/18/12 12:43	28.6	6.3	665	2.9
TA1-PZ-09-N3 DUP	10/18/12 12:43	28.6	6.3	665	2.9
TA1-PZ-16-N3	10/18/12 13:35	27.0	5.2	287	0.2
TA1-PZ-09-O7	10/18/12 10:25	26.9	5.6	282	0.9
TA1-PZ-16-O7	10/18/12 10:59	26.7	5.2	319	0.2
TA1-PZ-09-M9	10/18/12 9:15	26.5	6.0	242	2.5
TA1-PZ-16-M9	10/18/12 9:50	26.5	5.2	313	0.5
TA1-PZ-09-I7	10/18/12 8:10	25.7	5.5	209	3.5
TA1-PZ-16-I7	10/18/12 8:50	26.1	5.2	311	0.3
TA1-PZ-09-RS16	10/17/12 12:40	26.6	6.1	189	0.6
TA1-PZ-16-RS16	10/17/12 13:15	26.4	5.9	323	0.1
TA1-PZ-09-RS18	10/17/12 11:30	26.5	5.8	200	0.6
TA1-PZ-16-RS18	10/17/12 12:15	26.3	5.7	317	0.1
TA2-PZ-10-EF2	10/16/12 8:10	25.8	5.2	189	3.3
TA2-PZ-10-H5	10/16/12 8:50	26.0	4.9	306	1.7
TA2-PZ-10-J5	10/16/12 10:40	26.9	5.1	365	2.9
TA2-PZ-10-J5 DUP	10/16/12 10:45	26.9	5.1	365	2.9
TA2-PZ-10-K5	10/16/12 12:20	27.8	5.0	442	3.3
TA2-PZ-10-L2	10/16/12 9:55	26.7	4.4	264	1.0
TA2-PZ-10-L3	10/16/12 10:10	26.7	4.4	300	1.4
TA2-PZ-10-L4	10/16/12 11:09	27.2	4.6	450	2.4

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Table F.1
S&GW Test Facility Field Parameter Results
(October 15 through October 26, 2012)

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (µS)	DO (mg/L)
TA2-PZ-10-L5	10/16/12 11:34	27.2	4.4	410	1.5
TA2-PZ-10-L5 DUP	10/16/12 11:39	27.2	4.4	410	1.5
TA2-PZ-10-L6	10/16/12 12:03	27.0	4.6	437	1.4
TA2-PZ-09-M4	10/16/12 10:55	27.1	5.3	373	1.0
TA2-PZ-16-M4	10/16/12 10:52	26.5	5.3	212	0.3
TA2-PZ-09-N7	10/16/12 9:20	26.6	5.5	429	0.4
TA2-PZ-09-N7 DUP	10/16/12 9:25	26.6	5.5	429	0.4
TA2-PZ-16-N7	10/16/12 9:36	26.2	5.3	212	0.2
TA2-PZ-09-I7	10/16/12 9:30	26.4	5.8	264	0.8
TA2-PZ-16-I7	10/16/12 10:15	26.4	5.7	205	0.2
TA2-PZ-09-L8	10/16/12 11:20	27.5	6.6	454	2.8
TA2-PZ-16-L8	10/16/12 11:55	26.7	5.6	208	0.2
TA2-PZ-09-TU19	10/16/12 8:35	26.3	4.7	188	0.2
TA2-PZ-16-TU19	10/16/12 8:54	25.9	5.3	195	0.2
TA2-PZ-09-TU21	10/16/12 7:59	26.0	4.6	170	0.4
TA2-PZ-16-TU21	10/16/12 8:14	25.9	5.2	186	0.2
TA3-PZ-11-EF2	10/23/12 14:50	26.7	4.8	331	0.4
TA3-PZ-11-I2	10/23/12 14:18	26.6	4.6	377	0.8
TA3-PZ-10-J5	10/23/12 13:50	26.8	4.3	331	1.0
TA3-PZ-10-J5 DUP	10/23/12 13:55	26.8	4.3	331	1.0
TA3-PZ-10-K5	10/23/12 13:20	26.7	4.4	370	0.5
TA3-PZ-11-L2	10/17/12 8:55	26.0	5.4	617	2.2
TA3-PZ-11-L3	10/17/12 9:26	26.3	5.1	522	1.3
TA3-PZ-11-L4	10/23/12 13:00	27.1	4.4	494	0.7
TA3-PZ-10-L5	10/23/12 12:40	27.1	4.4	424	0.3
TA3-PZ-09-N3	10/17/12 10:10	26.8	6.7	571	0.5
TA3-PZ-16-N3	10/17/12 10:40	26.1	5.8	333	0.2
TA3-PZ-09-O7	10/17/12 8:11	25.9	6.1	398	0.3
TA3-PZ-16-O7	10/17/12 8:31	25.8	5.3	315	0.2
TA3-PZ-09-I7	10/16/12 13:50	27.9	7.0	689	3.8
TA3-PZ-16-I7	10/16/12 14:25	26.9	5.7	291	0.3

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Table F.1
S&GW Test Facility Field Parameter Results
(October 15 through October 26, 2012)

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (µS)	DO (mg/L)
TA3-PZ-09-M9	10/17/12 7:50	25.8	6.4	367	1.8
TA3-PZ-16-M9	10/17/12 8:25	25.9	5.7	288	0.2
TA3-PZ-09-ST14	10/17/12 7:35	25.9	4.6	184	0.4
TA3-PZ-16-ST14	10/17/12 7:50	25.7	5.2	288	0.4
TA3-PZ-09-ST16	10/16/12 13:46	27.1	5.5	243	0.5
TA3-PZ-16-ST16	10/16/12 14:06	26.3	5.2	266	0.2
TA4-PZ-11-EF2	10/15/12 12:00	27.2	3.9	188	1.4
TA4-PZ-10-H5	10/15/12 12:33	27.4	4.0	179	1.2
TA4-PZ-10-J5	10/15/12 14:18	27.6	4.0	284	2.2
TA4-PZ-10-K5	10/15/12 14:14	27.4	4.3	334	1.2
TA4-PZ-11-L2	10/15/12 12:24	27.2	4.8	267	0.9
TA4-PZ-11-L3	10/15/12 12:40	27.5	4.4	287	0.9
TA4-PZ-11-L4	10/15/12 13:30	27.4	4.4	338	1.6
TA4-PZ-11-L5	10/15/12 13:40	27.1	4.3	341	0.9
TA4-PZ-11-L6	10/15/12 14:01	27.1	4.3	331	0.7
TA4-PZ-09-M4	10/15/12 13:00	27.3	6.3	518	0.6
TA4-PZ-16-M4	10/15/12 13:16	26.7	5.2	226	0.1
TA4-PZ-09-N7	10/15/12 10:56	27.4	5.2	259	1.9
TA4-PZ-16-N7	10/15/12 11:14	26.7	5.1	221	0.1
TA4-PZ-09-I7	10/15/12 13:02	27.9	5.0	237	1.0
TA4-PZ-16-I7	10/15/12 13:42	26.6	4.7	214	0.2
TA4-PZ-09-L8	10/15/12 11:47	27.2	6.2	294	0.4
TA4-PZ-16-L8	10/15/12 12:05	26.6	5.1	222	0.2
TA4-PZ-09-TU14	10/15/12 10:19	27.0	4.6	198	0.7
TA4-PZ-16-TU14	10/15/12 10:33	26.6	5.1	226	0.2
TA4-PZ-09-TU16	10/15/12 9:40	27.0	5.3	190	0.6
TA4-PZ-16-TU16	10/15/12 9:59	26.4	5.2	242	0.2
PZ01-BKG-09	10/16/12 14:55	29.1	4.7	53	3.4
PZ04-BKG-09	10/16/12 9:35	26.5	5.5	105	2.6
PZ05-BKG-09	10/17/12 9:02	25.9	5.3	66	0.2
PZ24-BKG-26	10/17/12 11:41	25.4	5.1	283	0.5

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Table F.1
S&GW Test Facility Field Parameter Results
(October 15 through October 26, 2012)

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (µS)	DO (mg/L)
PZ24-BKG-26 DUP	10/17/12 11:46	25.4	5.1	283	0.5
PZ29-BKG09	10/16/12 10:05	26.9	4.9	214	1.1
PZ30-BKG-16	10/16/12 10:46	26.7	5.6	288	2.4
PZ31-BKG-26	10/16/12 11:10	26.3	5.1	325	3.7
PZ31-BKG-26 DUP	10/16/12 11:12	26.3	5.1	325	3.7
PZ32-BKG-09	10/16/12 11:35	27.6	4.5	163	3.1
PZ33-BKG-16	10/16/12 12:01	27.2	5.1	342	1.5
PZ34-BKG-26	10/16/12 13:05	26.8	5.6	316	2.8
PZ35-BKG09	10/17/12 9:29	26.1	6.6	473	1.5
PZ36-BKG-16	10/17/12 9:46	26.0	5.1	321	0.2
PZ37-BKG-26	10/17/12 10:07	25.4	5.0	331	0.1
PZ38-BKG09	10/17/12 10:32	26.0	5.9	196	0.2
PZ39-BKG-16	10/17/12 10:48	25.6	5.8	226	0.2
PZ40-BKG-26	10/17/12 11:13	24.9	5.2	310	0.1
PZ-41	10/16/12 15:50	27.8	5.0	901	6.8
PZ-42	10/16/12 16:10	27.6	5.0	882	5.8
PZ-43	10/16/12 13:27	27.7	5.0	98	4.7
PZ-44	10/23/12 11:50	28.5	4.6	831	2.8
PZ-45	10/23/12 12:10	28.3	4.6	371	3.5
PZ-46	10/25/12 10:55	26.7	4.6	730	1.2
PZ-47	10/25/12 11:55	27.0	4.8	313	1.7
PZ-48	10/25/12 11:20	26.7	4.7	195	0.3
PZ-49	10/25/12 10:15	26.4	4.6	434	2.6
PZ-50	10/25/12 11:05	26.9	5.5	191	4.7
PZ-51	10/25/12 10:10	26.1	5.6	112	3.6
PZ-52	10/25/12 9:37	25.6	5.9	531	5.0
PZ-53	10/25/12 9:35	26.0	5.3	135	2.7
PNRS II samples					
TA5-LY-C	10/15/12 13:10	30.7	5.8	663	6.2
TA5-Denite Tank	10/16/12 13:45	27.9	7.2	1,082	0.1
TA5-Denite Tank DUP	10/16/12 13:50	27.9	7.2	1,082	0.1

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Table F.1
S&GW Test Facility Field Parameter Results
(October 15 through October 26, 2012)

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (µS)	DO (mg/L)
TA5-PZ-1	10/25/12 11:38	27.1	4.4	376	0.4
TA5-PZ-1 DUP	10/25/12 11:45	27.1	4.4	376	0.4
TA6-LY-C	10/15/12 13:30	30.9	6.1	403	5.9
TA6-Denite Tank	10/17/12 12:25	26.0	6.5	844	0.9
TA6-PZ-1	10/17/12 12:06	27.0	5.9	330	0.6
TA6-PZ-1 DUP	10/17/12 12:11	27.0	5.9	330	0.6
Blanks					
FB - Tap	10/15/12 9:10	25.7	6.8	411	4.6
FB - DI	10/15/12 9:00	23.6	8.2	2	3.6
EB	10/15/12 9:05	23.6	8.2	2	3.6

NR = no reading

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