



Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task B.7

B-HS5 Field System Monitoring Report No. 3

Progress Report

March 2014

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Environmental Engineers & Scientists

In association with:



AET
Applied Environmental Technology

**Otis Environmental
Consultants, LLC**

Florida Onsite Sewage Nitrogen Reduction Strategies Study

TASK B.7 PROGRESS REPORT

B-HS5 Field System Monitoring Report No. 3

Prepared for:

Florida Department of Health
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Bureau of Environmental Health
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1.0 Background

Task B of the Florida Onsite Sewage Nitrogen Reduction Strategies Study (FOSNRS) includes performing field experiments to critically evaluate the performance of nitrogen removal technologies that were identified in FOSNRS Task A.9 and pilot tested in PNRS II. To meet this objective, full scale treatment systems are being installed at various residential sites in Florida and monitored over an extended timeframe under actual onsite conditions. The Task B Quality Assurance Project Plan (Task B.5) documents the objectives, monitoring framework, sample frequency and duration, and analytical methods to be used at the home sites. This report documents the third sample event of the passive nitrogen reduction system at home site B-HS5 in Seminole County, Florida.

2.0 Purpose

Operation of the B-HS5 system was initiated on July 9, 2013. This monitoring report documents data collected from the third B-HS5 monitoring and sampling event conducted on February 3, 2014 (Experimental Day 209). This monitoring event consisted of collecting flow measurements from the household water use meter, treatment system flow meters, recording electricity use, monitoring of field parameters, collection of water samples from nine points in the treatment system, and chemical analyses of water samples by a NELAC certified laboratory. In addition, daily samples were collected February 4th through February 7th, 2014 to evaluate daily variation of the treatment system.

3.0 Materials and Methods

3.1 Project Site

The B-HS5 field site is located in Seminole County, FL. The nitrogen reducing onsite treatment system for the single family residence was installed in June 2013. Design and construction details were presented previously in the Task B.6 document. Figure 1 is a system schematic showing the system components and layout of the installation. A flow schematic of the system is shown in Figure 2. The PNRS system consists of the

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addition of three tanks to the existing permitted system: a 1500 gallon plastic tank Stage 1 unsaturated media filter; 300 gallon concrete pump tank; and 1,500 gallon two chamber concrete Stage 2 saturated media biofilter. The existing 1,350 gallon concrete septic tank continues to provide primary treatment for the PNRS system. Based on measured average wastewater flow and tank volumes, there is over a ten day transit time through the treatment system prior to dispersal. The denitrified treated effluent is discharged into the soil via the existing drainfield which is a standard bed.

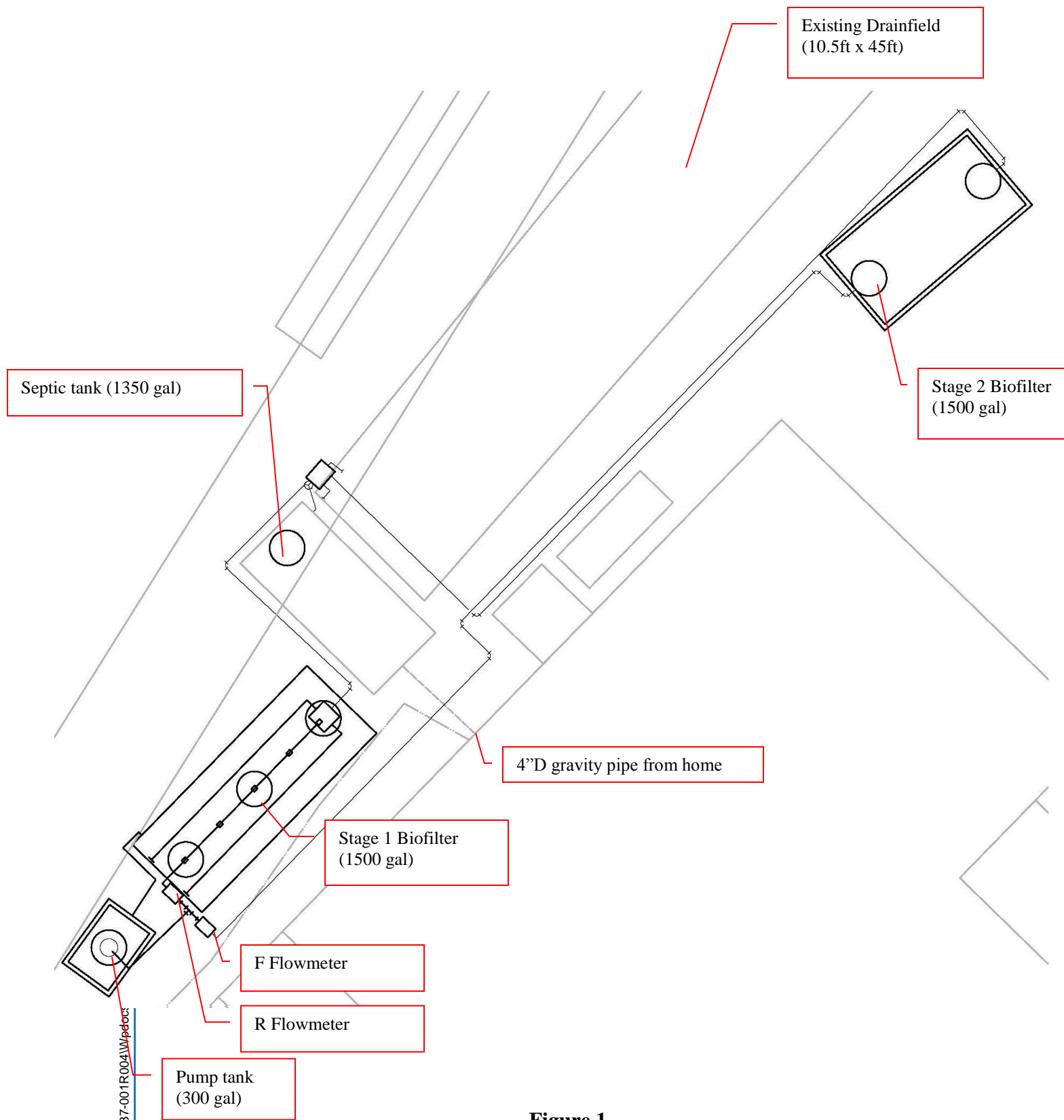


Figure 1
Plan View of B-HS5 System Layout

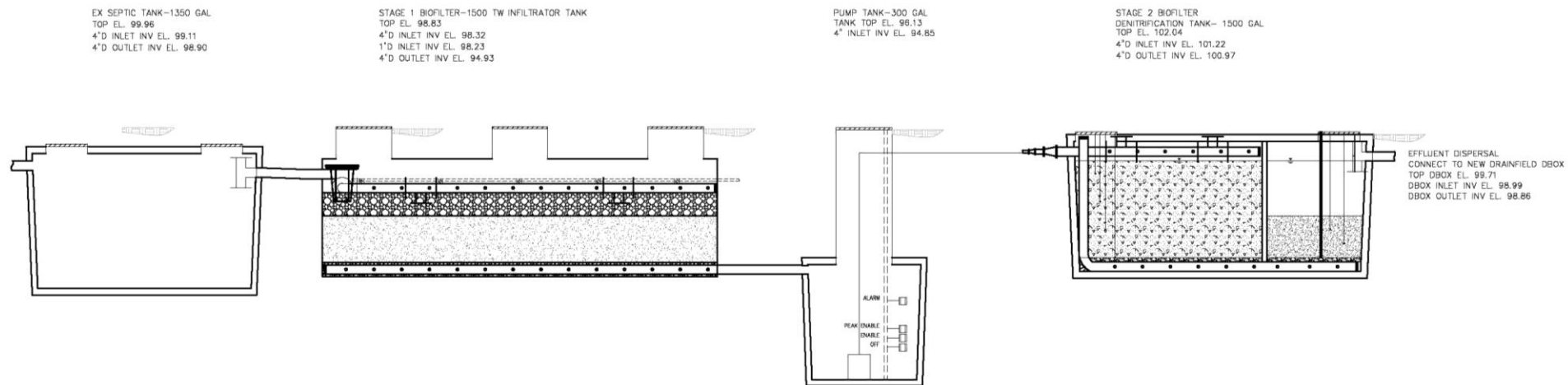


Figure 2
Flow Schematic of B-HS5 PNRS

3.2 Monitoring and Sample Locations and Identification

The four primary monitoring points for the B-HS5 system are shown in Figure 3. Household wastewater enters the primary tank and exits as septic tank effluent through an effluent filter screen into the Stage 1 biofilter. The first primary monitoring point, B-HS5-STE, is the effluent sampled approximately 1.5 feet below the surface of the primary tank prior to the effluent filter (Figure 4), which is referred to as primary effluent or septic tank effluent (STE). Samples from monitoring point B-HS5-STE are representative of the whole household wastewater and represent the influent to the remainder of the onsite nitrogen reduction system.

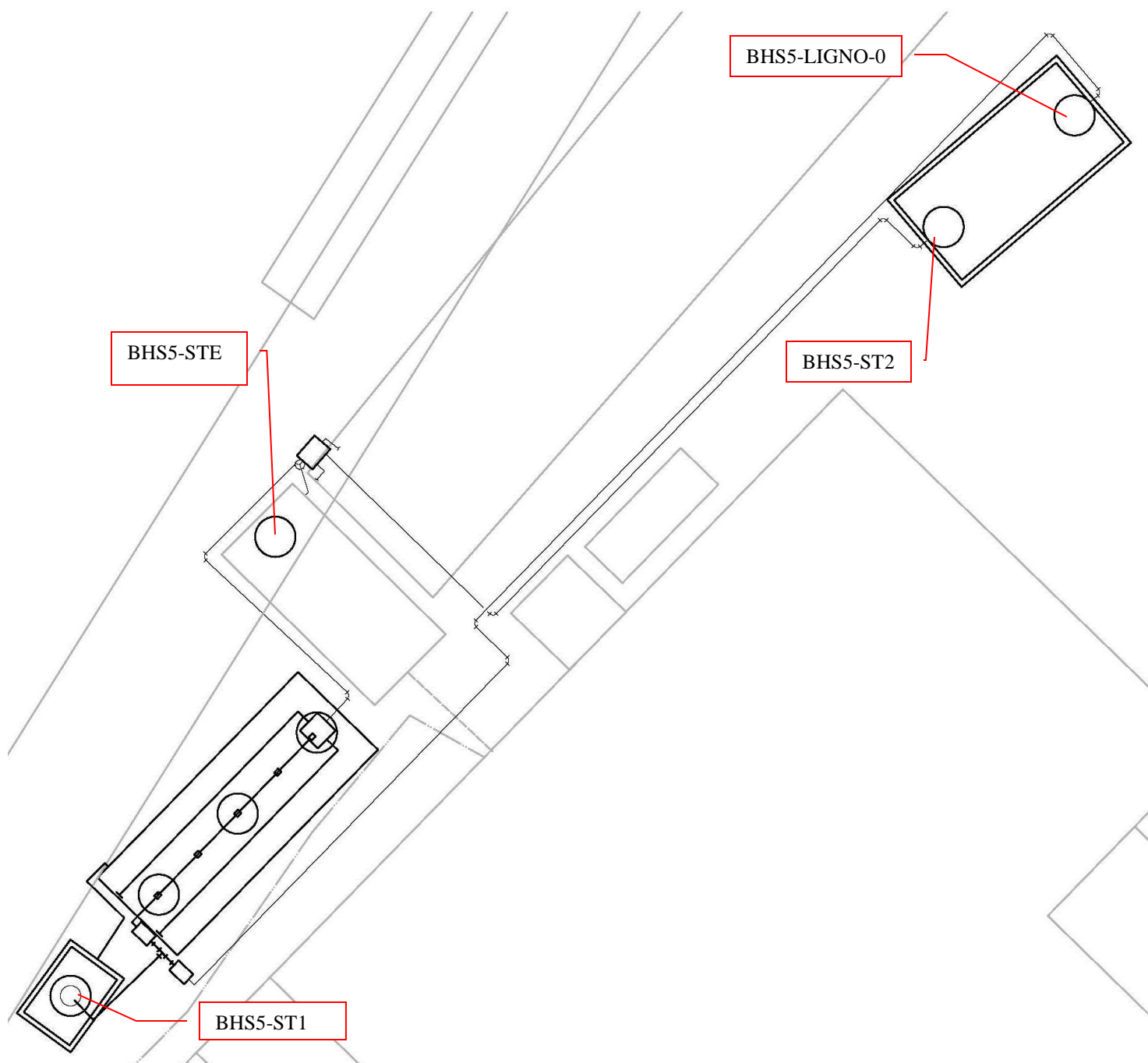


Figure 3
B-HS5 Sample and Monitoring Locations

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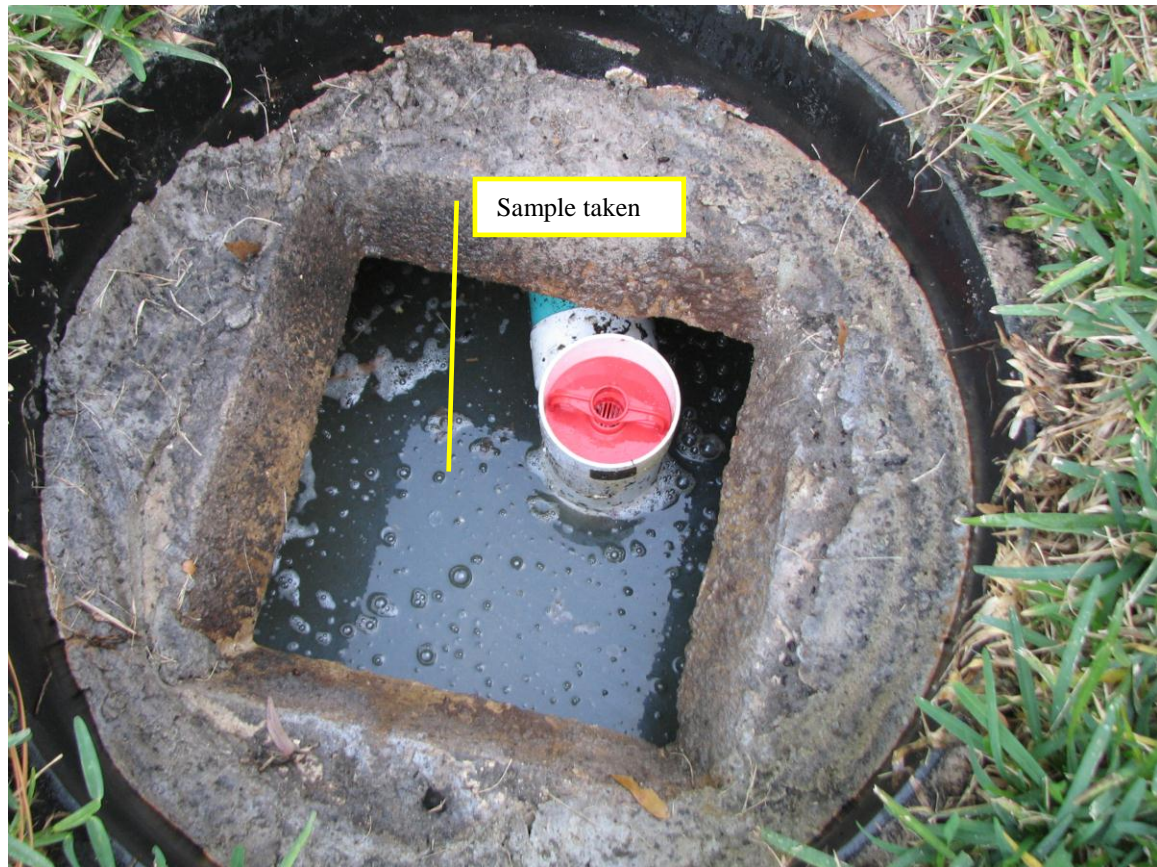


Figure 4
Primary Tank (B-HS5-STE sample)

The primary tank contents are discharged by gravity to a distribution box, located inside the Stage 1 biofilter, which splits the flow between two perforated distribution pipes along the top of the unsaturated Stage 1 biofilter media. In the Stage 1 biofilter, wastewater percolates downward through the unsaturated expanded clay media where nitrification occurs. The Stage 1 biofilter contains 12.8 inches of coarse expanded clay media (Riverlite™ 1/4; 1.1 to 4.8 mm) above 21 inches of finer expanded clay media (Riverlite™ 3/16; 0.6 to 2.4 mm). Stage 1 biofilter effluent flows into the pump tank by gravity. The second primary sampling point (B-HS5-ST1), is sampled approximately 1.5 feet below the surface of the pump tank representing the Stage 1 biofilter effluent (Figure 5).

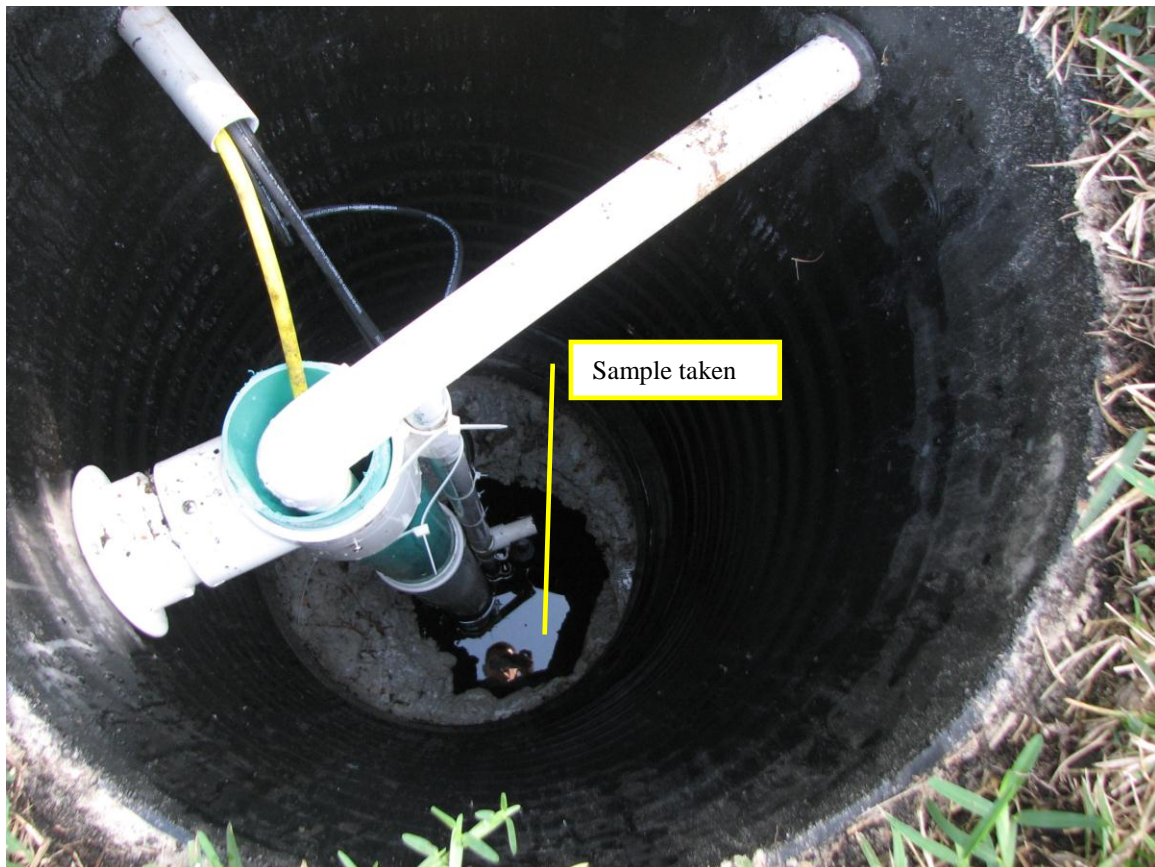


Figure 5
Stage 1 Effluent in Pump Tank (B-HS5-ST1 sample)

The pump tank discharge is split via two throttling gate valves which allow for optional recycling of a portion of the Stage 1 biofilter effluent with the balance proceeding to the Stage 2 biofilter. The system was designed with two operational modes. In the first mode, 100 percent of the Stage 1 effluent discharges to the Stage 2 biofilter. Initial operation of B-HS5 is in the non-recirculation mode. The second operating mode is to recirculate the Stage 1 effluent to the top of the Stage 1 biofilter and disperse it by five spray nozzles. The recirculated effluent would have an opportunity to mix with incoming septic tank effluent discharged by the distribution box. Recirculation back to the Stage 1 biofilter increases the hydraulic loading on the Stage 1 biofilter.

Effluent from the unsaturated (Stage 1) media tank enters the denitrification (Stage 2) biofilter into a standing water column lying above the media in the first chamber (lignocellulosic media), flows downward through the media, moves laterally through the baffle wall to the bottom of the second chamber, and upward through the media in the second chamber (elemental sulfur and oyster shell).

The first chamber of the Stage 2 biofilter contains 42-inches of lignocellulosic media. Stainless steel samplers are positioned at 12-inch increments for vertical profiling throughout the lignocellulosic media. The third primary sampling point is a stainless steel sampler positioned at the bottom of the lignocellulosic media (B-HS5-LIGNO-0) with tubing to the surface. The B-HS5-LIGNO-0 sample represents the lignocellulosic media effluent (Figure 6).

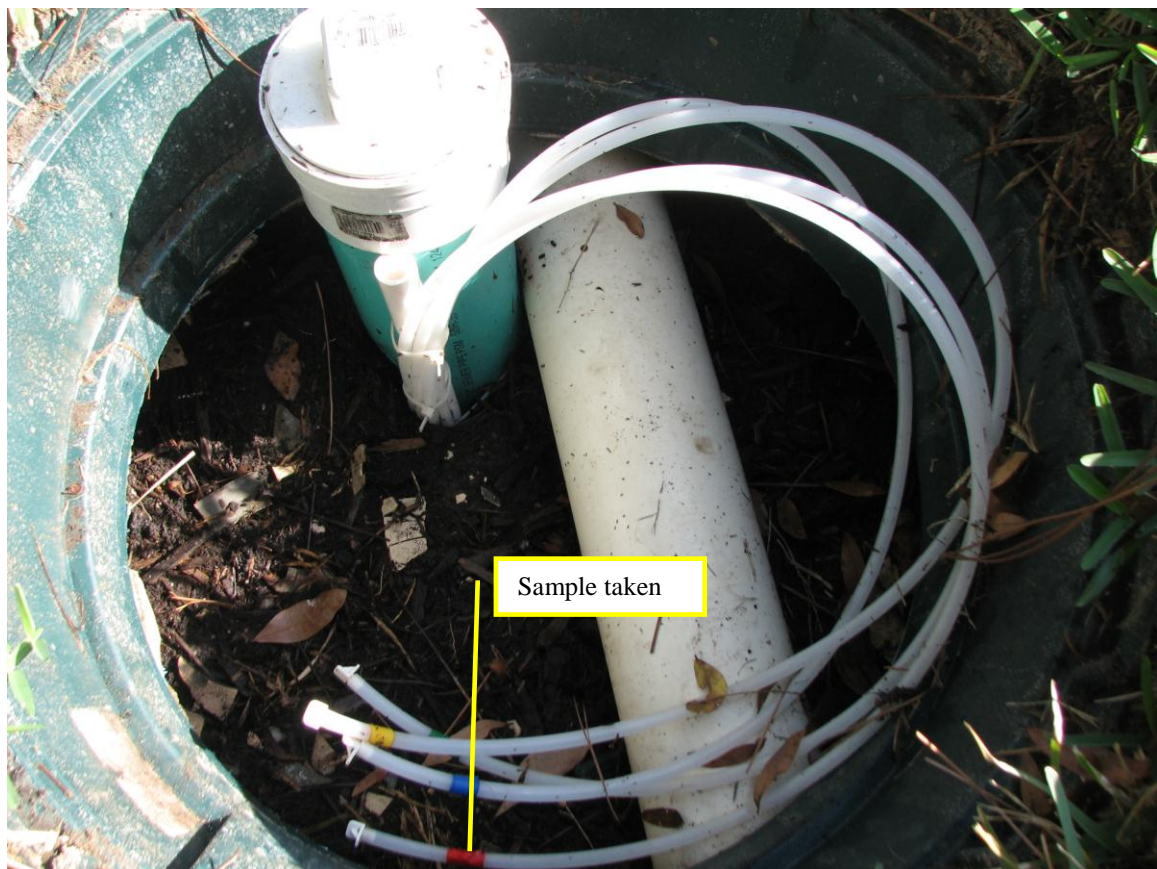


Figure 6
First chamber of Stage 2 biofilter (B-HS5-LIGNO-0" sample)

A collection pipe along the bottom transfers the first chamber (lignocellulosic media) effluent to the second chamber, which contains 18-inches of elemental sulfur mixed with oyster shell media. The fourth primary sampling point, B-HS5-ST2, is the second chamber of the Stage 2 biofilter effluent which is sampled approximately 1 foot below the

surface of the effluent baffle tee. This sample location is after passage through the sulfur media; it is the final effluent from the treatment system prior to being discharged to the soil infiltration system, or drainfield (Figure 7).



Figure 7
Second chamber of Stage 2 biofilter (B-HS5-ST2 sample)

3.3 Operational Monitoring

Start-up of the system occurred on July 9, 2013 (Experimental Day 0). The PNRS system has operated continually since that date. For this third formal sampling event, the water meter for the house and treatment system flow meters were read and recorded on February 3, 2014. The household water meter is located on the potable water line from the onsite well prior to entering the household plumbing. The water meter does not include the irrigation water use. Therefore, the water meter reading should be indicative of the wastewater flow to the system.

As previously discussed, the pump tank discharge is split via two throttling gate valves which allow for a portion of the Stage 1 biofilter effluent to be sent back to the Stage 1 biofilter spray nozzles (for recirculation) with the rest proceeding to the Stage 2 biofilter. The treatment system flow meters (Figure 1) are located on the pump tank discharge lines following the flow split, and record the cumulative flow in gallons pumped from the pump chamber to the Stage 1 biofilter (R flowmeter) and Stage 2 biofilter (F flowmeter). Currently, the mode of operation is set to non-recirculation mode, where 100 percent of the pumped flow is directed to the Stage 2 biofilter. For this sample event, the F flowmeter (Figure 1), which is located following the split on the line from the pump tank, records the cumulative forward flow in gallons pumped to the Stage 2 biofilter. The control panel includes telemetry where reports are generated regarding alarms, pump cycles, and other information using a Vericomm control panel system.

3.4 Energy Consumption

Energy consumption was monitored using an electrical meter installed between the main power box for the house and the control panel. The electrical meter records the cumulative power usage of the system in kilowatt-hours. The power usage of the system is primarily due to the single lift station pump installed within the pump tank, although a small amount of power is used by the control panel itself. There are no chemicals added to the system. However, the Stage 2 biofilter media (lignocellulosic and sulfur) are “reactive” media which will be consumed during operation. The Stage 2 biofilter was initially filled with 42 inches of lignocellulosic media and 18 inches of sulfur and oyster shell mixture media, which ostensibly will last for many years without replenishment or replacement.

3.5 Water Quality Sample Collection and Analyses

The third formal sample event (Sample Event No. 3) was conducted on February 3, 2014 (Experimental Day 209). A full suite of influent, intermediate and effluent water quality samples were collected from the system for water quality analysis. Samples were collected at each of the four monitoring points described in Section 3.2: B-HS5-

STE, B-HS5-ST1, B-HS5-LIGNO-0, and B-HS5-ST2. A peristaltic pump was used to collect samples and route them directly into analysis-specific containers after sufficient flushing of the tubing had occurred. Field parameters were then recorded.

Immediately subsequent to the regular samples for each primary monitoring point, additional sample was collected to be filtered at the laboratory (0.45 micron filter) for analysis of CBOD₅ and the nitrogen species to allow for comparison to the unfiltered sample water quality results. In addition, a field sample duplicate was taken. The field sample duplicate (B-HS5-ST2) was collected immediately subsequent to the regular samples.

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 laboratories. Each sample container was secured in packing material as appropriate to prevent damage and spills, and was recorded on chain-of-custody forms supplied by the laboratory. Chain of custody forms, provided in Appendix A, were used to document the transfer of samples from field personnel to the analytical laboratory.

Field parameters were measured using portable electronic probes and included temperature (Temp), dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, and specific conductance. The field parameters were measured by placing the analytical probes in a container overflowing with sample water. The influent, intermediate, and effluent samples were analyzed by the laboratory for: total alkalinity, chemical oxygen demand (COD), total Kjeldahl nitrogen (TKN-N), ammonia nitrogen (NH₃-N), nitrate nitrogen (NO₃-N), nitrite nitrogen (NO₂-N), total phosphorus (TP), orthophosphate (Ortho P), total suspended solids (TSS), volatile suspended solids (VSS), total organic carbon (TOC), fecal coliform (fecal), and E.coli. The influent and sulfur media samples included sulfate, sulfide, and hydrogen sulfide (unionized). All analyses were performed by an independent and fully NELAC certified analytical laboratory (Southern Analytical Laboratory). Table 1 lists the analytical parameters, analytical methods, and detection limits for laboratory analyses.

Similar methods were used for the daily sample collection and analysis that was conducted on February 4 through February 7, 2014.

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

Analytical Parameter	Method of Analysis	Method Detection Limit (mg/L)
Total Alkalinity as CaCO ₃	SM 2320B	2 mg/L
Chemical Oxygen Demand (COD)	EPA 410.4	10 mg/L
Total Kjeldahl Nitrogen (TKN-N)	EPA 351.2	0.05 mg/L
Ammonia Nitrogen (NH ₃ -N)	EPA 350.1	0.005 mg/L
Nitrate Nitrogen (NO ₃ -N)	EPA 300.0	0.01 mg/L
Nitrite Nitrogen (NO ₂ -N)	EPA 300.0	0.01 mg/L
Nitrate+Nitrite Nitrogen (NOX-N)	EPA 300.0	0.02 mg/L
Total Phosphorus (TP)	SM 4500P-E	0.01 mg/L
Orthophosphate as P (Ortho P)	EPA 300.0	0.01 mg/L
Carbonaceous Biological Oxygen Demand (CBOD ₅)	SM5210B	2 mg/L
Total Solids (TS)	EPA 160.3	.01 % by wt
Total Suspended Solids (TSS)	SM 2540D	1 mg/L
Volatile Suspended Solids (VSS)	EPA 160.4	1 mg/L
Total Organic Carbon (TOC)	SM5310B	0.06 mg/L
Sulfate	EPA 300.0	2.0 mg/L
Sulfide	SM 4500SF	0.10 mg/L
Hydrogen Sulfide (unionized)	SM 4550SF	0.01 mg/L
Fecal Coliform (fecal)	SM9222D	1 ct/100mL
E.coli	SM9223B	2 ct/100mL

4.0 Results and Discussion

4.1 Operational Monitoring

Table 2 provides a summary of the household water use since the water meter installation on February 12, 2013. The treatment system flow meter readings for the B-HS5 field site are summarized in Table 3. The operation and maintenance log which includes actions taken since start-up is provided in Appendix B. Summary tables of the Vericomm PLC recorded data are provided in Appendix C, Table C.1 and Table C.2. These include daily and cumulative pump runtime and system alarms that are used to check general pump operation and performance.

Table 2
Summary of Household Water Use Flowmeter

Date and Time Read	Cumulative Volume (gallons)	Average Daily Household Flow between readings, Q (gpd)	Average Daily Household Flow Since start-up, Q (gpd)
2/12/2013 10:30	166.0	INSTALLED	INSTALLED
2/21/2013 10:45	1,130.3	107.0	107.0
2/28/2013 11:45	2,323.9	169.5	134.4
3/7/2013 10:25	2,832.1	73.2	115.9
6/14/2013 13:00	13,460.9	107.2	108.9
6/25/2013 8:53	14,860.1	129.2	110.5
7/23/2013 8:31	17,659.4	100.0	108.7
7/29/2013 11:10	18,769.2	181.6	111.4
8/15/2013 12:28	21,078.4	135.4	113.6
8/27/2013 9:15	22,427.8	113.7	113.6
9/27/2013 10:40	25,738.3	106.6	112.6
11/8/2013 10:30	31,992.8	148.9	118.3
11/27/2013 11:12	34,400.8	126.5	118.9
12/4/2013 14:34	35,292.8	124.9	119.0
12/23/2013 12:38	37,649.1	124.5	119.3
1/23/2014 10:00	42,526.6	157.9	122.8
1/31/2014 13:00	43,688.6	143.0	123.3
2/3/2014 8:40	43,688.6	0.0	122.3
2/4/2014 11:45	43,841.1	135.1	122.3
2/5/2014 9:45	43,928.5	95.3	122.3
2/6/2014 8:20	44,029.1	106.9	122.2
2/7/2014 10:30	44,175.2	134.0	122.2

From start-up through February 3, 2014, the average household water use was 122.2 gallons per day with periods of higher and lower flows (Table 2). The homeowners were on vacation over the weekend prior to the sample event.

Table 3
Summary of Treatment System Flowmeters

Date	Recirculation Pumped Flow, R Water Meter Reading	Average Recirculation Ratio	Stage 2 Biofilter Pumped Flow, F Water Meter Reading	Average Daily Stage 2, Q between readings
	Cumulative Volume (gallons)	Recycle: Forward Flow	Cumulative Volume (gallons)	Gallons/Day
7/5/2013 12:00	386.1	0.0		Installed
7/9/2013 15:20	386.1	0.0	167.5	Following testing
7/12/2013 14:13	386.1	0.0	207.4	13.5
7/17/2013 9:02	386.1	0.0	995.6	164.8
7/23/2013 8:31	386.1	0.0	1,642.9	108.3
7/29/2013 11:10	386.1	0.0	2,733.4	178.5
8/6/2013 8:51	386.1	0.0	3,894.7	146.9
8/15/2013 11:40	386.1	0.0	4,884.6	108.6
8/27/2013 9:15	386.1	0.0	6,135.4	105.1
9/27/2013 10:40	386.1	0.0	9,035.2	93.4
11/8/2013 10:30	386.1	0.0	14,347.7	126.5
11/27/2013 10:55	386.1	0.0	16,591.6	118.0
12/4/2013 13:45	386.1	0.0	17,474.0	124.0
12/23/2013 12:38	386.1	0.0	19,610.1	112.7
1/23/2014 10:00	386.1	0.0	24,359.1	153.7
1/31/2014 13:00	386.1	0.0	25,506.3	141.2
2/3/2014 8:40	386.1	0.0	25,551.0	15.9
2/4/2014 11:45	386.1	0.0	25,659.1	95.7
2/5/2014 9:45	386.1	0.0	25,737.2	85.3
2/6/2014 8:20	386.1	0.0	25,836.3	105.3
2/7/2014 10:30	386.1	0.0	25,952.1	106.2
Total average start-up to 2/7/14		0.0		121.2

The two throttling gate valves control the fraction of Stage 1 effluent that is recirculated and the fraction sent to the Stage 2 biofilter. The gate valves were initially set so that 100 percent of the flow is to the Stage 2 tank (0 recycle ratio). From start-up through February 7, 2014, the average pumped flow (forward flow to the Stage 2 biofilter) was 121.2 gallons per day which correlates well with the household water use.

4.2 Energy Consumption

Energy consumption is monitored using an electrical meter installed between the main power box for the house and the control panel to record cumulative power usage of the pump in kilowatt-hours. The recorded electrical use for the system is summarized in Table 4.

Table 4
Summary of System Electrical Use

Date and Time Read	Electrical Meter Reading	Average Daily Electrical Use between readings	Average Electrical Use per Gallon Treated
	Cumulative (kWh)	(kWh/day)	(kWh/gal)
7/5/2013 12:00		Installed	
7/9/2013 15:20	0.3	Start-up	
7/12/2013 14:13	0.4	0.03	0.0025
7/17/2013 9:02	0.6	0.04	0.0004
7/23/2013 8:32	0.8	0.03	0.0003
7/29/2013 11:10	1.2	0.07	0.0005
8/6/2013 8:51	1.5	0.04	0.0003
8/15/2013 11:40	1.8	0.03	0.0003
8/27/2013 9:15	2.2	0.03	0.0003
9/27/2013 10:40	3.1	0.03	0.0003
11/8/2013 10:30	4.8	0.04	0.0003
11/27/2013 10:55	5.5	0.04	0.0003
12/4/2013 13:45	5.8	0.04	0.0003
12/23/2013 12:38	6.5	0.04	0.0003
1/23/2014 10:00	8.0	0.05	0.0003
1/31/2014 13:00	8.4	0.05	0.0003
2/3/2014 8:40	8.4	0.00	0.0000
Total average start-up to 2/3/14		0.04	0.0003

The total average electrical use through February 3, 2014 was 0.04 kWh per day. The average electrical use per gallon treated was 0.0003 kWh per gallon treated, and this parameter has been fairly stable since start-up.

4.3 Water Quality

Water quality analytical results for Sample Event No. 3 are listed in Table 5. Nitrogen results are graphically displayed in Figure 8. A summary of the water quality data collected to date for the test system is presented in Table 6. The laboratory report containing the raw analytical data is included in Appendix A. The following discussion summarizes the water quality analytical results. The performance of the various system components was compared by considering the changes through treatment of nitrogen species (TKN-N, $\text{NH}_3\text{-N}$, and $\text{NO}_x\text{-N}$), as well as supporting water quality parameters.



Figure 8
Graphical Representation of Nitrogen Results
Sample Event No. 3, February 3, 2014 (Experimental Day 209)

Septic Tank Effluent (STE) Quality: The water quality characteristics of STE collected in Sample Event 3 were within the typical range generally expected for domestic STE. The measured STE total nitrogen (TN) concentration was 66 mg/L, which is within the range that has been typically reported for Florida single family residence STE.

Stage 1 Effluent (ST1): The Stage 1 effluent $\text{NH}_3\text{-N}$ levels was 4.2 mg/L with a DO level at 3.23 mg/L (Table 5). The Stage 1 effluent TSS concentration was below the method detection limit of 1 mg/L and CBOD_5 was 13 mg/L. The Stage 1 effluent $\text{NO}_x\text{-N}$ was 39 mg/L. The Stage 1 biofilter showed incomplete nitrification with an effluent $\text{NH}_3\text{-N}$ concentration of 4.2 mg/L and TKN of 6.4 mg/L.

Stage 2 Biofilter Effluent (LIGNO-0" and ST2): Effluent $\text{NO}_x\text{-N}$ from the Stage 2 biofilter monitoring point was below the method detection limit of 0.02 mg/L. The low $\text{NO}_x\text{-N}$ was accompanied by a measured 0.08 mg/L DO and -202.3 mV ORP. The lignocellulosic media effluent $\text{NO}_x\text{-N}$ was 0.04 mg/L. The Stage 2 system produced a highly reducing environment and achieved essentially complete $\text{NO}_x\text{-N}$ reduction. Final total nitrogen (TN) in the treatment system effluent was 1.72 mg/L. The Stage 2 biofilter effluent and lignocellulosic media effluent CBOD_5 concentrations were 7 and 11 mg/L, respectively. The Stage 2 effluent sulfate concentration was 98 mg/L. The Stage 2 biofilter effluent fecal coliform and e-coli concentrations were 1,000 and 52 ct/100 mL, respectively.

In addition during this monitoring event, daily samples were collected from the nitrogen reducing onsite treatment system to evaluate the variability of daily data. Water quality analytical results, for Sample Events No. 4 through 7 are summarized in Appendix A, Table A.1 through Table A.4. Key parameter mean and standard deviations for these five sample events are provided in Figure 9. In addition, the total nitrogen time series for these five sample events are graphically displayed in Figure 10 for the treatment sample locations.



Figure 9
February 3rd through February 7th, 2014
Mean and Standard Deviations from Daily Sample Events

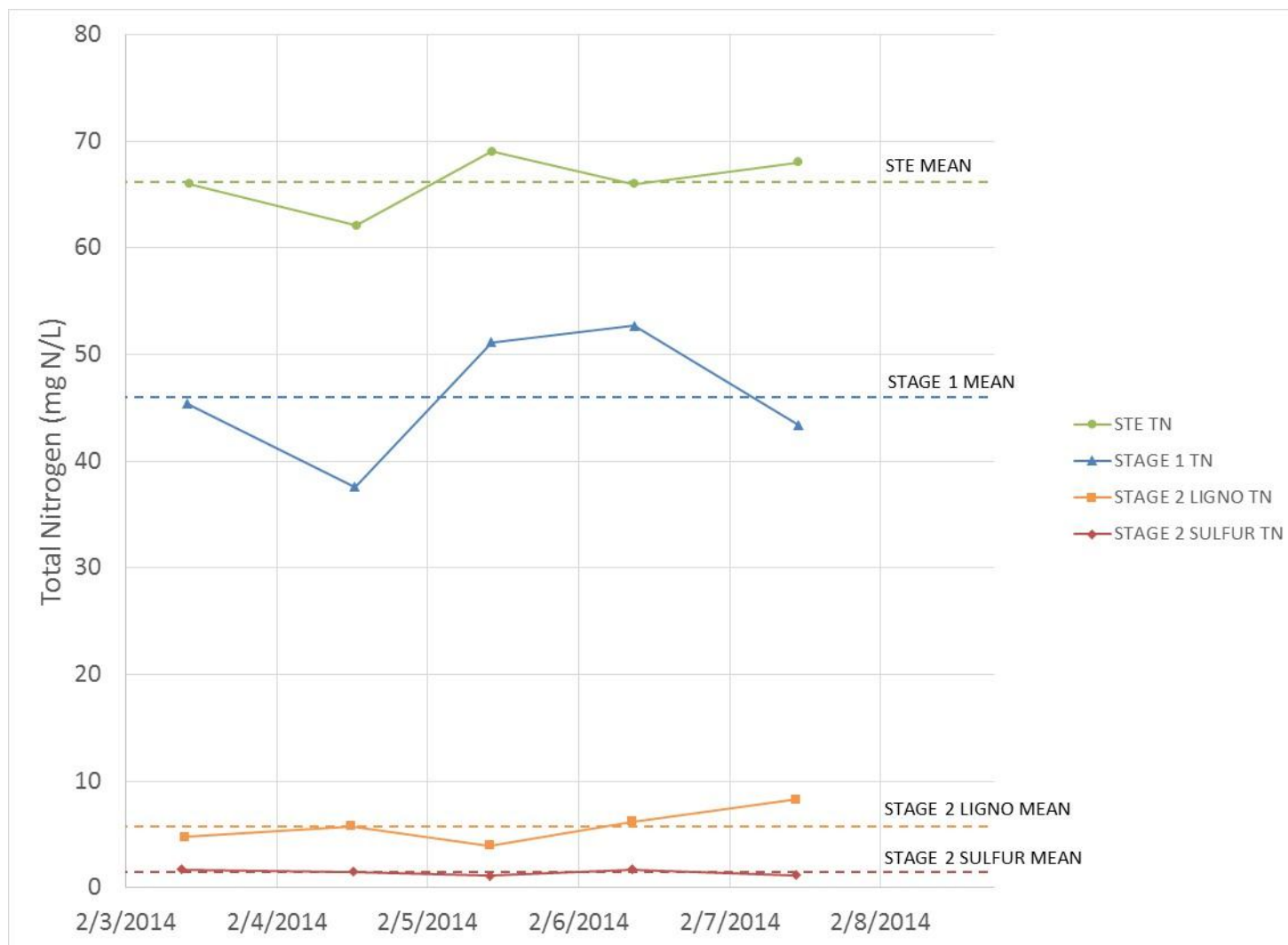


Figure 10
Graphical Representation of Total Nitrogen Time Series
February 3rd through February 7th, 2014

Table 5
Water Quality Analytical Results

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD ₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH ₃ -N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NO _x (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BH55-STE	2/3/14 10:10	19.9	7.33	1162	0.08	-238.9	390	25	22	79	37	66.02	66	7	59	0.01	0.01	0.02	59.02	7.2	5	2.2	6.9	10	24000	5500	32
BH55-STE-FILTERED	2/3/14 10:10	19.9	7.33	1162	0.08	-238.9				24		60.04	60	2	58	0.04	0.01	0.04	58.04								
BH55-ST1	2/3/14 9:45	21.2	6.99	1168	3.23	130.0	220	1	1	13	23	45.4	6.4	2.2	4.2	39	0.01	39	43.2	3	1.7	21	0.2	0.4	1000	10	6.7
BH55-ST1-FILTERED	2/3/14 9:45	21.2	6.99	1168	3.23	130.0				2		44.4	5.4	1.3	4.1	39	0.01	39	43.1			29					
BH55-LIGNO-0	2/3/14 9:20	19.3	6.70	1037	0.23	-23.5	380	3	3	11	41	4.74	4.7	4.32	0.38	0.04	0.01	0.04	0.42	1.5	0.51	18	0.54	0.81	1000	41	11
BH55-LIGNO-0-FILTERED	2/3/14 9:20	19.3	6.70	1037	0.23	-23.5				2		0.8	0.78	0.48	0.3	0.01	0.01	0.02	0.32								
BH55-ST2	2/3/14 8:55	18.3	6.79	1135	0.08	-202.3	350	1	1	7	23	1.72	1.7	1.53	0.17	0.01	0.01	0.02	0.19	1.1	0.41	98	1.3	2	1000	52	9.2
BH55-ST2-DUP	2/3/14 9:00	18.3	6.79	1135	0.08	-202.3	340	1	1	8	25	1.72	1.7	1.21	0.49	0.01	0.01	0.02	0.51	1.1	0.42	110	1	1.6	1000	31	8.6
BH55-ST2-FILTERED	2/3/14 8:55	18.3	6.79	1135	0.08	-202.3				2		0.94	0.92	0.48	0.44	0.01	0.01	0.02	0.46			98					

Notes:

¹Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO_x.

²Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH₃.

³Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH₃ and NO_x.

Gray-shaded data points indicate values below method detection level (mdl), mdl value used for statistical analyses.

Yellow-shaded data points indicate the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit, value used for statistical analysis.

Too many colonies were present. The numeric value represents the filtration volume.

Results based on colony counts outside the ideal range.

Sample held beyond the acceptable holding time

Table 6
Summary of Water Quality Data

Sample ID	Statistics	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD ₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH ₃ -N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NO _x (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydroge n Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
STE	n	9	9	9	9	9	7	9	7	9	7	9	9	8	9	9	9	9	9	7	7	9	9	9	7	7	7
	MEAN	23.11	7.29	1184.00	0.07	-285.99	411.43	37.56	32.43	73.56	139.71	72.25	72.22	9.63	63.67	0.02	0.01	0.03	63.69	7.56	5.10	2.66	3.39	8.61	34,728	3,913	34
	STD. DEV.	4.14		67.68	0.04	43.21	15.74	13.19	11.54	23.34	82.67	7.99	8.00	7.44	6.76	0.02	0.00	0.02	6.76	2.18	0.64	1.09	1.67	2.23			9
	MIN	19.10	6.99	1048.00	0.01	-341.90	390.00	22.00	22.00	32.00	37.00	62.08	62.00	2.00	54.00	0.01	0.01	0.02	54.02	5.90	3.70	1.30	1.60	5.10	3,100	1,700	20
	MAX	28.90	7.63	1294.00	0.11	-226.80	430.00	58.00	54.00	120.00	270.00	87.02	87.00	25.00	76.00	0.08	0.01	0.08	76.02	12.00	5.50	4.20	6.90	12.00	93,600	24,000	48
Stage 1	n	9	9	9	9	9	7	7	7	7	7	9	9	9	9	9	9	9	9	7	7	5	5	5	7	7	7
	MEAN	23.27	6.90	1143.11	2.23	-23.51	214.29	2.14	1.86	11.43	17.14	49.55	6.56	2.63	3.92	42.67	0.49	43.00	46.92	2.47	1.69	28.60	0.26	0.44	2,551	186	7
	STD. DEV.	3.55		81.38	0.68	96.43	7.87	1.07	1.21	4.20	8.57	7.70	2.80	0.98	2.58	6.80	0.53	6.74	7.23	0.48	0.21	6.99	0.32	0.45			2
	MIN	20.11	6.75	1057.00	1.64	-127.90	210.00	1.00	1.00	5.00	10.00	37.60	3.60	1.60	0.39	33.00	0.01	34.00	34.39	2.00	1.40	21.00	0.01	0.10	1,000	10	6
	MAX	28.20	7.18	1249.00	3.39	130.00	230.00	4.00	4.00	18.00	33.00	61.90	10.00	4.80	7.50	52.00	1.80	52.00	57.10	3.10	1.90	37.00	0.79	1.20	8,100	3,600	12
Stage 2 Ligno	n	9	9	9	9	9	7	9	7	9	7	9	9	9	9	9	9	9	9	7	7	6	5	5	7	7	7
	MEAN	23.14	6.63	1063.67	0.73	-98.66	382.86	6.33	3.14	15.33	30.43	5.98	3.21	2.14	1.07	1.63	1.14	2.77	3.84	0.97	0.47	23.67	0.13	0.26	462	54	14
	STD. DEV.	4.64		75.65	0.75	82.98	17.99	7.02	1.68	9.75	15.28	1.92	2.64	1.48	1.59	1.99	0.74	2.31	1.73	0.34	0.22	3.33	0.23	0.31			7
	MIN	18.40	6.25	946.00	0.14	-230.80	360.00	2.00	1.00	2.00	12.00	2.70	0.88	0.00	0.05	0.01	0.01	0.02	0.42	0.51	0.13	18.00	0.01	0.10	200	2	9
	MAX	30.20	7.38	1182.00	2.50	9.70	410.00	24.00	6.00	38.00	50.00	8.32	8.30	4.32	4.60	5.90	2.00	6.78	6.86	1.50	0.75	27.00	0.54	0.81	1,000	740	29
Stage 2 Sulfur	n	9	9	9	9	9	7	7	7	7	7	9	9	9	9	9	9	9	9	7	7	9	9	9	7	7	7
	MEAN	22.63	6.76	1194.89	0.18	-256.56	385.71	2.43	2.43	8.00	32.43	3.25	3.21	1.58	1.64	0.03	0.01	0.04	1.68	1.11	0.65	82.89	9.21	13.98	26	11	11
	STD. DEV.	5.15		257.94	0.10	57.24	45.41	1.40	1.40	5.03	7.35	3.10	3.12	1.15	2.06	0.05	0.00	0.05	2.05	0.35	0.29	48.04	14.17	20.15			6
	MIN	18.30	6.59	991.00	0.08	-357.00	350.00	1.00	1.00	2.00	23.00	1.12	1.00	0.65	0.16	0.01	0.01	0.02	0.18	0.42	0.18	29.00	0.42	0.61	1	2	7
	MAX	30.40	7.04	1781.00	0.38	-195.40	480.00	5.00	5.00	16.00	43.00	10.02	10.00	4.20	5.80	0.17	0.01	0.18	5.82	1.50	0.96	200.00	45.00	64.00	1,000	52	25
Tap	n	3	3	3	3	3	1	1	1	1	1	3	3	3	3	3	3	3	3	1	1	3	1	1	1	1	1
	MEAN	26.47	7.28	448.00	3.94	98.53	130.00	1.00	1.00	2.00	10.00	0.32	0.10	0.07	0.03	0.22	0.01	0.22	0.25	0.06	0.03	12.67	2.60	4.10	1	2	3
	STD. DEV.	3.01		15.72	2.22	173.67						0.18	0.01	0.03	0.02	0.18	0.00	0.18	0.19			0.58					
	MIN	23.60	6.73	431.00	2.31	-65.30	130.00	1.00	1.00	2.00	10.00	0.12	0.09	0.04	0.01	0.01	0.01	0.02	0.03	0.06	0.03	12.00	2.60	4.10	1	2	3
	MAX	29.60	7.60	462.00	6.47	280.60	130.00	1.00	1.00	2.00	10.00	0.44	0.11	0.09	0.05	0.33	0.01	0.33	0.37	0.06	0.03	13.00	2.60	4.10	1	2	3

Notes:

¹Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO_x

²Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH₃

³Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH₃ and NO_x

⁴Fecal coliform and pH values are reported as geometric mean.

Gray-shaded data points indicate values below method detection level (mdl), mdl value used for statistical analyses.

Yellow-shaded data points indicate the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit, value used for statistical analysis.

Too many colonies were present. The numeric value represents the filtration volume.

Sample held beyond the acceptable holding time

5.0 B-HS5 Sample Event No. 3: Summary and Recommendations

5.1 Summary

The results of the third sampling event indicate that the system is operating well and no adjustments are recommended at this time. The Sample Event No. 3 results indicate that:

- Septic tank effluent (STE) quality is characteristic of typical household STE quality. The total nitrogen concentration of 66 mg/L is within the range of values typically reported for Florida single family residence STE.
- The Stage 1 biofilter converted most of the ammonia N to oxidized nitrogen; effluent contained 6.4 mg/L TKN, of which 4.2 mg/L was ammonia.
- The Stage 2 biofilter produced a reducing environment and effluent NO_x-N was below the method detection limit of 0.02 mg N/L.
- The total nitrogen concentration in the final effluent from the total treatment system was 1.72 mg/L, an approximately 97% reduction from STE.
- The four additional daily sample events of the treatment system performed in conjunction with this formal sample event showed relatively small variations in system performance. The final effluent mean total nitrogen concentration during the first week of February 2014 was 1.5 mg/L, an average 98% reduction from STE. On a mass basis, the total nitrogen that was reduced occurred within:
 - Stage 1 biofilter reduced 31%
 - Stage 2 lignocellulosic media chamber reduced 62%
 - Stage 2 sulfur media chamber reduced 7%.

5.2 Recommendations

No operational adjustments are recommended at this time, and continued sampling should provide additional insight to system performance.



Appendix A: Laboratory Report

PRELIMINARY

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Table A.1
Water Quality Analytical Results
February 4, 2014

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD ₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH ₃ -N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NO _x (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BHS5-STE	2/4/14 12:40	19.1	7.42	1048	0.08	-244.8	400	39	39	78	200	62.08	62	2	60	0.08	0.01	0.08	60.08	5.9	5.4	2.4	3.3	11	3100	2800	37
BHS5-ST1	2/4/14 12:25	20.16	6.75	1057	1.64	-47.0	210	3	3	18	18	37.6	3.6	3.21	0.39	34	0.4	34	34.39	2.1	1.4	25	0.01	0.1	8100	3600	5.7
BHS5-LIGNO-0	2/4/14 11:50	20.81	6.58	962	0.98	0.8	360	5	4	9	17	5.8	1.3	1.213	0.087	2.6	1.9	4.5	4.587	1.1	0.75	27	0.01	0.1	520	120	9.9
BHS5-ST2	2/4/14 12:10	18.48	6.91	991	0.10	-247.5	360	1	1	5	39	1.52	1.5	1.34	0.16	0.01	0.01	0.02	0.18	1.2	0.76	81	3.4	6	30	20	9
BHS5-ST2-DUP	2/4/14 12:15	18.48	6.91	991	0.10	-247.5	360	1	1	5	37	1.62	1.6	1.46	0.14	0.01	0.01	0.02	0.16	1.1	0.76	84	3.3	5.8	5300	420	8.8
BHS5-FB	2/4/14 12:05	27	5.01	1.01	7.85	156.1	2	1	1	2	10	0.07	0.05	0.041	0.009	0.01	0.01	0.02	0.029	0.01	0.01	0.2	0.01	0.1	1	2	0.06

Notes:

¹Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO_x.

²Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH₃.

³Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH₃ and NO_x.

Gray-shaded data points indicate values below method detection level (mdl), mdl value used for statistical analyses.

Yellow-shaded data points indicate the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit, value used for statistical analysis.

Too many colonies were present. The numeric value represents the filtration volume.

Results based on colony counts outside the ideal range.

Table A.2
Water Quality Analytical Results
February 5, 2014

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD ₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH ₃ -N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NO _x (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BHS5-STE	2/5/14 10:10	20.2	7.31	1151	0.07	-263.0	400	42	36	32	270	69.02	69	7	62	0.01	0.01	0.02	62.02	6	5.4	1.3	2.9	8.5	49000	1700	36
BHS5-ST1	2/5/14 10:05	20.11	6.78	1073	1.69	-66.5	210	2	1	14	33	51.13	3.6	1.7	1.9	47	0.53	47.53	49.43	2	1.9	37	0.79	1.2	1480	140	7.1
BHS5-LIGNO-0	2/5/14 9:50	20.84	6.57	946	0.56	-128.5	390	2	2	16	47	3.98	0.88	0.808	0.072	1.1	2	3.1	3.172	1.1	0.59	23	0.01	0.1	450	98	11
BHS5-ST2	2/5/14 9:50	18.7	7.04	1005	0.12	-232.0	350	3	3	9	31	1.12	1.1	0.65	0.45	0.01	0.01	0.02	0.47	1.3	0.96	78	3.8	7.7	30	20	10
BHS5-ST2-DUP	2/5/14 9:55	18.7	7.04	1005	0.12	-232.0	360	3	3	9	29	1.02	1	0.55	0.45	0.01	0.01	0.02	0.47	1.3	0.96	82	4	8.1	30	30	10

Notes:

¹Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO_x.

²Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH₃.

³Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH₃ and NO_x.

Gray-shaded data points indicate values below method detection level (mdl), mdl value used for statistical analyses.

Yellow-shaded data points indicate the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit, value used for statistical analysis.

Too many colonies were present. The numeric value represents the filtration volume.

Results based on colony counts outside the ideal range.

Table A.3
Water Quality Analytical Results
February 6, 2014

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD ₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH ₃ -N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NO _x (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BHS5-STE	2/6/14 8:47	20.1	7.42	1192	0.01	-301.9	430	22	22	67	140	66.02	66	4	62	0.01	0.01	0.02	62.02	6.8	5.3	1.3	2.2	7.3	27000	1700	20
BHS5-ST1	2/6/14 8:50	20.14	6.76	1087	1.80	-71.0	210	2	1	9	16	52.69	4.3	2.9	1.4	48	0.39	48.39	49.79	2.2	1.7	35	0.01	0.1	1500	41	5.5
BHS5-LIGNO-0	2/6/14 8:30	18.7	6.71	1060	0.28	-119.8	390	4	4	17	22	6.2	1.9	1.855	0.045	2.9	1.4	4.3	4.345	1.1	0.58	23	0.01	0.1	200	31	11
BHS5-ST2	2/6/14 8:25	19.03	6.75	1008	0.15	-243.2	380	2	2	13	43	1.72	1.7	1.05	0.65	0.01	0.01	0.02	0.67	1.5	0.87	71	2.7	4	100	20	8.1
BHS5-ST2-DUP	2/6/14 8:30	19.03	6.75	1008	0.15	-243.2	380	2	2	13	45	1.92	1.9	1.27	0.63	0.01	0.01	0.02	0.65	1.4	0.88	74	2.7	4	100	20	8.3
BHS5-EB	2/6/14 9:05	17.7	6.23	2.43	8.15	-36.7	2	1	1	2	10	0.07	0.05	0.041	0.009	0.01	0.01	0.02	0.029	0.01	0.01	0.2	0.01	0.1	1	2	0.06

Notes:

¹Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO_x.

²Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH₃.

³Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH₃ and NO_x.

Gray-shaded data points indicate values below method detection level (mdl), mdl value used for statistical analyses.

Yellow-shaded data points indicate the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit, value used for statistical analysis.

Too many colonies were present. The numeric value represents the filtration volume.

Results based on colony counts outside the ideal range.

Table A.4
Water Quality Analytical Results
February 7, 2014

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD ₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH ₃ -N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NO _x (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BH55-STE	2/7/14 10:55	20.2	7.63	1206	0.03	-307.4	420	32	28	72	140	68.02	68	7	61	0.01	0.01	0.02	61.02	6.3	3.7	2.1	1.6	8.1	93600	1800	33
BH55-ST1	2/7/14 10:55	20.14	6.75	1070	1.93	-77.3	210	2	2	9	10	43.43	3.9	1.6	2.3	39	0.53	39.53	41.83	2.1	1.4	25	0.27	0.4	4400	72	5.5
BH55-LIGNO-0	2/7/14 10:35	18.4	7.38	1063	0.14	-177.0	360	2	1	14	12	8.28	1.5	1.42	0.08	5.9	0.88	6.78	6.86	0.95	0.49	24	0.06	0.2	600	63	9.3
BH55-ST2	2/7/14 10:35	18.9	6.79	995	0.38	-229.7	380	3	3	16	35	1.18	1	0.69	0.31	0.17	0.01	0.18	0.49	1.3	0.86	55	4.6	7.3	100	10	7.1
BH55-ST2-DUP	2/7/14 10:40	18.9	6.79	995	0.38	-229.7	370	3	3	17	33	1.28	1.1	0.78	0.32	0.17	0.01	0.18	0.5	1.3	0.91	54	4.4	6.8	100	31	7.1

Notes:

¹Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO_x.

²Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH₃.

³Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH₃ and NO_x.

Gray-shaded data points indicate values below method detection level (mdl), mdl value used for statistical analyses.

Yellow-shaded data points indicate the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit, value used for statistical analysis.

Too many colonies were present. The numeric value represents the filtration volume.

Results based on colony counts outside the ideal range.

Hazen and Sawyer
10002 Princess Palm Ave, Suite 200
Tampa, FL 33619

February 25, 2014
Work Order: 1401201

Laboratory Report

Project Name		B-HS5 SE#3						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-STE						
Matrix		Wastewater						
SAL Sample Number		1401201-01						
Date/Time Collected		02/03/14 10:10						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						
<u>Client Provided Field Data</u>								
pH		7.33						
Temperature		19.9 °C						
Conductivity		1162 umhos						
Dissolved Oxygen		0.08 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	6.9	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:52	1
Ammonia as N	mg/L	59	EPA 350.1	2.0	0.47		02/05/14 17:28	50
Carbonaceous BOD	mg/L	79	SM 5210B	2	2	02/04/14 15:07	02/09/14 09:57	1
Chemical Oxygen Demand	mg/L	37	EPA 410.4	25	10	02/06/14 09:30	02/06/14 12:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 04:25	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 04:25	1
Orthophosphate as P	mg/L	5.0	EPA 300.0	0.040	0.010		02/05/14 04:25	1
Phosphorous - Total as P	mg/L	7.2	SM 4500P-E	0.20	0.050	02/04/14 09:50	02/05/14 15:07	5
Sulfate	mg/L	2.2	EPA 300.0	0.60	0.20		02/05/14 04:25	1
Sulfide	mg/L	10	SM 4500SF	0.40	0.10		02/08/14 13:52	1
Total Alkalinity	mg/L	390	SM 2320B	8.0	2.0		02/14/14 11:50	1
Total Kjeldahl Nitrogen	mg/L	66	EPA 351.2	8.3	2.1	02/04/14 11:28	02/06/14 15:23	41.67
Total Organic Carbon	mg/L	32	SM 5310B	1.0	0.060		02/05/14 20:30	1
Total Suspended Solids	mg/L	25	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:58	1
Volatile Suspended Solids	mg/L	22	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:58	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 04:25	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	5,500	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:49	1
Fecal Coliforms	CFU/100 ml	24,000	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:40	1

Sample Description **BHS5-STE-FILTERED**
 Matrix **Wastewater**
 SAL Sample Number **1401201-02**
 Date/Time Collected **02/03/14 10:10**
 Collected by **Josefin Hirst**
 Date/Time Received **02/03/14 16:30**

Client Provided Field Data

pH 7.33
 Temperature 19.9 °C
 Conductivity 1162 umhos
 Dissolved Oxygen 0.08 mg/L

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Tampa, FL 33619

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Laboratory Report

Project Name		B-HS5 SE#3						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-STE-FILTERED						
Matrix		Wastewater						
SAL Sample Number		1401201-02						
Date/Time Collected		02/03/14 10:10						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						
<u>Inorganic, Dissolved</u>								
Ammonia as N	mg/L	58	EPA 350.1	2.0	0.47		02/18/14 17:24	50
Carbonaceous BOD	mg/L	24	SM 5210B	2	2	02/05/14 08:30	02/10/14 12:17	1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		02/05/14 04:34	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 04:34	1
Total Kjeldahl Nitrogen	mg/L	60	EPA 351.2	0.20	0.050	02/05/14 11:50	02/18/14 16:46	20
Nitrate+Nitrite (N)	mg/L	0.04 I	EPA 300.0	0.08	0.02		02/05/14 04:34	1
Lab filtration for diss. analytes							02/04/14 16:00	
Sample Description		BHS5-ST1						
Matrix		Wastewater						
SAL Sample Number		1401201-03						
Date/Time Collected		02/03/14 09:45						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						
<u>Client Provided Field Data</u>								
pH		6.99						
Temperature		21.2 °C						
Conductivity		1168 umhos						
Dissolved Oxygen		3.23 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.20	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:52	1
Ammonia as N	mg/L	4.2	EPA 350.1	0.040	0.009		02/05/14 16:11	1
Carbonaceous BOD	mg/L	13	SM 5210B	2	2	02/04/14 15:07	02/09/14 09:57	1
Chemical Oxygen Demand	mg/L	23 I	EPA 410.4	25	10	02/05/14 09:18	02/05/14 15:18	1
Nitrate (as N)	mg/L	39	EPA 300.0	0.40	0.10		02/05/14 08:30	10
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 07:50	1
Orthophosphate as P	mg/L	1.7	EPA 300.0	0.040	0.010		02/05/14 07:50	1
Phosphorous - Total as P	mg/L	3.0	SM 4500P-E	0.080	0.020	02/04/14 09:50	02/05/14 15:08	2
Sulfate	mg/L	21	EPA 300.0	0.60	0.20		02/05/14 07:50	1
Sulfide	mg/L	0.40	SM 4500SF	0.40	0.10		02/08/14 13:52	1
Total Alkalinity	mg/L	220	SM 2320B	8.0	2.0		02/14/14 11:56	1
Total Kjeldahl Nitrogen	mg/L	6.4	EPA 351.2	1.0	0.25	02/04/14 11:28	02/06/14 16:33	5
Total Organic Carbon	mg/L	6.7	SM 5310B	1.0	0.060		02/05/14 20:30	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:58	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:58	1
Nitrate+Nitrite (N)	mg/L	39	EPA 300.0	0.44	0.11		02/05/14 08:30	10

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Laboratory Report

Project Name		B-HS5 SE#3						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST1						
Matrix		Wastewater						
SAL Sample Number		1401201-03						
Date/Time Collected		02/03/14 09:45						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						

Microbiology

E. Coli	MPN/100 mL	10 Q	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:49	1
Fecal Coliforms	CFU/100 ml	1,000	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:40	1

Sample Description		BHS5-ST1-FILTERED						
Matrix		Wastewater						
SAL Sample Number		1401201-04						
Date/Time Collected		02/03/14 09:45						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						

Client Provided Field Data

pH	6.99
Temperature	21.2 °C
Conductivity	1168 umhos
Dissolved Oxygen	3.23 mg/L

Inorganics

Sulfate	mg/L	29	EPA 300.0	0.60	0.20		02/05/14 04:53	1
<u>Inorganic, Dissolved</u>								
Ammonia as N	mg/L	4.1	EPA 350.1	0.20	0.047		02/18/14 17:31	5
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	02/05/14 08:30	02/10/14 12:17	1
Nitrate (as N)	mg/L	39	EPA 300.0	0.40	0.10		02/05/14 08:30	10
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 04:53	1
Total Kjeldahl Nitrogen	mg/L	5.4	EPA 351.2	0.20	0.050	02/05/14 11:50	02/18/14 16:46	2
Nitrate+Nitrite (N)	mg/L	39	EPA 300.0	0.44	0.11		02/05/14 08:30	10
Lab filtration for diss. analytes							02/04/14 16:00	

Sample Description		BHS5-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1401201-05						
Date/Time Collected		02/03/14 09:20						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						

Client Provided Field Data

pH	6.70
Temperature	19.3 °C
Conductivity	1037 umhos

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Laboratory Report

Project Name		B-HS5 SE#3						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1401201-05						
Date/Time Collected		02/03/14 09:20						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						
Dissolved Oxygen		0.23 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.54	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.38	EPA 350.1	0.040	0.009		02/05/14 16:13	1
Carbonaceous BOD	mg/L	11	SM 5210B	2	2	02/04/14 15:07	02/09/14 09:57	1
Chemical Oxygen Demand	mg/L	41	EPA 410.4	25	10	02/05/14 09:18	02/05/14 15:18	1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		02/05/14 05:02	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:02	1
Orthophosphate as P	mg/L	0.51	EPA 300.0	0.040	0.010		02/05/14 05:02	1
Phosphorous - Total as P	mg/L	1.5	SM 4500P-E	0.040	0.010	02/04/14 09:50	02/05/14 15:10	1
Sulfate	mg/L	18	EPA 300.0	0.60	0.20		02/05/14 05:02	1
Sulfide	mg/L	0.81	SM 4500SF	0.40	0.10		02/08/14 13:52	1
Total Alkalinity	mg/L	380	SM 2320B	8.0	2.0		02/14/14 12:06	1
Total Kjeldahl Nitrogen	mg/L	4.7	EPA 351.2	0.20	0.05	02/04/14 11:27	02/06/14 11:45	1
Total Organic Carbon	mg/L	11	SM 5310B	1.0	0.060		02/05/14 20:30	1
Total Suspended Solids	mg/L	3	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:58	1
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:58	1
Nitrate+Nitrite (N)	mg/L	0.04 I	EPA 300.0	0.08	0.02		02/05/14 05:02	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	41 Q	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:49	1
Fecal Coliforms	CFU/100 ml	1,000 Q	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:40	1

Sample Description **BHS5-LIGNO-0-FILTERED**
 Matrix **Wastewater**
 SAL Sample Number **1401201-06**
 Date/Time Collected **02/03/14 09:20**
 Collected by **Josefin Hirst**
 Date/Time Received **02/03/14 16:30**

Client Provided Field Data

pH 6.70
 Temperature 19.3 °C
 Conductivity 1037 umhos
 Dissolved Oxygen 0.23 mg/L

Inorganic, Dissolved

Ammonia as N	mg/L	0.30	EPA 350.1	0.040	0.009		02/18/14 16:47	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	02/05/14 08:30	02/10/14 12:17	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:12	1

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Project Name		B-HS5 SE#3						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-LIGNO-0-FILTERED						
Matrix		Wastewater						
SAL Sample Number		1401201-06						
Date/Time Collected		02/03/14 09:20						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:12	1
Total Kjeldahl Nitrogen	mg/L	0.78	EPA 351.2	0.20	0.050	02/05/14 11:50	02/18/14 16:46	2
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 05:12	1
Lab filtration for diss. analytes							02/04/14 16:00	
Sample Description		BHS5-ST2						
Matrix		Wastewater						
SAL Sample Number		1401201-07						
Date/Time Collected		02/03/14 08:55						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						
<u>Client Provided Field Data</u>								
pH		6.79						
Temperature		18.3 °C						
Conductivity		1135 umhos						
Dissolved Oxygen		0.08 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	1.3	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.17	EPA 350.1	0.040	0.009		02/06/14 08:11	1
Carbonaceous BOD	mg/L	7	SM 5210B	2	2	02/04/14 15:07	02/09/14 09:57	1
Chemical Oxygen Demand	mg/L	23 I	EPA 410.4	25	10	02/05/14 09:18	02/05/14 15:18	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:21	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:21	1
Orthophosphate as P	mg/L	0.41	EPA 300.0	0.040	0.010		02/05/14 05:21	1
Phosphorous - Total as P	mg/L	1.1	SM 4500P-E	0.040	0.010	02/04/14 09:50	02/05/14 15:11	1
Sulfate	mg/L	98	EPA 300.0	0.60	0.20		02/05/14 05:21	1
Sulfide	mg/L	2.0	SM 4500SF	0.40	0.10		02/08/14 13:52	1
Total Alkalinity	mg/L	350	SM 2320B	8.0	2.0		02/14/14 12:15	1
Total Kjeldahl Nitrogen	mg/L	1.7	EPA 351.2	0.20	0.05	02/04/14 11:27	02/06/14 11:47	1
Total Organic Carbon	mg/L	9.2	SM 5310B	1.0	0.060		02/05/14 20:30	1
Total Suspended Solids	mg/L	1	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:58	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:58	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 05:21	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	52 Q	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:49	1
Fecal Coliforms	CFU/100 ml	1,000 Q	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:40	1

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Laboratory Report

Project Name		B-HS5 SE#3						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401201-08						
Date/Time Collected		02/03/14 09:00						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						
<u>Client Provided Field Data</u>								
pH		6.79						
Temperature		18.3 °C						
Conductivity		1135 umhos						
Dissolved Oxygen		0.08 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	1.0	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.49	EPA 350.1	0.040	0.009		02/06/14 08:12	1
Carbonaceous BOD	mg/L	8	SM 5210B	2	2	02/04/14 15:07	02/09/14 09:57	1
Chemical Oxygen Demand	mg/L	25	EPA 410.4	25	10	02/05/14 09:18	02/05/14 15:18	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:31	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:31	1
Orthophosphate as P	mg/L	0.42	EPA 300.0	0.040	0.010		02/05/14 05:31	1
Phosphorous - Total as P	mg/L	1.1	SM 4500P-E	0.040	0.010	02/04/14 09:50	02/05/14 15:12	1
Sulfate	mg/L	110	EPA 300.0	0.60	0.20		02/05/14 05:31	1
Sulfide	mg/L	1.6	SM 4500SF	0.40	0.10		02/08/14 13:52	1
Total Alkalinity	mg/L	340	SM 2320B	8.0	2.0		02/14/14 12:23	1
Total Kjeldahl Nitrogen	mg/L	1.7	EPA 351.2	0.20	0.05	02/04/14 11:27	02/06/14 11:48	1
Total Organic Carbon	mg/L	8.6	SM 5310B	1.0	0.060		02/05/14 20:30	1
Total Suspended Solids	mg/L	1	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:58	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:58	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 05:31	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	31 Q	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:49	1
Fecal Coliforms	CFU/100 ml	1,000 Q	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:40	1

Sample Description **BHS5-ST2-FILTERED**
 Matrix **Wastewater**
 SAL Sample Number **1401201-09**
 Date/Time Collected **02/03/14 08:55**
 Collected by **Josefin Hirst**
 Date/Time Received **02/03/14 16:30**

Client Provided Field Data

pH 6.79
 Temperature 18.3 °C
 Conductivity 1135 umhos
 Dissolved Oxygen 0.08 mg/L

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Laboratory Report

Project Name		B-HS5 SE#3						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2-FILTERED						
Matrix		Wastewater						
SAL Sample Number		1401201-09						
Date/Time Collected		02/03/14 08:55						
Collected by		Josefin Hirst						
Date/Time Received		02/03/14 16:30						
<u>Inorganics</u>								
Sulfate	mg/L	98	EPA 300.0	0.60	0.20		02/05/14 05:40	1
<u>Inorganic, Dissolved</u>								
Ammonia as N	mg/L	0.44	EPA 350.1	0.040	0.009		02/18/14 16:48	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	02/05/14 08:30	02/10/14 12:17	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:40	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 05:40	1
Total Kjeldahl Nitrogen	mg/L	0.92	EPA 351.2	0.20	0.050	02/05/14 11:50	02/18/14 16:46	2
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 05:40	1
Lab filtration for diss. analytes							02/04/14 16:00	

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40409 - Digestion for TP by EPA 365.2/SM4500PE										
Blank (BB40409-BLK1)					Prepared: 02/04/14 Analyzed: 02/05/14					
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BB40409-BS1)					Prepared: 02/04/14 Analyzed: 02/05/14					
Phosphorous - Total as P	0.800	0.040	0.010	mg/L	0.80		100	90-110		
Matrix Spike (BB40409-MS1)					Source: 1401032-02 Prepared: 02/04/14 Analyzed: 02/05/14					
Phosphorous - Total as P	1.05	0.040	0.010	mg/L	1.0	0.0203	103	90-110		
Matrix Spike (BB40409-MS2)					Source: 1401168-02 Prepared: 02/04/14 Analyzed: 02/05/14					
Phosphorous - Total as P	1.03	0.040	0.010	mg/L	1.0	0.0221	101	90-110		
Matrix Spike Dup (BB40409-MSD1)					Source: 1401032-02 Prepared: 02/04/14 Analyzed: 02/05/14					
Phosphorous - Total as P	1.04	0.040	0.010	mg/L	1.0	0.0203	101	90-110	1	25
Matrix Spike Dup (BB40409-MSD2)					Source: 1401168-02 Prepared: 02/04/14 Analyzed: 02/05/14					
Phosphorous - Total as P	1.11	0.040	0.010	mg/L	1.0	0.0221	109	90-110	7	25
Batch BB40416 - Digestion for TKN by EPA 351.2										
Blank (BB40416-BLK1)					Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BB40416-BS1)					Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	2.42	0.20	0.05	mg/L	2.5		96	90-110		
Matrix Spike (BB40416-MS1)					Source: 1401146-07 Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	3.14	0.20	0.05	mg/L	2.5	0.495	104	90-110		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40416 - Digestion for TKN by EPA 351.2										
Matrix Spike (BB40416-MS2)		Source: 1401171-01			Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	2.29	0.20	0.05	mg/L	2.5	ND	90	90-110		
Matrix Spike Dup (BB40416-MSD1)		Source: 1401146-07			Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	3.19	0.20	0.05	mg/L	2.5	0.495	106	90-110	2	20
Matrix Spike Dup (BB40416-MSD2)		Source: 1401171-01			Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	2.46	0.20	0.05	mg/L	2.5	ND	97	90-110	7	20
Batch BB40417 - Digestion for TKN by EPA 351.2										
Blank (BB40417-BLK1)		Prepared: 02/04/14 Analyzed: 02/06/14								
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BB40417-BS1)		Prepared: 02/04/14 Analyzed: 02/06/14								
Total Kjeldahl Nitrogen	2.70	0.20	0.05	mg/L	2.5		106	90-110		
Matrix Spike (BB40417-MS1)		Source: 1401199-21			Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	2.73	0.20	0.05	mg/L	2.5	ND	108	90-110		
Matrix Spike (BB40417-MS2)		Source: 1401199-22			Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	2.68	0.20	0.05	mg/L	2.5	ND	106	90-110		
Matrix Spike Dup (BB40417-MSD1)		Source: 1401199-21			Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	2.38	0.20	0.05	mg/L	2.5	ND	94	90-110	14	20
Matrix Spike Dup (BB40417-MSD2)		Source: 1401199-22			Prepared: 02/04/14 Analyzed: 02/06/14					
Total Kjeldahl Nitrogen	2.62	0.20	0.05	mg/L	2.5	ND	104	90-110	2	20

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February 25, 2014
Work Order: 1401201

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40422 - Ion Chromatography 300.0 Prep										
Blank (BB40422-BLK1)					Prepared & Analyzed: 02/05/14					
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
LCS (BB40422-BS1)					Prepared & Analyzed: 02/05/14					
Orthophosphate as P	0.884	0.040	0.010	mg/L	0.90		98	85-115		
Sulfate	9.44	0.60	0.20	mg/L	9.0		105	85-115		
Nitrite (as N)	1.50	0.04	0.01	mg/L	1.4		107	85-115		
Nitrate (as N)	1.78	0.04	0.01	mg/L	1.7		105	85-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
LCS Dup (BB40422-BSD1)					Prepared & Analyzed: 02/05/14					
Nitrate (as N)	1.71	0.04	0.01	mg/L	1.7		101	85-115	4	200
Orthophosphate as P	0.855	0.040	0.010	mg/L	0.90		95	85-115	3	200
Nitrite (as N)	1.50	0.04	0.01	mg/L	1.4		107	85-115	0.2	200
Sulfate	9.30	0.60	0.20	mg/L	9.0		103	85-115	1	200
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		

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February 25, 2014
Work Order: 1401201

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch BB40422 - Ion Chromatography 300.0 Prep

Matrix Spike (BB40422-MS1)		Source: 1401200-09			Prepared & Analyzed: 02/06/14					
Sulfate	42.4	0.60	0.20	mg/L	9.0	33.1	103	85-115		
Nitrate (as N)	1.66	0.04	0.01	mg/L	1.7	0.0370	95	85-115		
Nitrite (as N)	1.51	0.04	0.01	mg/L	1.4	ND	108	85-115		
Orthophosphate as P	3.29	0.040	0.010	mg/L	0.90	2.32	108	85-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		

Matrix Spike (BB40422-MS2)		Source: 1401201-09			Prepared & Analyzed: 02/05/14					
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7	ND	99	85-115		
Nitrite (as N)	1.43	0.04	0.01	mg/L	1.4	ND	102	85-115		
Sulfate	90.0 L	0.60	0.20	mg/L	9.0	98.3	NR	85-115		
Orthophosphate as P	1.36	0.040	0.010	mg/L	0.90	0.432	103	85-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		

Batch BB40439 - BOD

Blank (BB40439-BLK1)		Prepared: 02/04/14 Analyzed: 02/09/14								
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40439-BS1)		Prepared: 02/04/14 Analyzed: 02/09/14								
Carbonaceous BOD	210	2	2	mg/L	200		105	85-115		

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February 25, 2014
Work Order: 1401201

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40439 - BOD										
LCS Dup (BB40439-BSD1)					Prepared: 02/04/14 Analyzed: 02/09/14					
Carbonaceous BOD	207	2	2	mg/L	200		103	85-115	1	200
Duplicate (BB40439-DUP1)					Source: 1401169-01 Prepared: 02/04/14 Analyzed: 02/09/14					
Carbonaceous BOD	140	2	2	mg/L		150			5	25
Batch BB40502 - COD prep										
Blank (BB40502-BLK1)					Prepared & Analyzed: 02/05/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BB40502-BS1)					Prepared & Analyzed: 02/05/14					
Chemical Oxygen Demand	47	25	10	mg/L	50		94	90-110		
Matrix Spike (BB40502-MS1)					Source: 1401200-10 Prepared & Analyzed: 02/05/14					
Chemical Oxygen Demand	43	25	10	mg/L	50	ND	86	85-115		
Matrix Spike Dup (BB40502-MSD1)					Source: 1401200-10 Prepared & Analyzed: 02/05/14					
Chemical Oxygen Demand	43	25	10	mg/L	50	ND	86	85-115	0	32
Batch BB40510 - VSS Prep										
Blank (BB40510-BLK1)					Prepared: 02/05/14 Analyzed: 02/10/14					
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						
LCS (BB40510-BS1)					Prepared: 02/05/14 Analyzed: 02/10/14					
Total Suspended Solids	49.0	1	1	mg/L	50		98	85-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40510 - VSS Prep										
Duplicate (BB40510-DUP1)		Source: 1401199-01			Prepared: 02/05/14 Analyzed: 02/10/14					
Total Suspended Solids	17.5	1	1	mg/L		18.0			3	30
Volatile Suspended Solids	16.5	1		mg/L		17.0			3	20
Batch BB40532 - Ammonia by SEAL										
Blank (BB40532-BLK1)		Prepared & Analyzed: 02/05/14								
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB40532-BS1)		Prepared & Analyzed: 02/05/14								
Ammonia as N	0.51	0.040	0.009	mg/L	0.50		102	90-110		
Matrix Spike (BB40532-MS1)		Source: 1401196-07			Prepared & Analyzed: 02/05/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	0.020	99	90-110		
Matrix Spike (BB40532-MS2)		Source: 1401254-07			Prepared & Analyzed: 02/05/14					
Ammonia as N	0.50	0.040	0.009	mg/L	0.50	0.021	97	90-110		
Matrix Spike Dup (BB40532-MSD1)		Source: 1401196-07			Prepared & Analyzed: 02/05/14					
Ammonia as N	0.51	0.040	0.009	mg/L	0.50	0.020	98	90-110	0.8	10
Matrix Spike Dup (BB40532-MSD2)		Source: 1401254-07			Prepared & Analyzed: 02/05/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	0.021	99	90-110	3	10
Batch BB40533 - Ammonia by SEAL										
Blank (BB40533-BLK1)		Prepared & Analyzed: 02/05/14								
Ammonia as N	0.009 U	0.040	0.009	mg/L						

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40533 - Ammonia by SEAL										
LCS (BB40533-BS1)					Prepared & Analyzed: 02/05/14					
Ammonia as N	0.54	0.040	0.009	mg/L	0.50		107	90-110		
Matrix Spike (BB40533-MS1)					Source: 1401305-01 Prepared & Analyzed: 02/05/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50	ND	106	90-110		
Matrix Spike Dup (BB40533-MSD1)					Source: 1401305-01 Prepared & Analyzed: 02/05/14					
Ammonia as N	:S AT 109%	0.040	0.009	mg/L	0.50	ND	110	90-110	4	10
Batch BB40546 - TOC prep										
Blank (BB40546-BLK1)					Prepared & Analyzed: 02/05/14					
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
LCS (BB40546-BS1)					Prepared & Analyzed: 02/05/14					
Total Organic Carbon	9.60	1.0	0.060	mg/L	10		96	90-110		
Matrix Spike (BB40546-MS1)					Source: 1401252-03 Prepared & Analyzed: 02/05/14					
Total Organic Carbon	10.6	1.0	0.060	mg/L	10	0.656	99	85-115		
Matrix Spike Dup (BB40546-MSD1)					Source: 1401252-03 Prepared & Analyzed: 02/05/14					
Total Organic Carbon	10.4	1.0	0.060	mg/L	10	0.656	98	85-115	1	10
Batch BB40621 - COD prep										
Blank (BB40621-BLK1)					Prepared & Analyzed: 02/06/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40621 - COD prep										
LCS (BB40621-BS1)					Prepared & Analyzed: 02/06/14					
Chemical Oxygen Demand	45	25	10	mg/L	50		90	90-110		
Matrix Spike (BB40621-MS1)					Source: 1401256-06 Prepared & Analyzed: 02/06/14					
Chemical Oxygen Demand	45	25	10	mg/L	50	ND	90	85-115		
Matrix Spike Dup (BB40621-MSD1)					Source: 1401256-06 Prepared & Analyzed: 02/06/14					
Chemical Oxygen Demand	45	25	10	mg/L	50	ND	90	85-115	0	32
Batch BB40801 - Sulfide prep										
Blank (BB40801-BLK1)					Prepared & Analyzed: 02/08/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
Blank (BB40801-BLK2)					Prepared & Analyzed: 02/08/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BB40801-BS1)					Prepared & Analyzed: 02/08/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
LCS (BB40801-BS2)					Prepared & Analyzed: 02/08/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0		97	85-115		
Matrix Spike (BB40801-MS1)					Source: 1401199-21 Prepared & Analyzed: 02/08/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike (BB40801-MS2)					Source: 1401199-22 Prepared & Analyzed: 02/08/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40801 - Sulfide prep										
Matrix Spike Dup (BB40801-MSD1)		Source: 1401199-21			Prepared & Analyzed: 02/08/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115	0	14
Matrix Spike Dup (BB40801-MSD2)		Source: 1401199-22			Prepared & Analyzed: 02/08/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115	0	14
Batch BB41346 - alkalinity										
Blank (BB41346-BLK1)					Prepared & Analyzed: 02/14/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BB41346-BS1)					Prepared & Analyzed: 02/14/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		103	90-110		
Matrix Spike (BB41346-MS1)		Source: 1401533-01			Prepared & Analyzed: 02/14/14					
Total Alkalinity	270	8.0	2.0	mg/L	120	160	88	80-120		
Matrix Spike Dup (BB41346-MSD1)		Source: 1401533-01			Prepared & Analyzed: 02/14/14					
Total Alkalinity	270	8.0	2.0	mg/L	120	160	88	80-120	0.2	26
Batch BB42017 - Ion Chromatography 300.0 Prep										
Blank (BB42017-BLK1)					Prepared & Analyzed: 02/21/14					
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
LCS (BB42017-BS1)					Prepared & Analyzed: 02/21/14					
Nitrate (as N)	1.63	0.04	0.01	mg/L	1.7		96	85-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB42017 - Ion Chromatography 300.0 Prep										
LCS Dup (BB42017-BSD1)					Prepared & Analyzed: 02/21/14					
Nitrate (as N)	1.65	0.04	0.01	mg/L	1.7		97	85-115	1	200
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
Matrix Spike (BB42017-MS1)					Source: 1401224-05 Prepared & Analyzed: 02/21/14					
Nitrate (as N)	1,630	40	10	mg/L	1700	40.0	93	85-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		

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Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40422 - Ion Chromatography 300.0 Prep										
Blank (BB40422-BLK1)					Prepared & Analyzed: 02/05/14					
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
LCS (BB40422-BS1)					Prepared & Analyzed: 02/05/14					
Nitrate (as N)	1.78	0.04	0.01	mg/L	1.7		105	85-115		
Nitrite (as N)	1.50	0.04	0.01	mg/L	1.4		107	85-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
LCS Dup (BB40422-BSD1)					Prepared & Analyzed: 02/05/14					
Nitrate (as N)	1.71	0.04	0.01	mg/L	1.7		101	85-115	4	200
Nitrite (as N)	1.50	0.04	0.01	mg/L	1.4		107	85-115	0.2	200
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Matrix Spike (BB40422-MS1)					Source: 1401200-09		Prepared & Analyzed: 02/06/14			
Nitrate (as N)	1.66	0.04	0.01	mg/L	1.7	0.0370	95	85-115		
Nitrite (as N)	1.51	0.04	0.01	mg/L	1.4	ND	108	85-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Matrix Spike (BB40422-MS2)					Source: 1401201-09		Prepared & Analyzed: 02/05/14			
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7	ND	99	85-115		
Nitrite (as N)	1.43	0.04	0.01	mg/L	1.4	ND	102	85-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		

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Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40514 - BOD Dissolved										
Blank (BB40514-BLK1)					Prepared: 02/05/14 Analyzed: 02/10/14					
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40514-BS1)					Prepared: 02/05/14 Analyzed: 02/10/14					
Carbonaceous BOD	198	2	2	mg/L	200		99	85-115		
LCS Dup (BB40514-BSD1)					Prepared: 02/05/14 Analyzed: 02/10/14					
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115	2	200
Duplicate (BB40514-DUP1)					Source: 1401200-06 Prepared: 02/05/14 Analyzed: 02/10/14					
Carbonaceous BOD	2 U	2	2	mg/L		ND				25
Batch BB40521 - Digestion for TKN by EPA 351.2										
Blank (BB40521-BLK1)					Prepared: 02/05/14 Analyzed: 02/18/14					
Total Kjeldahl Nitrogen	0.050 U	0.20	0.050	mg/L						
LCS (BB40521-BS1)					Prepared: 02/05/14 Analyzed: 02/18/14					
Total Kjeldahl Nitrogen	0.915	0.20	0.050	mg/L	1.0		92	90-110		
Matrix Spike (BB40521-MS1)					Source: 1401199-07 Prepared: 02/05/14 Analyzed: 02/18/14					
Total Kjeldahl Nitrogen	2.05	0.20	0.050	mg/L	1.0	1.03	102	90-110		
Matrix Spike (BB40521-MS2)					Source: 1401201-06 Prepared: 02/05/14 Analyzed: 02/18/14					
Total Kjeldahl Nitrogen	1.72	0.20	0.050	mg/L	1.0	0.780	94	90-110		
Matrix Spike Dup (BB40521-MSD1)					Source: 1401199-07 Prepared: 02/05/14 Analyzed: 02/18/14					
Total Kjeldahl Nitrogen	2.07	0.20	0.050	mg/L	1.0	1.03	103	90-110	0.6	20

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Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40521 - Digestion for TKN by EPA 351.2										
Matrix Spike Dup (BB40521-MSD2)		Source: 1401201-06			Prepared: 02/05/14 Analyzed: 02/18/14					
Total Kjeldahl Nitrogen	1.70	0.20	0.050	mg/L	1.0	0.780	92	90-110	1	20
Batch BB41303 - Ammonia by SEAL										
Blank (BB41303-BLK1)					Prepared & Analyzed: 02/18/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB41303-BS1)					Prepared & Analyzed: 02/18/14					
Ammonia as N	0.54	0.040	0.009	mg/L	0.50		109	90-110		
Matrix Spike (BB41303-MS1)		Source: 1401199-07			Prepared & Analyzed: 02/18/14					
Ammonia as N	0.55	0.040	0.009	mg/L	0.50	0.021	105	90-110		
Matrix Spike (BB41303-MS2)		Source: 1401201-06			Prepared & Analyzed: 02/18/14					
Ammonia as N	0.80	0.040	0.009	mg/L	0.50	0.30	101	90-110		
Matrix Spike Dup (BB41303-MSD1)		Source: 1401199-07			Prepared & Analyzed: 02/19/14					
Ammonia as N	0.57	0.040	0.009	mg/L	0.50	0.021	109	90-110	3	10
Matrix Spike Dup (BB41303-MSD2)		Source: 1401201-06			Prepared & Analyzed: 02/18/14					
Ammonia as N	0.75	0.040	0.009	mg/L	0.50	0.30	91	90-110	6	10
Batch BB42017 - Ion Chromatography 300.0 Prep										
Blank (BB42017-BLK1)					Prepared & Analyzed: 02/21/14					
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



Hazen and Sawyer
10002 Princess Palm Ave, Suite 200
Tampa, FL 33619

February 25, 2014
Work Order: 1401201

Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB42017 - Ion Chromatography 300.0 Prep										
LCS (BB42017-BS1)					Prepared & Analyzed: 02/21/14					
Nitrate (as N)	1.63	0.04	0.01	mg/L	1.7		96	85-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		
LCS Dup (BB42017-BSD1)					Prepared & Analyzed: 02/21/14					
Nitrate (as N)	1.65	0.04	0.01	mg/L	1.7		97	85-115	1	200
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
Matrix Spike (BB42017-MS1)					Source: 1401224-05		Prepared & Analyzed: 02/21/14			
Nitrate (as N)	1,630	40	10	mg/L	1700	40.0	93	85-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		

SOUTHERN ANALYTICAL LABORATORIES, INC.

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Tampa, FL 33619

February 25, 2014
Work Order: 1401201

Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40402 - FC-MF										
Blank (BB40402-BLK1)					Prepared: 02/03/14 Analyzed: 02/04/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
Duplicate (BB40402-DUP1)					Source: 1401199-21 Prepared: 02/03/14 Analyzed: 02/04/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
Duplicate (BB40402-DUP2)					Source: 1401199-22 Prepared: 02/03/14 Analyzed: 02/04/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
Duplicate (BB40402-DUP3)					Source: 1401200-10 Prepared: 02/03/14 Analyzed: 02/04/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200

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February 25, 2014
Work Order: 1401201

*** Qualifiers, Notes and Definitions**

Results followed by a "U" indicate that the sample was analyzed but the compound was not detected. Results followed by "I" indicate that the reported value is between the laboratory method detection limits and the laboratory practical quantitation limit.

A statement of estimated uncertainty of test results is available upon request.

For methods marked with **, all QC criteria have been met for this method which is equivalent to a SAL certified method.

Test results in this report meet all the requirements of the NELAC standards. Any applicable qualifiers are shown below.

- Q Sample held beyond the accepted holding time.
L Off-scale high. Result exceeded highest calibration standard.

Questions regarding this report should be directed to :

Kathryn Nordmark
Telephone (813) 855-1844 FAX (813) 855-2218
Kathryn@southernanalyticalabs.com



Client Name Hazan and Sawyer										Contact / Phone: Josefin Hirst 813-630-4498																																														
Project Name / Location BHS5 SE#3																																																								
Samplers: (Signature) <i>Josefin Hirst</i>										PARAMETER / CONTAINER DESCRIPTION																																														
Matrix Codes: DW-Drinking Water WW-Wastewater SW-Surface Water SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water																																																								
SAL Use Only	Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	125mLP, Na ₂ S ₂ O ₃ FC-MF, FC-QT	1LP, Cool Total Alkalinity, TSS, VSS, CBOD, NOx, OP, SO ₄	125mLP, H ₂ SO ₄ COD, TKN, NH ₃ , TP	500mLP, NaOH, Zn Acetate H ₂ S	40mLaV, HCl TOC	1LP, Cool Lab Filtered: CBOD, TKN, NH ₃ , NOx	1LP, Cool Lab Filtered: CBOD, TKN, NH ₃ , NOx, SO ₄		pH	Temperature	Conductivity	DO																																					
	01	BHS5-STE	2/3/14	10:10	WW		X	4	1	1	1	2				7.33	19.9	1162	0.08																																					
	02	BHS5-STE-FILTERED		10:10	WW		X						1			7.33	19.9	1162	0.08																																					
	03	BHS5-ST1		9:45	WW		X	4	1	1	1	2				6.99	21.2	1168	3.23																																					
	04	BHS5-ST1-FILTERED		9:45	WW		X							1		6.99	21.2	1168	3.23																																					
	05	BHS5-LIGNO-0		9:20	WW		X	4	1	1	1	2				6.70	19.3	1037	0.23																																					
	06	BHS5-LIGNO-0-FILTERED		9:20	WW		X						1			6.70	19.3	1037	0.23																																					
	07	BHS5-ST2		8:55	WW		X	4	1	1	1	2				6.79	18.3	1135	0.08																																					
	08	BHS5-ST2-DUP		9:00	WW		X	4	1	1	1	2				6.79	18.3	1135	0.08																																					
	09	BHS5-ST2-FILTERED		8:55	WW		X							1		6.79	18.3	1135	0.08																																					
	10	BHS5-EB			R		X	4	1	1	1	2																																												
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Containers Prepared/Relinquished: <i>H. Hirst</i></td> <td>Date/Time: 1330 1-30-14</td> <td>Received: <i>A. J.</i></td> <td>Date/Time: 1/30/14</td> <td>Seal intact? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</td> <td rowspan="5" style="vertical-align: top;">Instructions / Remarks</td> </tr> <tr> <td>Relinquished: <i>A. J.</i></td> <td>Date/Time: 1630 2/3/14</td> <td>Received: <i>K. Mudment</i></td> <td>Date/Time: 1630 2/3/14</td> <td>Samples intact upon arrival? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</td> </tr> <tr> <td>Relinquished:</td> <td>Date/Time:</td> <td>Received:</td> <td>Date/Time:</td> <td>Received on ice? Temp: <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</td> </tr> <tr> <td>Relinquished:</td> <td>Date/Time:</td> <td>Received:</td> <td>Date/Time:</td> <td>Proper preservatives indicated? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</td> </tr> <tr> <td>Relinquished:</td> <td>Date/Time:</td> <td>Received:</td> <td>Date/Time:</td> <td>Rec'd w/within holding time? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</td> </tr> <tr> <td>Relinquished:</td> <td>Date/Time:</td> <td>Received:</td> <td>Date/Time:</td> <td>Volatiles rec'd w/out headspace <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</td> <td rowspan="2"></td> </tr> <tr> <td>Relinquished:</td> <td>Date/Time:</td> <td>Received:</td> <td>Date/Time:</td> <td>Proper containers used? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA</td> </tr> </table>																				Containers Prepared/Relinquished: <i>H. Hirst</i>	Date/Time: 1330 1-30-14	Received: <i>A. J.</i>	Date/Time: 1/30/14	Seal intact? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	Instructions / Remarks	Relinquished: <i>A. J.</i>	Date/Time: 1630 2/3/14	Received: <i>K. Mudment</i>	Date/Time: 1630 2/3/14	Samples intact upon arrival? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	Relinquished:	Date/Time:	Received:	Date/Time:	Received on ice? Temp: <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	Relinquished:	Date/Time:	Received:	Date/Time:	Proper preservatives indicated? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	Relinquished:	Date/Time:	Received:	Date/Time:	Rec'd w/within holding time? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	Relinquished:	Date/Time:	Received:	Date/Time:	Volatiles rec'd w/out headspace <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA		Relinquished:	Date/Time:	Received:	Date/Time:	Proper containers used? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA
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Hazen and Sawyer
10002 Princess Palm Ave, Suite 200
Tampa, FL 33619

February 24, 2014
Work Order: 1401256

Laboratory Report

Project Name		B-HS5 SE#4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-STE						
Matrix		Wastewater						
SAL Sample Number		1401256-01						
Date/Time Collected		02/04/14 12:40						
Collected by		Josefin Hirst						
Date/Time Received		02/04/14 15:30						
<u>Client Provided Field Data</u>								
pH		7.42						
Temperature		19.1 °C						
Conductivity		1048 umhos						
Dissolved Oxygen		0.08 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	3.3	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	60	EPA 350.1	2.0	0.47		02/12/14 11:36	50
Carbonaceous BOD	mg/L	78	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	200	EPA 410.4	25	10	02/05/14 09:18	02/05/14 15:18	1
Nitrate (as N)	mg/L	0.08	EPA 300.0	0.04	0.01		02/05/14 23:05	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 23:05	1
Orthophosphate as P	mg/L	5.4	EPA 300.0	0.040	0.010		02/05/14 23:05	1
Phosphorous - Total as P	mg/L	5.9	SM 4500P-E	0.80	0.20	02/19/14 08:47	02/21/14 12:59	20
Sulfate	mg/L	2.4	EPA 300.0	0.60	0.20		02/05/14 23:05	1
Sulfide	mg/L	11	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	400	SM 2320B	8.0	2.0		02/14/14 14:19	1
Total Kjeldahl Nitrogen	mg/L	62	EPA 351.2	8.3	2.1	02/05/14 11:47	02/07/14 13:04	41.67
Total Organic Carbon	mg/L	37	SM 5310B	1.0	0.060		02/06/14 14:53	1
Total Suspended Solids	mg/L	39	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	39	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	0.08	EPA 300.0	0.08	0.02		02/05/14 23:05	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	2,800	SM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:09	1
Fecal Coliforms	CFU/100 ml	3,100	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:02	1

Sample Description **BHS5-ST1**
 Matrix **Wastewater**
 SAL Sample Number **1401256-02**
 Date/Time Collected **02/04/14 12:25**
 Collected by **Josefin Hirst**
 Date/Time Received **02/04/14 15:30**

Client Provided Field Data

pH 6.75
 Temperature 20.16 °C
 Conductivity 1057 umhos
 Dissolved Oxygen 1.64 mg/L

Hazen and Sawyer
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Tampa, FL 33619

February 24, 2014
Work Order: 1401256

Laboratory Report

Project Name		B-HS5 SE#4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST1						
Matrix		Wastewater						
SAL Sample Number		1401256-02						
Date/Time Collected		02/04/14 12:25						
Collected by		Josefin Hirst						
Date/Time Received		02/04/14 15:30						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.39	EPA 350.1	0.040	0.009		02/12/14 11:38	1
Carbonaceous BOD	mg/L	18	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	18 I	EPA 410.4	25	10	02/05/14 09:18	02/05/14 15:18	1
Nitrate (as N)	mg/L	34	EPA 300.0	0.04	0.01		02/05/14 23:15	1
Nitrite (as N)	mg/L	0.40	EPA 300.0	0.04	0.01		02/05/14 23:15	1
Orthophosphate as P	mg/L	1.4	EPA 300.0	0.040	0.010		02/05/14 23:15	1
Phosphorous - Total as P	mg/L	2.1	SM 4500P-E	0.20	0.050	02/19/14 08:47	02/21/14 12:59	5
Sulfate	mg/L	25	EPA 300.0	0.60	0.20		02/05/14 23:15	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	210	SM 2320B	8.0	2.0		02/14/14 14:24	1
Total Kjeldahl Nitrogen	mg/L	3.6	EPA 351.2	0.20	0.05	02/05/14 11:47	02/07/14 13:06	1
Total Organic Carbon	mg/L	5.7	SM 5310B	1.0	0.060		02/06/14 14:53	1
Total Suspended Solids	mg/L	3	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	34	EPA 300.0	0.08	0.02		02/05/14 23:15	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	3,600	SM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:09	1
Fecal Coliforms	CFU/100 ml	8,100	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:02	1

Sample Description **BHS5-LIGNO-0**
 Matrix **Wastewater**
 SAL Sample Number **1401256-03**
 Date/Time Collected **02/04/14 11:50**
 Collected by **Josefin Hirst**
 Date/Time Received **02/04/14 15:30**

Client Provided Field Data

pH 6.58
 Temperature 20.81 °C
 Conductivity 962 umhos
 Dissolved Oxygen 0.98 mg/L

<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.087	EPA 350.1	0.040	0.009		02/12/14 11:40	1
Carbonaceous BOD	mg/L	9	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	17 I	EPA 410.4	25	10	02/06/14 09:30	02/06/14 12:00	1

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Tampa, FL 33619

February 24, 2014
Work Order: 1401256

Laboratory Report

Project Name		B-HS5 SE#4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1401256-03						
Date/Time Collected		02/04/14 11:50						
Collected by		Josefin Hirst						
Date/Time Received		02/04/14 15:30						
Nitrate (as N)	mg/L	2.6	EPA 300.0	0.04	0.01		02/05/14 23:24	1
Nitrite (as N)	mg/L	1.9	EPA 300.0	0.04	0.01		02/05/14 23:24	1
Orthophosphate as P	mg/L	0.75	EPA 300.0	0.040	0.010		02/05/14 23:24	1
Phosphorous - Total as P	mg/L	1.1	SM 4500P-E	0.20	0.050	02/19/14 08:47	02/21/14 12:59	5
Sulfate	mg/L	27	EPA 300.0	0.60	0.20		02/05/14 23:24	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		02/14/14 14:33	1
Total Kjeldahl Nitrogen	mg/L	1.3	EPA 351.2	0.20	0.05	02/05/14 11:47	02/07/14 13:07	1
Total Organic Carbon	mg/L	9.9	SM 5310B	1.0	0.060		02/06/14 14:53	1
Total Suspended Solids	mg/L	5	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	4	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	4.5	EPA 300.0	0.08	0.02		02/05/14 23:24	1
Microbiology								
E. Coli	MPN/100 mL	120	SM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:09	1
Fecal Coliforms	CFU/100 ml	520	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:02	1

Sample Description **BHS5-ST2**
 Matrix **Wastewater**
 SAL Sample Number **1401256-04**
 Date/Time Collected **02/04/14 12:10**
 Collected by **Josefin Hirst**
 Date/Time Received **02/04/14 15:30**

Client Provided Field Data

pH 6.91
 Temperature 18.48 °C
 Conductivity 991 umhos
 Dissolved Oxygen 0.10 mg/L

Inorganics

Hydrogen Sulfide (Unionized)	mg/L	3.4	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.16	EPA 350.1	0.040	0.009		02/12/14 11:42	1
Carbonaceous BOD	mg/L	5	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	39	EPA 410.4	25	10	02/06/14 09:30	02/06/14 12:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 23:33	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 23:33	1
Orthophosphate as P	mg/L	0.76	EPA 300.0	0.040	0.010		02/05/14 23:33	1
Phosphorous - Total as P	mg/L	1.2	SM 4500P-E	0.20	0.050	02/19/14 08:47	02/21/14 12:59	5
Sulfate	mg/L	81	EPA 300.0	0.60	0.20		02/05/14 23:33	1

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Tampa, FL 33619

February 24, 2014
Work Order: 1401256

Laboratory Report

Project Name		B-HS5 SE#4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2						
Matrix		Wastewater						
SAL Sample Number		1401256-04						
Date/Time Collected		02/04/14 12:10						
Collected by		Josefin Hirst						
Date/Time Received		02/04/14 15:30						
Sulfide	mg/L	6.0	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		02/14/14 14:41	1
Total Kjeldahl Nitrogen	mg/L	1.5	EPA 351.2	0.20	0.05	02/05/14 11:47	02/07/14 13:09	1
Total Organic Carbon	mg/L	9.0	SM 5310B	1.0	0.060		02/06/14 14:53	1
Total Suspended Solids	mg/L	1	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 23:33	1
Microbiology								
E. Coli	MPN/100 mL	20	SM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:09	1
Fecal Coliforms	CFU/100 ml	30	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:02	1
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401256-05						
Date/Time Collected		02/04/14 12:15						
Collected by		Josefin Hirst						
Date/Time Received		02/04/14 15:30						
Client Provided Field Data								
pH		6.91						
Temperature		18.48 °C						
Conductivity		991 umhos						
Dissolved Oxygen		0.10 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	3.3	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.14	EPA 350.1	0.040	0.009		02/12/14 11:44	1
Carbonaceous BOD	mg/L	5	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	37	EPA 410.4	25	10	02/06/14 09:30	02/06/14 12:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 12:37	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 12:37	1
Orthophosphate as P	mg/L	0.76	EPA 300.0	0.040	0.010		02/05/14 12:37	1
Phosphorous - Total as P	mg/L	1.1	SM 4500P-E	0.20	0.050	02/19/14 08:47	02/21/14 12:59	5
Sulfate	mg/L	84	EPA 300.0	0.60	0.20		02/05/14 12:37	1
Sulfide	mg/L	5.8	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		02/14/14 14:50	1
Total Kjeldahl Nitrogen	mg/L	1.6	EPA 351.2	0.20	0.05	02/05/14 11:47	02/07/14 13:11	1
Total Organic Carbon	mg/L	8.8	SM 5310B	1.0	0.060		02/06/14 14:53	1
Total Suspended Solids	mg/L	1	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1

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February 24, 2014
Work Order: 1401256

Laboratory Report

Project Name		B-HS5 SE#4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401256-05						
Date/Time Collected		02/04/14 12:15						
Collected by		Josefin Hirst						
Date/Time Received		02/04/14 15:30						
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 12:37	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	420	SM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:09	1
Fecal Coliforms	CFU/100 ml	5,300	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:02	1
Sample Description		BHS5-FB						
Matrix		Reagent Water						
SAL Sample Number		1401256-06						
Date/Time Collected		02/04/14 12:05						
Collected by		Josefin Hirst						
Date/Time Received		02/04/14 15:30						
<u>Client Provided Field Data</u>								
pH		5.01						
Temperature		27.0 °C						
Conductivity		1.01 umhos						
Dissolved Oxygen		7.85 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		02/12/14 12:47	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	02/06/14 09:30	02/06/14 12:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 12:46	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 12:46	1
Orthophosphate as P	mg/L	0.010 U	EPA 300.0	0.040	0.010		02/05/14 12:46	1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	02/19/14 08:47	02/21/14 12:59	1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		02/05/14 12:46	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		02/18/14 10:00	1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	02/05/14 11:47	02/07/14 13:12	1
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		02/06/14 14:53	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 12:46	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:09	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:02	1

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February 24, 2014
Work Order: 1401256

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40502 - COD prep										
Blank (BB40502-BLK1)					Prepared & Analyzed: 02/05/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BB40502-BS1)					Prepared & Analyzed: 02/05/14					
Chemical Oxygen Demand	47	25	10	mg/L	50		94	90-110		
Matrix Spike (BB40502-MS1)					Source: 1401200-10		Prepared & Analyzed: 02/05/14			
Chemical Oxygen Demand	43	25	10	mg/L	50	ND	86	85-115		
Matrix Spike Dup (BB40502-MSD1)					Source: 1401200-10		Prepared & Analyzed: 02/05/14			
Chemical Oxygen Demand	43	25	10	mg/L	50	ND	86	85-115	0	32
Batch BB40516 - Ion Chromatography 300.0 Prep										
Blank (BB40516-BLK1)					Prepared & Analyzed: 02/05/14					
Sulfate	0.20 U	0.60	0.20	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.00			mg/L	1.0		100	90-115		
Surrogate: Dichloroacetate	1.00			mg/L	1.0		100	90-115		
Surrogate: Dichloroacetate	1.00			mg/L	1.0		100	90-115		
Surrogate: Dichloroacetate	1.00			mg/L	1.0		100	90-115		
LCS (BB40516-BS1)					Prepared & Analyzed: 02/05/14					
Sulfate	9.60	0.60	0.20	mg/L	9.0		107	85-115		
Nitrate (as N)	1.82	0.04	0.01	mg/L	1.7		107	85-115		
Orthophosphate as P	0.901	0.040	0.010	mg/L	0.90		100	85-115		
Nitrite (as N)	1.55	0.04	0.01	mg/L	1.4		111	85-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40516 - Ion Chromatography 300.0 Prep										
LCS Dup (BB40516-BSD1)					Prepared & Analyzed: 02/05/14					
Sulfate	9.40	0.60	0.20	mg/L	9.0		104	85-115	2	200
Orthophosphate as P	0.878	0.040	0.010	mg/L	0.90		98	85-115	3	200
Nitrate (as N)	1.80	0.04	0.01	mg/L	1.7		106	85-115	1	200
Nitrite (as N)	1.54	0.04	0.01	mg/L	1.4		110	85-115	0.9	200
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Matrix Spike (BB40516-MS1)					Source: 1401257-04		Prepared & Analyzed: 02/06/14			
Sulfate	39.0	0.60	0.20	mg/L	9.0	29.9	100	85-115		
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4	ND	106	85-115		
Orthophosphate as P	3.64	0.040	0.010	mg/L	0.90	2.75	99	85-115		
Nitrate (as N)	1.61	0.04	0.01	mg/L	1.7	0.0400	92	85-115		
Surrogate: Dichloroacetate	0.910			mg/L	1.0		91	90-115		
Surrogate: Dichloroacetate	0.910			mg/L	1.0		91	90-115		
Surrogate: Dichloroacetate	0.910			mg/L	1.0		91	90-115		
Surrogate: Dichloroacetate	0.910			mg/L	1.0		91	90-115		
Matrix Spike (BB40516-MS2)					Source: 1401260-01		Prepared & Analyzed: 02/06/14			
Sulfate	41.0	0.60	0.20	mg/L	9.0	30.8	112	85-115		
Orthophosphate as P	0.537 J5	0.040	0.010	mg/L	0.90	ND	60	85-115		
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7	0.0390	99	85-115		
Nitrite (as N)	1.43	0.04	0.01	mg/L	1.4	ND	102	85-115		
Surrogate: Dichloroacetate	0.989			mg/L	1.0		99	90-115		
Surrogate: Dichloroacetate	0.989			mg/L	1.0		99	90-115		
Surrogate: Dichloroacetate	0.989			mg/L	1.0		99	90-115		
Surrogate: Dichloroacetate	0.989			mg/L	1.0		99	90-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40519 - Digestion for TKN by EPA 351.2										
Blank (BB40519-BLK1)					Prepared: 02/05/14 Analyzed: 02/07/14					
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BB40519-BS1)					Prepared: 02/05/14 Analyzed: 02/07/14					
Total Kjeldahl Nitrogen	2.64	0.20	0.05	mg/L	2.5		104	90-110		
Matrix Spike (BB40519-MS1)					Source: 1401256-06 Prepared: 02/05/14 Analyzed: 02/07/14					
Total Kjeldahl Nitrogen	2.43	0.20	0.05	mg/L	2.5	ND	96	90-110		
Matrix Spike (BB40519-MS2)					Source: 1401258-07 Prepared: 02/05/14 Analyzed: 02/07/14					
Total Kjeldahl Nitrogen	2.37	0.20	0.05	mg/L	2.5	ND	94	90-110		
Matrix Spike Dup (BB40519-MSD1)					Source: 1401256-06 Prepared: 02/05/14 Analyzed: 02/07/14					
Total Kjeldahl Nitrogen	2.50	0.20	0.05	mg/L	2.5	ND	99	90-110	3	20
Matrix Spike Dup (BB40519-MSD2)					Source: 1401258-07 Prepared: 02/05/14 Analyzed: 02/07/14					
Total Kjeldahl Nitrogen	2.38	0.20	0.05	mg/L	2.5	ND	94	90-110	0.5	20
Batch BB40621 - COD prep										
Blank (BB40621-BLK1)					Prepared & Analyzed: 02/06/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BB40621-BS1)					Prepared & Analyzed: 02/06/14					
Chemical Oxygen Demand	45	25	10	mg/L	50		90	90-110		
Matrix Spike (BB40621-MS1)					Source: 1401256-06 Prepared & Analyzed: 02/06/14					
Chemical Oxygen Demand	45	25	10	mg/L	50	ND	90	85-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40621 - COD prep										
Matrix Spike Dup (BB40621-MSD1)		Source: 1401256-06			Prepared & Analyzed: 02/06/14					
Chemical Oxygen Demand	45	25	10	mg/L	50	ND	90	85-115	0	32
Batch BB40625 - TOC prep										
Blank (BB40625-BLK1)					Prepared & Analyzed: 02/06/14					
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
LCS (BB40625-BS1)					Prepared & Analyzed: 02/06/14					
Total Organic Carbon	9.88	1.0	0.060	mg/L	10		99	90-110		
Matrix Spike (BB40625-MS1)		Source: 1401256-06			Prepared & Analyzed: 02/06/14					
Total Organic Carbon	9.24	1.0	0.060	mg/L	10	ND	92	85-115		
Matrix Spike Dup (BB40625-MSD1)		Source: 1401256-06			Prepared & Analyzed: 02/06/14					
Total Organic Carbon	9.11	1.0	0.060	mg/L	10	ND	91	85-115	1	10
Batch BB40626 - VSS Prep										
Blank (BB40626-BLK1)					Prepared: 02/06/14 Analyzed: 02/07/14					
Volatile Suspended Solids	1 U	1		mg/L						
Total Suspended Solids	1 U	1	1	mg/L						
LCS (BB40626-BS1)					Prepared: 02/06/14 Analyzed: 02/07/14					
Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
Duplicate (BB40626-DUP1)		Source: 1401256-01			Prepared: 02/06/14 Analyzed: 02/07/14					
Volatile Suspended Solids	41.0	1		mg/L		39.0			5	20
Total Suspended Solids	41.0	1	1	mg/L		39.0			5	30

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40629 - BOD										
Blank (BB40629-BLK1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40629-BLK2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40629-BLK3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40629-BS1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115		
LCS (BB40629-BS2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		94	85-115		
LCS (BB40629-BS3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		95	85-115		
LCS Dup (BB40629-BSD1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	198	2	2	mg/L	200		99	85-115	2	200
LCS Dup (BB40629-BSD2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	191	2	2	mg/L	200		95	85-115	1	200
LCS Dup (BB40629-BSD3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		95	85-115	0	200
Duplicate (BB40629-DUP1)					Prepared: 02/06/14 Analyzed: 02/11/14					
					Source: 1401256-05					
Carbonaceous BOD	5	2	2	mg/L		5			0	25

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40629 - BOD										
Duplicate (BB40629-DUP2)		Source: 1401349-05			Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	16	2	2	mg/L		16			2	25
Duplicate (BB40629-DUP3)		Source: 1401375-01			Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	120	2	2	mg/L		98			18	25
Batch BB41123 - Ammonia by SEAL										
Blank (BB41123-BLK1)		Prepared & Analyzed: 02/12/14								
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB41123-BS1)		Prepared & Analyzed: 02/12/14								
Ammonia as N	0.52	0.040	0.009	mg/L	0.50		105	90-110		
Matrix Spike (BB41123-MS1)		Source: 1401256-06			Prepared & Analyzed: 02/12/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	ND	103	90-110		
Matrix Spike (BB41123-MS2)		Source: 1401353-07			Prepared & Analyzed: 02/12/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	ND	103	90-110		
Matrix Spike Dup (BB41123-MSD1)		Source: 1401256-06			Prepared & Analyzed: 02/12/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50	ND	107	90-110	3	10
Matrix Spike Dup (BB41123-MSD2)		Source: 1401353-07			Prepared & Analyzed: 02/12/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	ND	105	90-110	1	10
Batch BB41140 - Sulfide prep										
Blank (BB41140-BLK1)		Prepared & Analyzed: 02/11/14								
Sulfide	0.10 U	0.40	0.10	mg/L						

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41140 - Sulfide prep										
Blank (BB41140-BLK2)					Prepared & Analyzed: 02/11/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BB41140-BS1)					Prepared & Analyzed: 02/11/14					
Sulfide	5.04	0.40	0.10	mg/L	5.0		101	85-115		
LCS (BB41140-BS2)					Prepared & Analyzed: 02/11/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
Matrix Spike (BB41140-MS1)					Source: 1401258-07		Prepared & Analyzed: 02/11/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike (BB41140-MS2)					Source: 1401317-01		Prepared & Analyzed: 02/11/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115		
Matrix Spike Dup (BB41140-MSD1)					Source: 1401258-07		Prepared & Analyzed: 02/11/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115	0	14
Matrix Spike Dup (BB41140-MSD2)					Source: 1401317-01		Prepared & Analyzed: 02/11/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115	4	14
Batch BB41407 - alkalinity										
Blank (BB41407-BLK1)					Prepared & Analyzed: 02/14/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BB41407-BS1)					Prepared & Analyzed: 02/14/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		108	90-110		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41407 - alkalinity										
Matrix Spike (BB41407-MS1)		Source: 1401533-02			Prepared & Analyzed: 02/14/14					
Total Alkalinity	290	8.0	2.0	mg/L	120	150	110	80-120		
Matrix Spike Dup (BB41407-MSD1)		Source: 1401533-02			Prepared & Analyzed: 02/14/14					
Total Alkalinity	290	8.0	2.0	mg/L	120	150	108	80-120	1	26
Batch BB41905 - Digestion for TP and TKN										
Blank (BB41905-BLK1)		Prepared: 02/19/14 Analyzed: 02/21/14								
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BB41905-BS1)		Prepared: 02/19/14 Analyzed: 02/21/14								
Phosphorous - Total as P	0.467	0.040	0.010	mg/L	0.50		93	90-110		
Matrix Spike (BB41905-MS1)		Source: 1401256-06			Prepared: 02/19/14 Analyzed: 02/21/14					
Phosphorous - Total as P	0.485	0.040	0.010	mg/L	0.50	ND	97	90-110		
Matrix Spike (BB41905-MS2)		Source: 1401258-07			Prepared: 02/19/14 Analyzed: 02/21/14					
Phosphorous - Total as P	0.476	0.040	0.010	mg/L	0.50	ND	95	90-110		
Matrix Spike Dup (BB41905-MSD1)		Source: 1401256-06			Prepared: 02/19/14 Analyzed: 02/21/14					
Phosphorous - Total as P	0.493	0.040	0.010	mg/L	0.50	ND	99	90-110	2	25
Matrix Spike Dup (BB41905-MSD2)		Source: 1401258-07			Prepared: 02/19/14 Analyzed: 02/21/14					
Phosphorous - Total as P	0.474	0.040	0.010	mg/L	0.50	ND	95	90-110	0.3	25
Batch BB41920 - alkalinity										
Blank (BB41920-BLK1)		Prepared & Analyzed: 02/19/14								
Total Alkalinity	2.0 U	8.0	2.0	mg/L						

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Hazen and Sawyer
10002 Princess Palm Ave, Suite 200
Tampa, FL 33619

February 24, 2014
Work Order: 1401256

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41920 - alkalinity										
LCS (BB41920-BS1)					Prepared & Analyzed: 02/19/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		108	90-110		
Matrix Spike (BB41920-MS1)					Source: 1401795-01 Prepared & Analyzed: 02/19/14					
Total Alkalinity	280	8.0	2.0	mg/L	120	160	99	80-120		
Matrix Spike Dup (BB41920-MSD1)					Source: 1401795-01 Prepared & Analyzed: 02/19/14					
Total Alkalinity	280	8.0	2.0	mg/L	120	160	99	80-120	0	26

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February 24, 2014
Work Order: 1401256

Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40449 - FC-MF										
Blank (BB40449-BLK1)					Prepared: 02/04/14 Analyzed: 02/05/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
Duplicate (BB40449-DUP1)					Source: 1401256-06 Prepared: 02/04/14 Analyzed: 02/05/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
Duplicate (BB40449-DUP2)					Source: 1401258-07 Prepared: 02/04/14 Analyzed: 02/05/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200

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*** Qualifiers, Notes and Definitions**

Results followed by a "U" indicate that the sample was analyzed but the compound was not detected. Results followed by "I" indicate that the reported value is between the laboratory method detection limits and the laboratory practical quantitation limit.

A statement of estimated uncertainty of test results is available upon request.

For methods marked with **, all QC criteria have been met for this method which is equivalent to a SAL certified method.

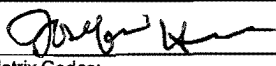
Test results in this report meet all the requirements of the NELAC standards. Any applicable qualifiers are shown below.

J5 Matrix spike of this sample was outside typical range. All other QC criteria were acceptable.

Questions regarding this report should be directed to :

Kathryn Nordmark
Telephone (813) 855-1844 FAX (813) 855-2218
Kathryn@southernanalyticalabs.com



Client Name Hazan and Sawyer										Contact / Phone: Josefin Hirst 813-630-4498										
Project Name / Location BHS5 SE#4																				
Samplers: (Signature) 										PARAMETER / CONTAINER DESCRIPTION										
<p>Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water</p>																				
SAL Use Only	Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	125mLP, Na ₂ S ₂ O ₃ FC-MF, FC-QT	1LP, Cool Total Alkalinity, TSS, VSS, CBOD, NOX, OP, SO ₄	125mLP, H ₂ SO ₄ COD, TKN, NH ₃ , TP	500mLP, NaOH, Zn Acetate H ₂ S	40mLaV, HCl TOC					pH	Temperature	Conductivity	DO
	01	BHS5-STE	2/4/14	12:40	WW		X	4	1	1	1	2					7.42	19.1	1048	0.08
	02	BHS5-ST1		12:45	WW		X	4	1	1	1	2					6.75	20.16	1057	1.64
	03	BHS5-LIGNO-0		11:50	WW		X	4	1	1	1	2					6.58	20.81	962	0.98
	04	BHS5-ST2		12:10	WW		X	4	1	1	1	2					6.91	18.48	991	0.10
	05	BHS5-ST2-DUP		12:15	WW		X	4	1	1	1	2					6.71	18.48	991	0.10
	06	BHS5-ED		12:08	R		X	4	1	1	1	2					5.01	27.0	1.01	7.85
Containers Prepared		Date/Time: 1:30	Received:		Date/Time: 1:30		Seal intact?		0 N NA		Instructions / Remarks									
Relinquished:		1-30-14	Received:		1/3/14		Samples intact upon arrival?		0 N NA											
Relinquished:		2/4/14	Received:		2-4-14		Received on ice? Temp		0 N NA											
Relinquished:			Received:				Proper preservatives indicated?		0 N NA											
Relinquished:			Received:				Rec'd within holding time?		0 N NA											
Relinquished:			Received:				Volatiles rec'd w/out headspace		Y N NA											
Relinquished:			Received:				Proper containers used?		0 N NA											

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March 14, 2014
Work Order: 1401346

Laboratory Report

Project Name		B-HS5 SE#5						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-STE						
Matrix		Wastewater						
SAL Sample Number		1401346-01						
Date/Time Collected		02/05/14 10:10						
Collected by		Josefin Hirst						
Date/Time Received		02/05/14 14:00						
<u>Client Provided Field Data</u>								
pH		7.31						
Temperature		20.2 °C						
Conductivity		1151 umhos						
Dissolved Oxygen		0.07 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	2.9	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	62	EPA 350.1	2.0	0.47		02/18/14 12:06	50
Carbonaceous BOD	mg/L	32	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	270	EPA 410.4	25	10	02/07/14 12:25	02/07/14 14:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 20:16	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 20:16	1
Orthophosphate as P	mg/L	5.4	EPA 300.0	0.040	0.010		02/06/14 20:16	1
Phosphorous - Total as P	mg/L	6.0	SM 4500P-E	0.80	0.20	02/19/14 08:50	02/21/14 13:08	20
Sulfate	mg/L	1.3	EPA 300.0	0.60	0.20		02/06/14 20:16	1
Sulfide	mg/L	8.5	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	400	SM 2320B	8.0	2.0		02/19/14 12:38	1
Total Kjeldahl Nitrogen	mg/L	69	EPA 351.2	4.0	1.0	02/19/14 08:50	02/21/14 13:12	20
Total Organic Carbon	mg/L	36	SM 5310B	1.0	0.060		02/06/14 22:18	1
Total Suspended Solids	mg/L	42	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	36	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/06/14 20:16	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	1,700	SM 9223B	2.0	2.0	02/05/14 16:05	02/06/14 10:18	1
Fecal Coliforms	CFU/100 ml	49,000	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:09	1

Sample Description **BHS5-ST1**
 Matrix **Wastewater**
 SAL Sample Number **1401346-02**
 Date/Time Collected **02/05/14 10:05**
 Collected by **Josefin Hirst**
 Date/Time Received **02/05/14 14:00**

Client Provided Field Data

pH 6.78
 Temperature 20.1 °C
 Conductivity 1073 umhos
 Dissolved Oxygen 1.69 mg/L

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March 14, 2014
Work Order: 1401346

Laboratory Report

Project Name		B-HS5 SE#5						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST1						
Matrix		Wastewater						
SAL Sample Number		1401346-02						
Date/Time Collected		02/05/14 10:05						
Collected by		Josefin Hirst						
Date/Time Received		02/05/14 14:00						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.79	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	1.9	EPA 350.1	0.040	0.009		02/18/14 09:56	1
Carbonaceous BOD	mg/L	14	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	33	EPA 410.4	25	10	02/07/14 12:25	02/07/14 14:00	1
Nitrate (as N)	mg/L	47	EPA 300.0	0.04	0.01		02/06/14 20:26	1
Nitrite (as N)	mg/L	0.53	EPA 300.0	0.04	0.01		02/06/14 20:26	1
Orthophosphate as P	mg/L	1.9	EPA 300.0	0.040	0.010		02/06/14 20:26	1
Phosphorous - Total as P	mg/L	2.0	SM 4500P-E	0.20	0.050	02/19/14 08:50	02/21/14 13:08	5
Sulfate	mg/L	37	EPA 300.0	0.60	0.20		02/06/14 20:26	1
Sulfide	mg/L	1.2	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	210	SM 2320B	8.0	2.0		02/19/14 12:38	1
Total Kjeldahl Nitrogen	mg/L	3.6	EPA 351.2	1.0	0.25	02/19/14 08:50	02/21/14 13:12	5
Total Organic Carbon	mg/L	7.1	SM 5310B	1.0	0.060		02/06/14 22:18	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	47	EPA 300.0	0.08	0.02		02/06/14 20:26	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	140	SM 9223B	2.0	2.0	02/05/14 16:05	02/06/14 10:18	1
Fecal Coliforms	CFU/100 ml	1,480	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:09	1

Sample Description **BHS5-LIGNO-0**
 Matrix **Wastewater**
 SAL Sample Number **1401346-03**
 Date/Time Collected **02/05/14 09:50**
 Collected by **Josefin Hirst**
 Date/Time Received **02/05/14 14:00**

Client Provided Field Data

pH 6.57
 Temperature 20.8 °C
 Conductivity 946 umhos
 Dissolved Oxygen 0.56 mg/L

<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.072	EPA 350.1	0.040	0.009		02/18/14 09:58	1
Carbonaceous BOD	mg/L	16	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	47	EPA 410.4	25	10	02/07/14 12:25	02/07/14 14:00	1

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March 14, 2014
Work Order: 1401346

Laboratory Report

Project Name		B-HS5 SE#5						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1401346-03						
Date/Time Collected		02/05/14 09:50						
Collected by		Josefin Hirst						
Date/Time Received		02/05/14 14:00						
Nitrate (as N)	mg/L	1.1	EPA 300.0	0.04	0.01		02/06/14 12:18	1
Nitrite (as N)	mg/L	2.0	EPA 300.0	0.04	0.01		02/06/14 12:18	1
Orthophosphate as P	mg/L	0.59	EPA 300.0	0.040	0.010		02/06/14 12:18	1
Phosphorous - Total as P	mg/L	1.1	SM 4500P-E	0.20	0.050	02/19/14 08:50	02/21/14 13:08	5
Sulfate	mg/L	23	EPA 300.0	0.60	0.20		02/06/14 12:18	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	390	SM 2320B	8.0	2.0		02/19/14 12:38	1
Total Kjeldahl Nitrogen	mg/L	0.88 I	EPA 351.2	1.0	0.25	02/19/14 08:50	02/21/14 13:12	5
Total Organic Carbon	mg/L	11	SM 5310B	1.0	0.060		02/06/14 22:18	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	3.1	EPA 300.0	0.08	0.02		02/06/14 12:18	1
Microbiology								
E. Coli	MPN/100 mL	98	SM 9223B	2.0	2.0	02/05/14 16:05	02/06/14 10:18	1
Fecal Coliforms	CFU/100 ml	450	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:09	1

Sample Description		BHS5-ST2						
Matrix		Wastewater						
SAL Sample Number		1401346-04						
Date/Time Collected		02/05/14 09:50						
Collected by		Josefin Hirst						
Date/Time Received		02/05/14 14:00						

Client Provided Field Data

pH	7.04
Temperature	18.7 °C
Conductivity	1005 umhos
Dissolved Oxygen	0.12 mg/L

Inorganics

Hydrogen Sulfide (Unionized)	mg/L	3.8	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.45	EPA 350.1	0.040	0.009		02/18/14 15:48	1
Carbonaceous BOD	mg/L	9	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	31	EPA 410.4	25	10	02/07/14 12:25	02/07/14 14:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 20:44	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 20:44	1
Orthophosphate as P	mg/L	0.96	EPA 300.0	0.040	0.010		02/06/14 20:44	1
Phosphorous - Total as P	mg/L	1.3	SM 4500P-E	0.20	0.050	02/19/14 08:50	02/21/14 13:08	5
Sulfate	mg/L	78	EPA 300.0	0.60	0.20		02/06/14 20:44	1

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Work Order: 1401346

Laboratory Report

Project Name		B-HS5 SE#5						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2						
Matrix		Wastewater						
SAL Sample Number		1401346-04						
Date/Time Collected		02/05/14 09:50						
Collected by		Josefin Hirst						
Date/Time Received		02/05/14 14:00						
Sulfide	mg/L	7.7	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	350	SM 2320B	8.0	2.0		02/19/14 12:38	1
Total Kjeldahl Nitrogen	mg/L	1.1	EPA 351.2	1.0	0.25	02/19/14 08:50	02/21/14 13:12	5
Total Organic Carbon	mg/L	10	SM 5310B	1.0	0.060		02/06/14 22:18	1
Total Suspended Solids	mg/L	3	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/06/14 20:44	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	20	SM 9223B	2.0	2.0	02/05/14 16:05	02/06/14 10:18	1
Fecal Coliforms	CFU/100 ml	30	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:09	1
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401346-05						
Date/Time Collected		02/05/14 09:55						
Collected by		Josefin Hirst						
Date/Time Received		02/05/14 14:00						
<u>Client Provided Field Data</u>								
pH		7.04						
Temperature		18.7 °C						
Conductivity		1005 umhos						
Dissolved Oxygen		0.12 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	4.0	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.45	EPA 350.1	0.040	0.009		02/18/14 15:49	1
Carbonaceous BOD	mg/L	9	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	29	EPA 410.4	25	10	02/07/14 12:25	02/07/14 14:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 12:28	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 12:28	1
Orthophosphate as P	mg/L	0.96	EPA 300.0	0.040	0.010		02/06/14 12:28	1
Phosphorous - Total as P	mg/L	1.3	SM 4500P-E	0.20	0.050	02/19/14 08:50	02/21/14 13:08	5
Sulfate	mg/L	82	EPA 300.0	0.60	0.20		02/06/14 12:28	1
Sulfide	mg/L	8.1	SM 4500SF	0.40	0.10		02/11/14 09:00	1
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		02/19/14 12:38	1
Total Kjeldahl Nitrogen	mg/L	1.0	EPA 351.2	1.0	0.25	02/19/14 08:50	02/21/14 13:12	5
Total Organic Carbon	mg/L	10	SM 5310B	1.0	0.060		02/06/14 22:18	1
Total Suspended Solids	mg/L	3	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:56	1

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March 14, 2014
Work Order: 1401346

Laboratory Report

Project Name		B-HS5 SE#5						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401346-05						
Date/Time Collected		02/05/14 09:55						
Collected by		Josefin Hirst						
Date/Time Received		02/05/14 14:00						
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:56	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/06/14 12:28	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	30	SM 9223B	2.0	2.0	02/05/14 16:05	02/06/14 10:18	1
Fecal Coliforms	CFU/100 ml	30	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:09	1

SOUTHERN ANALYTICAL LABORATORIES, INC.

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March 14, 2014
Work Order: 1401346

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40626 - VSS Prep										
Blank (BB40626-BLK1)					Prepared: 02/06/14 Analyzed: 02/07/14					
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						
LCS (BB40626-BS1)					Prepared: 02/06/14 Analyzed: 02/07/14					
Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
Duplicate (BB40626-DUP1)					Source: 1401256-01		Prepared: 02/06/14 Analyzed: 02/07/14			
Total Suspended Solids	41.0	1	1	mg/L		39.0			5	30
Volatile Suspended Solids	41.0	1		mg/L		39.0			5	20
Batch BB40629 - BOD										
Blank (BB40629-BLK1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40629-BLK2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40629-BLK3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40629-BS1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115		
LCS (BB40629-BS2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		94	85-115		

SOUTHERN ANALYTICAL LABORATORIES, INC.

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Hazen and Sawyer
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Tampa, FL 33619

March 14, 2014
Work Order: 1401346

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40629 - BOD										
LCS (BB40629-BS3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		95	85-115		
LCS Dup (BB40629-BSD1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	198	2	2	mg/L	200		99	85-115	2	200
LCS Dup (BB40629-BSD2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	191	2	2	mg/L	200		95	85-115	1	200
LCS Dup (BB40629-BSD3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		95	85-115	0	200
Duplicate (BB40629-DUP1)					Source: 1401256-05 Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	5	2	2	mg/L		5			0	25
Duplicate (BB40629-DUP2)					Source: 1401349-05 Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	16	2	2	mg/L		16			2	25
Duplicate (BB40629-DUP3)					Source: 1401375-01 Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	120	2	2	mg/L		98			18	25

Batch BB40636 - Ion Chromatography 300.0 Prep

Blank (BB40636-BLK1)					Prepared & Analyzed: 02/06/14					
Sulfate	0.20 U	0.60	0.20	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40636 - Ion Chromatography 300.0 Prep										
LCS (BB40636-BS1)					Prepared & Analyzed: 02/06/14					
Orthophosphate as P	0.874	0.040	0.010	mg/L	0.90		97	85-115		
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		104	85-115		
Sulfate	9.15	0.60	0.20	mg/L	9.0		102	85-115		
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7		102	85-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
LCS Dup (BB40636-BSD1)					Prepared & Analyzed: 02/06/14					
Sulfate	9.29	0.60	0.20	mg/L	9.0		103	85-115	1	200
Orthophosphate as P	0.907	0.040	0.010	mg/L	0.90		101	85-115	4	200
Nitrate (as N)	1.75	0.04	0.01	mg/L	1.7		103	85-115	1	200
Nitrite (as N)	1.47	0.04	0.01	mg/L	1.4		105	85-115	1	200
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Matrix Spike (BB40636-MS1)					Source: 1401368-01		Prepared & Analyzed: 02/06/14			
Orthophosphate as P	2.31	0.040	0.010	mg/L	0.90	1.46	94	85-115		
Nitrate (as N)	1.75	0.04	0.01	mg/L	1.7	0.0970	97	85-115		
Nitrite (as N)	1.55	0.04	0.01	mg/L	1.4	ND	111	85-115		
Sulfate	22.5	0.60	0.20	mg/L	9.0	14.3	90	85-115		
Surrogate: Dichloroacetate	0.917			mg/L	1.0		92	90-115		
Surrogate: Dichloroacetate	0.917			mg/L	1.0		92	90-115		
Surrogate: Dichloroacetate	0.917			mg/L	1.0		92	90-115		
Surrogate: Dichloroacetate	0.917			mg/L	1.0		92	90-115		

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Work Order: 1401346

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch BB40636 - Ion Chromatography 300.0 Prep

Matrix Spike (BB40636-MS2)		Source: 1401349-01			Prepared & Analyzed: 02/11/14					
Nitrate (as N)	1.75	0.04	0.01	mg/L	1.7	ND	103	85-115		
Orthophosphate as P	8.01	0.040	0.010	mg/L	0.90	7.12	99	85-115		
Nitrite (as N)	1.49	0.04	0.01	mg/L	1.4	ND	107	85-115		
Sulfate	14.4	0.60	0.20	mg/L	9.0	5.39	100	85-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		

Batch BB40657 - TOC prep

Blank (BB40657-BLK1)		Prepared & Analyzed: 02/06/14								
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
LCS (BB40657-BS1)		Prepared & Analyzed: 02/06/14								
Total Organic Carbon	9.36	1.0	0.060	mg/L	10		94	90-110		
Matrix Spike (BB40657-MS1)		Source: 1401354-01			Prepared & Analyzed: 02/06/14					
Total Organic Carbon	8.61	1.0	0.060	mg/L	10	ND	86	85-115		
Matrix Spike Dup (BB40657-MSD1)		Source: 1401354-01			Prepared & Analyzed: 02/06/14					
Total Organic Carbon	8.62	1.0	0.060	mg/L	10	ND	86	85-115	0.2	10

Batch BB40717 - COD prep

Blank (BB40717-BLK1)		Prepared & Analyzed: 02/07/14								
Chemical Oxygen Demand	10 U	25	10	mg/L						

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40717 - COD prep										
LCS (BB40717-BS1)					Prepared & Analyzed: 02/07/14					
Chemical Oxygen Demand	50	25	10	mg/L	50		100	90-110		
Matrix Spike (BB40717-MS1)					Source: 1401346-05 Prepared & Analyzed: 02/07/14					
Chemical Oxygen Demand	74	25	10	mg/L	50	29	90	85-115		
Matrix Spike Dup (BB40717-MSD1)					Source: 1401346-05 Prepared & Analyzed: 02/07/14					
Chemical Oxygen Demand	74	25	10	mg/L	50	29	90	85-115	0	32
Batch BB41140 - Sulfide prep										
Blank (BB41140-BLK1)					Prepared & Analyzed: 02/11/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
Blank (BB41140-BLK2)					Prepared & Analyzed: 02/11/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BB41140-BS1)					Prepared & Analyzed: 02/11/14					
Sulfide	5.04	0.40	0.10	mg/L	5.0		101	85-115		
LCS (BB41140-BS2)					Prepared & Analyzed: 02/11/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
Matrix Spike (BB41140-MS1)					Source: 1401258-07 Prepared & Analyzed: 02/11/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike (BB41140-MS2)					Source: 1401317-01 Prepared & Analyzed: 02/11/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41140 - Sulfide prep										
Matrix Spike Dup (BB41140-MSD1)		Source: 1401258-07			Prepared & Analyzed: 02/11/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115	0	14
Matrix Spike Dup (BB41140-MSD2)		Source: 1401317-01			Prepared & Analyzed: 02/11/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115	4	14
Batch BB41437 - Ammonia by SEAL										
Blank (BB41437-BLK1)					Prepared & Analyzed: 02/18/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB41437-BS1)					Prepared & Analyzed: 02/18/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50		106	90-110		
Matrix Spike (BB41437-MS1)		Source: 1401611-07			Prepared & Analyzed: 02/18/14					
Ammonia as N	0.56	0.040	0.009	mg/L	0.50	0.036	105	90-110		
Matrix Spike (BB41437-MS2)		Source: 1401686-07			Prepared & Analyzed: 02/18/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	0.031	98	90-110		
Matrix Spike Dup (BB41437-MSD1)		Source: 1401611-07			Prepared & Analyzed: 02/18/14					
Ammonia as N	0.54	0.040	0.009	mg/L	0.50	0.036	100	90-110	5	10
Matrix Spike Dup (BB41437-MSD2)		Source: 1401686-07			Prepared & Analyzed: 02/18/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	0.031	97	90-110	1	10
Batch BB41906 - Digestion for TP and TKN										
Blank (BB41906-BLK1)					Prepared: 02/19/14 Analyzed: 02/21/14					
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41906 - Digestion for TP and TKN										
LCS (BB41906-BS1)					Prepared: 02/19/14 Analyzed: 02/21/14					
Phosphorous - Total as P	0.475	0.040	0.010	mg/L	0.50		95	90-110		
Total Kjeldahl Nitrogen	0.929	0.20	0.05	mg/L	1.0		93	90-110		
Matrix Spike (BB41906-MS1)					Source: 1401575-02		Prepared: 02/19/14 Analyzed: 02/21/14			
Total Kjeldahl Nitrogen	1.59	0.20	0.05	mg/L	1.0	0.630	96	90-110		
Phosphorous - Total as P	0.498	0.040	0.010	mg/L	0.50	0.0318	93	90-110		
Matrix Spike (BB41906-MS2)					Source: 1401611-07		Prepared: 02/19/14 Analyzed: 02/21/14			
Phosphorous - Total as P	0.664	0.040	0.010	mg/L	0.50	0.136	106	90-110		
Total Kjeldahl Nitrogen	1.68	0.20	0.05	mg/L	1.0	0.662	101	90-110		
Matrix Spike Dup (BB41906-MSD1)					Source: 1401575-02		Prepared: 02/19/14 Analyzed: 02/21/14			
Phosphorous - Total as P	0.493	0.040	0.010	mg/L	0.50	0.0318	92	90-110	1	25
Total Kjeldahl Nitrogen	1.61	0.20	0.05	mg/L	1.0	0.630	98	90-110	1	20
Matrix Spike Dup (BB41906-MSD2)					Source: 1401611-07		Prepared: 02/19/14 Analyzed: 02/21/14			
Phosphorous - Total as P	0.666	0.040	0.010	mg/L	0.50	0.136	106	90-110	0.2	25
Total Kjeldahl Nitrogen	1.69	0.20	0.05	mg/L	1.0	0.662	103	90-110	0.9	20
Batch BB41920 - alkalinity										
Blank (BB41920-BLK1)					Prepared & Analyzed: 02/19/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BB41920-BS1)					Prepared & Analyzed: 02/19/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		108	90-110		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41920 - alkalinity										
Matrix Spike (BB41920-MS1)		Source: 1401795-01			Prepared & Analyzed: 02/19/14					
Total Alkalinity	280	8.0	2.0	mg/L	120	160	99	80-120		
Matrix Spike Dup (BB41920-MSD1)		Source: 1401795-01			Prepared & Analyzed: 02/19/14					
Total Alkalinity	280	8.0	2.0	mg/L	120	160	99	80-120	0	26

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Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40543 - FC-MF										
Blank (BB40543-BLK1)					Prepared: 02/05/14 Analyzed: 02/06/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
Duplicate (BB40543-DUP1)					Source: 1401349-06 Prepared: 02/05/14 Analyzed: 02/06/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
Duplicate (BB40543-DUP2)					Source: 1401353-07 Prepared: 02/05/14 Analyzed: 02/06/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200

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*** Qualifiers, Notes and Definitions**

Results followed by a "U" indicate that the sample was analyzed but the compound was not detected. Results followed by "I" indicate that the reported value is between the laboratory method detection limits and the laboratory practical quantitation limit.

A statement of estimated uncertainty of test results is available upon request.

For methods marked with **, all QC criteria have been met for this method which is equivalent to a SAL certified method.

Test results in this report meet all the requirements of the NELAC standards. Any applicable qualifiers are shown below.

Questions regarding this report should be directed to :

Kathryn Nordmark

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Kathryn@southernanalyticalabs.com



Client Name Hazan and Sawyer								Contact / Phone: Josefin Hirst 813-630-4498										
Project Name / Location BHS5 SE#5																		
Samplers: (Signature) <i>Josefin Hirst</i>								PARAMETER / CONTAINER DESCRIPTION										
Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water		Date	Time	Matrix	Composite	Grab	125mLP, Na ₂ S ₂ O ₃ FC-MF, FC-QT	TLP, Cool Total Alkalinity, TSS, VSS, CBOD, NOX, OP, SO ₄	125mLP, H ₂ SO ₄ COD, TKN, NH ₃ , TP	500mLP, NaOH, Zn Acetate H ₂ S	40mLaV, HCl TOC				pH	Temperature	Conductivity	DO
SAL Use Only Sample No.	Sample Description																	
01	BHS5-STE	2/5/14	10:10	WW	X		4	1	1	1	2				7.31	20.2	1151	0.07
02	BHS5-ST1	↓	10:25	WW	X		4	1	1	1	2				6.78	20.1	1073	1.69
03	BHS5-LIGNO-0		9:50	WW	X		4	1	1	1	2				6.57	20.8	946	0.56
04	BHS5-ST2		9:50	WW	X		4	1	1	1	2				7.04	18.7	1005	0.12
05	BHS5-ST2-DUP		9:58	WW	X		4	1	1	1	2				7.04	18.7	1005	0.12
06	BHS5-EB				R	X		4	1	1	1	2						
Containers Prepared/Relinquished: <i>H. Hirst</i>		Date/Time: 1500	Received: <i>Josefin Hirst</i>		Date/Time: 10:30		Seal intact? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA		Instructions / Remarks									
Relinquished: <i>H. Hirst</i>		Date/Time: 1-29-14	Received: <i>Josefin Hirst</i>		Date/Time: 1/30/14		Samples intact upon arrival? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA											
Relinquished: <i>H. Hirst</i>		Date/Time: 1400	Received: <i>K. Nudman</i>		Date/Time: 1400		Received on ice? Temp: <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA											
Relinquished:		Date/Time:	Received:		Date/Time:		Proper preservatives indicated? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA											
Relinquished:		Date/Time:	Received:		Date/Time:		Rec'd within holding time? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA											
Relinquished:		Date/Time:	Received:		Date/Time:		Volatiles rec'd w/out headspace? <input type="radio"/> Y <input checked="" type="radio"/> N <input type="radio"/> NA											
Relinquished:		Date/Time:	Received:		Date/Time:		Proper containers used? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA											

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March 18, 2014
Work Order: 1401419

Laboratory Report

Project Name		B-HS5 SE#6						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-STE						
Matrix		Wastewater						
SAL Sample Number		1401419-01						
Date/Time Collected		02/06/14 08:47						
Collected by		Sean Schmidt						
Date/Time Received		02/06/14 13:45						
<u>Client Provided Field Data</u>								
pH		7.42						
Temperature		20.1 °C						
Conductivity		1192 umhos						
Dissolved Oxygen		0.00 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	2.2	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	62	EPA 350.1	2.0	0.47		02/20/14 15:20	50
Carbonaceous BOD	mg/L	67	SM 5210B	2	2	02/06/14 15:35	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	140	EPA 410.4	25	10	02/10/14 09:30	02/10/14 12:30	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/07/14 22:40	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/07/14 22:40	1
Orthophosphate as P	mg/L	5.3	EPA 300.0	0.040	0.010		02/07/14 22:40	1
Phosphorous - Total as P	mg/L	6.8	SM 4500P-E	0.80	0.20	02/19/14 10:54	02/24/14 15:44	20
Sulfate	mg/L	1.3	EPA 300.0	0.60	0.20		02/07/14 22:40	1
Sulfide	mg/L	7.3	SM 4500SF	0.40	0.10		02/12/14 09:00	1
Total Alkalinity	mg/L	430	SM 2320B	8.0	2.0		02/19/14 16:30	1
Total Kjeldahl Nitrogen	mg/L	66	EPA 351.2	4.0	1.0	02/19/14 10:54	02/24/14 15:39	20
Total Organic Carbon	mg/L	20	SM 5310B	1.0	0.060		02/12/14 09:37	1
Total Suspended Solids	mg/L	22	SM 2540D	1	1	02/10/14 10:00	02/11/14 14:09	1
Volatile Suspended Solids	mg/L	22	EPA 160.4	1	1	02/10/14 10:00	02/11/14 14:09	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/07/14 22:40	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	1,700	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:07	1
Fecal Coliforms	CFU/100 ml	27,000	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:42	1

Sample Description **BHS5-ST1**
 Matrix **Wastewater**
 SAL Sample Number **1401419-02**
 Date/Time Collected **02/06/14 08:50**
 Collected by **Sean Schmidt**
 Date/Time Received **02/06/14 13:45**

Client Provided Field Data

pH 6.76
 Temperature 20.14 °C
 Conductivity 1087 umhos
 Dissolved Oxygen 1.80 mg/L

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March 18, 2014
Work Order: 1401419

Laboratory Report

Project Name		B-HS5 SE#6						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST1						
Matrix		Wastewater						
SAL Sample Number		1401419-02						
Date/Time Collected		02/06/14 08:50						
Collected by		Sean Schmidt						
Date/Time Received		02/06/14 13:45						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	1.4	EPA 350.1	0.040	0.009		02/20/14 15:22	1
Carbonaceous BOD	mg/L	9	SM 5210B	2	2	02/06/14 15:35	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	16 I	EPA 410.4	25	10	02/10/14 11:30	02/10/14 16:45	1
Nitrate (as N)	mg/L	48	EPA 300.0	0.04	0.01		02/07/14 22:49	1
Nitrite (as N)	mg/L	0.39	EPA 300.0	0.04	0.01		02/07/14 22:49	1
Orthophosphate as P	mg/L	1.7	EPA 300.0	0.040	0.010		02/07/14 22:49	1
Phosphorous - Total as P	mg/L	2.2	SM 4500P-E	0.20	0.050	02/19/14 10:54	02/24/14 15:44	5
Sulfate	mg/L	35	EPA 300.0	0.60	0.20		02/07/14 22:49	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/12/14 09:00	1
Total Alkalinity	mg/L	210	SM 2320B	8.0	2.0		02/19/14 16:30	1
Total Kjeldahl Nitrogen	mg/L	4.3	EPA 351.2	1.0	0.25	02/19/14 10:54	02/24/14 15:39	5
Total Organic Carbon	mg/L	5.5	SM 5310B	1.0	0.060		02/12/14 09:37	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	02/10/14 10:00	02/11/14 14:09	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/10/14 10:00	02/11/14 14:09	1
Nitrate+Nitrite (N)	mg/L	48	EPA 300.0	0.08	0.02		02/07/14 22:49	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	41	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:07	1
Fecal Coliforms	CFU/100 ml	1,500	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:42	1

Sample Description **BHS5-LIGNO-0**
 Matrix **Wastewater**
 SAL Sample Number **1401419-03**
 Date/Time Collected **02/06/14 08:30**
 Collected by **Sean Schmidt**
 Date/Time Received **02/06/14 13:45**

Client Provided Field Data

pH 6.71
 Temperature 18.7 °C
 Conductivity 1060 umhos
 Dissolved Oxygen 0.28 mg/L

<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.045	EPA 350.1	0.040	0.009		02/20/14 15:24	1
Carbonaceous BOD	mg/L	17	SM 5210B	2	2	02/06/14 15:35	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	22 I	EPA 410.4	25	10	02/10/14 11:30	02/10/14 16:45	1

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Laboratory Report

Project Name		B-HS5 SE#6						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1401419-03						
Date/Time Collected		02/06/14 08:30						
Collected by		Sean Schmidt						
Date/Time Received		02/06/14 13:45						
Nitrate (as N)	mg/L	2.9	EPA 300.0	0.04	0.01		02/07/14 23:27	1
Nitrite (as N)	mg/L	1.4	EPA 300.0	0.04	0.01		02/07/14 23:27	1
Orthophosphate as P	mg/L	0.58	EPA 300.0	0.040	0.010		02/07/14 23:27	1
Phosphorous - Total as P	mg/L	1.1	SM 4500P-E	0.20	0.050	02/19/14 10:54	02/24/14 15:44	5
Sulfate	mg/L	23	EPA 300.0	0.60	0.20		02/07/14 23:27	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/12/14 09:00	1
Total Alkalinity	mg/L	390	SM 2320B	8.0	2.0		02/19/14 16:30	1
Total Kjeldahl Nitrogen	mg/L	1.9	EPA 351.2	1.0	0.25	02/19/14 10:54	02/24/14 15:39	5
Total Organic Carbon	mg/L	11	SM 5310B	1.0	0.060		02/12/14 09:37	1
Total Suspended Solids	mg/L	4	SM 2540D	1	1	02/10/14 10:00	02/11/14 14:09	1
Volatile Suspended Solids	mg/L	4	EPA 160.4	1	1	02/10/14 10:00	02/11/14 14:09	1
Nitrate+Nitrite (N)	mg/L	4.3	EPA 300.0	0.08	0.02		02/07/14 23:27	1
Microbiology								
E. Coli	MPN/100 mL	31	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:07	1
Fecal Coliforms	CFU/100 ml	200	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:42	1
Sample Description		BHS5-ST2						
Matrix		Wastewater						
SAL Sample Number		1401419-04						
Date/Time Collected		02/06/14 08:25						
Collected by		Sean Schmidt						
Date/Time Received		02/06/14 13:45						
Client Provided Field Data								
pH		6.75						
Temperature		19.03 °C						
Conductivity		1008 umhos						
Dissolved Oxygen		0.15 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	2.7	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.65	EPA 350.1	0.040	0.009		02/21/14 08:15	1
Carbonaceous BOD	mg/L	13	SM 5210B	2	2	02/06/14 15:35	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	43	EPA 410.4	25	10	02/10/14 11:30	02/10/14 16:45	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/07/14 23:29	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/07/14 23:29	1
Orthophosphate as P	mg/L	0.87	EPA 300.0	0.040	0.010		02/07/14 23:29	1
Phosphorous - Total as P	mg/L	1.5	SM 4500P-E	0.20	0.050	02/19/14 10:54	02/24/14 15:44	5
Sulfate	mg/L	71	EPA 300.0	0.60	0.20		02/12/14 08:29	1

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Laboratory Report

Project Name		B-HS5 SE#6						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2						
Matrix		Wastewater						
SAL Sample Number		1401419-04						
Date/Time Collected		02/06/14 08:25						
Collected by		Sean Schmidt						
Date/Time Received		02/06/14 13:45						
Sulfide	mg/L	4.0	SM 4500SF	0.40	0.10		02/12/14 09:00	1
Total Alkalinity	mg/L	380	SM 2320B	8.0	2.0		02/19/14 16:30	1
Total Kjeldahl Nitrogen	mg/L	1.7	EPA 351.2	1.0	0.25	02/19/14 10:54	02/24/14 15:39	5
Total Organic Carbon	mg/L	8.1	SM 5310B	1.0	0.060		02/12/14 09:37	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	02/10/14 10:00	02/11/14 14:09	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	02/10/14 10:00	02/11/14 14:09	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/07/14 23:29	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	20	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:07	1
Fecal Coliforms	CFU/100 ml	100	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:42	1
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401419-05						
Date/Time Collected		02/06/14 08:30						
Collected by		Sean Schmidt						
Date/Time Received		02/06/14 13:45						
<u>Client Provided Field Data</u>								
pH		6.75						
Temperature		19.03 °C						
Conductivity		1008 umhos						
Dissolved Oxygen		0.15 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	2.7	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.63	EPA 350.1	0.040	0.009		02/20/14 13:41	1
Carbonaceous BOD	mg/L	13	SM 5210B	2	2	02/06/14 15:35	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	45	EPA 410.4	25	10	02/10/14 11:30	02/10/14 16:45	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/07/14 23:46	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/07/14 23:46	1
Orthophosphate as P	mg/L	0.88	EPA 300.0	0.040	0.010		02/07/14 23:46	1
Phosphorous - Total as P	mg/L	1.4	SM 4500P-E	0.20	0.050	02/19/14 10:54	02/24/14 15:44	5
Sulfate	mg/L	74	EPA 300.0	0.60	0.20		02/07/14 23:46	1
Sulfide	mg/L	4.0	SM 4500SF	0.40	0.10		02/12/14 09:00	1
Total Alkalinity	mg/L	380	SM 2320B	8.0	2.0		02/19/14 16:30	1
Total Kjeldahl Nitrogen	mg/L	1.9	EPA 351.2	1.0	0.25	02/19/14 10:54	02/24/14 15:39	5
Total Organic Carbon	mg/L	8.3	SM 5310B	1.0	0.060		02/12/14 09:37	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	02/10/14 10:00	02/11/14 14:09	1

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Laboratory Report

Project Name		B-HS5 SE#6						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401419-05						
Date/Time Collected		02/06/14 08:30						
Collected by		Sean Schmidt						
Date/Time Received		02/06/14 13:45						
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	02/10/14 10:00	02/11/14 14:09	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/07/14 23:46	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	20	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:07	1
Fecal Coliforms	CFU/100 ml	100	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:42	1
Sample Description		BHS5-EB						
Matrix		Reagent Water						
SAL Sample Number		1401419-06						
Date/Time Collected		02/06/14 09:05						
Collected by		Sean Schmidt						
Date/Time Received		02/06/14 13:45						
<u>Client Provided Field Data</u>								
pH		6.23						
Temperature		17.7 °C						
Conductivity		2.43 umhos						
Dissolved Oxygen		8.15 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:52	1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		02/20/14 12:19	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	02/06/14 15:35	02/11/14 14:01	1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	02/10/14 11:30	02/10/14 16:45	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/07/14 23:55	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/07/14 23:55	1
Orthophosphate as P	mg/L	0.010 U	EPA 300.0	0.040	0.010		02/07/14 23:55	1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	02/19/14 10:54	02/24/14 15:44	1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		02/07/14 23:55	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/12/14 09:00	1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		02/19/14 16:30	1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	02/19/14 10:54	02/24/14 15:39	1
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		02/12/14 09:37	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	02/10/14 10:00	02/11/14 14:09	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/10/14 10:00	02/11/14 14:09	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/07/14 23:55	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:07	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:42	1

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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March 18, 2014
Work Order: 1401419

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40629 - BOD										
Blank (BB40629-BLK1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40629-BLK2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40629-BLK3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40629-BS1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115		
LCS (BB40629-BS2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		94	85-115		
LCS (BB40629-BS3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		95	85-115		
LCS Dup (BB40629-BSD1)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	198	2	2	mg/L	200		99	85-115	2	200
LCS Dup (BB40629-BSD2)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	191	2	2	mg/L	200		95	85-115	1	200
LCS Dup (BB40629-BSD3)					Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	189	2	2	mg/L	200		95	85-115	0	200
Duplicate (BB40629-DUP1)		Source: 1401256-05			Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	5	2	2	mg/L		5			0	25

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40629 - BOD										
Duplicate (BB40629-DUP2)		Source: 1401349-05			Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	16	2	2	mg/L		16			2	25
Duplicate (BB40629-DUP3)		Source: 1401375-01			Prepared: 02/06/14 Analyzed: 02/11/14					
Carbonaceous BOD	120	2	2	mg/L		98			18	25
Batch BB40711 - Ion Chromatography 300.0 Prep										
Blank (BB40711-BLK1)		Prepared & Analyzed: 02/07/14								
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
LCS (BB40711-BS1)		Prepared & Analyzed: 02/07/14								
Sulfate	9.11	0.60	0.20	mg/L	9.0		101	85-115		
Orthophosphate as P	0.881	0.040	0.010	mg/L	0.90		98	85-115		
Nitrate (as N)	1.71	0.04	0.01	mg/L	1.7		101	85-115		
Nitrite (as N)	1.47	0.04	0.01	mg/L	1.4		105	85-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		

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Work Order: 1401419

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40711 - Ion Chromatography 300.0 Prep										
LCS Dup (BB40711-BSD1)					Prepared & Analyzed: 02/07/14					
Orthophosphate as P	0.882	0.040	0.010	mg/L	0.90		98	85-115	0.1	200
Sulfate	9.22	0.60	0.20	mg/L	9.0		102	85-115	1	200
Nitrite (as N)	1.47	0.04	0.01	mg/L	1.4		105	85-115	0.2	200
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7		102	85-115	1	200
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Matrix Spike (BB40711-MS1)					Source: 1401419-02		Prepared & Analyzed: 02/07/14			
Nitrate (as N)	17.0 L	0.04	0.01	mg/L	1.7	47.6	NR	85-115		
Nitrite (as N)	1.79	0.04	0.01	mg/L	1.4	0.389	100	85-115		
Sulfate	44.5	0.60	0.20	mg/L	9.0	34.7	109	85-115		
Orthophosphate as P	2.56	0.040	0.010	mg/L	0.90	1.75	90	85-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Matrix Spike (BB40711-MS2)					Source: 1401421-01		Prepared & Analyzed: 02/08/14			
Orthophosphate as P	3.77	0.040	0.010	mg/L	0.90	2.81	107	85-115		
Nitrite (as N)	1.40	0.04	0.01	mg/L	1.4	ND	100	85-115		
Sulfate	36.1	0.60	0.20	mg/L	9.0	26.4	108	85-115		
Nitrate (as N)	1.60	0.04	0.01	mg/L	1.7	0.0370	92	85-115		
Surrogate: Dichloroacetate	0.995			mg/L	1.0		100	90-115		
Surrogate: Dichloroacetate	0.995			mg/L	1.0		100	90-115		
Surrogate: Dichloroacetate	0.995			mg/L	1.0		100	90-115		
Surrogate: Dichloroacetate	0.995			mg/L	1.0		100	90-115		

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



Hazen and Sawyer
10002 Princess Palm Ave, Suite 200
Tampa, FL 33619

March 18, 2014
Work Order: 1401419

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40718 - TOC prep										
Blank (BB40718-BLK1)					Prepared & Analyzed: 02/12/14					
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
LCS (BB40718-BS1)					Prepared & Analyzed: 02/12/14					
Total Organic Carbon	10.4	1.0	0.060	mg/L	10		104	90-110		
Matrix Spike (BB40718-MS1)					Source: 1401437-01		Prepared & Analyzed: 02/12/14			
Total Organic Carbon	8.93	1.0	0.060	mg/L	10	ND	89	85-115		
Matrix Spike Dup (BB40718-MSD1)					Source: 1401437-01		Prepared & Analyzed: 02/12/14			
Total Organic Carbon	8.57	1.0	0.060	mg/L	10	ND	86	85-115	4	10
Batch BB41012 - COD prep										
Blank (BB41012-BLK1)					Prepared & Analyzed: 02/10/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BB41012-BS1)					Prepared & Analyzed: 02/10/14					
Chemical Oxygen Demand	50	25	10	mg/L	50		100	90-110		
Matrix Spike (BB41012-MS1)					Source: 1401349-06		Prepared & Analyzed: 02/10/14			
Chemical Oxygen Demand	50	25	10	mg/L	50	ND	100	85-115		
Matrix Spike Dup (BB41012-MSD1)					Source: 1401349-06		Prepared & Analyzed: 02/10/14			
Chemical Oxygen Demand	49	25	10	mg/L	50	ND	98	85-115	2	32
Batch BB41014 - COD prep										
Blank (BB41014-BLK1)					Prepared & Analyzed: 02/10/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						

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Tampa, FL 33619

March 18, 2014
Work Order: 1401419

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41014 - COD prep										
LCS (BB41014-BS1)					Prepared & Analyzed: 02/10/14					
Chemical Oxygen Demand	52	25	10	mg/L	50		104	90-110		
Matrix Spike (BB41014-MS1)					Source: 1401353-06 Prepared & Analyzed: 02/10/14					
Chemical Oxygen Demand	77	25	10	mg/L	50	29	96	85-115		
Matrix Spike Dup (BB41014-MSD1)					Source: 1401353-06 Prepared & Analyzed: 02/10/14					
Chemical Oxygen Demand	72	25	10	mg/L	50	29	86	85-115	7	32
Batch BB41205 - VSS Prep										
Blank (BB41205-BLK1)					Prepared: 02/10/14 Analyzed: 02/11/14					
Volatile Suspended Solids	1 U	1		mg/L						
Total Suspended Solids	1 U	1	1	mg/L						
LCS (BB41205-BS1)					Prepared: 02/10/14 Analyzed: 02/11/14					
Total Suspended Solids	50.0	1	1	mg/L	50		100	85-115		
Duplicate (BB41205-DUP1)					Source: 1401258-01 Prepared: 02/10/14 Analyzed: 02/11/14					
Volatile Suspended Solids	12.0	1		mg/L		13.0			8	20
Total Suspended Solids	18.0	1	1	mg/L		19.0			5	30
Batch BB41245 - Sulfide prep										
Blank (BB41245-BLK1)					Prepared & Analyzed: 02/12/14					
Sulfide	0.10 U	0.40	0.10	mg/L						

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March 18, 2014
Work Order: 1401419

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41245 - Sulfide prep										
Blank (BB41245-BLK2)					Prepared & Analyzed: 02/12/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BB41245-BS1)					Prepared & Analyzed: 02/12/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
LCS (BB41245-BS2)					Prepared & Analyzed: 02/12/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
Matrix Spike (BB41245-MS1)					Source: 1401349-06		Prepared & Analyzed: 02/12/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115		
Matrix Spike (BB41245-MS2)					Source: 1401419-06		Prepared & Analyzed: 02/12/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115		
Matrix Spike Dup (BB41245-MSD1)					Source: 1401349-06		Prepared & Analyzed: 02/12/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	0	14
Matrix Spike Dup (BB41245-MSD2)					Source: 1401419-06		Prepared & Analyzed: 02/12/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	0	14
Batch BB41915 - Digestion for TP and TKN										
Blank (BB41915-BLK1)					Prepared: 02/19/14 Analyzed: 02/24/14					
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BB41915-BS1)					Prepared: 02/19/14 Analyzed: 02/24/14					
Total Kjeldahl Nitrogen	0.924	0.20	0.05	mg/L	1.0		92	90-110		
Phosphorous - Total as P	0.502	0.040	0.010	mg/L	0.50		100	90-110		

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March 18, 2014
Work Order: 1401419

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41915 - Digestion for TP and TKN										
Matrix Spike (BB41915-MS1)		Source: 1401419-06			Prepared: 02/19/14 Analyzed: 02/24/14					
Total Kjeldahl Nitrogen	0.988	0.20	0.05	mg/L	1.0	ND	99	90-110		
Phosphorous - Total as P	0.513	0.040	0.010	mg/L	0.50	ND	103	90-110		
Matrix Spike (BB41915-MS2)		Source: 1401421-02			Prepared: 02/19/14 Analyzed: 02/24/14					
Total Kjeldahl Nitrogen	2.25	0.20	0.05	mg/L	1.0	1.64	62	90-110		
Phosphorous - Total as P	0.579	0.040	0.010	mg/L	0.50	0.0729	101	90-110		
Matrix Spike Dup (BB41915-MSD1)		Source: 1401419-06			Prepared: 02/19/14 Analyzed: 02/24/14					
Total Kjeldahl Nitrogen	1.01	0.20	0.05	mg/L	1.0	ND	101	90-110	3	20
Phosphorous - Total as P	0.500	0.040	0.010	mg/L	0.50	ND	100	90-110	3	25
Matrix Spike Dup (BB41915-MSD2)		Source: 1401421-02			Prepared: 02/19/14 Analyzed: 02/24/14					
Total Kjeldahl Nitrogen	2.72	0.20	0.05	mg/L	1.0	1.64	108	90-110	19	20
Phosphorous - Total as P	0.573	0.040	0.010	mg/L	0.50	0.0729	100	90-110	1	25
Batch BB41943 - alkalinity										
Blank (BB41943-BLK1)		Prepared & Analyzed: 02/19/14								
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BB41943-BS1)		Prepared & Analyzed: 02/19/14								
Total Alkalinity	130	8.0	2.0	mg/L	120		108	90-110		
Matrix Spike (BB41943-MS1)		Source: 1401419-06			Prepared & Analyzed: 02/19/14					
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	108	80-120		
Matrix Spike Dup (BB41943-MSD1)		Source: 1401419-06			Prepared & Analyzed: 02/19/14					
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	108	80-120	0	26

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March 18, 2014
Work Order: 1401419

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB42006 - Ammonia by SEAL										
Blank (BB42006-BLK1)					Prepared & Analyzed: 02/20/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB42006-BS1)					Prepared & Analyzed: 02/20/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50		105	90-110		
Matrix Spike (BB42006-MS1)					Source: 1401419-06 Prepared & Analyzed: 02/20/14					
Ammonia as N	0.54	0.040	0.009	mg/L	0.50	ND	108	90-110		
Matrix Spike (BB42006-MS2)					Source: 1401421-07 Prepared & Analyzed: 02/20/14					
Ammonia as N	0.54	0.040	0.009	mg/L	0.50	ND	109	90-110		
Matrix Spike Dup (BB42006-MSD1)					Source: 1401419-06 Prepared & Analyzed: 02/20/14					
Ammonia as N	0.54	0.040	0.009	mg/L	0.50	ND	108	90-110	0.1	10
Matrix Spike Dup (BB42006-MSD2)					Source: 1401421-07 Prepared & Analyzed: 02/20/14					
Ammonia as N	0.54	0.040	0.009	mg/L	0.50	ND	107	90-110	1	10
Batch BB42007 - Ammonia by SEAL										
Blank (BB42007-BLK1)					Prepared & Analyzed: 02/20/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB42007-BS1)					Prepared & Analyzed: 02/20/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50		105	90-110		
Matrix Spike (BB42007-MS1)					Source: 1401419-03 Prepared & Analyzed: 02/20/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50	0.045	96	90-110		

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March 18, 2014
Work Order: 1401419

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB42007 - Ammonia by SEAL										
Matrix Spike (BB42007-MS2)		Source: 1401794-07			Prepared & Analyzed: 02/20/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50	0.027	100	90-110		
Matrix Spike Dup (BB42007-MSD1)		Source: 1401419-03			Prepared & Analyzed: 02/20/14					
Ammonia as N	0.57	0.040	0.009	mg/L	0.50	0.045	104	90-110	7	10
Matrix Spike Dup (BB42007-MSD2)		Source: 1401794-07			Prepared & Analyzed: 02/20/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	0.027	98	90-110	2	10

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Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40665 - FC-MF										
Blank (BB40665-BLK1)					Prepared: 02/06/14 Analyzed: 02/07/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
Duplicate (BB40665-DUP1)					Source: 1401419-06 Prepared: 02/06/14 Analyzed: 02/07/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
Duplicate (BB40665-DUP2)					Source: 1401421-07 Prepared: 02/06/14 Analyzed: 02/07/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200

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March 18, 2014
Work Order: 1401419

*** Qualifiers, Notes and Definitions**

Results followed by a "U" indicate that the sample was analyzed but the compound was not detected. Results followed by "I" indicate that the reported value is between the laboratory method detection limits and the laboratory practical quantitation limit.

A statement of estimated uncertainty of test results is available upon request.

For methods marked with **, all QC criteria have been met for this method which is equivalent to a SAL certified method.

Test results in this report meet all the requirements of the NELAC standards. Any applicable qualifiers are shown below.

L Off-scale high. Result exceeded highest calibration standard.

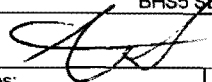
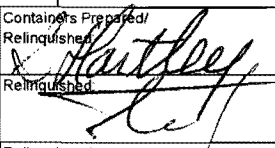
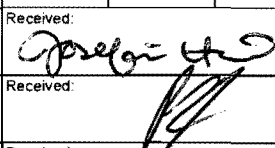
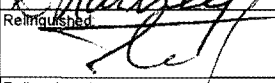
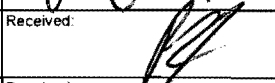
Questions regarding this report should be directed to :

Kathryn Nordmark

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Kathryn@southernanalyticalabs.com



Client Name Hazan and Sawyer								Contact / Phone: Josefin Hirst 813-630-4498												
Project Name / Location BHS5 SE#6																				
Samplers: (Signature) 																				
<p>Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water</p>								PARAMETER / CONTAINER DESCRIPTION												
SAL Use Only	Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	125mLP, Na ₂ S ₂ O ₃ FC-MF, FC-QT	11LP, Cool Total Alkalinity, TSS, VSS, CBOD, NOx, OP, SO ₄	125mLP, H ₂ SO ₄ COD, TKN, NH ₃ , TP	500mLP, NaOH, Zn Acetate H ₂ S	40mLAV, HCl TOC					pH	Temperature	Conductivity	DO
	01	BHS5-STE	2/6/14	0847	WW		X	4	1	1	1	2					7.92	20.1	1192	0.00
	02	BHS5-ST1		0850	WW		X	4	1	1	1	2					6.76	20.14	1087	1.80
	03	BHS5-LIGNO-0		0830	WW		X	4	1	1	1	2					6.71	18.7	1060	0.28
	04	BHS5-ST2		0825	WW		X	4	1	1	1	2					6.75	19.03	1008	0.15
	05	BHS5-ST2-DUP		0830	WW		X	4	1	1	1	2					1	1	1	1
	06	BHS5-EB		0905	R		X	4	1	1	1	2					6.23	17.7	243	8.15
Containers Prepared/ Relinquished: 		Date/Time: 1400 1/29/14	Received: 		Date/Time: 10:30 1-30-14	Seal intact? <input checked="" type="checkbox"/> N NA				Instructions / Remarks										
Relinquished: 		Date/Time: 1345 2/6/14	Received: 		Date/Time: 1345 2-6-14	Samples intact upon arrival? <input checked="" type="checkbox"/> N NA														
Relinquished:		Date/Time:	Received:		Date/Time:	Received on ice? Temp <input checked="" type="checkbox"/> N NA														
Relinquished:		Date/Time:	Received:		Date/Time:	Proper preservatives indicated? <input checked="" type="checkbox"/> N NA														
Relinquished:		Date/Time:	Received:		Date/Time:	Rec'd w/in holding time? <input checked="" type="checkbox"/> N NA														
Relinquished:		Date/Time:	Received:		Date/Time:	Volatiles rec'd w/out headspace? Y N <input checked="" type="checkbox"/> NA														
Relinquished:		Date/Time:	Received:		Date/Time:	Proper containers used? <input checked="" type="checkbox"/> N NA														

Hazen and Sawyer
10002 Princess Palm Ave, Suite 200
Tampa, FL 33619

February 26, 2014
Work Order: 1401481

Laboratory Report

Project Name		B-HS5 SE#7						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-STE						
Matrix		Wastewater						
SAL Sample Number		1401481-01						
Date/Time Collected		02/07/14 10:55						
Collected by		Josefin Hirst						
Date/Time Received		02/07/14 13:45						
<u>Client Provided Field Data</u>								
pH		7.63						
Temperature		20.2 °C						
Conductivity		1206 umhos						
Dissolved Oxygen		0.03 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	1.6	SM 4550SF	0.04	0.01	02/14/14 08:20	02/14/14 10:28	1
Ammonia as N	mg/L	61	EPA 350.1	2.0	0.47		02/21/14 15:26	50
Carbonaceous BOD	mg/L	72	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:03	1
Chemical Oxygen Demand	mg/L	140	EPA 410.4	25	10	02/12/14 12:30	02/12/14 15:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 07:26	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 07:26	1
Orthophosphate as P	mg/L	3.7	EPA 300.0	0.040	0.010		02/08/14 07:26	1
Phosphorous - Total as P	mg/L	6.3	SM 4500P-E	0.80	0.20	02/21/14 15:14	02/25/14 14:45	20
Sulfate	mg/L	2.1	EPA 300.0	0.60	0.20		02/08/14 07:26	1
Sulfide	mg/L	8.1	SM 4500SF	0.40	0.10		02/14/14 10:23	1
Total Alkalinity	mg/L	420	SM 2320B	8.0	2.0		02/20/14 14:45	1
Total Kjeldahl Nitrogen	mg/L	68	EPA 351.2	4.0	1.0	02/21/14 15:14	02/25/14 16:50	20
Total Organic Carbon	mg/L	33	SM 5310B	1.0	0.060		02/12/14 23:18	1
Total Suspended Solids	mg/L	32	SM 2540D	1	1	02/10/14 10:02	02/12/14 11:44	1
Volatile Suspended Solids	mg/L	28	EPA 160.4	1	1	02/10/14 10:02	02/12/14 11:44	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/08/14 07:26	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	1,800	SM 9223B	2.0	2.0	02/07/14 15:20	02/08/14 12:30	1
Fecal Coliforms	CFU/100 ml	93,600	SM 9222D	1	1	02/07/14 15:15	02/08/14 13:25	1

Sample Description **BHS5-ST1**
 Matrix **Wastewater**
 SAL Sample Number **1401481-02**
 Date/Time Collected **02/07/14 10:55**
 Collected by **Josefin Hirst**
 Date/Time Received **02/07/14 13:45**

Client Provided Field Data

pH 6.75
 Temperature 20.14 °C
 Conductivity 1070 umhos
 Dissolved Oxygen 1.93 mg/L

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February 26, 2014
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Laboratory Report

Project Name		B-HS5 SE#7						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST1						
Matrix		Wastewater						
SAL Sample Number		1401481-02						
Date/Time Collected		02/07/14 10:55						
Collected by		Josefin Hirst						
Date/Time Received		02/07/14 13:45						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.27	SM 4550SF	0.04	0.01	02/14/14 08:20	02/14/14 10:28	1
Ammonia as N	mg/L	2.3	EPA 350.1	0.080	0.019		02/21/14 16:44	2
Carbonaceous BOD	mg/L	9	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:03	1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	02/12/14 12:30	02/12/14 15:00	1
Nitrate (as N)	mg/L	39	EPA 300.0	0.04	0.01		02/08/14 07:35	1
Nitrite (as N)	mg/L	0.53	EPA 300.0	0.04	0.01		02/08/14 07:35	1
Orthophosphate as P	mg/L	1.4	EPA 300.0	0.040	0.010		02/08/14 07:35	1
Phosphorous - Total as P	mg/L	2.1	SM 4500P-E	0.20	0.050	02/21/14 15:14	02/25/14 14:45	5
Sulfate	mg/L	25	EPA 300.0	0.60	0.20		02/08/14 07:35	1
Sulfide	mg/L	0.40	SM 4500SF	0.40	0.10		02/14/14 10:23	1
Total Alkalinity	mg/L	210	SM 2320B	8.0	2.0		02/20/14 14:45	1
Total Kjeldahl Nitrogen	mg/L	3.9	EPA 351.2	1.0	0.25	02/21/14 15:14	02/25/14 16:50	5
Total Organic Carbon	mg/L	5.5	SM 5310B	1.0	0.060		02/12/14 23:18	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	02/10/14 10:02	02/12/14 11:44	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	02/10/14 10:02	02/12/14 11:44	1
Nitrate+Nitrite (N)	mg/L	40	EPA 300.0	0.08	0.02		02/08/14 07:35	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	72	SM 9223B	2.0	2.0	02/07/14 15:20	02/08/14 12:30	1
Fecal Coliforms	CFU/100 ml	4,400	SM 9222D	1	1	02/07/14 15:15	02/08/14 13:25	1

Sample Description **BHS5-LIGNO-0**
 Matrix **Wastewater**
 SAL Sample Number **1401481-03**
 Date/Time Collected **02/07/14 10:35**
 Collected by **Josefin Hirst**
 Date/Time Received **02/07/14 13:45**

Client Provided Field Data

pH 7.38
 Temperature 18.4 °C
 Conductivity 1063 umhos
 Dissolved Oxygen 0.14 mg/L

<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.06	SM 4550SF	0.04	0.01	02/14/14 08:20	02/14/14 10:28	1
Ammonia as N	mg/L	0.080	EPA 350.1	0.040	0.009		02/21/14 15:39	1
Carbonaceous BOD	mg/L	14	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:03	1
Chemical Oxygen Demand	mg/L	12 I	EPA 410.4	25	10	02/12/14 12:30	02/12/14 15:00	1

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Work Order: 1401481

Laboratory Report

Project Name		B-HS5 SE#7						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1401481-03						
Date/Time Collected		02/07/14 10:35						
Collected by		Josefin Hirst						
Date/Time Received		02/07/14 13:45						
Nitrate (as N)	mg/L	5.9	EPA 300.0	0.04	0.01		02/08/14 07:44	1
Nitrite (as N)	mg/L	0.88	EPA 300.0	0.04	0.01		02/08/14 07:44	1
Orthophosphate as P	mg/L	0.49	EPA 300.0	0.040	0.010		02/08/14 07:44	1
Phosphorous - Total as P	mg/L	0.95	SM 4500P-E	0.20	0.050	02/21/14 15:14	02/25/14 14:45	5
Sulfate	mg/L	24	EPA 300.0	0.60	0.20		02/08/14 07:44	1
Sulfide	mg/L	0.20 I	SM 4500SF	0.40	0.10		02/14/14 10:23	1
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		02/21/14 14:00	1
Total Kjeldahl Nitrogen	mg/L	1.5	EPA 351.2	1.0	0.25	02/21/14 15:14	02/25/14 16:50	5
Total Organic Carbon	mg/L	9.3	SM 5310B	1.0	0.060		02/12/14 23:18	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	02/10/14 10:02	02/12/14 11:44	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/10/14 10:02	02/12/14 11:44	1
Nitrate+Nitrite (N)	mg/L	6.8	EPA 300.0	0.08	0.02		02/08/14 07:44	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	63	SM 9223B	2.0	2.0	02/07/14 15:20	02/08/14 12:30	1
Fecal Coliforms	CFU/100 ml	600	SM 9222D	1	1	02/07/14 15:15	02/08/14 13:25	1
Sample Description		BHS5-ST2						
Matrix		Wastewater						
SAL Sample Number		1401481-04						
Date/Time Collected		02/07/14 10:35						
Collected by		Josefin Hirst						
Date/Time Received		02/07/14 13:45						
<u>Client Provided Field Data</u>								
pH		6.79						
Temperature		18.9 °C						
Conductivity		995 umhos						
Dissolved Oxygen		0.38 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	4.6	SM 4550SF	0.04	0.01	02/14/14 08:20	02/14/14 10:28	1
Ammonia as N	mg/L	0.31	EPA 350.1	0.040	0.009		02/21/14 09:04	1
Carbonaceous BOD	mg/L	16	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:03	1
Chemical Oxygen Demand	mg/L	35	EPA 410.4	25	10	02/12/14 12:30	02/12/14 15:00	1
Nitrate (as N)	mg/L	0.17	EPA 300.0	0.04	0.01		02/08/14 08:22	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 08:22	1
Orthophosphate as P	mg/L	0.86	EPA 300.0	0.040	0.010		02/08/14 08:22	1
Phosphorous - Total as P	mg/L	1.3	SM 4500P-E	0.20	0.050	02/21/14 15:14	02/25/14 14:45	5
Sulfate	mg/L	55	EPA 300.0	0.60	0.20		02/08/14 08:22	1

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Laboratory Report

Project Name		B-HS5 SE#7						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2						
Matrix		Wastewater						
SAL Sample Number		1401481-04						
Date/Time Collected		02/07/14 10:35						
Collected by		Josefin Hirst						
Date/Time Received		02/07/14 13:45						
Sulfide	mg/L	7.3	SM 4500SF	0.40	0.10		02/14/14 10:23	1
Total Alkalinity	mg/L	380	SM 2320B	8.0	2.0		02/21/14 14:00	1
Total Kjeldahl Nitrogen	mg/L	1.0	EPA 351.2	1.0	0.25	02/21/14 15:14	02/25/14 16:50	5
Total Organic Carbon	mg/L	7.1	SM 5310B	1.0	0.060		02/12/14 23:18	1
Total Suspended Solids	mg/L	3	SM 2540D	1	1	02/10/14 10:02	02/12/14 11:44	1
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	02/10/14 10:02	02/12/14 11:44	1
Nitrate+Nitrite (N)	mg/L	0.17	EPA 300.0	0.08	0.02		02/08/14 08:22	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	10	SM 9223B	2.0	2.0	02/07/14 15:20	02/08/14 12:30	1
Fecal Coliforms	CFU/100 ml	100	SM 9222D	1	1	02/07/14 15:15	02/08/14 13:25	1
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401481-05						
Date/Time Collected		02/07/14 10:40						
Collected by		Josefin Hirst						
Date/Time Received		02/07/14 13:45						
<u>Client Provided Field Data</u>								
pH		6.79						
Temperature		18.9 °C						
Conductivity		995 umhos						
Dissolved Oxygen		0.38 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	4.4	SM 4550SF	0.04	0.01	02/14/14 08:20	02/14/14 10:28	1
Ammonia as N	mg/L	0.32	EPA 350.1	0.040	0.009		02/21/14 08:41	1
Carbonaceous BOD	mg/L	17	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:03	1
Chemical Oxygen Demand	mg/L	33	EPA 410.4	25	10	02/12/14 12:30	02/12/14 15:00	1
Nitrate (as N)	mg/L	0.17	EPA 300.0	0.04	0.01		02/08/14 08:31	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 08:31	1
Orthophosphate as P	mg/L	0.91	EPA 300.0	0.040	0.010		02/08/14 08:31	1
Phosphorous - Total as P	mg/L	1.3	SM 4500P-E	0.20	0.050	02/21/14 15:14	02/25/14 14:45	5
Sulfate	mg/L	54	EPA 300.0	0.60	0.20		02/08/14 08:31	1
Sulfide	mg/L	6.8	SM 4500SF	0.40	0.10		02/14/14 10:23	1
Total Alkalinity	mg/L	370	SM 2320B	8.0	2.0		02/21/14 14:00	1
Total Kjeldahl Nitrogen	mg/L	1.1	EPA 351.2	1.0	0.25	02/21/14 15:14	02/25/14 16:50	5
Total Organic Carbon	mg/L	7.1	SM 5310B	1.0	0.060		02/12/14 23:18	1
Total Suspended Solids	mg/L	3	SM 2540D	1	1	02/10/14 10:02	02/12/14 11:44	1

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Laboratory Report

Project Name		B-HS5 SE#7						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS5-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1401481-05						
Date/Time Collected		02/07/14 10:40						
Collected by		Josefin Hirst						
Date/Time Received		02/07/14 13:45						
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	02/10/14 10:02	02/12/14 11:44	1
Nitrate+Nitrite (N)	mg/L	0.17	EPA 300.0	0.08	0.02		02/08/14 08:31	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	31	SM 9223B	2.0	2.0	02/07/14 15:20	02/08/14 12:30	1
Fecal Coliforms	CFU/100 ml	100	SM 9222D	1	1	02/07/14 15:15	02/08/14 13:25	1

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40716 - BOD										
Blank (BB40716-BLK1)					Prepared: 02/07/14 Analyzed: 02/12/14					
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40716-BLK2)					Prepared: 02/07/14 Analyzed: 02/12/14					
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40716-BS1)					Prepared: 02/07/14 Analyzed: 02/12/14					
Carbonaceous BOD	193	2	2	mg/L	200		97	85-115		
LCS (BB40716-BS2)					Prepared: 02/07/14 Analyzed: 02/12/14					
Carbonaceous BOD	182	2	2	mg/L	200		91	85-115		
LCS Dup (BB40716-BSD1)					Prepared: 02/07/14 Analyzed: 02/12/14					
Carbonaceous BOD	185	2	2	mg/L	200		92	85-115	4	200
LCS Dup (BB40716-BSD2)					Prepared: 02/07/14 Analyzed: 02/12/14					
Carbonaceous BOD	189	2	2	mg/L	200		94	85-115	4	200
Duplicate (BB40716-DUP1)					Source: 1401420-05 Prepared: 02/07/14 Analyzed: 02/12/14					
Carbonaceous BOD	17	2	2	mg/L		18			7	25
Duplicate (BB40716-DUP2)					Source: 1401481-05 Prepared: 02/07/14 Analyzed: 02/12/14					
Carbonaceous BOD	16	2	2	mg/L		17			6	25
Batch BB40723 - Ion Chromatography 300.0 Prep										
Blank (BB40723-BLK1)					Prepared & Analyzed: 02/08/14					
Sulfate	0.20 U	0.60	0.20	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40723 - Ion Chromatography 300.0 Prep										
LCS (BB40723-BS1)					Prepared & Analyzed: 02/08/14					
Orthophosphate as P	0.823	0.040	0.010	mg/L	0.90		91	85-115		
Nitrite (as N)	1.50	0.04	0.01	mg/L	1.4		107	85-115		
Sulfate	9.20	0.60	0.20	mg/L	9.0		102	85-115		
Nitrate (as N)	1.75	0.04	0.01	mg/L	1.7		103	85-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
LCS Dup (BB40723-BSD1)					Prepared & Analyzed: 02/08/14					
Sulfate	8.94	0.60	0.20	mg/L	9.0		99	85-115	3	200
Nitrate (as N)	1.65	0.04	0.01	mg/L	1.7		97	85-115	6	200
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		104	85-115	3	200
Orthophosphate as P	0.812	0.040	0.010	mg/L	0.90		90	85-115	1	200
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	90-115		
Matrix Spike (BB40723-MS1)					Source: 1401481-03		Prepared & Analyzed: 02/08/14			
Orthophosphate as P	1.44	0.040	0.010	mg/L	0.90	0.494	105	85-115		
Nitrite (as N)	2.32	0.04	0.01	mg/L	1.4	0.876	104	85-115		
Nitrate (as N)	7.78	0.04	0.01	mg/L	1.7	5.92	110	85-115		
Sulfate	33.0	0.60	0.20	mg/L	9.0	23.9	100	85-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch BB40723 - Ion Chromatography 300.0 Prep

Matrix Spike (BB40723-MS2)		Source: 1401482-05			Prepared & Analyzed: 02/08/14					
Orthophosphate as P	4.48	0.040	0.010	mg/L	0.90	3.58	100	85-115		
Sulfate	29.5	0.60	0.20	mg/L	9.0	20.8	97	85-115		
Nitrate (as N)	1.72	0.04	0.01	mg/L	1.7	0.0720	97	85-115		
Nitrite (as N)	1.39	0.04	0.01	mg/L	1.4	ND	100	85-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		

Batch BB41125 - TOC prep

Blank (BB41125-BLK1)		Prepared & Analyzed: 02/12/14								
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
LCS (BB41125-BS1)		Prepared & Analyzed: 02/12/14								
Total Organic Carbon	10.1	1.0	0.060	mg/L	10		101	90-110		
Matrix Spike (BB41125-MS1)		Source: 1401583-03			Prepared & Analyzed: 02/12/14					
Total Organic Carbon	9.25	1.0	0.060	mg/L	10	ND	92	85-115		
Matrix Spike Dup (BB41125-MSD1)		Source: 1401583-03			Prepared & Analyzed: 02/12/14					
Total Organic Carbon	9.10	1.0	0.060	mg/L	10	ND	91	85-115	2	10

Batch BB41224 - COD prep

Blank (BB41224-BLK1)		Prepared & Analyzed: 02/12/14								
Chemical Oxygen Demand	10 U	25	10	mg/L						

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41224 - COD prep										
LCS (BB41224-BS1)					Prepared & Analyzed: 02/12/14					
Chemical Oxygen Demand	49	25	10	mg/L	50		98	90-110		
Matrix Spike (BB41224-MS1)					Source: 1401480-03 Prepared & Analyzed: 02/12/14					
Chemical Oxygen Demand	49	25	10	mg/L	50	ND	98	85-115		
Matrix Spike Dup (BB41224-MSD1)					Source: 1401480-03 Prepared & Analyzed: 02/12/14					
Chemical Oxygen Demand	50	25	10	mg/L	50	ND	100	85-115	2	32
Batch BB41431 - Sulfide prep										
Blank (BB41431-BLK1)					Prepared & Analyzed: 02/14/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BB41431-BS1)					Prepared & Analyzed: 02/14/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
Matrix Spike (BB41431-MS1)					Source: 1401480-07 Prepared & Analyzed: 02/14/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike Dup (BB41431-MSD1)					Source: 1401480-07 Prepared & Analyzed: 02/14/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
Batch BB41709 - VSS Prep										
Blank (BB41709-BLK1)					Prepared: 02/10/14 Analyzed: 02/12/14					
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB41709 - VSS Prep										
LCS (BB41709-BS1)					Prepared: 02/10/14 Analyzed: 02/12/14					
Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
Duplicate (BB41709-DUP1)					Source: 1401420-03 Prepared: 02/10/14 Analyzed: 02/12/14					
Total Suspended Solids	2.00	1	1	mg/L		2.00			0	30
Volatile Suspended Solids	2.00	1		mg/L		2.00			0	20
Batch BB41944 - alkalinity										
Blank (BB41944-BLK1)					Prepared & Analyzed: 02/20/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BB41944-BS1)					Prepared & Analyzed: 02/20/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		99	90-110		
Matrix Spike (BB41944-MS1)					Source: 1401481-02 Prepared & Analyzed: 02/20/14					
Total Alkalinity	340	8.0	2.0	mg/L	120	210	99	80-120		
Matrix Spike Dup (BB41944-MSD1)					Source: 1401481-02 Prepared & Analyzed: 02/20/14					
Total Alkalinity	340	8.0	2.0	mg/L	120	210	99	80-120	0	26
Batch BB42007 - Ammonia by SEAL										
Blank (BB42007-BLK1)					Prepared & Analyzed: 02/20/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB42007-BS1)					Prepared & Analyzed: 02/20/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50		105	90-110		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB42007 - Ammonia by SEAL										
Matrix Spike (BB42007-MS1)		Source: 1401419-03			Prepared & Analyzed: 02/20/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50	0.045	96	90-110		
Matrix Spike (BB42007-MS2)		Source: 1401794-07			Prepared & Analyzed: 02/20/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50	0.027	100	90-110		
Matrix Spike Dup (BB42007-MSD1)		Source: 1401419-03			Prepared & Analyzed: 02/20/14					
Ammonia as N	0.57	0.040	0.009	mg/L	0.50	0.045	104	90-110	7	10
Matrix Spike Dup (BB42007-MSD2)		Source: 1401794-07			Prepared & Analyzed: 02/20/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	0.027	98	90-110	2	10
Batch BB42102 - Ammonia by SEAL										
Blank (BB42102-BLK1)		Prepared & Analyzed: 02/21/14								
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB42102-BS1)		Prepared & Analyzed: 02/22/14								
Ammonia as N	0.50	0.040	0.009	mg/L	0.50		101	90-110		
Matrix Spike (BB42102-MS1)		Source: 1401480-07			Prepared & Analyzed: 02/21/14					
Ammonia as N	0.51	0.040	0.009	mg/L	0.50	ND	103	90-110		
Matrix Spike (BB42102-MS2)		Source: 1401818-07			Prepared & Analyzed: 02/21/14					
Ammonia as N	0.53	0.040	0.009	mg/L	0.50	0.038	98	90-110		
Matrix Spike Dup (BB42102-MSD1)		Source: 1401480-07			Prepared & Analyzed: 02/21/14					
Ammonia as N	0.54	0.040	0.009	mg/L	0.50	ND	108	90-110	5	10

SOUTHERN ANALYTICAL LABORATORIES, INC.

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Hazen and Sawyer
10002 Princess Palm Ave, Suite 200
Tampa, FL 33619

February 26, 2014
Work Order: 1401481

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB42102 - Ammonia by SEAL										
Matrix Spike Dup (BB42102-MSD2)		Source: 1401818-07			Prepared & Analyzed: 02/21/14					
Ammonia as N	0.58	0.040	0.009	mg/L	0.50	0.038	108	90-110	9	10
Batch BB42122 - alkalinity										
Blank (BB42122-BLK1)					Prepared & Analyzed: 02/21/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BB42122-BS1)					Prepared & Analyzed: 02/21/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		108	90-110		
Matrix Spike (BB42122-MS1)		Source: 1401482-05			Prepared & Analyzed: 02/21/14					
Total Alkalinity	570	8.0	2.0	mg/L	120	450	99	80-120		
Matrix Spike Dup (BB42122-MSD1)		Source: 1401482-05			Prepared & Analyzed: 02/21/14					
Total Alkalinity	570	8.0	2.0	mg/L	120	450	99	80-120	0	26
Batch BB42128 - Digestion for TP and TKN										
Blank (BB42128-BLK1)					Prepared: 02/21/14 Analyzed: 02/25/14					
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BB42128-BS1)					Prepared: 02/21/14 Analyzed: 02/25/14					
Phosphorous - Total as P	0.469	0.040	0.010	mg/L	0.50		94	90-110		
Total Kjeldahl Nitrogen	0.967	0.20	0.05	mg/L	1.0		97	90-110		

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Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB42128 - Digestion for TP and TKN										
Matrix Spike (BB42128-MS1)		Source: 1401480-07			Prepared: 02/21/14 Analyzed: 02/25/14					
Phosphorous - Total as P	0.488	0.040	0.010	mg/L	0.50	ND	98	90-110		
Total Kjeldahl Nitrogen	0.983	0.20	0.05	mg/L	1.0	ND	98	90-110		
Matrix Spike (BB42128-MS2)		Source: 1401750-01			Prepared: 02/21/14 Analyzed: 02/25/14					
Phosphorous - Total as P	0.470	0.040	0.010	mg/L	0.50	ND	94	90-110		
Total Kjeldahl Nitrogen	0.998	0.20	0.05	mg/L	1.0	ND	100	90-110		
Matrix Spike Dup (BB42128-MSD1)		Source: 1401480-07			Prepared: 02/21/14 Analyzed: 02/25/14					
Total Kjeldahl Nitrogen	0.949	0.20	0.05	mg/L	1.0	ND	95	90-110	3	20
Phosphorous - Total as P	0.466	0.040	0.010	mg/L	0.50	ND	93	90-110	4	25
Matrix Spike Dup (BB42128-MSD2)		Source: 1401750-01			Prepared: 02/21/14 Analyzed: 02/25/14					
Phosphorous - Total as P	0.480	0.040	0.010	mg/L	0.50	ND	96	90-110	2	25
Total Kjeldahl Nitrogen	0.960	0.20	0.05	mg/L	1.0	ND	96	90-110	4	20

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Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40725 - FC-MF										
Blank (BB40725-BLK1)					Prepared: 02/07/14 Analyzed: 02/08/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
Duplicate (BB40725-DUP1)					Source: 1401480-07 Prepared: 02/07/14 Analyzed: 02/08/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		1.00				200

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February 26, 2014
Work Order: 1401481

*** Qualifiers, Notes and Definitions**

Results followed by a "U" indicate that the sample was analyzed but the compound was not detected. Results followed by "I" indicate that the reported value is between the laboratory method detection limits and the laboratory practical quantitation limit.

A statement of estimated uncertainty of test results is available upon request.

For methods marked with **, all QC criteria have been met for this method which is equivalent to a SAL certified method.

Test results in this report meet all the requirements of the NELAC standards. Any applicable qualifiers are shown below.

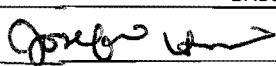
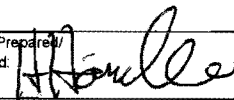
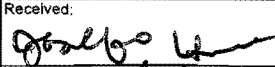


Questions regarding this report should be directed to :

Kathryn Nordmark

Telephone (813) 855-1844 FAX (813) 855-2218

Kathryn@southernanalyticalabs.com



Client Name Hazan and Sawyer										Contact / Phone: Josefin Hirst 813-630-4498										
Project Name / Location BHS5 SE#7																				
Samplers: (Signature) 																				
<p>Matrix Codes: DW-Drinking Water WW-Wastewater SW-Surface Water SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water</p>										PARAMETER / CONTAINER DESCRIPTION										
SAL Use Only	Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	125mLP, Na ₂ S ₂ O ₃ FC-MF, FC-QT	1LP, Cool Total Alkalinity, TSS, VSS, CBOD, NOx, OP, SO ₄	125mLP, H ₂ SO ₄ COD, TKN, NH ₃ , TP	500mLP, NaOH, Zn Acetate H ₂ S	40mLaV, HCl TOC					pH	Temperature	Conductivity	DO
	01	BHS5-STE	2/7/14	10:55	WW		X	4	1	1	1	2					7.63	20.2	1206	0.03
	02	BHS5-ST1	↓	10:55	WW		X	4	1	1	1	2					6.75	20.14	1070	1.93
	03	BHS5-LIGNO-0		10:35	WW		X	4	1	1	1	2					7.38	18.4	1063	0.14
	04	BHS5-ST2		10:35	WW		X	4	1	1	1	2					6.79	18.5	995	0.38
	05	BHS5-ST2-DUP		10:40	WW		X	4	1	1	1	2					6.79	18.5	995	0.38
	06	BHS5-EB				R		X	4	1	1	1	2							
Containers Prepared / Relinquished: 		Date/Time: 1240 1-30-14	Received: 		Date/Time: 12:00 1-31-14		Seal intact? <input checked="" type="checkbox"/> N NA				Instructions / Remarks									
Relinquished: 		Date/Time: 1345 2/7/14	Received: 		Date/Time: 1345 2-7-14		Samples intact upon arrival? <input checked="" type="checkbox"/> N NA													
Relinquished:		Date/Time:	Received:		Date/Time:		Received on ice? Temp <input checked="" type="checkbox"/> N NA													
Relinquished:		Date/Time:	Received:		Date/Time:		Proper preservatives indicated? <input checked="" type="checkbox"/> N NA													
Relinquished:		Date/Time:	Received:		Date/Time:		Rec'd within holding time? <input checked="" type="checkbox"/> N NA													
Relinquished:		Date/Time:	Received:		Date/Time:		Volatiles rec'd w/out headspace? <input checked="" type="checkbox"/> Y N NA													
Relinquished:		Date/Time:	Received:		Date/Time:		Proper containers used? <input checked="" type="checkbox"/> N NA													



Appendix B: Operation & Maintenance Log

Table B.1
Operation and Maintenance Log

Date	Description
6/24/2013	Construction - Stage 1 and Stage 2 tanks installed
6/25/2013	Construction - Drainfield distribution box installed and all pipework
7/9/2013	System Start-up
	Bull run valve switched from drainfield to Stage 1 biofilter
7/17/2013	System check
7/23/2013	Construction - sod installation
7/29/2013	Preliminary sample event No. 1
8/6/2013	System check
	Need to add soil around low side of pump tank riser
8/15/2013	Preliminary sample event No. 2
9/27/2013	Sample Event No. 1
11/8/2013	System check
11/27/2013	System check
12/4/2013	Sample Event No. 2
12/23/2013	System check
1/23/2014	System check
1/31/2014	System check
2/3/2014	Sample Event No. 3
2/4/2014	Sample Event No. 4
2/5/2014	Sample Event No. 5
2/6/2014	Sample Event No. 6
2/7/2014	Sample Event No. 7

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Appendix C: Vericomm PLC Data

Table C.1
Vericomm Data Dec 4, 2013 through Jan 31, 2014

System Status		1/31/2014	1/23/2014	12/23/2013	12/4/2013
Point	Description	Value	Value	Value	Value
1	Alarm Status	OK	OK	OK	OK
2	Alert Status	OK	OK	OK	OK
3	System Mode	Normal	Normal	Normal	Normal
5	Timer Mode	Normal	Off	Off	Off
6	Active Off Time	60.0 Minutes	60.0 Minutes	60.0 Minutes	60.0 Minutes
7	Active On Time	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes
9	Pump Mode	OffCycl	Off	Off	Off
10	Pump Status	Off	Off	Off	Off
12	Pump Cycles Today	5.0 Cycles	2.0 Cycles	4.0 Cycles	3.0 Cycles
13	Override Cycles Today	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles
14	Pump Run Time Today	3.5 Minutes	1.5 Minutes	2.9 Minutes	2.1 Minutes
Settings					
Point	Description	Value	Value	Value	Value
17	Off Cycle Time	60.0 Minutes	60.0 Minutes	60.0 Minutes	60.0 Minutes
18	On Cycle Time	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes
19	Override Off Cycle Time	30.0 Minutes	30.0 Minutes	30.0 Minutes	30.0 Minutes
20	Override On Cycle Time	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes
21	Minimum Override Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles
23	Override Cycle Limit per Day	7.0 Cycles	7.0 Cycles	7.0 Cycles	7.0 Cycles
24	Time Limit per Day	16.0 Minutes	16.0 Minutes	16.0 Minutes	16.0 Minutes
25	High Level Pump Test	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes
28	Alarm Update Interval	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes
29	Page Delay	960.0 Minutes	960.0 Minutes	960.0 Minutes	960.0 Minutes
30	Page Interval	30.0 Minutes	30.0 Minutes	30.0 Minutes	30.0 Minutes
31	Local Alarm Delay	1140.0 Minutes	1140.0 Minutes	1140.0 Minutes	1140.0 Minutes
32	Local Reactivate Delay	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes
Troubleshooting					
Point	Description	Value	Value	Value	Value
33	Top Float Status	OK	OK	OK	OK
34	Middle Float Status	OK	OK	OK	OK
35	Bottom Float Status	OK	OK	OK	OK
37	Contactor Status	OK	OK	OK	OK
38	Pump Status	OK	OK	OK	OK
40	Filter Status	OK	OK	OK	OK
41	Tank Status	OK	OK	OK	OK
43	Power Status	OK	OK	OK	OK
Flow Data					
Point	Description	Value	Value	Value	Value
49	Pump Run Time Today	3.5 Minutes	1.5 Minutes	2.9 Minutes	2.1 Minutes
50	Override Cycles Today	0	0	0	0
51	Pump Cycles Today	5.0 Cycles	2.0 Cycles	4.0 Cycles	3.0 Cycles
52	Average Run Time per Cycle Today	0.7 Minutes	0.8 Minutes	0.7 Minutes	0.7 Minutes
54	Brownouts Today	0	0	0	0

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Table C.1 (continued)
Vericom Data Dec 4, 2013 through Jan 31, 2014

		1/31/2014	1/23/2014	12/23/2013	12/4/2013
30-Day History Data					
Point	Description	Value	Value	Value	Value
65	30 Day Average Run Time per Day	4.9 Minutes	5.6 Minutes	4.2 Minutes	4.3 Minutes
66	30 Day Average Override Cycles per Day	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles
67	30 Day Average Cycles per Day	6.9 Cycles	7.9 Cycles	5.9 Cycles	6.1 Cycles
68	30 Day Average Run Time per Cycle	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes
71	30 Day Total Pump Run Time	148.3 Minutes	168.4 Minutes	125.5 Minutes	130.4 Minutes
72	30 Day Total Override Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles
73	30 Day Total Cycles	208.0 Cycles	236.0 Cycles	176.0 Cycles	183.0 Cycles
76	30 Day Total Brownouts	0	0	0	0
Totalized Pump Data					
Point	Description	Value	Value	Value	Value
82	Pump Total Run Time	16.0 Hours	15.3 Hours	12.5 Hours	11.2 Hours
83	Pump Total Cycles	1357.0 Cycles	1298.0 Cycles	1056.0 Cycles	947.0 Cycles
Miscellaneous					
Point	Description	Value	Value	Value	Value
145	Pump On Auto	Off	Off	Off	Off
147	Pump Test Today	Off	Off	Off	Off
148	Pump Check Enable	Off	Off	Off	Off
149	Total Override Cycles	0	0	0	0
150	High Level Condition	Off	Off	Off	Off
151	Leak Check Enable	On	Off	Off	Off
152	Brownout State	Off	Off	Off	Off
153	Test Mode	Off	Off	Off	Off
Alarm Points					
Point	Description	Value	Value	Value	Value
161	General Alarm	Off	Off	Off	Off
162	New Alarm	Off	Off	Off	Off
163	Update Central Enable	On	On	On	On
167	Page Alarm Start	Off	Off	Off	Off
168	Pager Signal	Off	Off	Off	Off
169	Local Alarm Start	Off	Off	Off	Off
170	Local Alarm Silence	Off	Off	Off	Off
Inputs & Outputs					
Point	Description	Value	Value	Value	Value
177	High Level/Override Timer Float Input	Off	Off	Off	Off
178	Timer Float Input	On	Off	Off	Off
179	Redundant Off Float & Low Level Alarm Input	On	On	On	On
181	Push To Silence Input	Off	Off	Off	Off
182	Auxiliary Contact Input	Off	Off	Off	Off
186	Pump Output	Off	Off	Off	Off
188	Alarm Light Output	Off	Off	Off	Off
189	Audible Alarm Output	Off	Off	Off	Off

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Table C.2
Vericomm Data Feb 3, 2014 through Feb 7, 2014

System Status		2/7/2014	2/6/2014	2/5/2014	2/4/2014	2/3/2014
Point	Description	Value	Value	Value	Value	Value
1	Alarm Status	OK	OK	OK	OK	OK
2	Alert Status	OK	OK	OK	OK	OK
3	System Mode	Normal	Normal	Normal	Normal	Normal
5	Timer Mode	Off	Off	Normal	Normal	Off
6	Active Off Time	60.0 Minutes	60.0 Minutes	60.0 Minutes	60.0 Minutes	60.0 Minutes
7	Active On Time	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes
9	Pump Mode	Off	Off	OffCycl	OffCycl	Off
10	Pump Status	Off	Off	Off	Off	Off
12	Pump Cycles Today	1.0 Cycles	2.0 Cycles	1.0 Cycles	1.0 Cycles	1.0 Cycles
13	Override Cycles Today	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles
14	Pump Run Time Today	0.7 Minutes	1.5 Minutes	0.7 Minutes	0.7 Minutes	0.6 Minutes
Settings						
Point	Description	Value	Value	Value	Value	Value
17	Off Cycle Time	60.0 Minutes	60.0 Minutes	60.0 Minutes	60.0 Minutes	60.0 Minutes
18	On Cycle Time	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes
19	Override Off Cycle Time	30.0 Minutes	30.0 Minutes	30.0 Minutes	30.0 Minutes	30.0 Minutes
20	Override On Cycle Time	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes
21	Minimum Override Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles
23	Override Cycle Limit per Day	7.0 Cycles	7.0 Cycles	7.0 Cycles	7.0 Cycles	7.0 Cycles
24	Time Limit per Day	16.0 Minutes	16.0 Minutes	16.0 Minutes	16.0 Minutes	16.0 Minutes
25	High Level Pump Test	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes
28	Alarm Update Interval	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes
29	Page Delay	960.0 Minutes	960.0 Minutes	960.0 Minutes	960.0 Minutes	960.0 Minutes
30	Page Interval	30.0 Minutes	30.0 Minutes	30.0 Minutes	30.0 Minutes	30.0 Minutes
31	Local Alarm Delay	1140.0 Minutes	1140.0 Minutes	1140.0 Minutes	1140.0 Minutes	1140.0 Minutes
32	Local Reactivate Delay	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes
Troubleshooting						
Point	Description	Value	Value	Value	Value	Value
33	Top Float Status	OK	OK	OK	OK	OK
34	Middle Float Status	OK	OK	OK	OK	OK
35	Bottom Float Status	OK	OK	OK	OK	OK
37	Contactor Status	OK	OK	OK	OK	OK
38	Pump Status	OK	OK	OK	OK	OK
40	Filter Status	OK	OK	OK	OK	OK
41	Tank Status	OK	OK	OK	OK	OK
43	Power Status	OK	OK	OK	OK	OK
Flow Data						
Point	Description	Value	Value	Value	Value	Value
49	Pump Run Time Today	0.7 Minutes	1.5 Minutes	0.7 Minutes	0.7 Minutes	0.6 Minutes
50	Override Cycles Today	0	0	0	0	0
51	Pump Cycles Today	1.0 Cycles	2.0 Cycles	1.0 Cycles	1.0 Cycles	1.0 Cycles
52	Average Run Time per Cycle Today	0.7 Minutes	0.8 Minutes	0.7 Minutes	0.7 Minutes	0.6 Minutes
54	Brownouts Today	0	0	0	0	0

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Table C.2 (continued)
Vericomm Data Feb 3, 2014 through Feb 7, 2014

		2/7/2014	2/6/2014	2/5/2014	2/4/2014	2/3/2014
30-Day History Data						
Point	Description	Value	Value	Value	Value	Value
65	30 Day Average Run Time per Day	4.5 Minutes	4.5 Minutes	4.5 Minutes	4.6 Minutes	4.6 Minutes
66	30 Day Average Override Cycles per Day	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles
67	30 Day Average Cycles per Day	6.3 Cycles	6.3 Cycles	6.4 Cycles	6.4 Cycles	6.5 Cycles
68	30 Day Average Run Time per Cycle	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes	0.7 Minutes
71	30 Day Total Pump Run Time	133.7 Minutes	133.7 Minutes	135.8 Minutes	136.6 Minutes	138.1 Minutes
72	30 Day Total Override Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles
73	30 Day Total Cycles	188.0 Cycles	188.0 Cycles	191.0 Cycles	192.0 Cycles	194.0 Cycles
76	30 Day Total Brownouts	0	0	0	0	0
Totalized Pump Data						
Point	Description	Value	Value	Value	Value	Value
82	Pump Total Run Time	16.3 Hours	16.2 Hours	16.2 Hours	16.1 Hours	16.1 Hours
83	Pump Total Cycles	1380.0 Cycles	1374.0 Cycles	1369.0 Cycles	1365.0 Cycles	1360.0 Cycles
Miscellaneous						
Point	Description	Value	Value	Value	Value	Value
145	Pump On Auto	Off	Off	Off	Off	Off
147	Pump Test Today	Off	Off	Off	Off	Off
148	Pump Check Enable	Off	Off	Off	Off	Off
149	Total Override Cycles	0	0	0	0	0
150	High Level Condition	Off	Off	Off	Off	Off
151	Leak Check Enable	Off	Off	On	On	Off
152	Brownout State	Off	Off	Off	Off	Off
153	Test Mode	Off	Off	Off	Off	Off
Alarm Points						
Point	Description	Value	Value	Value	Value	Value
161	General Alarm	Off	Off	Off	Off	Off
162	New Alarm	Off	Off	Off	Off	Off
163	Update Central Enable	On	On	On	On	On
167	Page Alarm Start	Off	Off	Off	Off	Off
168	Pager Signal	Off	Off	Off	Off	Off
169	Local Alarm Start	Off	Off	Off	Off	Off
170	Local Alarm Silence	Off	Off	Off	Off	Off
Inputs & Outputs						
Point	Description	Value	Value	Value	Value	Value
177	High Level/Override Timer Float Input	Off	Off	Off	Off	Off
178	Timer Float Input	Off	Off	On	On	Off
179	Redundant Off Float & Low Level Alarm Input	On	On	On	On	On
181	Push To Silence Input	Off	Off	Off	Off	Off
182	Auxiliary Contact Input	Off	Off	Off	Off	Off
186	Pump Output	Off	Off	Off	Off	Off
188	Alarm Light Output	Off	Off	Off	Off	Off
189	Audible Alarm Output	Off	Off	Off	Off	Off

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