Florida HEALTH

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task B.7

B-HS4 Field System Monitoring Report No. 3

Progress Report

March 2014



In association with:



Otis Environmental Consultants, LLC



Florida Onsite Sewage Nitrogen Reduction Strategies Study

TASK B.7 PROGRESS REPORT

B-HS4 Field System Monitoring Report No. 3

Prepared for:

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

FDOH Contract CORCL

March 2014

Prepared by:



In Association With:





B-HS4 Field System Monitoring Report No. 3

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-HS4 in Seminole County, Florida.

2.0 Purpose

Operation of the B-HS4 system was initiated on July 9, 2013. This monitoring report documents data collected from the third B-HS4 monitoring and sampling event conducted on February 3, 2014 (Experimental Day 209). This monitoring event consisted of conducting flow measurements from the household water use meter, 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-HS4 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. Prior to the installation of the nitrogen removal system, the property had two existing onsite sewage treatment and

disposal systems. The pre-existing 1,200 gallon concrete septic tank, located on the west side of the property, continues to provide primary treatment, now as part of the PNRS system. The pre-existing 900 gallon septic tank, located on the northeast side of the property, was converted to a lift station. In the new configuration, it pumps the raw sewage from that system to the head end of the new gravity flow PNRS. All subsequent flow is by gravity. The passive nitrogen reduction system consists of an addition of two tanks and a new drainfield to the existing permitted systems. The B-HS4 tankage includes a 2,800 gallon concrete Stage 1 unsaturated media biofilter and 1,500 gallon two chamber concrete Stage 2 saturated media biofilter. 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 treated effluent from the Stage 2 biofilter is discharged into the soil via the new drainfield (EQ36-LPTM chambers).



March 2014





FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3

PAGE 1-4 HAZEN AND SAWYER, P.C.

locs\Report\Final

3.2 Monitoring and Sample Locations and Identification

The four primary monitoring points for the B-HS4 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-HS4-STE, is the effluent sampled approximately 1.5 feet below the surface of the primary tank before the effluent filter screen (Figure 4), which is referred to as primary effluent or septic tank effluent (STE). The lift station wastewater is pumped into the inlet side of the primary tank; therefore, samples from monitoring point B-HS4-STE are representative of the whole household wastewater and represent the influent to the remainder of the onsite nitrogen reduction system.



March 2014



Figure 4 Primary Tank (B-HS4-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 30-inches of unsaturated expanded clay media where nitrification occurs. Stage 1 biofilter effluent flows into the Stage 2 biofilter by gravity. The second primary sampling point (B-HS4-ST1) is taken from a sample port in the gravity pipe connecting the Stage 1 biofilter outlet to the Stage 2 biofilter inlet representing the Stage 1 biofilter effluent.

Effluent from the unsaturated (Stage 1) media tank enters the saturated denitrification (Stage 2) biofilter into a standing water column lying above the media in the first chamber (lignocellulosic media), flows downward through the media into underdrain media, moves laterally in a perforated 4-inch pipe 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-HS4-LIGNO-0) with tubing to the surface. The B-HS4-LIGNO-0 sample represents the lignocellulosic media effluent (Figure 5).



Figure 5 First Chamber of Stage 2 Biofilter (B-HS4-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-HS4-ST2, is the second cham-

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3 PAGE 1-7 HAZEN AND SAWYER, P.C. ber 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 6).



Figure 6 Second Chamber of Stage 2 Biofilter (B-HS4-ST2 Sample)

3.3 Operational Monitoring

Start-up of the system occurred on July 9, 2013 (Experimental Day 0). Preliminary sampling for several key parameters was conducted July 29, 2013 (Experimental Day 20) to evaluate start-up performance. It was noted during sampling that the incoming lift station wastewater flow into the primary tank was causing mixing in the primary tank and the carryover of solids into the Stage 1 biofilter d-box. Therefore, the PNRS system was bypassed on August 15, 2013. On September 5, 2013 a smaller (less horsepower) pump was installed in the lift station with a mechanical float switch to cause the lift station to dose less volume but more frequent doses to the primary tank which resulted in less mixing within the primary tank. The PNRS system has operated continually since that date. For the third formal sampling event, Sample Event No. 3, the water meter for the house was 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.

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 second chamber of the lift station. 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 was conducted on February 3, 2014. A full suite of samples were collected for water quality analysis, including influent, intermediate and effluent points. Samples were collected at each of the four monitoring points described in Section 3.2: B-HS4-STE, B-HS4-ST1, B-HS4-LIGNO-0, and B-HS4-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.

Lastly, equipment blank (EB), field blank (FB) and field duplicate samples were taken. The equipment blank was collected by pumping deionized water through the cleaned pump tubing. The field blank was collected by filling sample containers with deionized water that had been transported into the field along with other sample containers. The field sample duplicate (B-HS4-ST2) was collected immediately subsequent to the regular samples. These samples were then analyzed for the same parameters as the monitoring 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.

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 (NO3-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

	Table 1			
Analytical Parameters,	Method of Ana	lysis, and	Detection	Limits

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 8, 2013. The operation and maintenance log which includes actions taken since start-up is provided in Appendix B.

Date and Time Read	Cumulative Volume (gallons)	Average Daily Household Flow between readings, Q (gpd)
2/8/2013 13:45	0.0	INSTALLED
2/21/2013 11:25	4,391.0	340.3
2/28/2013 12:00	6,292.5	270.7
6/7/2013 8:00	34,417.4	284.6
6/14/2013 8:00	36,179.5	251.7
6/20/2013 12:40	37,981.2	290.9
7/17/2013 14:30	45,422.8	274.8
7/23/2013 13:32	47,051.9	273.4
7/29/2013 11:25	48,658.8	271.8
8/6/2013 12:15	50,922.9	281.8
8/12/2013 10:24	52,614.2	285.6
8/15/2013 8:20	53,328.4	245.1
8/27/2013 10:20	56,550.0	266.6
9/5/2013 9:59	58,748.1	244.6
9/30/2013 13:15	65,633.7	273.9
11/8/2013 11:00	76,559.6	280.8
11/27/2013 11:15	82,039.9	288.3
12/2/2013 13:30	83,048.8	198.1
12/23/2013 13:00	88,271.2	248.9
1/23/2014 10:30	98,116.0	318.6
1/31/2014 10:48	100,521.0	300.2
2/3/2014 11:20	101,475.3	315.8
2/4/2014 10:05	101,844.6	389.6
2/5/2014 8:05	102,095.7	273.9
2/6/2014 9:25	102,275.2	170.1
2/7/2014 9:11	102,557.9	285.5
Total average through 2/7/14		281.9

Table 2Summary of Household Water Use

From start-up through February 7, 2014, the household water use average was 281.9 gallons per day with periods of higher and lower flows (Table 2).

4.2 Energy Consumption

Energy consumption is monitored using an electrical meter installed between the main power box for the house and the lift station pump outlet to record cumulative power usage of the pump in kilowatt-hours. The recorded electrical use for the system is summarized in Table 3.

Summary	of System Electrical Use	
Date and Time Read	Electrical Meter Reading	Average Daily Electrical Use between readings
	Cumulative (kWh)	(kWh/day)
6/20/2013 14:00		Installed
7/9/2013 15:45	0.3	Start Up
7/17/2013 10:41	0.5	0.026
7/23/2013 13:34	0.6	0.016
7/29/2013 11:30	0.8	0.034
8/6/2013 11:42	0.9	0.012
8/12/2013 10:24	1.2	0.050
8/15/2013 8:20	1.3	0.034
8/27/2013 10:20	1.8	0.041
9/5/2013 9:59	2.2	0.045
9/30/2013 13:15	5.8	0.143
11/8/2013 11:00	12.3	0.167
11/27/2013 11:15	14.1	0.095
12/2/2013 12:55	14.5	0.079
12/23/2013 13:00	17.3	0.133
1/23/2014 10:30	21.1	0.123
1/31/2014 10:48	22.2	0.137
2/3/2014 11:20	22.7	0.165
2/4/2014 10:05	22.9	0.211
2/5/2014 8:05	23.0	0.109
2/6/2014 9:25	23.1	0.095
2/7/2014 9:11	23.1	0.000
Total average through 2/7/14		0.107

Table 3 ummary of System Electrical Us

The total average electrical use through February 7, 2014 was 0.107 kWh per day.

4.3 Water Quality

Water quality analytical results, for Sample Event No. 3 are listed in Table 4 and nitrogen results are graphically displayed in Figure 7. A summary of the water quality data collected to date for the test system is presented in Table 5. 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, NH₃-N, and NO_X-N), as well as supporting water quality parameters.

۵ 🗖	STE	STAGE 1	STAGE 2 LIGNO	STAGE 2 SULFUR	
CBOD₅ mg/L	170	18	16	10	
TKN mg N/L	61	25	13	8.4	
NH ₃ mg N/L	59	23	10	7	
NO _x mg N/L	0.04	12	0.04	0.04	
TN mg N/L	61	37	13	8.4	
Sulfate mg/L	1	17	8	33	
Fecal Coliform (Ct/100mL)	43,000	9,000	4,000	3,000	

Figure 7

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 61 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 NH_3 -N level was 23 mg/L with a DO level at 1.85 mg/L (Table 4). The Stage 1 effluent TSS concentration was 22 mg/L and CBOD₅ was 18 mg/L. The Stage 1 effluent NO_x -N was 12 mg/L. The Stage 1 biofilter showed incomplete nitrification with an effluent NH_3 -N concentration of 23 mg/L and TKN of 25 mg/L. During the system check prior to this sample event, conducted on January 23, 2014, ponding was observed near the distribution box (d-box) within the Stage 1 biofilter. Then on the sample event preparation day, January 31, 2014, it was observed that the Stage 1 distribution pipe out of the d-box had fallen off its support, possibly affecting distribution of wastewater over the surface of the biofilter media. The incomplete nitrification results may be attributed to the d-box issues.

Stage 2 Biofilter Effluent (LIGNO-0" and ST2): Effluent NO_x-N from the Stage 2 biofilter monitoring point was 0.04 mg/L. The low NO_x-N was accompanied by a measured 0.04 mg/L DO and -349 mV ORP. The lignocellulosic media effluent NO_x-N was also 0.04 mg/L. The Stage 2 system produced a highly reducing environment and achieved essentially complete NO_x-N reduction. However, the only partially successful NH₃-N reduction through the Stage 1 biofilter, was evidenced in the Stage 2 effluent NH₃-N concentration of 6.9 mg/L and TKN of 8.4 mg/L. Final total nitrogen (TN) in the treatment system effluent CBOD₅ were 16 and 10 mg/L, respectively. The Stage 2 effluent sulfate concentration was 33 mg/L.

EB and FB: Described in Section 3.5, the equipment blank (EB) and field blank (FB) results for all parameters measured were at or below the method detection limit.

Daily Monitoring: 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 8. In addition, the total nitrogen time series for these five sample events are graphically displayed in Figure 9 for the treatment sample locations.

					DISPERSA
c		STAGE 1	STAGE 2 LIGNO	STAGE 2 SULFUR	⊳ ^Q
$CBOD_5 mg/L$	158±30	15 ± 5	17 ± 4	13 ± 4	
TKN mg N/L	65 ± 6	19±6	15 ± 2	11 ± 2	
$\rm NH_3~mg~N/L$	59 ± 3	14 ± 9	11 ± 6	7 ± 4	
NO _x mg N/L	0.03 ± 0.01	22 ± 7	0.2 ± 0.3	0.05 ± 0.02	
TN mg N/L	65 ± 6	41±3	15 ± 2	10.7 ± 1.8	
Sulfate mg/L	2 ± 2	18±1	9 ± 3	31 ± 9	
Fecal Colifor geomean (Ct/100mL)	m 44,268	11,588	2,406	1,610	

Figure 8 Mean and Standard Deviations from Daily Sample Events February 3rd through February 7th, 2014

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3



Table 4Water Quality Analytical Results

Sample ID	Sample Date/Time	Temp (°C)	рН	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)	NOx (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)
BHS4-STE	2/3/14 13:05	19.5	6.7	1148	0.08	-208	420	118	111	170	310	61.04	61	2	59	0.04	0.01	0.04	59.04	9.5	6.9	1.1	4.5	6.7	43000	24000	80
BHS4-STE-FILTERED	2/3/14 13:05	19.5	6.7	1148	0.08	-208			2	89		58.04	58	2	56	0.04	0.01	0.04	56.04								
BHS4-ST1	2/3/14 12:35	19.6	7.06	5 1150	1.85	41.7	390	22	18	18	64	37	25	2	23	12	0.01	12	35	5.5	4.1	17	0.3	0.6	9000	6500	22
BHS4-ST1-FILTERED	2/3/14 12:35	19.6	7.06	5 1150	1.85	41.7			5	36		37	25	8	17	12	0.01	12	29								
BHS4-LIGNO-0	2/3/14 12:15	20.1	6.77	7 1098	0.24	-196	430	7	6	16	56	13.04	13	. 3	10	0.04	0.01	0.04	10.04	4.1	3.1	8.3	1.3	2	4000	2400	14
BHS4-LIGNO-0- FILTERED	2/3/14 12:15	20.1	6.77	7 1098	0.24	-196				2		11.04	11	4	7	0.04	0.01	0.04	7.04								
BHS4-ST2	2/3/14 11:40	19.6	7.66	5 1187	0.04	-349	450	6	6	10	43	8.44	8.4	1.5	6.9	0.04	0.01	0.04	6.94	3.1	2.4	33	3.9	4.8	3000	1400	11
BHS4-ST2-DUP	2/3/14 11:45	19.6	7.66	5 1187	0.04	-349	450	5	5	11	49	8.42	8.4	1.7	6.7	0.01	0.01	0.02	6.72	3	2.3	35	4	5	4000	1700	11
BHS4-ST2-FILTERED	2/3/14 11:40	19.6	7.66	5 1187	0.04	-349				2		7.34	7.3	0.7	6.6	0.04	0.01	0.04	6.64			33					
BHS4-EB	2/3/14 13:50	26.4	5.58	3 1.4	8.34		2	1	1	2	10	0.06	0.05	0.041	0.009	0.01	0.01	0.01	0.019	0.01	0.01	0.2	0.01	0.1	1	2	0.06
BHS4-FB	2/3/14 13:55	26.4	5.58	3 1.4	8.2		2	1	1	2	10	0.06	0.05	0.041	0.009	0.01	0.01	0.01	0.019	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 NH_{3.}

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.

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3 PAGE 1-17 HAZEN AND SAWYER, P.C

Table 5Summary of Water Quality Data

Sample ID	Statistical Parameter	Temp (°C)	рН	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH3-N (mg/LN)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NOx (mg/LN)	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)
	n	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7 7	7	7	7	7	7	7	7	7	7	6	1
	MEAN	21.46	6.78	1140.29	0.11	-243.26	437.14	65.43	62.00	140.00	196.86	70.33	70.29	8.29	62.00	0.04	0.01	0.04	62.04	9.80	5.80	2.01	3.26	5.17	39,295	14,480	73.57
STE	STD. DEV.	2.93	0.00	96.21	0.06	48.47	26.90	26.34	24.97	39.09	132.62	10.01	. 9.98	7.61	6.53	0.05	0.00	0.04	6.53	2.63	2.63	1.76	1.23	1.75			11.84
	MIN	19.50	6.52	1059.00	0.01	-321.80	400.00	38.00	38.00	92.00	10.00	58.02	58.00	1.00	56.00	0.01	0.01	0.02	56.04	7.60	0.01	0.62	1.50	2.60	23,000	10,000	52.00
	MAX	27.80	6.94	1277.00	0.19	-207.50	470.00	118.00	111.00	180.00	330.00	87.14	87.00	23.00	75.00	0.14	0.01	0.14	75.02	14.00	7.50	5.40	4.50	6.80	71,000	24,000	85.00
	n	7	7	7 7	7	7	7	7	7	7	7	7	7 7	7	7	7 7	7	7	7	7	7	5	5	5	7	6	7
	MEAN	21.27	6.91	1164.29	3.06	26.29	331.43	12.00	10.71	11.57	41.14	46.46	15.60	5.21	10.39	30.57	0.22	30.86	41.25	3.79	3.04	18.40	0.32	0.58	6,635	4,273	18.14
Stage 1	STD. DEV.	2.98	0.00	155.93	1.57	56.76	39.76	6.90	5.59	6.45	23.54	9.22	7.68	4.37	9.78	16.34	0.37	16.13	9.95	1.42	1.06	1.34	0.39	0.71			4.95
	MIN	19.00	6.61	1012.00	1.21	-69.70	290.00	3.00	3.00	3.00	10.00	37.00	6.30	2.00	0.38	12.00	0.01	12.00	27.56	1.80	1.50	17.00	0.01	0.10	100	41	12.00
	MAX	27.60	7.39	1385.00	5.16	97.00	390.00	22.00	18.00	18.00	74.00	63.30	25.00	14.44	23.00	57.00	0.85	57.00	58.80	5.50	4.10	20.00	1.00	1.80	32,000	24,000	24.00
	n	7	7	7 7	7	7	7	7	7	7	7	7	7 7	7	7	7 7	7	7	7	7	7	6	6	6	7	6	7
Stage 2	MEAN	21.29	6.69	1100.86	0.59	-198.49	437.14	6.43	6.00	12.86	46.29	13.36	11.73	3.86	7.87	1.63	0.01	1.63	9.50	2.86	2.27	11.37	1.18	1.73	1,703	886	16.43
Ligno	STD. DEV.	3.26	0.00	104.82	0.72	28.52	19.76	4.35	3.96	7.73	13.20	3.69	6.08	4.26	6.90	2.51	0.00	2.51	5.26	1.68	1.43	6.28	0.71	1.03			2.30
2.8.10	MIN	18.20	6.56	956.00	0.13	-238.00	400.00	2.00	2.00	2.00	30.00	8.00	2.70	2.00	0.51	0.04	0.01	0.04	1.21	0.42	0.18	5.70	0.00	0.00	30	10	13.00
	MAX	27.50	6.80	1247.00	2.16	-157.60	460.00	12.00	12.00	23.00	64.00	17.04	17.00	13.49	15.00	5.90	0.01	5.90	15.04	4.10	3.30	23.00	2.10	3.00	17,200	6,100	19.00
	n	7	7	7	7	7	7	7	7	7	7	7	7 7	7	7	7 7	7	7	7	7	7	7	7	7	7	6	7
Stage 2	MEAN	21.27	6.91	. 1149.86	0.16	-250.89	461.43	5.00	4.57	10.29	45.14	8.17	8.13	2.82	5.31	0.04	0.01	0.04	5.35	2.80	2.29	34.29	4.10	6.31	666	411	15.29
Sulfur	STD. DEV.	2.88	0.35	106.41	0.07	46.70	25.45	2.52	2.57	5.94	11.22	4.63	4.61	3.96	4.22	0.02	0.00	0.02	4.22	1.39	1.28	9.93	2.10	3.59			2.69
	MIN	19.60	6.61	1054.00	0.04	-348.90	440.00	2.00	1.00	3.00	30.00	1.32	1.30	0.40	0.56	0.01	0.01	0.02	0.58	0.70	0.32	21.00	1.30	1.30	1	2	11.00
	MAX	27.10	7.66	1306.00	0.24	-222.90	510.00	9.00	8.00	17.00	64.00	13.07	13.00	11.70	10.00	0.07	0.01	0.07	10.04	4.10	3.50	50.00	7.00	11.00	5,400	1,400	18.00
	n	1	1	. 1	1	. 1	1	. 1	1	1	1	1	. 1	1	1	. 1	. 1	1	1	1	1	1	1	1	1	1	1
	MEAN	27.90	7.32	529.00	5.10	101.30	150.00	1.00	1.00	2.00	10.00	1.58	0.18	0.16	0.02	1.40	0.01	1.40	1.42	0.49	0.20	8.70	0.13	0.41	1	2	2.10
Well	STD. DEV.							-																			
	MIN	27.90	7.32	529.00	5.10	101.30	150.00	1.00	1.00	2.00	10.00	1.58	0.18	0.16	0.02	1.40	0.01	1.40	1.42	0.49	0.20	8.70	0.13	0.41	1	2	2.10
	MAX	27.90	7.32	529.00	5.10	101.30	150.00	1.00	1.00	2.00	10.00	1.58	0.18	0.16	0.02	1.40	0.01	1.40	1.42	0.49	0.20	8.70	0.13	0.41	1	2	2.10

Notes:

 $^1\text{Total}$ Nitrogen (TN) is a calculated value equal to the sum of TKN and NO_{χ}

 $^2 \text{Organic Nitrogen}$ (ON) is a calculated value equal to the difference of TKN and $\text{NH}_{3.}$

 $^3\text{Total}$ Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH_3 and NO_{χ}

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.

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3 PAGE 1-18 HAZEN AND SAWYER, P.C

5.0 B-HS4 Sample Event No. 3: Summary and Recommendations

5.1 Summary

The results of the third sampling event indicate that:

- Septic tank effluent (STE) quality is characteristic of typical household STE quality. The total nitrogen concentration of 61 mg/L is within the range of values typically reported for Florida single family residence STE.
- The Stage 1 biofilter was only partially successful in removing ammonia N; effluent TKN and ammonia N were 25 mg/L and 23 mg/L, respectively.
- The Stage 2 biofilter produced a reducing environment and effluent NO_x-N was of 0.04 mg N/L. However, as expected, the NH₃-N from the Stage 1 biofilter passed through the Stage 2 biofilter as evidenced in the Stage 2 effluent NH₃-N concentration of 6.9 mg/L and TKN of 8.4 mg/L.
- The total nitrogen concentration in the final effluent from the total treatment system was 8.44 mg/L, an approximately 86% 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 10.7 mg/L, an average 84% reduction from STE. On a mass basis, the total nitrogen that was reduced occurred within:
 - Stage 1 biofilter reduced 44%
 - Stage 2 lignocellulosic media chamber reduced 48%
 - Stage 2 sulfur media chamber reduced 9%.

5.2 Recommendations

An investigation into possible reasons for the significantly reduced nitrification performance of the Stage 1 biofilter are ongoing. As discussed in Section 4.3, there were issues with the d-box within the Stage 1 biofilter during system checks prior to the sample event. Continued sampling should provide additional insight to system performance.



Appendix A: Laboratory Report

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3

PAGE A-1 HAZEN AND SAWYER, P.C.

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

Sample ID	Sample Date/Time	Temp (°C)	рН	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD _s (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)	NOx (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)
BHS4-STE	2/4/14 11:15	19.89	6.89	9 1059	0.07	-212.6	5 400	59	51	110	48	58.02	58	1	57	0.01	0.01	0.02	57.02	7.6	6.7	0.62	1.5	2.6	71,000	10,000	81
BHS4-ST1	2/4/14 11:00	20.51	6.69	9 1033	1.48	-69.7	360	20	17	18	26	42	24	3	21	. 17	0.66	18	39	4.7	4.1	19	0.14	0.2	32,000	24,000	23
BHS4-LIGNO-0	2/4/14 10:45	20.80	6.66	5 1001	0.27	-173.7	450	12	12	15	56	16.04	16	2	14	0.04	0.01	0.04	14.04	4	¥ 3.3	7.2	1.6	2.4	8,000	6,100	19
BHS4-ST2	2/4/14 10:22	19.60	6.72	2 1054	0.19	-222.9	440	6	6	8	37	10.04	10	1.7	8.3	0.04	0.01	0.04	8.34	3.2	2.7	30	4.7	7.1	2,000	1,400	16
BHS4-ST2-DUP	2/4/14 10:27	19.60	6.72	2 1054	0.19	-222.9	440	6	6	8	39	10.04	10	1.2	8.8	0.04	0.01	0.04	8.84	3.2	2 2.7	33	4	6	2,000	1,000	15

Notes:

 $^{1}\mbox{Total}$ Nitrogen (TN) is a calculated value equal to the sum of TKN and \mbox{NO}_{χ}

 $^2 \text{Organic Nitrogen}$ (ON) is a calculated value equal to the difference of TKN and $\text{NH}_{3.}$

 $^3\text{Total}$ Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH_3 and $\text{NO}_{\chi.}$

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.

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3

Table A.2Water Quality Analytical ResultsFebruary 5, 2014

Sample ID	Sample Date/Time	Temp (°C)	рН	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/LN)	NO₂-N (mg/L N)	NOx (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)
BHS4-STE	2/5/14 9:00	19.9	6.88	1068	0.16	-224.3	430	51	47	180	10	70.02	70	11	59	0.01	0.01	0.02	59.02	7.8	7.1	5.4	3.4	5.8	32,000		81
BHS4-ST1	2/5/14 8:50	20.3	6.61	1012	1.21	34.6	360	11	10	18	74	44	20	4	16	23	0.85	24	40	4.6	3	17	0.14	0.2	18,000		24
BHS4-LIGNO-0	2/5/14 8:38	20.0	6.67	1095	0.13	-219.3	440	12	10	23	64	17.04	17	2	15	0.04	0.01	0.04	15.04	4	3.3	5.7	2.1	3	2,000		17
BHS4-ST2	2/5/14 8:20	19.7	7.04	1073	0.22	-231.9	450	6	6	16	47	10.07	10	0.8	9.2	0.07	0.01	0.07	9.27	3.4	2.9	44	3.8	7.7	1,000		14
BHS4-ST2-DUP	2/5/14 8:25	19.7	7.04	1073	0.22	-231.9	440	7	6	16	45	5 11.07	11	2	9	0.07	0.01	0.07	9.07	3.4	3.1	43	3.8	7.3	1		13
BHS4-EB	2/5/14 9:20	23.3	5.98	1.33	8.2	76	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		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 NH_{3.}

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.

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3

PAGE A-3 HAZEN AND SAWYER, P.C.

Table A.3Water Quality Analytical ResultsFebruary 6, 2014

Sample ID	Sample Date/Time	Temp (°C)	рН	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	NH₃-N (mg/L N)	NO₃-N (mg/L N)	NO ₂ -N (mg/L N)	NOx (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)
BHS4-STE	2/6/14 10:15	20.30	6.76	1095	0.11	-220.8	470	80	79	180	330	72.02	. 72	8	64	0.01	0.01	0.02	64.02	8.8	6.9	0.67	1.8	2.8	29000	24000	72
BHS4-ST1	2/6/14 10:00	19.00	7.39	1173	5.16	97	300	10	10	10	41	. 42	. 12	2	10	30	0.01	30	40	4	3.5	20	0.01	0.1	6500	6500	15
BHS4-LIGNO-0	2/6/14 9:55	18.70	6.56	956	0.62	-157.6	430	2	2	18	43	16.12	16	2	14	0.12	0.01	0.12	14.12	4.1	3.1	11	1.2	1.6	1800	1600	19
BHS4-ST2	2/6/14 9:35	19.82	6.82	1074	0.11	-230.6	460	4	3	17	54	12.04	12	2	10	0.04	0.01	0.04	10.04	4.1	3.5	27	7	11	2000	1100	18
BHS4-ST2-DUP	2/6/14 9:40	19.82	6.82	1074	0.11	-230.6	450	4	4	18	58	12.04	12	2	10	0.04	0.01	0.04	10.04	4.1	3.8	30	6.8	11	2000	1200	15

Notes:

 $^1\text{Total}$ Nitrogen (TN) is a calculated value equal to the sum of TKN and NO_{χ}

 $^2 \text{Organic Nitrogen}$ (ON) is a calculated value equal to the difference of TKN and $\text{NH}_{3.}$

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.

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3

PAGE A-4 HAZEN AND SAWYER, P.C.

Table A.4Water Quality Analytical ResultsFebruary 7, 2014

Sample ID	Sample Date/Time	Temp (°C)	рН	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)	NOx (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)
BHS4-STE	2/7/14 9:55	20.64	6.78	1064	0.19	-210.9	420	58	54	150	300	66.04	66	10	56	0.04	0.01	0.04	56.04	7.9	5.5	2.3	4.4	6.8	60000	10000	85
BHS4-ST1	2/7/14 9:45	19.60	6.88	1034	3.26	-25.4	330	12	12	9	52	42	15	14.44	0.56	27	0.01	27	27.56	4	3.4	19	1	1.8	6200	6100	18
BHS4-LIGNO-0	2/7/14 9:40	18.20	6.8	1092	0.56	-185.4	400	7	7	13	45	14.7	14	13.49	0.51	0.7	0.01	0.7	1.21	2.8	2.7	13	0.9	1.4	700	560	16
BHS4-ST2	2/7/14 9:23	19.90	6.78	1078	0.24	-224.6	440	9	8	15	64	13.07	13	11.7	1.3	0.07	0.01	0.07	1.37	4.1	3.5	21	6.2	9.7	900	860	17
BHS4-ST2-DUP	2/7/14 9:27	19.90	6.78	1078	0.24	-224.6	450	7	4	15	58	13.07	13	11.6	1.4	0.07	0.01	0.07	1.47	4.1	3.6	21	6.2	9.7	900	890	16
Notes:																											
1	(751) 1																										

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 NH_{3.}

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.

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS4 FIELD SYSTEM MONITORING REPORT NO. 3

PAGE A-5 HAZEN AND SAWYER, P.C.

/pdocs\Report\Draft

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 19, 2014 Work Order: 1401200

Laboratory Report

Project Name		B-HS4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Di	lution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-STE Wastewater 1401200-01 02/03/14 13:05 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.70 19.5 °C 1148 umhos 0.08 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	4.5	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		02/07/14 12:45	50
Carbonaceous BOD	mg/L	170	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:18	1
Chemical Oxygen Demand	mg/L	310	EPA 410.4	25	10	02/04/14 13:27	02/04/14 16:45	1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		02/05/14 02:13	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 02:13	1
Orthophosphate as P	mg/L	6.9	EPA 300.0	0.040	0.010	00/04/44 00 50	02/05/14 02:13	1
Phosphorous - Total as P	mg/L	9.5	SM 4500P-E	0.40	0.10	02/04/14 09:52	02/05/14 14:43	10
	mg/L	1.1	EPA 300.0	0.60	0.20		02/05/14 02:13	1
	mg/L	0.7	SIVI 43003F	0.40	0.10		02/08/14 13:52	1
Total Aikalinity	mg/L	420	51VI 2320B	8.0	2.0	00/04/44 44:00	02/14/14 10:46	1
Total Argania Carbon	mg/L	01	EFA 331.2	4.2	1.0	02/04/14 11:28	02/06/14 16:22	20.03
Total Supponded Solida	mg/L	00	SM 2540D	10	0.00	02/05/14 10:40	02/04/14 10.34	10
Volatila Suspended Solida	mg/L	110	5101 2340D	1	1	02/05/14 10:49	02/10/14 10:50	1
Nitroto+Nitrito (N)	mg/L	0.04	EPA 300.0	1	0.02	02/03/14 10.49	02/10/14 10:30	1
	ilig/L	0.04 1	217(000.0	0.00	0.02		02/03/14 02.13	
		24.000	SM 0222D	2.0	2.0	00/00/44 40:00	00/04/44 40:40	1
E. COII	CELI/100 mL	24,000	SM 9223D	2.0	2.0	02/03/14 18:03	02/04/14 12:49	1
		43,000	5101 92220	1	I	02/03/14 17.40	02/04/14 15.40	
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-STE-FILTERED Wastewater 1401200-02 02/03/14 13:05 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
рН		6.70						
Temperature		19.5 °C						
Conductivity		1148 umhos						
		0.00 mg/L						

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-HS4	SE#3					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	lution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-STE-FILTERED Wastewater 1401200-02 02/03/14 13:05 Josefin Hirst 02/03/14 16:30						
Inorganic, Dissolved								
Ammonia as N	mg/L	56	EPA 350.1	2.0	0.47		02/18/14 17:17	50
Carbonaceous BOD	ma/L	89	SM 5210B	2	2	02/05/14 08:30	02/10/14 12:17	' 1
Nitrate (as N)	ma/L	0.04	EPA 300.0	0.04	0.01		02/05/14 02:23	; 1
Nitrite (as N)	ma/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 02:23	6 1
Total Kieldahl Nitrogen	ma/L	58	EPA 351.2	0.20	0.050	02/05/14 11:50	02/18/14 16:46	; 20
Nitrate+Nitrite (N)	ma/l	0.04 1	EPA 300.0	0.08	0.02	000,	02/05/14 02:23	
Lab filtration for diss. analytes					0.02		02/04/14 16:00	1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401200-03 02/03/14 12:35 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		7.06 19.6 °C 1150 umhos 1.85 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.30	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:52	. 1
Ammonia as N	mg/L	23	EPA 350.1	0.80	0.19		02/07/14 12:47	20
Carbonaceous BOD	mg/L	18	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:18	1
Chemical Oxygen Demand	mg/L	64	EPA 410.4	25	10	02/04/14 13:27	02/04/14 16:45	i 1
Nitrate (as N)	mg/L	12	EPA 300.0	0.04	0.01		02/05/14 08:25	i 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 08:25	i 1
Orthophosphate as P	mg/L	4.1	EPA 300.0	0.040	0.010		02/05/14 08:25	i 1
Phosphorous - Total as P	mg/L	5.5	SM 4500P-E	0.20	0.050	02/04/14 09:52	02/05/14 15:15	5
Sulfate	mg/L	17	EPA 300.0	0.60	0.20		02/05/14 08:25	i 1
Sulfide	mg/L	0.60	SM 4500SF	0.40	0.10		02/08/14 13:52	<u>1</u>
Total Alkalinity	mg/L	390	SM 2320B	8.0	2.0		02/14/14 10:56	i 1
Total Kjeldahl Nitrogen	mg/L	25	EPA 351.2	1.9	0.48	02/04/14 11:28	02/06/14 16:24	9.62
Total Organic Carbon	mg/L	22	SM 5310B	1.0	0.060		02/04/14 10:34	1
Total Suspended Solids	mg/L	22	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:58	i 1
Volatile Suspended Solids	mg/L	18	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:58	1
Nitrate+Nitrite (N)	mg/L	12	EPA 300.0	0.08	0.02		02/05/14 08:25	1

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-HS4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	ilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401200-03 02/03/14 12:35 Josefin Hirst 02/03/14 16:30						
Microbiology								
E. Coli	MPN/100 mL	6,500	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:49	91
Fecal Coliforms	CFU/100 ml	9,000	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:40	0 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1-FILTERED Wastewater 1401200-04 02/03/14 12:35 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		7.06 19.6 °C 1150 umhos 1.85 mg/L						
Inorganic, Dissolved								
Ammonia as N	mg/L	17	EPA 350.1	0.40	0.095		02/19/14 08:18	3 10
Carbonaceous BOD	mg/L	36	SM 5210B	2	2	02/05/14 08:30	02/10/14 12:17	71
Nitrate (as N)	mg/L	12	EPA 300.0	0.04	0.01		02/05/14 02:42	21
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 02:42	2 1
Total Kjeldahl Nitrogen	mg/L	25	EPA 351.2	0.20	0.050	02/05/14 11:50	02/18/14 16:46	5 10
Nitrate+Nitrite (N) Lab filtration for diss. analytes	mg/L	12	EPA 300.0	0.08	0.02		02/05/14 02:42 02/04/14 16:00	2 1 D
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401200-05 02/03/14 12:15 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen <u>Inorganics</u>		6.77 20.1 °C 1098 umhos 0.28 mg/L						

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 19, 2014 Work Order: 1401200

Laboratory Report

Project Name		B-HS4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401200-05 02/03/14 12:15 Josefin Hirst 02/03/14 16:30						
Hydrogen Sulfide (Unionized)	mg/L	1.3	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:5	52 1
Ammonia as N	mg/L	10	EPA 350.1	0.40	0.095		02/07/14 12:2	26 10
Carbonaceous BOD	ma/L	16	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:1	8 1
Chemical Oxygen Demand	ma/l	56	EPA 410.4	25	10	02/04/14 13:27	02/04/14 16.4	5 1
Nitrate (as N)	ma/l	0.04	EPA 300.0	0.04	0.01	02.0	02/05/14 02:5	51 1
Nitrite (as N)	mg/L	0.01 []	EPA 300 0	0.04	0.01		02/05/14 02:5	31 1
Orthonhosphate as P	mg/L	3.1	EPA 300 0	0.040	0.01		02/05/14 02:5	,, , ,1 1
Phosphorous Total as P	mg/L	J.1	SM 4500P-F	0.040	0.010	02/04/14 00.52	02/05/14 02:3	6 5
Filospilorous - Total as F	mg/∟	4.1		0.20	0.050	02/04/14 09.32	02/05/14 15.1	1 1
Sulface	mg/L	0.3	EFA 300.0	0.00	0.20		02/05/14 02.5	0 1 0 1
	mg/L	2.0	SIM 4500SF	0.40	0.10		02/08/14 13:5	2 1
	mg/L	430	SIM 2320B	8.0	2.0	00/04/44400	02/14/14 11:0	
Iotal Kjeldahl Nitrogen	mg/L	13	EPA 351.2	1.0	0.25	02/04/14 11:28	02/06/14 16:2	26 5
Total Organic Carbon	mg/L	14	SM 5310B	1.0	0.060		02/05/14 20:3	80 1
Total Suspended Solids	mg/L	7	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:5	58 1
Volatile Suspended Solids	mg/L	6	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:5	58 1
Nitrate+Nitrite (N)	mg/L	0.04 I	EPA 300.0	0.08	0.02		02/05/14 02:5	51 1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	2,400	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:4	9 1
Fecal Coliforms	CFU/100 ml	4,000	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:4	0 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0-FILTEI Wastewater 1401200-06 02/03/14 12:15 Josefin Hirst 02/03/14 16:30	RED					
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.77 20.1 °C 1098 umhos 0.24 mg/L						
Inorganic, Dissolved								
Ammonia as N	mg/L	7.0	EPA 350.1	0.40	0.095		02/19/14 08:2	20 10
Carbonaceous BOD	ma/L	2 U	SM 5210B	2	2	02/05/14 08:30	02/10/14 12:1	7 1
Nitrate (as N)	ma/l	0.04	EPA 300.0	0.04	0 01		02/05/14 12.1	4 1
Nitrite (as N)	ma/l	0.01.11	EPA 300.0	0.04	0.01		02/05/14 12.1	4 1
Total Kieldahl Nitrogen	ma/l	11	FPA 351 2	0.04	0.050	02/05/14 11.50	02/18/14 16:4	
	ing/L		2.7.001.2	0.20	0.000	52,00,14 11.00	52,10,14 10.4	т С

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

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 19, 2014 Work Order: 1401200

Laboratory Report

Project Name		B-HS4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0-FILTE Wastewater 1401200-06 02/03/14 12:15 Josefin Hirst 02/03/14 16:30	RED					
Nitrate+Nitrite (N) Lab filtration for diss. analytes	mg/L	0.04 I	EPA 300.0	0.08	0.02		02/05/14 12:1 02/04/14 16:0	4 1 0
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		3HS4-ST2 Wastewater 1401200-07 02/03/14 11:40 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		7.66 19.6 °C 1187 umhos 0.04 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	3.9	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:5	2 1
	mg/L	6.9	EPA 330.1	0.40	0.095	00/05/44 44.47	02/07/14 10:4	9 10
Carbonaceous BOD	mg/L	10		2	2	02/05/14 11.17	02/10/14 12.1	
Chemical Oxygen Demand	mg/L	43	EPA 410.4	25	10	02/04/14 13:27	02/04/14 16:4	
	mg/L	0.04	EPA 300.0	0.04	0.01		02/05/14 09.2	
Orthonhoonhote on R	mg/L	0.01 0	EPA 300.0	0.04	0.01		02/05/14 09.2	3 I 2 1
Dhannharaua, Tatal as P	mg/L	2.4	SM 4500P-F	0.040	0.010	02/04/14 00.52	02/05/14 09.2	Эл
Sulfato	mg/L	3.1	EPA 300 0	0.20	0.050	02/04/14 09.52	02/05/14 15.1	2 1
Sulfido	mg/L	18	SM 4500SE	0.00	0.20		02/03/14 09.2	.5 I :5 1
	mg/L	4.0	SM 2320B	0.40 8.0	2.0		02/08/14 13:3	Q 1
Total Kieldahl Nitrogon	mg/L	430	EPA 351 2	1.0	0.25	02/04/14 11.28	02/06/14 11:1	7 5
	mg/L	0.4	SM 5310B	1.0	0.25	02/04/14 11.20	02/06/14 10.2	0 1
Total Suspended Solida	mg/L	6	SM 2540D	1.0	0.000	02/05/14 10:40	02/03/14 20.3	0 1
Veletile Suspended Solids	mg/L	0		1	1	02/05/14 10:49	02/10/14 10.5	
Nitroto+Nitrito (N)	mg/L			1	0.02	02/03/14 10.49	02/10/14 10:0	0 I
	mg/L	0.04 1	LFA 300.0	0.00	0.02		02/05/14 09:2	. 5 I
		4 400	SM 0000D	0.0	~ ~	00/00/44 40:00	00/04/4440	0 1
	MPN/100 mL	1,400	SIM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:4	91
Fecal Coliforms	CFU/100 ml	3,000	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:4	U 1

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-HS4	SE#3					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2-DUP Wastewater 1401200-08 02/03/14 11:45 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		7.66 19.6 °C 1187 umhos 0.04 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized) Ammonia as N	mg/L mg/L	4.0 6.7	SM 4550SF EPA 350.1	0.04 0.40	0.01 0.095	02/08/14 09:00	02/13/14 15:5 02/07/14 10:5	52 1 51 10
Carbonaceous BOD	mg/L	11	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:1	8 1
Chemical Oxygen Demand	mg/L	49	EPA 410.4	25	10	02/04/14 13:27	02/04/14 16:4	5 1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 03:1	9 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 03:1	9 1
Orthophosphate as P	mg/L	2.3	EPA 300.0	0.040	0.010		02/05/14 03:1	9 1
Phosphorous - Total as P	mg/L	3.0	SM 4500P-E	0.20	0.050	02/04/14 09:52	02/05/14 15:1	75
Sulfate	mg/L	35	EPA 300.0	0.60	0.20		02/05/14 03:1	9 1
Sulfide	mg/L	5.0	SM 4500SF	0.40	0.10		02/08/14 13:5	52 1
Total Alkalinity	mg/L	450	SM 2320B	8.0	2.0		02/14/14 11:3	5 1
Total Kjeldahl Nitrogen	mg/L	8.4	EPA 351.2	1.0	0.25	02/04/14 11:28	02/06/14 16:2	29 5
Total Organic Carbon	mg/L	11	SM 5310B	1.0	0.060		02/05/14 20:3	80 1
Total Suspended Solids	mg/L	5	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:5	8 1
Volatile Suspended Solids	mg/L	5	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:5	68 1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 03:1	9 1
Microbiology								
E. Coli	MPN/100 mL	1,700	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:4	9 1
Fecal Coliforms	CFU/100 ml	4,000	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:4	0 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2-FILTERED Wastewater 1401200-09 02/03/14 11:40 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
Ha		7.66						
Temperature Conductivity Dissolved Oxygen		19.6 °C 1187 umhos 0.04 mg/L						

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-HS4						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2-FILTERED Wastewater 1401200-09 02/03/14 11:40 Josefin Hirst 02/03/14 16:30						
Inorganics Sulfate	mg/L	33	EPA 300.0	0.60	0.20		02/05/14 03:2	91
Inorganic, Dissolved	g							
Ammonia as N	ma/L	6.6	EPA 350.1	0.20	0.047		02/18/14 17:2	35
Carbonaceous BOD	ma/L	2 U	SM 5210B	2	2	02/05/14 08:30	02/10/14 12:1	7 1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		02/05/14 03:2	91
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 03:2	9 1
Total Kieldahl Nitrogen	mg/L	7.3	EPA 351.2	0.20	0.050	02/05/14 11:50	02/18/14 16:4	6 2
Nitrate+Nitrite (N) Lab filtration for diss. analytes	mg/L	0.04 I	EPA 300.0	0.08	0.02		02/05/14 03:2 02/04/14 16:0	9 1 0
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-EB Reagent Water 1401200-10 02/03/14 13:50 Josefin Hirst 02/03/14 16:30						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		5.58 26.46 °C 1.4 umhos 8.34 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:5	2 1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		02/05/14 16:0	91
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:1	81
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	02/05/14 09:18	02/05/14 15:1	8 1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 03:4	71
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 03:4	71
Orthophosphate as P	mg/L	0.010 U	EPA 300.0	0.040	0.010		02/05/14 03:4	71
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	02/04/14 09:52	02/05/14 15:1	8 1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		02/05/14 03:4	71
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/08/14 13:5	2 1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		02/14/14 12:5	2 1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	02/04/14 11:28	02/06/14 16:3	0 1
Iotal Organic Carbon Total Suspended Solids	mg/L mg/L	0.060 U 1 U	SM 5310B SM 2540D	1.0 1	0.060 1	02/05/14 10:49	02/05/14 20:3 02/10/14 10:5	υ 1 8 1

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-H	IS4 SE#3					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-EB Reagent Water 1401200-10 02/03/14 13:50 Josefin Hirst 02/03/14 16:30						
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:5	58 1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 03:4	7 1
Microbiology	-							
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:4	9 1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:4	0 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-FB Reagent Water 1401200-11 02/03/14 13:55 Josefin Hirst 02/03/14 16:30						
<u>Client Provided Field Data</u> pH Temperature Conductivity Dissolved Oxygen		5.58 26.48 °C 1.4 umhos 8.20 ma/L						
Inorganics		Ū						
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/08/14 09:00	02/13/14 15:5	52 1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		02/05/14 15:5	52 1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:1	8 1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	02/05/14 09:18	02/05/14 15:1	8 1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 04:1	5 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/05/14 04:1	5 1
Orthophosphate as P	mg/L	0.010 U	EPA 300.0	0.040	0.010		02/05/14 04:1	5 1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	02/04/14 09:52	02/05/14 15:1	9 1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		02/05/14 04:1	5 1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/08/14 13:5	52 1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		02/14/14 11:4	1 1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	02/04/14 11:28	02/06/14 16:3	32 1
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		02/05/14 20:3	30 1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	02/05/14 10:49	02/10/14 10:5	58 1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/05/14 10:49	02/10/14 10:5	58 1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/05/14 04:1	5 1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	02/03/14 18:03	02/04/14 12:4	19 1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	02/03/14 17:40	02/04/14 15:4	0 1

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40410 - Digestion for	TP by EPA 36	65.2/SM4500)PE							
Blank (BB40410-BLK1)					Prepared:	02/04/14 Ar	nalyzed: 02	/05/14		
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BB40410-BS1)					Prepared:	02/04/14 Ar	nalyzed: 02	/05/14		
Phosphorous - Total as P	0.804	0.040	0.010	mg/L	0.80		101	90-110		
Matrix Spike (BB40410-MS1)		Source: 1	401199-21		Prepared:	02/04/14 Ar	nalyzed: 02	/05/14		
Phosphorous - Total as P	1.03	0.040	0.010	mg/L	1.0	ND	103	90-110		
Matrix Spike Dup (BB40410-MSD1)	Source: 1	401199-21		Prepared: 02/04/14 Analyzed: 02/05/14						
Phosphorous - Total as P	1.02	0.040	0.010	mg/L	1.0	ND	102	90-110	1	25
Batch BB40417 - Digestion for	TKN by EPA	351.2								
Blank (BB40417-BLK1)					Prepared:	02/04/14 Ar	nalyzed: 02	/06/14		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BB40417-BS1)					Prepared:	02/04/14 Ar	nalyzed: 02	/06/14		
Total Kjeldahl Nitrogen	2.70	0.20	0.05	mg/L	2.5		106	90-110		
Matrix Spike (BB40417-MS1)		Source: 1	401199-21		Prepared:	02/04/14 Ar	nalyzed: 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: 1	401199-22		Prepared:	02/04/14 Ar	nalyzed: 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: 1	401199-21		Prepared:	02/04/14 Ar	nalyzed: 02	/06/14		
Total Kjeldahl Nitrogen	2.38	0.20	0.05	mg/L	2.5	ND	94	90-110	14	20

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

Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40417 - Digestion f	or TKN by EPA	351.2								
Matrix Spike Dup (BB40417-MS	D2)	Source: 1	401199-22		Prepared:	02/04/14 Ar	nalyzed: 02/	/06/14		
Total Kjeldahl Nitrogen	2.62	0.20	0.05	mg/L	2.5	ND	104	90-110	2	20
Batch BB40422 - Ion Chroma	atography 300.0	Prep								
Blank (BB40422-BLK1)					Prepared 8	Analyzed:	02/05/14			
Sulfate	0.20 U	0.60	0.20	mg/L						
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						
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		
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		
Sulfate	9.44	0.60	0.20	mg/L	9.0		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			
Orthophosphate as P	0.855	0.040	0.010	mg/L	0.90		95	85-115	3	200
Sulfate	9.30	0.60	0.20	mg/L	9.0		103	85-115	1	200
Nitrite (as N)	1.50	0.04	0.01	mg/L	1.4		107	85-115	0.2	200
Nitrate (as N)	1.71	0.04	0.01	mg/L	1.7		101	85-115	4	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		

February 19, 2014 Work Order: 1401200
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40422 - Ion Chromate	ography 300.0	Prep								
Matrix Spike (BB40422-MS1)		Source: 1	401200-09		Prepared 8	Analyzed:	02/06/14			
Orthophosphate as P	3.29	0.040	0.010	mg/L	0.90	2.32	108	85-115		
Sulfate	42.4	0.60	0.20	mg/L	9.0	33.1	103	85-115		
Nitrite (as N)	1.51	0.04	0.01	mg/L	1.4	ND	108	85-115		
Nitrate (as N)	1.66	0.04	0.01	mg/L	1.7	0.0370	95	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: 1	401201-09		Prepared 8	Analyzed:	02/05/14			
Orthophosphate as P	1.36	0.040	0.010	mg/L	0.90	0.432	103	85-115		
Sulfate	90.0 L	0.60	0.20	mg/L	9.0	98.3	NR	85-115		
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		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		
Surrogate: Dichloroacetate	0.983			mg/L	1.0		98	90-115		
Batch BB40430 - COD prep										
Blank (BB40430-BLK1)					Prepared 8	Analyzed:	02/04/14			
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BB40430-BS1)					Prepared 8	Analyzed:	02/04/14			
Chemical Oxygen Demand	47	25	10	mg/L	50		94	90-110		

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40430 - COD prep										
Matrix Spike (BB40430-MS1)		Source: 1	401199-21		Prepared 8	& Analyzed:	02/04/14			
Chemical Oxygen Demand	47	25	10	mg/L	50	ND	94	85-115		
Matrix Spike Dup (BB40430-MSD1)		Source: 1	401199-21		Prepared &	Analyzed:	02/04/14			
Chemical Oxygen Demand	49	25	10	mg/L	50	ND	98	85-115	4	32
Batch BB40444 - TOC prep										
Blank (BB40444-BLK1)					Prepared 8	Analyzed:	02/04/14			
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
LCS (BB40444-BS1)					Prepared &	& Analyzed:	02/04/14			
Total Organic Carbon	10.4	1.0	0.060	mg/L	10		104	90-110		
Matrix Spike (BB40444-MS1)		Source: 1	401147-01		Prepared &	Analyzed:	02/04/14			
Total Organic Carbon	9.41	1.0	0.060	mg/L	10	ND	94	85-115		
Matrix Spike Dup (BB40444-MSD1)		Source: 1	401147-01		Prepared &	Analyzed:	02/04/14			
Total Organic Carbon	10.8 J3	1.0	0.060	mg/L	10	ND	108	85-115	14	10
Batch BB40502 - COD prep										
Blank (BB40502-BLK1)					Prepared 8	& 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		

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40502 - COD prep										
Matrix Spike (BB40502-MS1)		Source: 1	401200-10		Prepared &	Analyzed:	02/05/14			
Chemical Oxygen Demand	43	25	10	mg/L	50	ND	86	85-115		
Matrix Spike Dup (BB40502-MSD1)		Source: 1	401200-10		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 Ar	nalyzed: 02	/10/14		
Volatile Suspended Solids	1 U	1		mg/L						
Total Suspended Solids	1 U	1	1	mg/L						
LCS (BB40510-BS1)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Total Suspended Solids	49.0	1	1	mg/L	50		98	85-115		
Duplicate (BB40510-DUP1)		Source: 1	401199-01		Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Volatile Suspended Solids	16.5	1		mg/L		17.0			3	20
Total Suspended Solids	17.5	1	1	mg/L		18.0			3	30
Batch BB40513 - BOD										
Blank (BB40513-BLK1)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40513-BLK2)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	2 U	2	2	mg/L						

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40513 - BOD										
LCS (BB40513-BS1)					Prepared:	02/05/14 Ar	alyzed: 02/	10/14		
Carbonaceous BOD	190	2	2	mg/L	200		95	85-115		
LCS (BB40513-BS2)					Prepared:	02/05/14 Ar	alyzed: 02/	10/14		
Carbonaceous BOD	200	2	2	mg/L	200		100	85-115		
LCS Dup (BB40513-BSD1)					Prepared:	02/05/14 Ar	alyzed: 02/	10/14		
Carbonaceous BOD	187	2	2	mg/L	200		94	85-115	1	200
LCS Dup (BB40513-BSD2)					Prepared:	02/05/14 Ar	alyzed: 02/	10/14		
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115	0.7	200
Duplicate (BB40513-DUP1)		Source: 1	401199-02		Prepared:	02/05/14 Ar	alyzed: 02/	10/14		
	42	2	2	mg/L		40			4	25
Carbonaceous DOD										
Duplicate (BB40513-DUP2)		Source: 1	401258-06		Prepared:	02/05/14 Ar	alyzed: 02/	10/14		
Duplicate (BB40513-DUP2) Carbonaceous BOD	2 U	Source: 1 2	401258-06 2	mg/L	Prepared: (02/05/14 Ar ND	alyzed: 02/	10/14		25
Duplicate (BB40513-DUP2) Carbonaceous BOD Batch BB40532 - Ammonia b	2 U y SEAL	Source: 1 2	401258-06 2	mg/L	Prepared: (02/05/14 Ar ND	alyzed: 02/	10/14		25
Duplicate (BB40513-DUP2) Carbonaceous BOD Batch BB40532 - Ammonia b Blank (BB40532-BLK1)	2 U y SEAL	Source: 1 2	401258-06 2	mg/L	Prepared: 0 Prepared 8	ND	nalyzed: 02/ 02/05/14	10/14		25
Duplicate (BB40513-DUP2) Carbonaceous BOD Batch BB40532 - Ammonia b Blank (BB40532-BLK1) Ammonia as N	2 U y SEAL 0.009 U	Source: 1 2 0.040	401258-06 2 0.009	mg/L mg/L	Prepared: (Prepared 8	ND	02/05/14	10/14		25
Duplicate (BB40513-DUP2) Carbonaceous BOD Batch BB40532 - Ammonia b Blank (BB40532-BLK1) Ammonia as N LCS (BB40532-BS1)	2 U y SEAL 0.009 U	Source: 1 2 0.040	401258-06 2 0.009	mg/L mg/L	Prepared 8 Prepared 8	ND Analyzed: (02/05/14 02/05/14	10/14		25
Duplicate (BB40513-DUP2) Carbonaceous BOD Batch BB40532 - Ammonia b Blank (BB40532-BLK1) Ammonia as N LCS (BB40532-BS1) Ammonia as N	2 U y SEAL 0.009 U 0.51	Source: 1 2 0.040 0.040	401258-06 2 0.009 0.009	mg/L mg/L mg/L	Prepared: (Prepared 8 Prepared 8 0.50	02/05/14 Ar ND Analyzed: (02/05/14 02/05/14 02/05/14 102	90-110		25
Duplicate (BB40513-DUP2) Carbonaceous BOD Batch BB40532 - Ammonia by Blank (BB40532-BLK1) Ammonia as N LCS (BB40532-BS1) Ammonia as N Matrix Spike (BB40532-MS1)	2 U y SEAL 0.009 U 0.51	Source: 1 2 0.040 0.040 Source: 1	401258-06 2 0.009 0.009 401196-07	mg/L mg/L mg/L	Prepared 8 Prepared 8 0.50 Prepared 8	02/05/14 Ar ND Analyzed: (Analyzed: (02/05/14 02/05/14 02/05/14 102 02/05/14	90-110		25

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40532 - Ammonia	by SEAL									
Matrix Spike (BB40532-MS2)		Source: 1	401254-07		Prepared 8	& 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-M	SD1)	Source: 1	401196-07		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-M	SD2)	Source: 1	401254-07		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						
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: 1	401305-01		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-M	SD1)	Source: 1	401305-01		Prepared &	Analyzed:	02/05/14			
Ammonia as N	ES 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						

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40546 - TOC prep										
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: 1	401252-03		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-MSD	1)	Source: 1	401252-03		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 BB40651 - Ammonia by	/ SEAL									
Blank (BB40651-BLK1)					Prepared &	& Analyzed:	02/07/14			
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BB40651-BS1)					Prepared &	Analyzed:	02/07/14			
Ammonia as N	0.50	0.040	0.009	mg/L	0.50		100	90-110		
Matrix Spike (BB40651-MS1)		Source: 1	401199-21		Prepared &	Analyzed:	02/07/14			
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110		
Matrix Spike (BB40651-MS2)		Source: 1	401199-22		Prepared &	Analyzed:	02/07/14			
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110		
Matrix Spike Dup (BB40651-MSD	1)	Source: 1	401199-21		Prepared &	Analyzed:	02/07/14			
Ammonia as N	0.49	0.040	0.009	mg/L	0.50	ND	98	90-110	2	10
Matrix Spike Dup (BB40651-MSD	2)	Source: 1	401199-22		Prepared &	Analyzed:	02/07/14			
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	97	90-110	1	10

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40801 - Sulfide prep										
Blank (BB40801-BLK1)					Prepared 8	Analyzed:	02/08/14			
Sulfide	0.10 U	0.40	0.10	mg/L						
Blank (BB40801-BLK2)					Prepared 8	Analyzed:	02/08/14			
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BB40801-BS1)					Prepared 8	Analyzed:	02/08/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
LCS (BB40801-BS2)					Prepared 8	Analyzed:	02/08/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0		97	85-115		
Matrix Spike (BB40801-MS1)		Source: 1	401199-21		Prepared 8	Analyzed:	02/08/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike (BB40801-MS2)		Source: 1	401199-22		Prepared 8	Analyzed:	02/08/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike Dup (BB40801-MSD1)		Source: 1	401199-21		Prepared 8	Analyzed:	02/08/14			
Sulfide	1 61	0.40	0.10	ma/l	5.0	ND	93	85-115	0	14
cuilido	4.04	0.40	00	<u>9</u> / =	0.0					
Matrix Spike Dup (BB40801-MSD2)	4.04	Source: 1	401199-22		Prepared 8	Analyzed:	02/08/14			
Matrix Spike Dup (BB40801-MSD2) Sulfide	4.64	Source: 1 0.40	401199-22 0.10	mg/L	Prepared 8 5.0	Analyzed:	02/08/14 93	85-115	0	14
Matrix Spike Dup (BB40801-MSD2) Sulfide Batch BB41346 - alkalinity	4.64	0.40 Source: 1 0.40	401199-22 0.10	mg/L	Prepared 8 5.0	Analyzed:	02/08/14 93	85-115	0	14
Matrix Spike Dup (BB40801-MSD2) Sulfide Batch BB41346 - alkalinity Blank (BB41346-BLK1)	4.64	Source: 1 0.40	401199-22 0.10	mg/L	Prepared 8 5.0 Prepared 8	Analyzed: ND	02/08/14 93 02/14/14	85-115	0	14

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41346 - alkalinity										
LCS (BB41346-BS1)					Prepared 8	Analyzed:	02/14/14			
Total Alkalinity	130	8.0	2.0	mg/L	120		103	90-110		
Matrix Spike (BB41346-MS1)		Source: 1	401533-01		Prepared &	Analyzed:	02/14/14			
Total Alkalinity	270	8.0	2.0	mg/L	120	160	88	80-120		
Matrix Spike Dup (BB41346-MS	D1)	Source: 1	401533-01		Prepared &	Analyzed:	02/14/14			
Total Alkalinity	270	8.0	2.0	mg/L	120	160	88	80-120	0.2	26

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Inorganic, Dissolved - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40422 - Ion Chroma	tography 300.0	Prep								
Blank (BB40422-BLK1)					Prepared 8	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						
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 8	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 8	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: 1	401200-09		Prepared 8	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: 1	401201-09		Prepared 8	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		

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Inorganic, Dissolved - Quality Control

Analyta	Pocult	POI	МП	Linite	Spike	Source	% DEC	%REC	חסס	RPD Limit
Analyte	Result	FQL	NIDL	Units	Levei	Result	70REC	LIITIIIS	RFD	LIIIII
Batch BB40514 - BOD Dissolve	d									
Blank (BB40514-BLK1)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40514-BS1)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	198	2	2	mg/L	200		99	85-115		
LCS Dup (BB40514-BSD1)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115	2	200
Duplicate (BB40514-DUP1)		Source: 1	401200-06		Prepared:	02/05/14 Ar	nalyzed: 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 Ar	nalyzed: 02	/18/14		
Total Kjeldahl Nitrogen	0.050 U	0.20	0.050	mg/L						
LCS (BB40521-BS1)					Prepared:	02/05/14 Ar	nalyzed: 02	/18/14		
Total Kjeldahl Nitrogen	0.915	0.20	0.050	mg/L	1.0		92	90-110		
Matrix Spike (BB40521-MS1)		Source: 1	401199-07		Prepared:	02/05/14 Ar	nalyzed: 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: 1	401201-06		Prepared:	02/05/14 Ar	nalyzed: 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: 1	401199-07		Prepared:	02/05/14 Ar	nalyzed: 02	/18/14		
Total Kjeldahl Nitrogen	2.07	0.20	0.050	mg/L	1.0	1.03	103	90-110	0.6	20

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Inorganic, Dissolved - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40521 - Digestion	for TKN by EPA	351.2								
Matrix Spike Dup (BB40521-MS	SD2)	Source: 1	401201-06	;	Prepared:	02/05/14 Ar	nalyzed: 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: 1	401199-07		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: 1	401201-06	i	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-MS	SD1)	Source: 1	401199-07		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-MS	SD2)	Source: 1	401201-06	i	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

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



February 19, 2014

Work Order: 1401200

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Microbiology - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40402 - FC-MF										
Blank (BB40402-BLK1)					Prepared:	02/03/14 Ar	nalyzed: 02/	04/14		
Fecal Coliforms	1 U	1	1	CFU/100 m	nl					
Duplicate (BB40402-DUP1)		Source: 1	401199-2	21	Prepared:	02/03/14 Ar	nalyzed: 02/	04/14		
Fecal Coliforms	1 U	1	1	CFU/100 m	nl	ND				200
Duplicate (BB40402-DUP2)		Source: 1	401199-2	22	Prepared:	02/03/14 Ar	nalyzed: 02/	04/14		
Fecal Coliforms	1 U	1	1	CFU/100 m	nl	ND				200
Duplicate (BB40402-DUP3)		Source: 1	401200- ⁻	10	Prepared:	02/03/14 Ar	nalyzed: 02/	04/14		
Fecal Coliforms	1 U	1	1	CFU/100 m	nl	ND				200

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

* 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 limts 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.

J3 Quality control value for precision was outside control limits.

Questions regarding this report should be directed to :

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



February 19, 2014 Work Order: 1401200

SOUTHERN ANALYTICAL LABORATORIES, INC. 110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 B13-855-1844 fax B13-855-2218

Client	Name Haze	n and	Sawye	er								Contact	Phone:						
Projec	it Name / Location B-HS	4 ŞE#	3																
Samp	lers: (Signature) Joshi 40										Р	ARAMETE	ER / CONT	AINER DESCRIP	TION				
SAL Use Only Sample No.	Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water Sample Description		Date	Time	Matrix	Composite	orab 125mLP, Na ₂ S ₂ O ₃ FC-MF, FC-QT	TLP. Cool Total Alkalinity, TSS, VSS, CBOD, NOX, OP SO,	125mLP, H ₂ SO4 COD, TKN, NH ₃ , TP	strumLP, NaOH, Zh Acetate H ₃ S	40mLaV, HCI TOC	1LP, Cool Lab Filtered: CBOD, TKN, NH ₃ , NOX	1LP, Cool Lab Filtered: CBOD, TKN, NH ₃ , NOX, SO ₄			H	Temperature	Conductivity	8
01	BHS4-STE	a	3/14	15:05	ww		X 4	1	1	1	2					6.70	19.5	1148	0,08
02	BHS4-STE-FILTERED		ļ	13:05	ww		x					1				670	9.5	1148	0.08
03	BHS4-ST1			12:35	ww		X 4	1	1	1	2					7.06	19.4	1150	1.85
04	BHS4-ST1-FILTERED			12:35	ww		x					1				7.06	19.4	1150). 85
05	BHS4-LIGNO-0		ļ	12:15	ww		x 4	1	1	1	2					6.77	20.1	101P	0,24
06	BHS4-LIGNO-0-FILTERED			12:10	ww	 	×					1			_	6.37	20.1	1098	0.24
07	BHS4-ST2		 	11:00	ww	_	x 4	1	1	1	2					7.106	19.6	1187	0,04
08	BHS4-ST2-DUP			11:45		_↓	x 4	1	1	1	2					7.66	19.6	1/87	0.04
09	BHS4-ST2-FILTERED		ļ	11:40	ww		×						1			7.66	19.6	1187	0.04
10	BHS4-EB		<u></u>	13:50	R	++	x 4	1	1	1	2					5.58	26.46	1.4	B.3Y
11	BHS4-FB		¥	13:55	R	 -	X 4	1	1	1	2					5.58	26.48	1.4	8.20
Contair Relinqu Relinqu Relinqu	ished: Date/Time: ished: Date/Time: Date/Time: Date/Time: 2/3/14 Date/Time:	Rec Rec Rec Rec	eived: eived: Wed: eived:	eoo (d udm	ho	Date/ i/ Date/ Date/ Date/	ime: 30/14 ime: (3/14 ime:	10:3	20 20	Seal Sam Reci Prop Rec'	l intact? ples intact sived on ic er preserv d within ho	upon arriva e? Terrp atives indic olding time?	ai? 		Instructions / Re	emarks:		<u> </u>	
Relinqu	iished: Date/Ţime;	Rec	eived:			Date/	lime:			Prop	er contain	ers used?		0 N NA					

Chain of Custody xis Rev.Dale 11/19/01

Page 24 of 24

Chain of Custody

SAL Project No. 1401200

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 14, 2014 Work Order: 1401257

Project Name B-HS4 SE#4									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Dil	lution	
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-STE Wastewater 1401257-01 02/04/14 11:15 Josefin Hirst 02/04/14 15:30							
		02/04/14 10:00							
Client Provided Field Data pH Temperature Conductivity Dissolved Oxygen		6.89 19.9 °C 1059 umhos 0.07 mg/L							
Inorganics		-							
Hydrogen Sulfide (Unionized) Ammonia as N	mg/L mg/L mg/l	1.5 57 110	SM 4550SF EPA 350.1 SM 5210B	0.04 2.0 2	0.01 0.47 2	02/11/14 08:00	02/13/14 15:52 02/12/14 11:56 02/10/14 12:18	1 50 1	
Chemical Oxygen Demand Nitrate (as N)	mg/L mg/L	48 0.01 U	EPA 410.4 EPA 300.0	25 0.04	10 0.01	02/06/14 09:30	02/06/14 12:00 02/06/14 00:10	1 1	
Nitrite (as N) Orthophosphate as P	mg/L mg/L	0.01 U 6.7	EPA 300.0 EPA 300.0	0.04 0.040	0.01 0.010		02/06/14 00:10 02/06/14 00:10	1 1	
Phosphorous - Total as P Sulfate	mg/L mg/L	7.6 0.62	SM 4500P-E EPA 300.0	0.80 0.60	0.20 0.20	02/19/14 08:47	02/21/14 12:59 02/06/14 00:10	20 1	
Sulfide Total Alkalinity Total Kieldabl Nitrogen	mg/L mg/L mg/l	2.6 400 58	SM 4500SF SM 2320B FPA 351 2	0.40 8.0 8.3	0.10 2.0 2.1	02/05/14 11:47	02/11/14 09:00 02/18/14 10:00 02/07/14 13:21	1 1 41 67	
Total Organic Carbon Total Suspended Solids	mg/L mg/L	81 59	SM 5310B SM 2540D	1.0 1	0.060	02/05/14 10:49	02/06/14 14:53 02/10/14 10:58	1	
Volatile Suspended Solids Nitrate+Nitrite (N)	mg/L mg/L	51 0.02 U	EPA 160.4 EPA 300.0	1 0.08	1 0.02	02/05/14 10:49	02/10/14 10:58 02/06/14 00:10	1 1	
Microbiology E. Coli	MPN/100 mL	10,000	SM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:09	1	
Fecal Coliforms	CFU/100 ml	71,000	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:02	1	
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401257-02 02/04/14 11:00 Josefin Hirst 02/04/14 15:30							
Client Provided Field Data									
pH Temperature Conductivity Dissolved Oxygen		6.69 20.5 °C 1033 umhos 1.48 mg/L							

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Project Name		B-HS4	SE#4					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401257-02 02/04/14 11:00 Josefin Hirst 02/04/14 15:30						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.14	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:5	2 1
Ammonia as N	mg/L	21	EPA 350.1	0.80	0.19		02/12/14 11:5	8 20
Carbonaceous BOD	mg/L	18	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:1	8 1
Chemical Oxygen Demand	mg/L	26	EPA 410.4	25	10	02/06/14 09:30	02/06/14 12:0	0 1
Nitrate (as N)	mg/L	17	EPA 300.0	0.04	0.01		02/06/14 00:1	91
Nitrite (as N)	mg/L	0.66	EPA 300.0	0.04	0.01		02/06/14 00:1	91
Orthophosphate as P	mg/L	4.1	EPA 300.0	0.040	0.010		02/06/14 00:1	9 1
Phosphorous - Total as P	ma/L	4.7	SM 4500P-E	0.20	0.050	02/19/14 08:47	02/21/14 12:5	9 5
Sulfate	ma/l	19	EPA 300.0	0.60	0.20		02/06/14 00.1	9 1
Sulfide	ma/l	0 20 1	SM 4500SF	0.40	0.10		02/11/14 09:0	0 1
Total Alkalinity	ma/l	360	SM 2320B	8.0	2.0		02/18/14 10:0	0 1
Total Kieldahl Nitrogen	mg/L	24	EPA 351.2	1.0	0.25	02/05/14 11:47	02/07/14 15:0	2 5
Total Organic Carbon	mg/L	23	SM 5310B	1.0	0.060	02/00/14 11.47	02/06/14 14:5	3 1
Total Suspended Solids	mg/L	20	SM 2540D	1.0	1	02/06/14 11:54	02/07/14 15:5	6 1
Volatile Suspended Solids	mg/L	17	EPA 160 4	1	1	02/06/14 11:54	02/07/14 15:5	6 1
Nitrate+Nitrite (N)	mg/L	18	EPA 300.0	0.08	0 02	02/00/14 11:54	02/06/14 00:1	0 1 0 1
Mienshiele m	iiig/L	10	217100010	0.00	0.02		02/00/14 00.1	5 1
		04.000	CM 0222D	0.0	0.0	00/04/44 40:54	00/05/44 44.0	0 1
	MPN/100 mL	24,000	SIM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:0	9 1
Fecal Coliforms	CFU/100 ml	32,000	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:0	2 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401257-03 02/04/14 10:45 Josefin Hirst 02/04/14 15:30						
Client Provided Field Data								
nH		6 66						
Temperature		20.8 °C						
Conductivity		1001 umhos						
Dissolved Oxygen		0.27 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	1.6	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:5	2 1
Ammonia as N	mg/L	14	EPA 350.1	0.40	0.095		02/12/14 12:0	0 10
Carbonaceous BOD	mg/L	15	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:1	8 1
Chemical Oxygen Demand	mg/L	56	EPA 410.4	25	10	02/06/14 09:30	02/06/14 12:0	0 1
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								

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 14, 2014 Work Order: 1401257

Laboratory Report

Project Name B-HS4 SE#4										
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	ilution		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401257-03 02/04/14 10:45 Josefin Hirst 02/04/14 15:30								
Nitrate (as N) Nitrite (as N) Orthophosphate as P Phosphorous - Total as P Sulfate	mg/L mg/L mg/L mg/L mg/L	0.04 0.01 U 3.3 4.0 7.2	EPA 300.0 EPA 300.0 EPA 300.0 SM 4500P-E EPA 300.0	0.04 0.04 0.040 0.20 0.60	0.01 0.01 0.010 0.050 0.20	02/19/14 08:47	02/06/14 00:24 02/06/14 00:24 02/06/14 00:24 02/21/14 12:55 02/06/14 00:24	8 1 8 1 8 1 9 5 8 1		
Sulfide Total Alkalinity Total Kjeldahl Nitrogen Total Organic Carbon Total Suspended Solids	mg/L mg/L mg/L mg/L mg/L	2.4 450 16 19 12	SM 4500SF SM 2320B EPA 351.2 SM 5310B SM 2540D	0.40 8.0 1.0 1.0 1	0.10 2.0 0.25 0.060 1	02/05/14 11:47 02/06/14 11:54	02/11/14 09:00 02/18/14 10:00 02/07/14 15:00 02/06/14 14:50 02/07/14 15:50	0 1 0 1 3 5 3 1 6 1		
Volatile Suspended Solids Nitrate+Nitrite (N) <u>Microbiology</u>	mg/L mg/L	12 0.04 I	EPA 160.4 EPA 300.0	1 0.08	1 0.02	02/06/14 11:54	02/07/14 15:50 02/06/14 00:20	6 1 8 1		
E. Coli Fecal Coliforms	MPN/100 mL CFU/100 ml	6,100 8,000	SM 9223B SM 9222D	2.0 1	2.0 1	02/04/14 16:54 02/04/14 16:43	02/05/14 11:09 02/05/14 15:02	9 1 2 1		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2 Wastewater 1401257-04 02/04/14 10:22 Josefin Hirst 02/04/14 15:30								
<u>Client Provided Field Data</u> pH Temperature Conductivity Dissolved Oxygen		6.72 19.6 °C 1054 umhos 0.19 mg/L								
Inorganics Hydrogen Sulfide (Unionized) Ammonia as N Carbonaceous BOD Chemical Oxygen Demand Nitrate (as N) Nitrite (as N) Orthophosphate as P Phosphorous - Total as P Sulfate	mg/L mg/L mg/L mg/L mg/L mg/L mg/L	4.7 8.3 8 37 0.04 0.01 U 2.7 3.2 30	SM 4550SF EPA 350.1 SM 5210B EPA 410.4 EPA 300.0 EPA 300.0 SM 4500P-E EPA 300.0	0.04 0.40 2 25 0.04 0.04 0.040 0.20 0.60	0.01 0.095 2 10 0.01 0.010 0.050 0.20	02/11/14 08:00 02/05/14 11:17 02/06/14 09:30 02/19/14 08:47	02/13/14 15:52 02/12/14 12:02 02/10/14 12:12 02/06/14 12:02 02/06/14 00:32 02/06/14 00:33 02/06/14 00:33 02/21/14 12:52 02/06/14 00:33	2 1 2 10 8 1 0 1 8 1 8 1 8 1 9 5 8 1		

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

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 14, 2014 Work Order: 1401257

Laboratory Report

Project Name B-HS4 SE#4											
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution			
Sample Description Matrix SAL Sample Number		BHS4-ST2 Wastewater 1401257-04									
Collected by		Josefin Hirst									
Date/Time Received		02/04/14 15:30									
Sulfide	mg/L	7.1	SM 4500SF	0.40	0.10		02/11/14 09:0	0 1			
Total Alkalinity	mg/L	440	SM 2320B	8.0	2.0		02/18/14 10:0	0 1			
Total Kjeldahl Nitrogen	mg/L	10	EPA 351.2	1.0	0.25	02/05/14 11:47	02/07/14 15:0	5 5			
Total Organic Carbon	ma/L	16	SM 5310B	1.0	0.060		02/06/14 14:5	3 1			
Total Suspended Solids	ma/L	6	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:5	6 1			
Volatile Suspended Solids	ma/l	6	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:5	6 1			
Nitrate+Nitrite (N)	mg/l	0.04 1	EPA 300.0	0.08	0.02	0_0000000000000000000000000000000000000	02/06/14 00:3	8 1			
Mierobiology				0.00	0.01		02,000,0000	•			
	MDN/100 ml	1 400	SM 0223B	2.0	2.0	02/04/14 16:54	02/05/14 11:0	0 1			
E. Coll Facal Califorma		1,400	SIM 9223D	2.0	2.0	02/04/14 10.04	02/05/14 11.0	9 1			
	CF0/100 mi	2,000	5WI 9222D	1	1	02/04/14 16:43	02/05/14 15:0	<u> </u>			
Sample Description		BHS4-ST2-DUP									
Matrix		Wastewater									
SAL Sample Number		1401257-05									
Date/Time Collected		02/04/14 10:27									
Collected by		Josefin Hirst									
Date/Time Received		02/04/14 15:30									
Client Provided Field Data											
Н		6.72									
Temperature		19.6 °C									
Conductivity		1054 umhos									
Dissolved Oxygen		0.19 mg/L									
Inorganics											
Hydrogen Sulfide (Unionized)	mg/L	4.0	SM 4550SF	0.04	0.01	02/11/14 08:00	02/13/14 15:5	2 1			
Ammonia as N	mg/L	8.8	EPA 350.1	0.40	0.095		02/12/14 12:0	4 10			
Carbonaceous BOD	mg/L	8	SM 5210B	2	2	02/05/14 11:17	02/10/14 12:1	8 1			
Chemical Oxygen Demand	mg/L	39	EPA 410.4	25	10	02/06/14 09:30	02/06/14 12:0	0 1			
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		02/06/14 01:2	3 1			
Nitrite (as N)	ma/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 01:2	3 1			
Orthophosphate as P	mg/l	2.7	EPA 300.0	0.040	0.010		02/06/14 01:2	3 1			
Phosphorous - Total as P	ma/l	3.2	SM 4500P-E	0.20	0.050	02/19/14 08:47	02/21/14 12:5	ig 5			
Sulfate	mg/L	33	EPA 300 0	0.60	0.000	02/10/14 00.47	02/06/14 01:2	0 0 2 1			
Sulfide	ma/l	6.0	SM 4500SF	0.00	0.20		02/11/14 00.0	0 1			
Total Alkalinity	mg/L	440	SM 2320B	8 N	20		02/18/14 10:0	0 1			
Total Kieldahl Nitrogon	mg/L	10	EPA 351 2	1.0	2.0 0.25	02/05/14 11.47	02/10/14 10.0	6 5			
Total Organic Carbon	mg/L	15	SM 5310B	1.0	0.20	52/05/14 11.4/	02/06/14 14:5	3 1			
Total Suspended Selide	ma/l	6	SM 2540D	1.0	0.000	02/06/14 11.54	02/07/14 14:0	6 1			
iolai Suspenueu Sullus	nig/L	Ö	SIVI 2040D	1	1	02/00/14 11.34	02/07/14 10:5	υΙ			

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Project Name		B-HS						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2-DUP Wastewater 1401257-05 02/04/14 10:27 Josefin Hirst 02/04/14 15:30						
Volatile Suspended Solids	mg/L	6	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:	:56 1
Nitrate+Nitrite (N)	mg/L	0.04 I	EPA 300.0	0.08	0.02		02/06/14 01:	23 1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	1,000	SM 9223B	2.0	2.0	02/04/14 16:54	02/05/14 11:	09 1
Fecal Coliforms	CFU/100 ml	2,000	SM 9222D	1	1	02/04/14 16:43	02/05/14 15:	:02 1

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40510 - VSS Prop										
Batch BB40510 - VSS Flep										
Blank (BB40510-BLK1)					Prepared:	02/05/14 Aı	nalyzed: 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 Ai	nalyzed: 02	/10/14		
Total Suspended Solids	49.0	1	1	mg/L	50		98	85-115		
Duplicate (BB40510-DUP1)		Source: 1	401199-01	l	Prepared:	02/05/14 Ai	nalyzed: 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 BB40513 - BOD										
Blank (BB40513-BLK1)					Prepared:	02/05/14 Aı	nalyzed: 02	/10/14		
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40513-BLK2)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40513-BS1)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	190	2	2	mg/L	200		95	85-115		
LCS (BB40513-BS2)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	200	2	2	mg/L	200		100	85-115		
LCS Dup (BB40513-BSD1)					Prepared:	02/05/14 Ar	nalyzed: 02	/10/14		
Carbonaceous BOD	187	2	2	mg/L	200		94	85-115	1	200

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40513 - BOD										
LCS Dup (BB40513-BSD2)					Prepared:	02/05/14 Ar	nalyzed: 02/	/10/14		
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115	0.7	200
Duplicate (BB40513-DUP1)		Source: 1	401199-02		Prepared:	02/05/14 Ar	nalyzed: 02/	/10/14		
Carbonaceous BOD	42	2	2	mg/L		40			4	25
Duplicate (BB40513-DUP2)		Source: 1	401258-06		Prepared:	02/05/14 Ar	nalyzed: 02/	/10/14		
Carbonaceous BOD	2 U	2	2	mg/L		ND				25
Batch BB40516 - Ion Chroma	atography 300.0	Prep								
Blank (BB40516-BLK1)					Prepared &	& Analyzed:	02/05/14			
Sulfate	0.20 U	0.60	0.20	mg/L						
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						
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			
Orthophosphate as P	0.901	0.040	0.010	mg/L	0.90		100	85-115		
Sulfate	9.60	0.60	0.20	mg/L	9.0		107	85-115		
Nitrite (as N)	1.55	0.04	0.01	mg/L	1.4		111	85-115		
Nitrate (as N)	1.82	0.04	0.01	mg/L	1.7		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		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		

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

Inorganics - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40516 - Ion Chroma	tography 300.0	Prep								
LCS Dup (BB40516-BSD1)					Prepared 8	& Analyzed:	02/05/14			
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
Sulfate	9.40	0.60	0.20	mg/L	9.0		104	85-115	2	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: 1	401257-04		Prepared &	Analyzed:	02/06/14			
Orthophosphate as P	3.64	0.040	0.010	mg/L	0.90	2.75	99	85-115		
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4	ND	106	85-115		
Sulfate	39.0	0.60	0.20	mg/L	9.0	29.9	100	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: 1	401260-01		Prepared &	Analyzed:	02/06/14			
Orthophosphate as P	0.537 J5	0.040	0.010	mg/L	0.90	ND	60	85-115		
Nitrite (as N)	1.43	0.04	0.01	mg/L	1.4	ND	102	85-115		
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7	0.0390	99	85-115		
Sulfate	41.0	0.60	0.20	mg/L	9.0	30.8	112	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		

March 14, 2014 Work Order: 1401257

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40519 - Digestion for	TKN by EPA	351.2								
Blank (BB40519-BLK1)					Prepared:	02/05/14 Ar	nalyzed: 02/	/07/14		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BB40519-BS1)					Prepared:	02/05/14 Ar	nalyzed: 02	/07/14		
Total Kjeldahl Nitrogen	2.64	0.20	0.05	mg/L	2.5		104	90-110		
Matrix Spike (BB40519-MS1)		Source: 1	401256-06		Prepared:	02/05/14 Ar	nalyzed: 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: 1	401258-07		Prepared:	02/05/14 Ar	nalyzed: 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: 1	401256-06		Prepared:	02/05/14 Ar	nalyzed: 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: 1	401258-07		Prepared:	02/05/14 Ar	nalyzed: 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 8	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: 1	401256-06		Prepared &	Analyzed:	02/06/14			
Chemical Oxygen Demand	45	25	10	mg/L	50	ND	90	85-115		

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Analyte	Pesult	POI	MDI	Linite	Spike	Source	%REC	%REC	PPD	RPD Limit
Analyte	Result	I QL	MBE	Onits	Level	Result	/orceo	Linits		LITIN
Batch BB40621 - COD prep										
Matrix Spike Dup (BB40621-MS	D1)	Source: 1	401256-06		Prepared 8	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: 1	401256-06	i	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-MSI	D1)	Source: 1	401256-06	i	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 Ar	nalyzed: 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 Ar	nalyzed: 02	/07/14		
Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
Duplicate (BB40626-DUP1)		Source: 1	401256-01		Prepared:	02/06/14 Ar	nalyzed: 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

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41123 - Ammonia by S	EAL									
Blank (BB41123-BLK1)					Prepared 8	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: 1	401256-06		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: 1	401353-07		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: 1	401256-06		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: 1	401353-07		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 8	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		

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41140 - Sulfide prep										
LCS (BB41140-BS2)					Prepared 8	Analyzed:	02/11/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
Matrix Spike (BB41140-MS1)		Source: 1	401258-07		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: 1	401317-01		Prepared &	Analyzed:	02/11/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115		
Matrix Spike Dup (BB41140-MSD	1)	Source: 1	401258-07		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-MSD	2)	Source: 1	401317-01		Prepared &	Analyzed:	02/11/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115	4	14
Batch BB41905 - Digestion fo	r TP and TKN									
Blank (BB41905-BLK1)					Prepared:	02/19/14 Ar	nalyzed: 02	/21/14		
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BB41905-BS1)					Prepared:	02/19/14 Ar	nalyzed: 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: 1	401256-06		Prepared:	02/19/14 Ar	nalyzed: 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: 1	401258-07		Prepared:	02/19/14 Ar	nalyzed: 02	/21/14		
Phosphorous - Total as P	0.476	0.040	0.010	mg/L	0.50	ND	95	90-110		

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD		
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit		
Batch BB41905 - Digestion	for TP and TKN											
Matrix Spike Dup (BB41905-MS	5D1)	Source: 1	401256-06		Prepared:	02/19/14 Ar	nalyzed: 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-MS	6D2)	Source: 1	401258-07		Prepared:	02/19/14 Ar	nalyzed: 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								
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: 1	401795-01		Prepared &	& Analyzed:	02/19/14					
Total Alkalinity	280	8.0	2.0	mg/L	120	160	99	80-120				
Matrix Spike Dup (BB41920-MS	6D1)	Source: 1	401795-01		Prepared &	& Analyzed:	02/19/14		4 110 2 25 4 110 0.3 25 110 120 120 0 26			
Total Alkalinity	280	8.0	2.0	mg/L	120	160	99	80-120	0	26		

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



March 14, 2014

Work Order: 1401257

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Microbiology - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40449 - FC-MF										
Blank (BB40449-BLK1)					Prepared:	02/04/14 Ar	nalyzed: 02/	05/14		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl					
Duplicate (BB40449-DUP1)		Source: 1	401256-0	06	Prepared:	02/04/14 Ar	nalyzed: 02/	05/14		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl	ND				200
Duplicate (BB40449-DUP2)		Source: 1	401258-0	07	Prepared:	02/04/14 Ar	nalyzed: 02/	05/14		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl	ND				200

AND IN ACCORDANCE

Work Order: 1401257

March 14, 2014

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

* 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 limts 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@southernanalyticallabs.com

Finbail

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

Client	Name	Hazen and Sav	vver								Contact /	Phone:							
Projec	t Name / Location	D 110 1 05 11 1															·····		
Samp	lers: (Signature)	B-H54 SE#4				η													
	And a carden			1	T T			·	1	P		R / CONT	AINER DE	SCRIPT	ION		· · · · · · · · · · · · · · · · · · ·	T	
-SAL	DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-So GW-Groundwater SA-Saline Water O-Of R-Reagent Water	l her				4a ₂ S ₂ O ₃ C-QT	inity, TSS, D, NOx, OP,	t₂SO₄ , NH₃, TP	laUH, Zh	õ							ė	Æ	
Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	125mLP, 1 FC-MF, FG	1LP, Cool Total Alkal VSS, CBO SO4	125mLP, H COD, TKN	500mLP, N Acetate H ₂ S	40mLaV, F TOC						E	Temperatu	Conductiv	2
01	BHS4-STE	2/4/0	11:15	ww		4	1	1	1	2						6.89	19.9	1059	0.07
02	BHS4-ST1		11/00	ww	×	4	1	1	1	2						6.69	20.5	1033	1.48
03	BHS4-LIGNO-0		1045	ww	×	4	1	1	1	2	L					6.66	208	1001	0,27
04	BHS4-ST2		0.22	ww	×	4	1	1	1	2						6.72	19.6	1054	0.19
05	BHS4-ST2-DUP		10-27	ww		4	1	1	1	2						6.72	11.6	1054	0.19
06	BHS4-EB	¥		R	<u>+</u> >	4			1	2				••••••••••••••••••••••••••••••••••••••	<u> </u>	anna basalaran ing sa		· · · · ·	-
					┨┠-	4		ļ	ļ						-				
					+ $+$						┝──┝								
					++				<u> </u>								<u> </u>		
					╆╌╁╌												<u> </u>		
					+-+			 	<u> </u>										
Contain Relingu	hers greptings Date/Time	1300 Receive	sole C	429	Date/T	14 30~14	10:	30	Seal	intact? ples intact		 >	ON 1 ON 1	₩A ₩A	Instructions	/ Remarks:	L		
Relinq	issned: Date/Time	A Receive		, 	2 Date/T	-4-14	1530		Rece	ived on ic	e? Temp		ON I	N/A					
Kelindi	Jisrieu. Uate/1/me	- Keceive	··· //		Udle/				Prop	er preserv	atives indical	led?	ON 1	N/A					
Relinqu	ished: Date/Time	Receive	ed:		Date/T	ime:			Rec'	i within ho iles rec'd	lding time? w/out heads:	pace?	ØN I Y N I	VA VA					
Reling	ished: Date/Time	Receive	id:		Date/T	ime:			Prop	er containe	ers used?		ONT	VA VA					

Chain of Custody xis Rev.Oate 11/19/01

Chain of Custody

Page 16 of 16

SAL Project No. 1401257

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Project Name		B-HS4	SE#5					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	ilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by		BHS4-STE Wastewater 1401349-01 02/05/14 09:00 Josefin Hirst						
Date/Time Received		02/05/14 14:00						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.88 19.9 °C 1068 umhos 0.16 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	3.4	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:5	2 1
Ammonia as N	mg/L	59	EPA 350.1	2.0	0.47		02/18/14 12:13	3 50
Carbonaceous BOD	mg/L	180	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:0 ²	1 1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	02/07/14 12:25	02/07/14 14:00	0 1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 15:09	91
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 15:09	91
Orthophosphate as P	mg/L	7.1	EPA 300.0	0.040	0.010		02/06/14 15:09	91
Phosphorous - Total as P	mg/L	7.8	SM 4500P-E	0.80	0.20	02/19/14 08:50	02/21/14 13:08	8 20
Sulfate	mg/L	5.4	EPA 300.0	0.60	0.20		02/06/14 15:0	91
Sulfide	mg/L	5.8	SM 4500SF	0.40	0.10		02/12/14 09:00	0 1
Total Alkalinity	mg/L	430	SM 2320B	8.0	2.0		02/19/14 16:30	0 1
Total Kieldahl Nitrogen	ma/L	70	EPA 351.2	4.0	1.0	02/19/14 08:50	02/21/14 13:1;	2 20
Total Organic Carbon	ma/L	81	SM 5310B	1.0	0.060		02/06/14 22:18	8 1
Total Suspended Solids	ma/L	51	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:50	6 1
Volatile Suspended Solids	ma/L	47	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:50	6 1
Nitrate+Nitrite (N)	mg/l	0.02 U	EPA 300.0	0.08	0.02		02/06/14 15:0	9 1
Microbiology	5							
Fecal Coliforms	CFU/100 ml	32,000	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:09	91
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401349-02 02/05/14 08:50 Josefin Hirst 02/05/14 14:00						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.61 20.3 °C 1012 umhos 1.21 mg/L						
						- • · · -		D

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: 1401349

Project Name		B-HS4	SE#5					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401349-02 02/05/14 08:50 Josefin Hirst 02/05/14 14:00						
Hydrogen Sulfide (Unionized)	mg/L	0.14	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:5	2 1
Ammonia as N	mg/L	16	EPA 350.1	0.40	0.095		02/18/14 13:1	6 10
Carbonaceous BOD	mg/L	18	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:0	1 1
Chemical Oxygen Demand	mg/L	74	EPA 410.4	25	10	02/07/14 12:25	02/07/14 14:0	0 1
Nitrate (as N)	mg/L	23	EPA 300.0	0.04	0.01		02/06/14 22:0	91
Nitrite (as N)	mg/L	0.85	EPA 300.0	0.04	0.01		02/06/14 22:0	91
Orthophosphate as P	mg/L	3.0	EPA 300.0	0.040	0.010		02/06/14 22:0	91
Phosphorous - Total as P	mg/L	4.6	SM 4500P-E	0.20	0.050	02/19/14 08:50	02/21/14 13:0	85
Sulfate	mg/L	17	EPA 300.0	0.60	0.20		02/06/14 22:0	9 1
Sulfide	mg/L	0.20	SM 4500SF	0.40	0.10		02/12/14 09:0	0 1
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		02/19/14 16:3	0 1
Total Kjeldahl Nitrogen	mg/L	20	EPA 351.2	1.0	0.25	02/19/14 08:50	02/21/14 13:1	25
Total Organic Carbon	mg/L	24	SM 5310B	1.0	0.060		02/06/14 22:1	8 1
Total Suspended Solids	mg/L	11	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:5	6 1
Volatile Suspended Solids	mg/L	10	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:5	6 1
Nitrate+Nitrite (N)	mg/L	24	EPA 300.0	0.08	0.02		02/06/14 22:0	9 1
Microbiology	-							
Fecal Coliforms	CFU/100 ml	18,000	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:0	9 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401349-03 02/05/14 08:38 Josefin Hirst 02/05/14 14:00						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.67 20.0 °C 1095 umhos 0.13 mg/L						
Hydrogen Sulfide (Unionized)	ma/l	2.1	SM 4550SE	0.04	0.01	02/12/14 08.00	02/13/11 1E.E	2 1
Ammonia as N	mg/L	2.1 15	51VI 43503P	0.04		02/12/14 00.00	02/13/14 13:5	Z I 7 10
	mg/L	01 02	CFA 330.1	0.40	0.095	02/06/14 00:00	02/10/14 13:1	7 IU 1 1
Chamical Oxygen Domand	mg/L	20		2	∠ 10	02/00/14 09.00	02/11/14 14:0	1 I 0 1
	mg/L	04		20	0.01	02/07/14 12.20	02/07/14 14:0	
Nitrite (as N)	mg/L	0.04		0.04	0.01		02/06/14 12:5	U I 6 1
	nig/L	0.01 0		0.04	0.01		02/00/14 12:5	υI

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: 1401349

Project Name		B-HS4	SE#5					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401349-03 02/05/14 08:38 Josefin Hirst 02/05/14 14:00						
Orthophosphate as P	mg/L	3.3	EPA 300.0	0.040	0.010		02/06/14 12:5	6 1
Phosphorous - Total as P	mg/L	4.0	SM 4500P-E	0.20	0.050	02/19/14 08:50	02/21/14 13:0	85
Sulfate	mg/L	5.7	EPA 300.0	0.60	0.20		02/06/14 12:5	6 1
Sulfide	mg/L	3.0	SM 4500SF	0.40	0.10		02/12/14 09:0	0 1
Total Alkalinity	mg/L	440	SM 2320B	8.0	2.0		02/19/14 16:3	0 1
Total Kieldahl Nitrogen	ma/L	17	EPA 351.2	1.0	0.25	02/19/14 08:50	02/21/14 13:1	25
Total Organic Carbon	mg/L	17	SM 5310B	1.0	0.060		02/06/14 22:1	8 1
Total Suspended Solids	mg/l	12	SM 2540D	1	1	02/06/14 11:54	02/07/14 15:5	6 1
Volatile Suspended Solids	mg/l	10	EPA 160.4	1	1	02/06/14 11:54	02/07/14 15:5	6 1
Nitrate+Nitrite (N)	mg/L	0.04 1	EPA 300.0	0.08	0.02	02,00,1111.01	02/06/14 12:5	6 1
Microbiology	111g/ E	0.011		0.00	0.02		02/00/11 12:0	•
Fecal Coliforms	CFU/100 ml	2,000	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:0	9 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2 Wastewater 1401349-04 02/05/14 08:20 Josefin Hirst 02/05/14 14:00						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		7.04 19.7 °C 1073 umhos 0.22 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	3.8	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:5	2 1
Ammonia as N	mg/L	9.2	EPA 350.1	0.20	0.047		02/18/14 12:2	5 5
Carbonaceous BOD	mg/L	16	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:0	1 1
Chemical Oxygen Demand	mg/L	47	EPA 410.4	25	10	02/07/14 12:25	02/07/14 14:0	0 1
Nitrate (as N)	mg/L	0.07	EPA 300.0	0.04	0.01		02/06/14 13:0	51
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 13:0	5 1
Orthophosphate as P	mg/L	2.9	EPA 300.0	0.040	0.010		02/06/14 13:0	5 1
Phosphorous - Total as P	mg/L	3.4	SM 4500P-E	0.20	0.050	02/19/14 08:50	02/21/14 13:0	85
Sulfate	mg/L	44	EPA 300.0	0.60	0.20		02/06/14 13:0	51
Sulfide	mg/L	7.7	SM 4500SF	0.40	0.10		02/12/14 09:0	0 1
Total Alkalinity	mg/L	450	SM 2320B	8.0	2.0		02/19/14 16:3	0 1
Total Kjeldahl Nitrogen	mg/L	10	EPA 351.2	1.0	0.25	02/19/14 08:50	02/21/14 13:1	25

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-HS4	SE#5					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Di	lution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2 Wastewater 1401349-04 02/05/14 08:20 Josefin Hirst 02/05/14 14:00						
Total Organic Carbon Total Suspended Solids Volatile Suspended Solids Nitrate+Nitrite (N) <u>Microbiology</u>	mg/L mg/L mg/L mg/L	14 6 6 0.07 I	SM 5310B SM 2540D EPA 160.4 EPA 300.0	1.0 1 1 0.08	0.060 1 1 0.02	02/06/14 11:54 02/06/14 11:54	02/06/14 22:18 02/07/14 15:56 02/07/14 15:56 02/06/14 13:05	1 1 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2-DUP Wastewater 1401349-05 02/05/14 08:25 Josefin Hirst 02/05/14 14:00						
<u>Client Provided Field Data</u> pH Temperature Conductivity Dissolved Oxygen		7.04 19.7 °C 1073 umhos 0.22 mg/L						
Inorganics Hydrogen Sulfide (Unionized) Ammonia as N Carbonaceous BOD Chemical Oxygen Demand Nitrate (as N) Nitrite (as N) Orthophosphate as P Phosphorous - Total as P Sulfate Sulfide Total Alkalinity Total Alkalinity Total Kjeldahl Nitrogen Total Organic Carbon Total Organic Carbon Total Suspended Solids Volatile Suspended Solids Nitrate+Nitrite (N)	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	3.8 9.0 16 45 0.07 0.01 U 3.1 3.4 43 7.3 440 11 13 7 6 0.07 I	SM 4550SF EPA 350.1 SM 5210B EPA 410.4 EPA 300.0 EPA 300.0 SM 4500P-E EPA 300.0 SM 4500SF SM 2320B EPA 351.2 SM 5310B SM 2540D EPA 160.4 EPA 300.0	0.04 0.20 2 5 0.04 0.04 0.20 0.60 0.40 8.0 1.0 1.0 1.0 1 1 0.08	$\begin{array}{c} 0.01\\ 0.047\\ 2\\ 10\\ 0.01\\ 0.010\\ 0.050\\ 0.20\\ 0.10\\ 2.0\\ 0.25\\ 0.060\\ 1\\ 1\\ 0.02\\ \end{array}$	02/12/14 08:00 02/06/14 09:00 02/10/14 09:30 02/19/14 10:50 02/19/14 10:50 02/06/14 11:54 02/06/14 11:54	02/13/14 15:52 02/18/14 12:26 02/11/14 14:01 02/10/14 12:30 02/06/14 22:37 02/06/14 22:37 02/06/14 22:37 02/24/14 15:34 02/06/14 22:37 02/12/14 09:00 02/19/14 16:30 02/24/14 15:30 02/06/14 22:18 02/07/14 15:56 02/06/14 22:37	1 5 1 1 1 1 5 1 1 5 1 1 1 1 1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:09	1

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Project Name		B-HS4	SE#5					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-EB Reagent Water 1401349-06 02/05/14 09:20 Josefin Hirst 02/05/14 14:00						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		5.98 23.3 °C 1.33 umhos 8.20 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:5	52 1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		02/18/14 14:2	21 1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	02/06/14 09:00	02/11/14 14:0)1 1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	02/10/14 09:30	02/10/14 12:3	30 1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 22:4	16 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/06/14 22:4	16 1
Orthophosphate as P	mg/L	0.010 U	EPA 300.0	0.040	0.010		02/06/14 22:4	46 1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	02/19/14 10:50	02/24/14 15:3	34 1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		02/06/14 22:4	46 1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		02/12/14 09:0	00 1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		02/19/14 16:3	30 1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	02/19/14 10:50	02/24/14 15:3	30 1
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		02/06/14 22:1	18 1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	02/10/14 10:00	02/11/14 14:0	9 1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	02/10/14 10:00	02/11/14 14:0	9 1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/06/14 22:4	16 1
<u>Microbiology</u>								
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	02/05/14 15:31	02/06/14 14:0)9 1

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40626 - VSS Prep										
Blank (BB40626 BLK1)					Prenared:	02/06/14 A	nalvzed: 02	/07/14		
Valatile Suggested Solida	4 1 1	1		ma/l	r repared.	02/00/14 / 4				
Total Suspended Solids	10	1	4	mg/∟						
lotal Suspended Solids	10	1	1	mg/L						
LCS (BB40626-BS1)					Prepared:	02/06/14 Ar	nalyzed: 02	/07/14		
Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
Duplicate (BB40626-DUP1)		Source: 1	401256-01	1	Prepared:	02/06/14 Aı	nalyzed: 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
Batch BB40629 - BOD										
Blank (BB40629-BLK1)					Prepared:	02/06/14 Aı	nalyzed: 02	/11/14		
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40629-BLK2)					Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40629-BLK3)					Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40629-BS1)					Prepared:	02/06/14 Ai	nalyzed: 02	/11/14		
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115		
LCS (BB40629-BS2)					Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	189	2	2	mg/L	200		94	85-115		
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218



March 18, 2014

Work Order: 1401349

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40629 - BOD										
LCS (BB40629-BS3)					Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	189	2	2	mg/L	200		95	85-115		
LCS Dup (BB40629-BSD1)					Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	198	2	2	mg/L	200		99	85-115	2	200
LCS Dup (BB40629-BSD2)					Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	191	2	2	mg/L	200		95	85-115	1	200
LCS Dup (BB40629-BSD3)					Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	189	2	2	mg/L	200		95	85-115	0	200
Duplicate (BB40629-DUP1)		Source: 1	401256-05		Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	5	2	2	mg/L		5			0	25
Duplicate (BB40629-DUP2)		Source: 1	401349-05		Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	16	2	2	mg/L		16			2	25
Duplicate (BB40629-DUP3)		Source: 1	401375-01		Prepared:	02/06/14 Ar	nalyzed: 02	/11/14		
Carbonaceous BOD	120	2	2	mg/L		98			18	25
Batch BB40636 - Ion Chroma	atography 300.0	Prep								
Blank (BB40636-BLK1)					Prepared 8	Analyzed:	02/06/14			
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						

Nitrate (as N)	0.01 U	0.04	0.01	mg/L				
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				
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	

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40636 - Ion Chroma	tography 300.	0 Prep								
LCS (BB40636-BS1)					Prepared 8	Analyzed:	02/06/14			
Sulfate	9.15	0.60	0.20	mg/L	9.0		102	85-115		
Orthophosphate as P	0.874	0.040	0.010	mg/L	0.90		97	85-115		
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7		102	85-115		
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		104	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			
Nitrite (as N)	1.47	0.04	0.01	mg/L	1.4		105	85-115	1	200
Orthophosphate as P	0.907	0.040	0.010	mg/L	0.90		101	85-115	4	200
Sulfate	9.29	0.60	0.20	mg/L	9.0		103	85-115	1	200
Nitrate (as N)	1.75	0.04	0.01	mg/L	1.7		103	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: 1	401368-01		Prepared &	Analyzed:	02/06/14			
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		
Orthophosphate as P	2.31	0.040	0.010	mg/L	0.90	1.46	94	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		

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40636 - Ion Chroma	atography 300.0	Prep								
Matrix Spike (BB40636-MS2)		Source: 1	401349-01		Prepared 8	Analyzed:	02/11/14			
Sulfate	14.4	0.60	0.20	ma/L	9.0	5.39	100	85-115		
Nitrate (as N)	1.75	0.04	0.01	ma/L	1.7	ND	103	85-115		
Nitrite (as N)	1.49	0.04	0.01	mg/L	1.4	ND	107	85-115		
Orthophosphate as P	8.01	0.040	0.010	mg/L	0.90	7.12	99	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 BB40637 - Ion Chroma	atography 300.0	Prep								
Blank (BB40637-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						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Surrogate: Dichloroacetate	0.975			mg/L	1.0		98	90-115		
Surrogate: Dichloroacetate	0.975			mg/L	1.0		98	90-115		
Surrogate: Dichloroacetate	0.975			mg/L	1.0		98	90-115		
Surrogate: Dichloroacetate	0.975			mg/L	1.0		98	90-115		
LCS (BB40637-BS1)					Prepared &	Analyzed:	02/06/14			
Orthophosphate as P	0.815	0.040	0.010	mg/L	0.90		91	85-115		
Nitrate (as N)	1.71	0.04	0.01	mg/L	1.7		101	85-115		
Sulfate	9.19	0.60	0.20	mg/L	9.0		102	85-115		
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		104	85-115		
Surrogate: Dichloroacetate	0.988			mg/L	1.0		99	90-115		
Surrogate: Dichloroacetate	0.988			mg/L	1.0		99	90-115		
Surrogate: Dichloroacetate	0.988			mg/L	1.0		99	90-115		
Surrogate: Dichloroacetate	0.988			mg/L	1.0		99	90-115		

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40637 - Ion Chroma	tography 300.0	Prep								
LCS Dup (BB40637-BSD1)					Prepared &	Analyzed:	02/06/14			
Sulfate	9.11	0.60	0.20	mg/L	9.0		101	85-115	0.9	200
Nitrite (as N)	1.46	0.04	0.01	mg/L	1.4		104	85-115	0.4	200
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	0.6	200
Orthophosphate as P	0.816	0.040	0.010	mg/L	0.90		91	85-115	0.1	200
Surrogate: Dichloroacetate	0.966			mg/L	1.0		97	90-115		
Surrogate: Dichloroacetate	0.966			mg/L	1.0		97	90-115		
Surrogate: Dichloroacetate	0.966			mg/L	1.0		97	90-115		
Surrogate: Dichloroacetate	0.966			mg/L	1.0		97	90-115		
Matrix Spike (BB40637-MS1)		Source: 1	401353-05		Prepared &	Analyzed:	02/06/14			
Orthophosphate as P	0.351 J5	0.040	0.010	mg/L	0.90	ND	39	85-115		
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4	ND	104	85-115		
Nitrate (as N)	1.55	0.04	0.01	mg/L	1.7	ND	91	85-115		
Sulfate	90.0 L	0.60	0.20	mg/L	9.0	136	NR	85-115		
Surrogate: Dichloroacetate	0.913			mg/L	1.0		91	90-115		
Surrogate: Dichloroacetate	0.913			mg/L	1.0		91	90-115		
Surrogate: Dichloroacetate	0.913			mg/L	1.0		91	90-115		
Surrogate: Dichloroacetate	0.913			mg/L	1.0		91	90-115		
Matrix Spike (BB40637-MS2)		Source: 1	401383-01		Prepared &	Analyzed:	02/07/14			
Orthophosphate as P	0.856	0.040	0.010	mg/L	0.90	0.0240	92	85-115		
Nitrite (as N)	1.54	0.04	0.01	mg/L	1.4	ND	110	85-115		
Nitrate (as N)	4.27	0.04	0.01	mg/L	1.7	2.35	113	85-115		
Sulfate	25.5	0.60	0.20	mg/L	9.0	16.7	98	85-115		
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		
Surrogate: Dichloroacetate	1.00			mg/L	1.0		100	90-115		

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
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: 1	401354-01		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: 1	401354-01		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						
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: 1	401346-05		Prepared &	Analyzed:	02/07/14			
Chemical Oxygen Demand	74	25	10	mg/L	50	29	90	85-115		
Matrix Spike Dup (BB40717-MSD1)		Source: 1	401346-05		Prepared &	Analyzed:	02/07/14			
Chemical Oxygen Demand	74	25	10	mg/L	50	29	90	85-115	0	32
Batch BB41012 - COD prep										
Blank (BB41012-BLK1)					Prepared &	Analyzed:	02/10/14			
Chemical Oxygen Demand	10 U	25	10	mg/L						

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41012 - COD prep										
LCS (BB41012-BS1)					Prepared 8	Analyzed:	02/10/14			
Chemical Oxygen Demand	50	25	10	mg/L	50		100	90-110		
Matrix Spike (BB41012-MS1)		Source: 1	401349-06	6	Prepared &	Analyzed:	02/10/14			
Chemical Oxygen Demand	50	25	10	mg/L	50	ND	100	85-115		
Matrix Spike Dup (BB41012-MSD1)		Source: 1	401349-06	6	Prepared &	Analyzed:	02/10/14			
Chemical Oxygen Demand	49	25	10	mg/L	50	ND	98	85-115	2	32
Batch BB41205 - VSS Prep										
Blank (BB41205-BLK1)					Prepared:	02/10/14 Ar	nalyzed: 02	/11/14		
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						
LCS (BB41205-BS1)					Prepared:	02/10/14 Ar	nalyzed: 02	/11/14		
Total Suspended Solids	50.0	1	1	mg/L	50		100	85-115		
Duplicate (BB41205-DUP1)		Source: 1	401258-01	l	Prepared:	02/10/14 Ar	nalyzed: 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						

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	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: 1	401349-06		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: 1	401419-06		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: 1	401349-06		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: 1	401419-06		Prepared &	Analyzed:	02/12/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	0	14
Batch BB41437 - Ammonia by S	EAL									
Blank (BB41437-BLK1)					Prepared 8	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		

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41437 - Ammonia by	SEAL									
Matrix Spike (BB41437-MS1)		Source: 1	401611-07		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: 1	401686-07		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: 1	401611-07		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	2)	Source: 1	401686-07		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 Ar	nalyzed: 02/	/21/14		
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 (BB41906-BS1)					Prepared:	02/19/14 Ar	nalyzed: 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: 1	401575-02		Prepared:	02/19/14 Ar	nalyzed: 02/	/21/14		
Phosphorous - Total as P	0.498	0.040	0.010	mg/L	0.50	0.0318	93	90-110		
Total Kjeldahl Nitrogen	1.59	0.20	0.05	mg/L	1.0	0.630	96	90-110		
Matrix Spike (BB41906-MS2)		Source: 1	401611-07		Prepared:	02/19/14 Ar	nalyzed: 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		

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41906 - Digestion f	or TP and TKN									
Matrix Spike Dup (BB41906-MSI	D1)	Source: 1	401575-02		Prepared:	02/19/14 Ar	nalyzed: 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-MSI	02)	Source: 1	401611-07		Prepared:	02/19/14 Ar	nalyzed: 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 BB41914 - Digestion f	or TP and TKN									
Blank (BB41914-BLK1)					Prepared:	02/19/14 Ar	nalyzed: 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 (BB41914-BS1)					Prepared:	02/19/14 Ar	nalyzed: 02/	/24/14		
Total Kjeldahl Nitrogen	1.09	0.20	0.05	mg/L	1.0		109	90-110		
Phosphorous - Total as P	0.489	0.040	0.010	mg/L	0.50		98	90-110		
Matrix Spike (BB41914-MS1)		Source: 1	401349-06		Prepared:	02/19/14 Ar	nalyzed: 02/	/24/14		
Total Kjeldahl Nitrogen	1.06	0.20	0.05	mg/L	1.0	ND	106	90-110		
Phosphorous - Total as P	0.504	0.040	0.010	mg/L	0.50	ND	101	90-110		
Matrix Spike (BB41914-MS2)		Source: 1	401686-07		Prepared:	02/19/14 Ar	nalyzed: 02/	/24/14		
Phosphorous - Total as P	0.718	0.040	0.010	mg/L	0.50	0.211	101	90-110		
Total Kjeldahl Nitrogen	1.82	0.20	0.05	mg/L	1.0	0.812	101	90-110		
Matrix Spike Dup (BB41914-MSI	01)	Source: 1	401349-06		Prepared:	02/19/14 Ar	nalyzed: 02/	/24/14		
Phosphorous - Total as P	0.484	0.040	0.010	mg/L	0.50	ND	97	90-110	4	25
Total Kjeldahl Nitrogen	1.08	0.20	0.05	mg/L	1.0	ND	108	90-110	2	20

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41914 - Digestion for	TP and TKN									
Matrix Spike Dup (BB41914-MSD2)	Source: 1	401686-07		Prepared:	02/19/14 Ar	nalyzed: 02/	24/14		
Phosphorous - Total as P	0.720	0.040	0.010	mg/L	0.50	0.211	102	90-110	0.3	25
Total Kjeldahl Nitrogen	1.78	0.20	0.05	mg/L	1.0	0.812	97	90-110	2	20
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: 1	401419-06		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: 1	401419-06		Prepared &	Analyzed:	02/19/14			
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	108	80-120	0	26

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



March 18, 2014

Work Order: 1401349

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Microbiology - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40543 - FC-MF										
Blank (BB40543-BLK1)					Prepared:	02/05/14 Ar	nalyzed: 02/	06/14		
Fecal Coliforms	1 U	1	1	CFU/100 n	nl					
Duplicate (BB40543-DUP1)		Source: 1	401349-0	06	Prepared:	02/05/14 Ar	nalyzed: 02/	06/14		
Fecal Coliforms	1 U	1	1	CFU/100 n	nl	ND				200
Duplicate (BB40543-DUP2)		Source: 1	401353-0)7	Prepared:	02/05/14 Ar	nalyzed: 02/	06/14		
Fecal Coliforms	1 U	1	1	CFU/100 n	nl	ND				200

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



March 18, 2014

Work Order: 1401349

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

* 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 limts 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.

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@southernanalyticallabs.com



Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

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

Client	Name												Contact	/ Phone:								
Droje	Hazen	and S	Sawye	r																		
riojev	B-HS4	SE#5	5					5														
Samp	lers: (Signature)	-						3/51				p	ARAMET	ER / CON		DESCRIP						
	Matrix Codes:	T)	1	T	Γİ	3				<u>_</u>										
	DW-Drinking Water WW-Wastewater							2	, d													
	GW-Groundwater SA-Saline Water O-Other							ő.	TSS Dx, -	Ц Ц	uz.											
	R-Reagent Water							P12S	, NY	OS H	Ь Б	a								e	\$	
SAL Use Onty Sample	Sample Description		Date	Time	Matrix	Composite	Grab	125mLP, Na FC-MF, FC	1LP, Cool Total Alkalir VSS, CBOC SO4	125mLP, H ₂ COD, TKN,	500mLP, Na Acetate H ₂ S	40mLaV, H(TOC						Ŧ	5	Temperatu	Conductivi	8
01	BHS4-STE	2/5	5/14	9:00	ww		x	4	1	1	1	2						6.8	55	19.9	1068	016
02	BHS4-ST1	ļ	1	8:50	ww		x	4	1	1	1	2_	ļ					6.6	01	20,3	1012	1.21
03	BHS4-LIGNO-0			8:38	ww		x	4	1	1	1	2					_	6.4	·7	20.0	1095	0.(3
04	BHS4-ST2			\$20	ww		x	4	1	1	1	2						7.0	24	19.7	1073	0,22
05	BHS4-ST2-DUP			8.15	ww		x	4	1	1	1	2	ļ					7.0	24	19.7	1073	0.22
06	BHS4-EB	V	/	9:20	R		x	4	1	1	1	2	ļ					ડલ	8	23,3	1.33	8.20
						_																
						-							+									
						-							+			-	+					
Contai Reling	ners Prepage // AA Date/Time: 1400	Rece	ived:	1 0 (L <>	Dat	e/Tim	e	10.3	L	Seal	intact?	1	I	1 Y N	Q	Instruction	is / Remarks:		I		
Reling	HINTERNAL 1.29-14	Rena	<u>pri</u>	000	1-		* 3 a/Tim	0-14			- Sam	oles intact	upon arrivi	31?	Ø	N/A						
	Att 1/190	11	N,	1. dm	n an h			-1	1400		Rece	ived on ic	e? Temp		Q	i N/A						
Reling	uished:	Rece	eived:	uarr	Charles and a	Dat	e/Tim	JIA.			Prop	er preserv	atives indic	ated?	C.							
								-			Berle	i within h	aldina time?		ð.							
Reling	uished: Date/Time:	Rece	eived;			Dat	e/Tim	e:			Volat	iles rec'd	w/out head	ispace?	YN							
Relinq	uished: Date/Time:	Rece	eived:			Dat	e/Tim	6:			Prop	er contain	ers used?		Θ	I NVA						
		1																				

Chain of Cuslody xis Rev.Date 11/19/01

Page 19 of 19

Chain of Custody

SAL Project No. 1401349

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 27, 2014 Work Order: 1401420

Project Name		B-HS4	SE#6					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-STE Wastewater 1401420-01 02/06/14 10:15 Josefin Hirst 02/06/14 13:45						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.76 20.3 °C 1095 umhos 0.11 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized) Ammonia as N	mg/L mg/L	1.8 64	SM 4550SF EPA 350.1	0.04 2.0	0.01 0.47	02/12/14 08:00	02/13/14 15:5 02/20/14 12:2	2 1 1 50
Carbonaceous BOD	mg/L	180	SM 5210B	2	2	02/07/14 11:36	02/12/14 09:0	3 1
Chemical Oxygen Demand	mg/L	330	EPA 410.4	25	10	02/10/14 11:30	02/10/14 16:4	5 1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 00:0	4 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 00:0	4 1
Orthophosphate as P	mg/L	6.9	EPA 300.0	0.040	0.010		02/08/14 00:0	4 1
Phosphorous - Total as P	mg/L	8.8	SM 4500P-E	0.80	0.20	02/19/14 10:54	02/24/14 15:4	4 20
Sulfate	mg/L	0.67	EPA 300.0	0.60	0.20		02/08/14 00:0	4 1
Sulfide	mg/L	2.8	SM 4500SF	0.40	0.10		02/12/14 09:0	0 1
Total Alkalinity	mg/L	470	SM 2320B	8.0	2.0		02/20/14 14:4	5 1
Total Kjeldahl Nitrogen	mg/L	72	EPA 351.2	4.0	1.0	02/19/14 10:54	02/24/14 15:3	9 20
Total Organic Carbon	mg/L	72	SM 5310B	1.0	0.060		02/12/14 09:3	7 1
Total Suspended Solids	mg/L	80	SM 2540D	1	1	02/10/14 10:00	02/11/14 14:0	91
Volatile Suspended Solids	mg/L	79	EPA 160.4	1	1	02/10/14 10:00	02/11/14 14:0	91
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		02/08/14 00:0	4 1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	24,000	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:0	7 1
Fecal Coliforms	CFU/100 ml	29,000	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:4	2 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401420-02 02/06/14 10:00 Josefin Hirst 02/06/14 13:45						
Client Provided Field Data								
μ		7.39						
Temperature		19.0 °C						
Conductivity Dissolved Oxygen		1123 umhos 5.16 mg/L						

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Project Name		B-HS4	SE#6					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401420-02 02/06/14 10:00 Josefin Hirst 02/06/14 13:45						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:5	52 1
Ammonia as N	mg/L	10	EPA 350.1	0.40	0.095		02/20/14 14:2	25 10
Carbonaceous BOD	mg/L	10	SM 5210B	2	2	02/07/14 11:36	02/12/14 09:0)3 1
Chemical Oxygen Demand	mg/L	41	EPA 410.4	25	10	02/10/14 11:30	02/10/14 16:4	45 1
Nitrate (as N)	mg/L	30	EPA 300.0	0.04	0.01		02/08/14 00:1	14 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 00:1	14 1
Orthophosphate as P	mg/L	3.5	EPA 300.0	0.040	0.010		02/08/14 00:1	14 1
Phosphorous - Total as P	ma/L	4.0	SM 4500P-E	0.20	0.050	02/19/14 10:54	02/24/14 15:4	14 5
Sulfate	ma/l	20	EPA 300.0	0.60	0.20		02/08/14 00.1	14 1
Sulfide	ma/l	0 10 U	SM 4500SF	0.40	0.10		02/12/14 09:0	00 1
Total Alkalinity	mg/L	300	SM 2320B	8.0	20		02/20/14 14.4	15 1
Total Kieldahl Nitrogen	mg/L	12	EPA 351.2	1.0	0.25	02/19/14 10:54	02/24/14 15:3	39 5
Total Organic Carbon	mg/L	15	SM 5310B	1.0	0.060	02/10/14 10:04	02/12/14 09:3	37 1
Total Suspended Solids	mg/L	10	SM 2540D	1.0	1	02/10/14 10:00	02/11/14 14:0	ng 1
Volatile Suspended Solids	mg/L	10	EPA 160 4	1	1	02/10/14 10:00	02/11/14 14:0	10 1
	mg/L	30	EPA 300.0	0.08	0 02	02/10/14 10:00	02/08/14 00:1	1 I I
Mierobiele m	ing/L	50	2171000.0	0.00	0.02		02/00/14 00.1	· ·
		0.500	CM 0222D	0.0	0.0	00/00/44 40:00	00/07/44 40-0	
	MPN/100 mL	6,500	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:0)/ 1
Fecal Coliforms	CFU/100 ml	6,500	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:4	12 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401420-03 02/06/14 09:55 Josefin Hirst 02/06/14 13:45						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.56 18.7 °C 956 umhos 0.62 mg/L						
Inorganics		-						
Hydrogen Sulfide (Unionized)	mg/L	1.2	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:5	52 1
Ammonia as N	ma/L	14	EPA 350.1	0.40	0.095		02/20/14 14:2	26 10
Carbonaceous BOD	ma/l	18	SM 5210B	2	2	02/07/14 11:36	02/12/14 09:0)3 1
Chemical Oxygen Demand	ma/l	43	EPA 410.4	_ 25	- 10	02/10/14 11:30	02/10/14 16:4	15 1
enemiear exygen Demana		-10		20	10	<u>. </u>	JE 10 17 10.7	

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 27, 2014 Work Order: 1401420

Project Name		B-HS4	SE#6					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401420-03 02/06/14 09:55 Josefin Hirst 02/06/14 13:45						
Nitrate (as N) Nitrite (as N) Orthophosphate as P Phosphorous - Total as P Sulfate Sulfide Total Alkalinity Total Kjeldahl Nitrogen Total Organic Carbon Total Suspended Solids	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	0.12 0.01 U 3.1 4.1 11 1.6 430 16 19 2	EPA 300.0 EPA 300.0 EPA 300.0 SM 4500P-E EPA 300.0 SM 4500SF SM 2320B EPA 351.2 SM 5310B SM 2540D	0.04 0.040 0.20 0.60 0.40 8.0 1.0 1.0 1.0	0.01 0.010 0.050 0.20 0.10 2.0 0.25 0.060 1	02/19/14 10:54 02/19/14 10:54 02/10/14 10:02	02/08/14 00:2 02/08/14 00:2 02/08/14 00:2 02/24/14 15:4 02/08/14 00:2 02/12/14 09:0 02/20/14 14:4 02/24/14 15:3 02/12/14 09:3 02/12/14 11:4	3 1 3 1 4 5 3 1 6 1 5 1 9 5 7 1 4 1
Volatile Suspended Solids Nitrate+Nitrite (N)	mg/L mg/L	2 0.12	EPA 160.4 EPA 300.0	1 0.08	1 0.02	02/10/14 10:02	02/12/14 11:44 02/08/14 00:23	4 1 3 1
Microbiology E. Coli Fecal Coliforms	MPN/100 mL CFU/100 ml	1,600 1,800	SM 9223B SM 9222D	2.0 1	2.0 1	02/06/14 16:03 02/06/14 15:42	02/07/14 10:0 02/07/14 13:4:	7 1 2 1
Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		Wastewater 1401420-04 02/06/14 09:35 Josefin Hirst 02/06/14 13:45						
<u>Client Provided Field Data</u> pH Temperature Conductivity Dissolved Oxygen		6.82 19.8 °C 1074 umhos 0.11 mg/L						
Inorganics Hydrogen Sulfide (Unionized) Ammonia as N Carbonaceous BOD Chemical Oxygen Demand Nitrate (as N) Nitrite (as N) Orthophosphate as P Phosphorous - Total as P Sulfate	mg/L mg/L mg/L mg/L mg/L mg/L mg/L	7.0 10 17 54 0.04 0.01 U 3.5 4.1 27	SM 4550SF EPA 350.1 SM 5210B EPA 410.4 EPA 300.0 EPA 300.0 SM 4500P-E EPA 300.0	0.04 0.40 2 25 0.04 0.04 0.040 0.20 0.60	0.01 0.095 2 10 0.01 0.01 0.010 0.050 0.20	02/12/14 08:00 02/07/14 11:36 02/10/14 11:30 02/19/14 10:54	02/13/14 15:5: 02/20/14 14:2: 02/12/14 09:0: 02/10/14 16:4: 02/08/14 00:3: 02/08/14 00:3: 02/08/14 00:3: 02/24/14 15:4: 02/08/14 00:3:	2 1 8 10 3 1 5 1 2 1 2 1 2 1 4 5 2 1

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-HS4	SE#6					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2 Wastewater 1401420-04 02/06/14 09:35 Josefin Hirst 02/06/14 13:45						
Sulfide	mg/L	11	SM 4500SF	0.40	0.10		02/12/14 09:0	00 1
Total Alkalinity	ma/L	460	SM 2320B	8.0	2.0		02/20/14 14:4	5 1
Total Kieldahl Nitrogen	ma/L	12	EPA 351.2	1.0	0.25	02/19/14 10:54	02/24/14 15:3	39 5
Total Organic Carbon	mg/l	18	SM 5310B	1.0	0.060	0	02/12/14 09:3	37 1
Total Suspended Solids	mg/l	4	SM 2540D	1	1	02/10/14 10.02	02/12/14 11:4	4 1
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	02/10/14 10:02	02/12/14 11:4	
Nitrate+Nitrite (N)	mg/L	0.04 1	EPA 300.0	0.08	0.02	02/10/14 10:02	02/08/14 00:3	32 1
Microbiology		0.011		0.00	0.02		02,00,1100.0	
E Coli	MPN/100 ml	1 100	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10.0	07 1
Fecal Coliforms	CEU/100 mL	2 000	SM 9222D	1	2.0	02/06/14 15:42	02/07/14 13:4	12 1
		,						
Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		Wastewater 1401420-05 02/06/14 09:40 Josefin Hirst 02/06/14 13:45						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.82 19.8 °C 1074 umhos 0.11 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	6.8	SM 4550SF	0.04	0.01	02/12/14 08:00	02/13/14 15:5	52 1
Ammonia as N	mg/L	10	EPA 350.1	0.40	0.095		02/20/14 14:3	30 10
Carbonaceous BOD	mg/L	18	SM 5210B	2	2	02/07/14 11:36	02/12/14 09:0)3 1
Chemical Oxygen Demand	mg/L	58	EPA 410.4	25	10	02/11/14 11:46	02/11/14 14:4	.9 1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		02/08/14 00:4	2 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 00:4	2 1
Orthophosphate as P	ma/L	3.8	EPA 300.0	0.040	0.010		02/08/14 00:4	2 1
Phosphorous - Total as P	ma/L	4.1	SM 4500P-E	0.20	0.050	02/19/14 10:54	02/24/14 15:4	4 5
Sulfate	ma/L	30	EPA 300.0	0.60	0.20		02/08/14 00:4	2 1
Sulfide	ma/L	11	SM 4500SF	0.40	0.10		02/12/14 09.0	0 1
Total Alkalinity	ma/L	450	SM 2320B	8.0	2.0		02/20/14 14.4	5 1
Total Kieldahl Nitrogen	ma/L	12	EPA 351.2	1.0	0.25	02/19/14 10:54	02/24/14 15:3	39 5
Total Organic Carbon	ma/L	15	SM 5310B	1.0	0.060		02/12/14 09:3	37 1

Total Suspended Solids

mg/L

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

1

02/10/14 10:02 02/12/14 11:44

SM 2540D

1

1

4

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Project Name		B-HS	64 SE#6					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2-DUP Wastewater 1401420-05 02/06/14 09:40 Josefin Hirst 02/06/14 13:45						
Volatile Suspended Solids	mg/L	4	EPA 160.4	1	1	02/10/14 10:02	02/12/14 11:	44 1
Nitrate+Nitrite (N)	mg/L	0.04 I	EPA 300.0	0.08	0.02		02/08/14 00:	42 1
Microbiology								
E. Coli	MPN/100 mL	1,200	SM 9223B	2.0	2.0	02/06/14 16:03	02/07/14 10:	:07 1
Fecal Coliforms	CFU/100 ml	2,000	SM 9222D	1	1	02/06/14 15:42	02/07/14 13:	42 1

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

Inorganics - Quality Control

Analyte	Result	POI	MDL	Units	Spike Level	Source Result	%RFC	%REC Limits	RPD	RPD Limit
Batch BB40711 - Ion Chroma	atography 300.0	Prep								
Blank (BB40711-BLK1)					Prepared 8	Analyzed:	02/07/14			
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						
Nitrite (as N)	0.01 U	0.04	0.01	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 8	Analyzed:	02/07/14			
Sulfate	9.11	0.60	0.20	mg/L	9.0		101	85-115		
Nitrite (as N)	1.47	0.04	0.01	mg/L	1.4		105	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		
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 (BB40711-BSD1)					Prepared 8	Analyzed:	02/07/14			
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
Orthophosphate as P	0.882	0.040	0.010	mg/L	0.90		98	85-115	0.1	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		

February 27, 2014 Work Order: 1401420

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40711 - Ion Chroma	tography 300.0	Prep								
Matrix Spike (BB40711-MS1)		Source: 1	401419-02		Prepared &	Analyzed:	02/07/14			
Orthophosphate as P	2.56	0.040	0.010	mg/L	0.90	1.75	90	85-115		
Nitrate (as N)	17.0 L	0.04	0.01	mg/L	1.7	47.6	NR	85-115		
Sulfate	44.5	0.60	0.20	mg/L	9.0	34.7	109	85-115		
Nitrite (as N)	1.79	0.04	0.01	mg/L	1.4	0.389	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		
Matrix Spike (BB40711-MS2)		Source: 1	401421-01		Prepared &	Analyzed:	02/08/14			
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		
Nitrite (as N)	1.40	0.04	0.01	mg/L	1.4	ND	100	85-115		
Orthophosphate as P	3.77	0.040	0.010	mg/L	0.90	2.81	107	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		
Batch BB40716 - BOD										
Blank (BB40716-BLK1)					Prepared:	02/07/14 Ar	nalyzed: 02/	/12/14		
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40716-BLK2)					Prepared:	02/07/14 Ar	nalyzed: 02/	'12/14		
Carbonaceous BOD	2 U	2	2	mg/L						

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40716 - BOD										
LCS (BB40716-BS1)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	193	2	2	mg/L	200		97	85-115		
LCS (BB40716-BS2)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	182	2	2	mg/L	200		91	85-115		
LCS Dup (BB40716-BSD1)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	185	2	2	mg/L	200		92	85-115	4	200
LCS Dup (BB40716-BSD2)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	189	2	2	mg/L	200		94	85-115	4	200
Duplicate (BB40716-DUP1)		Source: 1	401420-05		Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	17	2	2	mg/L		18			7	25
Duplicate (BB40716-DUP2)		Source: 1	401481-05		Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	16	2	2	mg/L		17			6	25
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: 1	401437-01		Prepared &	Analyzed:	02/12/14			
Total Organic Carbon	8.93	1.0	0.060	mg/L	10	ND	89	85-115		

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BB40718 - TOC prep										
Matrix Spike Dup (BB40718-MSD1)		Source: 1	401437-01		Prepared 8	Analyzed:	02/12/14			
Total Organic Carbon	8.57	1.0	0.060	mg/L	10	ND	86	85-115	4	10
Batch BB41014 - COD prep										
Blank (BB41014-BLK1)					Prepared 8	Analyzed:	02/10/14			
Chemical Oxygen Demand	10 U	25	10	mg/L						
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: 1	401353-06		Prepared &	Analyzed:	02/10/14			
Chemical Oxygen Demand	77	25	10	mg/L	50	29	96	85-115		
Matrix Spike Dup (BB41014-MSD1)		Source: 1	401353-06		Prepared &	Analyzed:	02/10/14			
Chemical Oxygen Demand	72	25	10	mg/L	50	29	86	85-115	7	32
Batch BB41131 - COD prep										
Blank (BB41131-BLK1)					Prepared 8	Analyzed:	02/11/14			
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BB41131-BS1)					Prepared &	Analyzed:	02/11/14			
Chemical Oxygen Demand	54	25	10	mg/L	50		108	90-110		
Matrix Spike (BB41131-MS1)		Source: 1	401480-02		Prepared &	Analyzed:	02/11/14			
Chemical Oxygen Demand	66	25	10	mg/L	50	23	86	85-115		

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Analista	Desult	DOI		L lusite	Spike	Source		%REC		RPD
Analyte	Result	PQL	NDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41131 - COD prep										
Matrix Spike Dup (BB41131-MSD1)		Source: 1	401480-02	2	Prepared &	Analyzed:	02/11/14			
Chemical Oxygen Demand	66	25	10	mg/L	50	23	86	85-115	0	32
Batch BB41205 - VSS Prep										
Blank (BB41205-BLK1)					Prepared:	02/10/14 Ar	nalyzed: 02	/11/14		
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						
LCS (BB41205-BS1)					Prepared:	02/10/14 Ar	nalyzed: 02	/11/14		
Total Suspended Solids	50.0	1	1	mg/L	50		100	85-115		
Duplicate (BB41205-DUP1)		Source: 1	401258-01		Prepared:	02/10/14 Ar	nalyzed: 02	/11/14		
Total Suspended Solids	18.0	1	1	mg/L		19.0			5	30
Volatile Suspended Solids	12.0	1		mg/L		13.0			8	20
Batch BB41245 - Sulfide prep										
Blank (BB41245-BLK1)					Prepared 8	Analyzed:	02/12/14			
Sulfide	0.10 U	0.40	0.10	mg/L						
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		

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41245 - Sulfide prep										
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: 1	401349-06		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: 1	401419-06		Prepared &	& Analyzed:	02/12/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115		
Matrix Spike Dup (BB41245-MSD	1)	Source: 1	401349-06		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-MSD	2)	Source: 1	401419-06		Prepared &	Analyzed:	02/12/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	0	14
Batch BB41709 - VSS Prep										
Blank (BB41709-BLK1)					Prepared:	02/10/14 Ar	nalyzed: 02/	/12/14		
Volatile Suspended Solids	1 U	1		mg/L						
Total Suspended Solids	1 U	1	1	mg/L						
LCS (BB41709-BS1)					Prepared:	02/10/14 Ar	nalyzed: 02/	/12/14		
Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
Duplicate (BB41709-DUP1)		Source: 1	401420-03		Prepared:	02/10/14 Ar	nalyzed: 02/	/12/14		
Volatile Suspended Solids	2.00	1		mg/L		2.00			0	20
Total Suspended Solids	2.00	1	1	mg/L		2.00			0	30

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

	D "	DOI	MDI		Spike	Source	0/ DE0	%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41915 - Digestion for	TP and TKN									
Blank (BB41915-BLK1)					Prepared:	02/19/14 Ar	alyzed: 02/	/24/14		
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 (BB41915-BS1)					Prepared:	02/19/14 Ar	alyzed: 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		
Matrix Spike (BB41915-MS1)		Source: 1	401419-06		Prepared:	02/19/14 Ar	alyzed: 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: 1	401421-02		Prepared:	02/19/14 Ar	alyzed: 02/	/24/14		
Phosphorous - Total as P	0.579	0.040	0.010	mg/L	0.50	0.0729	101	90-110		
Total Kjeldahl Nitrogen	2.25	0.20	0.05	mg/L	1.0	1.64	62	90-110		
Matrix Spike Dup (BB41915-MSD1)		Source: 1	401419-06		Prepared:	02/19/14 Ar	alyzed: 02/	/24/14		
Phosphorous - Total as P	0.500	0.040	0.010	mg/L	0.50	ND	100	90-110	3	25
Total Kjeldahl Nitrogen	1.01	0.20	0.05	mg/L	1.0	ND	101	90-110	3	20
Matrix Spike Dup (BB41915-MSD2)		Source: 1	401421-02		Prepared:	02/19/14 Ar	alyzed: 02/	/24/14		
Phosphorous - Total as P	0.573	0.040	0.010	mg/L	0.50	0.0729	100	90-110	1	25
Total Kjeldahl Nitrogen	2.72	0.20	0.05	mg/L	1.0	1.64	108	90-110	19	20
Batch BB41944 - alkalinity										
Blank (BB41944-BLK1)					Prepared 8	Analyzed:	02/20/14			
Total Alkalinity	2.0 U	8.0	2.0	mg/L						

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41944 - alkalinity										
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: 1	401481-02		Prepared &	Analyzed:	02/20/14			
Total Alkalinity	340	8.0	2.0	mg/L	120	210	99	80-120		
Matrix Spike Dup (BB41944-MSD1	I)	Source: 1	401481-02		Prepared &	Analyzed:	02/20/14			
Total Alkalinity	340	8.0	2.0	mg/L	120	210	99	80-120	0	26
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: 1	401419-06		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: 1	401421-07		Prepared 8	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	I)	Source: 1	401419-06		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	2)	Source: 1	401421-07		Prepared &	Analyzed:	02/20/14			
Ammonia as N	0.54	0.040	0.009	mg/L	0.50	ND	107	90-110	1	10

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



February 27, 2014

Work Order: 1401420

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Microbiology - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40665 - FC-MF										
Blank (BB40665-BLK1)					Prepared:	02/06/14 Ar	nalyzed: 02/	07/14		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl					
Duplicate (BB40665-DUP1)		Source: 1	401419-0	06	Prepared:	02/06/14 Ar	nalyzed: 02/	07/14		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl	ND				200
Duplicate (BB40665-DUP2)		Source: 1	401421-0	07	Prepared:	02/06/14 Ar	nalyzed: 02/	07/14		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl	ND				200

STRED IN ACCORDANCE

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

* 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 limts 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 Telephone (813) 855-1844 FAX (813) 855-2218 Kathryn@southernanalyticallabs.com

Findard

February 27, 2014 Work Order: 1401420

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

Client	t Name												Contact	Phone						_	1901	420
Chern	Hazen a	nd S	awye	r						_				r none.			~		_			
Projec	ct Name / Location	~ #c		-			_															
Samp	Ders: (Signature)	0040											<u> </u>							_		
	Josep etc								1			. P/		ER / CONT	AINER D	ESCRIPT				r	-	
	Marrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water							32S2O3 QT	iity, TSS, , NOX, OP,	SO4 NH ₃ , TP	iOH, Zh	ō								Ð	4	
SAL Use Only ^{Sample} No.	Sample Description		Date	Time	Matrix	Composite	Grab	125mLP, Na FC-MF, FC-	1LP, Cool Total Alkalin VSS, CBOD SO4	125mLP, H ₂ СОD, TKN,	500mLP, Na Acetate H ₂ S	40mLaV, H0 TOC							Hd	Temperatu	Conductivi	8
01	BHS4-STE	2/6	114	10:15	ww		x	4	1	1	1	2						61	76	20,3	1095	ð.11
02	BHS4-ST1	•	1	10:00	ww		x	4	1	1	1	2						a . 3	39	19.0	1173	5.16
03	BHS4-LIGNO-0			0955	ww		x	4	1	1	1	2						6.9	56	11.7	956	0,62
04	BHS4-ST2			9:35	ww		x	4	1	1	1	2 .						<i>b.</i> 5	62	19.8	1074	0.1(
05	BHS4-ST2-DUP			9.40	ww		x	4	1	1	1	2						6.	82	19.8	1074	0.11
06,,,,,,	BH\$4_EB	4			R	+	×	4	1	1			<u> </u>							and the second		···· -· · · ·
															_							
					_																	1
Contair Relingu Relingu Relingu	iners Preparate/ uished: Uished: Uished: Date/Time: 1400 1-29-14 Date/Time: 1345 2/6/14 Uished: Date/Time: 1400	Rece Rece	ived: ived: ived:	foi 4		Date	e/Tim 8/Tim 2/Tim 9/Tim	ne: 0/14 ne: -6 -14 ne:	10:34 4 134	0 5	Seal Sam Rece	intact? bles intact ived on icc	upon arriv; e? Temp	al?		NVA NVA	Instruction	s / Remarks	S;			
Relinqu	uished: Date/Time:	Rece	eived:	*/		Date	e/Tim	ne;			Recio Volat	n preserv I within ho iles rec'd	biding time? w/out head	space?		NA NA						
Relinqu	uished: Date/Time:	Rece	ived:			Date	e/Tim	ne:			Bron	er contain	ere used?		A N	N/A						

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

Page 16 of 16

Chain of Custody

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Project Name		B-HS4	SE#7					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-STE Wastewater 1401482-01 02/07/14 09:55 Josefin Hirst 02/07/14 13:45						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.78 20.64 °C 1064 umhos 0.19 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized) Ammonia as N	mg/L mg/L	4.4 56	SM 4550SF EPA 350.1	0.04 2.0	0.01 0.47	02/14/14 08:20	02/14/14 10:2 02/20/14 15:3	28 1 32 50
Carbonaceous BOD	mg/L	150	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:0	03 1
Chemical Oxygen Demand	mg/L	300	EPA 410.4	25	10	03/05/14 13:27	03/05/14 16:3	36 1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		02/08/14 08:4	41 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 08:4	41 1
Orthophosphate as P	mg/L	5.5	EPA 300.0	0.040	0.010		02/08/14 08:4	41 1
Phosphorous - Total as P	mg/L	7.9	SM 4500P-E	0.80	0.20	02/21/14 15:14	02/25/14 14:4	45 20
Sulfate	mg/L	2.3	EPA 300.0	0.60	0.20		02/08/14 08:4	41 1
Sulfide	mg/L	6.8	SM 4500SF	0.40	0.10		02/14/14 10:2	23 1
Total Alkalinity	mg/L	420	SM 2320B	8.0	2.0		02/21/14 14:0	00 1
Total Kjeldahl Nitrogen	mg/L	66	EPA 351.2	4.0	1.0	02/21/14 15:14	02/25/14 16:	50 20
Total Organic Carbon	mg/L	85	SM 5310B	1.0	0.060		02/12/14 23:	18 1
Total Suspended Solids	mg/L	58	SM 2540D	1	1	02/11/14 17:00	02/13/14 17:2	21 1
Volatile Suspended Solids	mg/L	54	EPA 160.4	1	1	02/11/14 17:00	02/13/14 17:2	21 1
Nitrate+Nitrite (N)	mg/L	0.04 l	EPA 300.0	0.08	0.02		02/08/14 08:4	41 1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	10,000	SM 9223B	2.0	2.0	02/07/14 15:20	02/08/14 12:3	30 1
Fecal Coliforms	CFU/100 ml	60,000	SM 9222D	1	1	02/07/14 15:15	02/08/14 13:2	25 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401482-02 02/07/14 09:45 Josefin Hirst 02/07/14 13:45						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.88 19.6 °C 1034 umhos 3.26 mg/L						

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

Laboratory Report

Project Name		B-HS4	SE#7					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST1 Wastewater 1401482-02 02/07/14 09:45 Josefin Hirst 02/07/14 13:45						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	1.0	SM 4550SF	0.04	0.01	02/14/14 08:20	02/14/14 10:2	28 1
Ammonia as N	mg/L	0.56	EPA 350.1	0.040	0.009		02/20/14 15:4	3 1
Carbonaceous BOD	mg/L	9	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:0)3 1
Chemical Oxygen Demand	mg/L	52	EPA 410.4	25	10	02/27/14 09:48	02/27/14 10:0	0 1
Nitrate (as N)	mg/L	27	EPA 300.0	0.04	0.01		02/08/14 08:5	50 1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		02/08/14 08:5	50 1
Orthophosphate as P	ma/L	3.4	EPA 300.0	0.040	0.010		02/08/14 08:5	50 1
Phosphorous - Total as P	ma/l	4 0	SM 4500P-E	0.20	0.050	02/21/14 15:14	02/25/14 14.4	5 5
Sulfate	mg/l	19	EPA 300.0	0.60	0.20		02/08/14 08:5	50 1
Sulfide	mg/L	1.8	SM 4500SF	0.00	0.10		02/14/14 10:2	23 1
Total Alkalinity	mg/L	330	SM 2320B	8.0	2.0		02/21/14 14:0	0 1
Total Kieldahl Nitrogen	mg/L	15	EPA 351 2	1.0	0.25	02/21/14 15:14	02/25/14 16:5	5 5
Total Organic Carbon	mg/L	18	SM 5310B	1.0	0.20	02/21/14 10:14	02/20/14 10:0	8 1
Total Suspended Solids	mg/L	10	SM 2540D	1.0	0.000	02/11/14 17:00	02/12/14 23.1	0 1
Velatile Supponded Solida	mg/L	12	EDA 160 4	1	1	02/11/14 17:00	02/13/14 17.2	1 I 1 1
Nitroto I Nitrito (NI)	mg/L	12	EPA 300.0	0.09	0.02	02/11/14 17:00	02/13/14 17.2	. 1 :0 1
	IIIg/L	21	LI A 300.0	0.00	0.02		02/06/14 06.5	0 1
Microbiology			014 00005					
E. Coli	MPN/100 mL	6,100	SM 9223B	2.0	2.0	02/07/14 15:20	02/08/14 12:3	80 1
Fecal Coliforms	CFU/100 ml	6,200	SM 9222D	1	1	02/07/14 15:15	02/08/14 13:2	25 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401482-03 02/07/14 09:40 Josefin Hirst 02/07/14 13:45						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.80 18.2 °C 1092 umhos 0.53 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.90	SM 4550SF	0.04	0.01	02/14/14 08:20	02/14/14 10:2	28 1
Ammonia as N	mg/L	0.51	EPA 350.1	0.040	0.009		02/20/14 15:4	5 1
Carbonaceous BOD	mg/L	13	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:0)3 1
Chemical Oxygen Demand	mg/L	45	EPA 410.4	25	10	02/27/14 09:48	02/27/14 10:0	00 1



Work Order: 1401482

March 6, 2014

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

Laboratory Report

Project Name		B-HS4	SE#7					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-LIGNO-0 Wastewater 1401482-03 02/07/14 09:40 Josefin Hirst 02/07/14 13:45						
Nitrate (as N) Nitrite (as N) Orthophosphate as P Phosphorous - Total as P Sulfate Sulfide Total Alkalinity Total Kjeldahl Nitrogen Total Organic Carbon Total Organic Carbon Total Suspended Solids Volatile Suspended Solids Nitrate+Nitrite (N) <u>Microbiology</u> E Coli	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	0.70 0.01 U 2.7 2.8 13 1.4 400 14 16 7 7 0.70	EPA 300.0 EPA 300.0 SM 4500P-E EPA 300.0 SM 4500SF SM 2320B EPA 351.2 SM 5310B SM 2540D EPA 160.4 EPA 300.0	0.04 0.040 0.040 0.60 0.40 8.0 1.0 1.0 1 1 0.08	0.01 0.010 0.010 0.20 0.10 2.0 0.25 0.060 1 1 0.02 2.0	02/21/14 15:14 02/21/14 15:14 02/11/14 17:00 02/11/14 17:00	02/08/14 08:5 02/08/14 08:5 02/08/14 08:5 02/25/14 14:4 02/08/14 08:5 02/14/14 10:2 02/21/14 14:0 02/25/14 16:5 02/12/14 23:1 02/13/14 17:2 02/08/14 08:5	9 1 9 1 5 1 9 1 3 1 0 5 8 1 1 1 9 1 9 1
E. Coll Fecal Coliforms	CFU/100 mL	560 700	SM 9223B SM 9222D	2.0 1	2.0 1	02/07/14 15:20 02/07/14 15:15	02/08/14 12:3 02/08/14 13:2	0 1 5 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2 Wastewater 1401482-04 02/07/14 09:23 Josefin Hirst 02/07/14 13:45						
Client Provided Field Data pH Temperature Conductivity Dissolved Oxygen		6.78 19.9 ℃ 1078 umhos 0.24 mg/L						
Inorganics Hydrogen Sulfide (Unionized) Ammonia as N Carbonaceous BOD Chemical Oxygen Demand Nitrate (as N) Nitrite (as N) Orthophosphate as P Phosphorous - Total as P Sulfate	mg/L mg/L mg/L mg/L mg/L mg/L mg/L	6.2 1.3 15 64 0.07 0.01 U 3.5 4.1 21	SM 4550SF EPA 350.1 SM 5210B EPA 410.4 EPA 300.0 EPA 300.0 SM 4500P-E EPA 300.0	0.04 0.040 2 25 0.04 0.04 0.040 0.20 0.60	0.01 0.009 2 10 0.01 0.01 0.010 0.050 0.20	02/14/14 08:20 02/07/14 14:00 02/27/14 09:48 02/21/14 15:20	02/14/14 10:2 02/21/14 08:4 02/12/14 09:0 02/27/14 10:0 02/08/14 09:0 02/08/14 09:0 02/08/14 09:0 02/25/14 14:5 02/08/14 09:0	8 1 3 1 0 1 9 1 9 1 9 1 0 5 9 1

March 6, 2014 Work Order: 1401482

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-HS4	SE#7					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by		BHS4-ST2 Wastewater 1401482-04 02/07/14 09:23 Josefin Hirst						
Date/Time Received		02/07/14 13:45						
Sulfide Total Alkalinity Total Kjeldahl Nitrogen Total Organic Carbon	mg/L mg/L mg/L mg/L	9.7 440 13 17	SM 4500SF SM 2320B EPA 351.2 SM 5310B	0.40 8.0 1.0 1.0	0.10 2.0 0.25 0.060	02/21/14 15:20	02/14/14 10:2 02/21/14 14:0 02/25/14 16:5 02/12/14 23:1	23 1 00 1 54 5 18 1
Total Suspended Solids Volatile Suspended Solids Nitrate+Nitrite (N)	mg/L mg/L mg/L	9 8 0.07 I	SM 2540D EPA 160.4 EPA 300.0	1 1 0.08	1 1 0.02	02/11/14 17:00 02/11/14 17:00	02/13/14 17:2 02/13/14 17:2 02/08/14 09:0	21 1 21 1 09 1
<u>Microbiology</u> E. Coli Fecal Coliforms	MPN/100 mL CFU/100 ml	860 900	SM 9223B SM 9222D	2.0 1	2.0 1	02/07/14 15:20 02/07/14 15:15	02/08/14 12:3 02/08/14 13:2	30 1 25 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2-DUP Wastewater 1401482-05 02/07/14 09:27 Josefin Hirst 02/07/14 13:45						
Client Provided Field Data								
pH Temperature Conductivity Dissolved Oxygen		6.78 19.9 °C 1078 umhos 0.24 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized) Ammonia as N	mg/L mg/L	6.2 1.4	SM 4550SF EPA 350.1	0.04 0.040	0.01 0.009	02/14/14 08:20	02/14/14 10:2 02/21/14 09:0	28 1 05 1
Carbonaceous BOD	mg/L	15	SM 5210B	2	2	02/07/14 14:00	02/12/14 09:0	J3 1
Nitrate (as N)	mg/L	0C 0 07	EPA 300.0	∠5 0.04	0.01	02/21/14 09.48	02/27/14 10:0	18 1
Nitrite (as N)	mg/L	0.01	EPA 300.0	0.04	0.01		02/08/14 09.1	18 1
Orthophosphate as P	mg/L	3.6	EPA 300.0	0.040	0.010		02/08/14 09:1	18 1
Phosphorous - Total as P	ma/l	4 1	SM 4500P-E	0.20	0.050	02/21/14 15:20	02/25/14 14:5	50 5
Sulfate	mg/L mg/L	21 9.7	EPA 300.0 SM 4500SF	0.60 0.40	0.20 0.10		02/08/14 09:1	18 1 23 1

SM 2320B

EPA 351.2

SM 5310B

SM 2540D

450

13

16

7

2.0

0.25

0.060

1

02/21/14 15:20

02/11/14 17:00

8.0

1.0

1.0

1

mg/L

mg/L

mg/L

mg/L

Total Alkalinity

Total Kjeldahl Nitrogen

Total Organic Carbon

Total Suspended Solids

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager

02/21/14 14:00

02/25/14 16:54

02/12/14 23:18

02/13/14 17:21

1

5

1

1

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Project Name		B-HS	64 SE#7					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS4-ST2-DUP Wastewater 1401482-05 02/07/14 09:27 Josefin Hirst 02/07/14 13:45						
Volatile Suspended Solids	mg/L	4	EPA 160.4	1	1	02/11/14 17:00	02/13/14 17:	:21 1
Nitrate+Nitrite (N)	mg/L	0.07 I	EPA 300.0	0.08	0.02		02/08/14 09:	:18 1
Microbiology								
E. Coli	MPN/100 mL	890	SM 9223B	2.0	2.0	02/07/14 15:20	02/08/14 12:	:30 1
Fecal Coliforms	CFU/100 ml	900	SM 9222D	1	1	02/07/14 15:15	02/08/14 13	:25 1

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

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 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BB40716-BLK2)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BB40716-BS1)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	193	2	2	mg/L	200		97	85-115		
LCS (BB40716-BS2)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	182	2	2	mg/L	200		91	85-115		
LCS Dup (BB40716-BSD1)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	185	2	2	mg/L	200		92	85-115	4	200
LCS Dup (BB40716-BSD2)					Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	189	2	2	mg/L	200		94	85-115	4	200
Duplicate (BB40716-DUP1)		Source: 1	401420-05		Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	17	2	2	mg/L		18			7	25
Duplicate (BB40716-DUP2)		Source: 1	401481-05		Prepared:	02/07/14 Ar	nalyzed: 02	/12/14		
Carbonaceous BOD	16	2	2	mg/L		17			6	25
Batch BB40723 - Ion Chroma	atography 300.0	Prep								

Blank (BB40723-BLK1)					Prepared & Anal	yzed: 02/08/14	
Sulfate	0.20 U	0.60	0.20	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			
Orthophosphate as P	0.010 U	0.040	0.010	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

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40723 - Ion Chroma	tography 300.	0 Prep								
LCS (BB40723-BS1)					Prepared 8	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 8	Analyzed:	02/08/14			
Sulfate	8.94	0.60	0.20	mg/L	9.0		99	85-115	3	200
Orthophosphate as P	0.812	0.040	0.010	mg/L	0.90		90	85-115	1	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
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: 1	401481-03		Prepared 8	Analyzed:	02/08/14			
Orthophosphate as P	1.44	0.040	0.010	mg/L	0.90	0.494	105	85-115		
Sulfate	33.0	0.60	0.20	mg/L	9.0	23.9	100	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		
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		
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218



Work Order: 1401482

March 6, 2014

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB40723 - Ion Chromatog	raphy 300.0	Prep								
Matrix Spike (BB40723-MS2)		Source: 1	401482-05		Prepared &	& Analyzed:	02/08/14			
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		
Orthophosphate as P	4.48	0.040	0.010	mg/L	0.90	3.58	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 &	02/12/14				
Total Organic Carbon	10.1	1.0	0.060	mg/L	10		101	90-110		
Matrix Spike (BB41125-MS1)		Source: 1	401583-03		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: 1	401583-03		Prepared &	& Analyzed:	02/12/14			
Total Organic Carbon	9.10	1.0	0.060	mg/L	10	ND	91	85-115	2	10
Batch BB41431 - Sulfide prep										
Blank (BB41431-BLK1)					Prepared 8	& Analyzed:	02/14/14			
Sulfide	0.10 U	0.40	0.10	mg/L						

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB41431 - Sulfide pre	р									
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: 1	401480-07	,	Prepared &	Analyzed:	02/14/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike Dup (BB41431-MSI	D1)	Source: 1	401480-07	,	Prepared &	Analyzed:	02/14/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
Batch BB41710 - VSS Prep										
Blank (BB41710-BLK1)					Prepared:	02/11/14 Ar	nalyzed: 02/	/13/14		
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						
LCS (BB41710-BS1)					Prepared:	02/11/14 Ar	nalyzed: 02/	/13/14		
Total Suspended Solids	42.5	1	1	mg/L	50		85	85-115		
Duplicate (BB41710-DUP1)		Source: 1	401482-01		Prepared:	02/11/14 Ar	nalyzed: 02/	/13/14		
Volatile Suspended Solids	53.0	1		mg/L		54.0			2	20
Total Suspended Solids	59.0	1	1	mg/L		58.0			2	30
Batch BB42007 - Ammonia b	y SEAL									
Blank (BB42007-BLK1)					Prepared &	Analyzed:	02/20/14			
Ammonia as N	0.009 U	0.040	0.009	mg/L						

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB42007 - Ammonia by S	EAL									
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: 1	401419-03		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: 1	401794-07		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: 1	401419-03		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: 1	401794-07		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 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: 1	401482-05		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: 1	401482-05		Prepared &	Analyzed:	02/21/14			
Total Alkalinity	570	8.0	2.0	mg/L	120	450	99	80-120	0	26

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Inorganics - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB42128 - Digestion for 1	P and TKN									
Blank (BB42128-BLK1)					Prepared:	02/21/14 Ar	nalyzed: 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 Ar	nalyzed: 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		
Matrix Spike (BB42128-MS1)		Source: 1	401480-07		Prepared: 02/21/14 Analyzed: 02/25/14					
Total Kjeldahl Nitrogen	0.983	0.20	0.05	mg/L	1.0	ND	98	90-110		
Phosphorous - Total as P	0.488	0.040	0.010	mg/L	0.50	ND	98	90-110		
Matrix Spike (BB42128-MS2)		Source: 1401750-01			Prepared: 02/21/14 Analyzed: 02/25/14					
Total Kjeldahl Nitrogen	0.998	0.20	0.05	mg/L	1.0	ND	100	90-110		
Phosphorous - Total as P	0.470	0.040	0.010	mg/L	0.50	ND	94	90-110		
Matrix Spike Dup (BB42128-MSD1)		Source: 1	401480-07		Prepared: 02/21/14 Analyzed: 02/25/14					
Phosphorous - Total as P	0.466	0.040	0.010	mg/L	0.50	ND	93	90-110	4	25
Total Kjeldahl Nitrogen	0.949	0.20	0.05	mg/L	1.0	ND	95	90-110	3	20
Matrix Spike Dup (BB42128-MSD2)		Source: 1	401750-01		Prepared:	02/21/14 Ar	nalyzed: 02	/25/14		
Total Kjeldahl Nitrogen	0.960	0.20	0.05	mg/L	1.0	ND	96	90-110	4	20
Phosphorous - Total as P	0.480	0.040	0.010	mg/L	0.50	ND	96	90-110	2	25
Batch BB42129 - Digestion for 1	P and TKN									
Blank (BB42129-BLK1)					Prepared:	02/21/14 Ar	nalyzed: 02	/25/14		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						

mg/L

Phosphorous - Total as P 0.010 U 0.040 0.010

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD	
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit	
Batch BB42129 - Digestion f	or TP and TKN										
LCS (BB42129-BS1)					Prepared:	02/21/14 Ar	nalyzed: 02	/25/14			
Phosphorous - Total as P	0.462	0.040	0.010	mg/L	0.50		92	90-110			
Total Kjeldahl Nitrogen	0.970	0.20	0.05	mg/L	1.0		97	90-110			
Matrix Spike (BB42129-MS1) Source: 1401794-07					Prepared:	02/21/14 Ar	nalyzed: 02	/25/14			
Phosphorous - Total as P	0.668	0.040	0.010	mg/L	0.50	0.159	102	90-110			
Total Kjeldahl Nitrogen	1.70	0.20	0.05	mg/L	1.0	0.768	93	90-110			
Matrix Spike (BB42129-MS2) Source: 1401819-07 Prepared: 02/21/14 Analyzed: 02/25/14							/25/14				
Phosphorous - Total as P	0.613	0.040	0.010	mg/L	0.50	0.147	93	90-110			
Total Kjeldahl Nitrogen	1.68	0.20	0.05	mg/L	1.0	0.730	95	90-110			
Matrix Spike Dup (BB42129-MS	D1)	Source: 1	401794-07		Prepared: 02/21/14 Analyzed: 02/25/14						
Phosphorous - Total as P	0.661	0.040	0.010	mg/L	0.50	0.159	100	90-110	1	25	
Total Kjeldahl Nitrogen	1.69	0.20	0.05	mg/L	1.0	0.768	92	90-110	0.4	20	
Matrix Spike Dup (BB42129-MS	D2)	Source: 1	401819-07		Prepared:	02/21/14 Ar	/25/14				
Total Kjeldahl Nitrogen	1.72	0.20	0.05	mg/L	1.0	0.730	99	90-110	2	20	
Phosphorous - Total as P	0.602	0.040	0.010	mg/L	0.50	0.147	91	90-110	2	25	
Batch BB42709 - COD prep											
Blank (BB42709-BLK1)					Prepared &	Analyzed:	02/27/14				
Chemical Oxygen Demand	10 U	25	10	mg/L							
LCS (BB42709-BS1)					Prepared &	Analyzed:	02/27/14				
Chemical Oxygen Demand	54	25	10	mg/L	50		108	90-110			

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BB42709 - COD prep										
Matrix Spike (BB42709-MS1)		Source: 1	401954-06		Prepared &	Analyzed:	02/27/14			
Chemical Oxygen Demand	100	25	10	mg/L	50	49	102	85-115		
Matrix Spike Dup (BB42709-MSD1)		Source: 1	401954-06		Prepared &	Analyzed:	02/27/14			
Chemical Oxygen Demand	99	25	10	mg/L	50	49	100	85-115	1	32
Batch BC40313 - COD prep										
Blank (BC40313-BLK1)					Prepared &	Analyzed:	03/05/14			
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BC40313-BS1)					Prepared 8	Analyzed:	03/05/14			
Chemical Oxygen Demand	49	25	10	mg/L	50		98	90-110		
Matrix Spike (BC40313-MS1)		Source: 1	402279-02		Prepared &	Analyzed:	03/05/14			
Chemical Oxygen Demand	52	25	10	mg/L	50	ND	104	85-115		
Matrix Spike Dup (BC40313-MSD1)		Source: 1	402279-02		Prepared &	Analyzed:	03/05/14			
Chemical Oxygen Demand	56	25	10	mg/L	50	ND	112	85-115	7	32

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



Work Order: 1401482

March 6, 2014

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Microbiology - Quality Control

					Spike	Source		%REC		RPD	
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit	
Batch BB40725 - FC-MF											
Blank (BB40725-BLK1)					Prepared:	02/07/14 Ar	nalyzed: 02/	08/14			
Fecal Coliforms	1 U	1	1	CFU/100 m	d						_
Duplicate (BB40725-DUP1)		Source: 1	401480-0)7	Prepared:	02/07/14 Ar	nalyzed: 02/	08/14			
Fecal Coliforms	1 U	1	1	CFU/100 m	l	1.00				200	

She Corord

Work Order: 1401482

March 6, 2014

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

* 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 limts 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@southernanalyticallabs.com

Finbal



Appendix B: Operation & Maintenance Log

	Operation and Maintenance Log
Date	Description
6/19/2013	Construction - Stage 1 and Stage 2 tank installed
6/20/2013	Construction - drainfield installed
6/21/2013	Construction - electrical work
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 sampling event
8/6/2013	System check
	Back-up in STE tank, water level above outlet effluent screen
8/12/2013	Back-up in STE tank again
	Removed filter screen
	Lift station pump causing lots of mixing in STE tank
	Shortened float swing on lift station pump to reduce pump runtime
	Lots of solids in Stage 1 Biofilter
	During lift station pump dose, ponding in Stage 1 biofilter
8/15/2013	Bull run valve switched to drainfield
9/5/2013	Lift station pump replaced with smaller pump
	Smaller pump installed in second chamber of old septic tank
	Switched bull run valve to PNRS system
9/10/2013	System check
9/30/2013	Sample Event No. 1
11/8/2013	System check
11/27/2013	System check
12/2/2013	Sample Event No. 2
	Cleaned STE effluent filter screen
	A little bit of ponding in Stage 1 biofilter influent side
	No ponding in all 4 drainfield observation ports
	*homeowners were out of town for Thanksgiving holiday
12/23/2013	System check. No ponding in all 4 drainfield observation ports

Table B.1 Dperation and Maintenance Log

Date	Description
1/23/2014	System check
	Ponding near Stage 1 d-box, adjusted pipe and raked media
	No ponding in all 4 drainfield observation ports
1/31/2014	System check
	Fixed Stage 1 biofilter distribution pipe (east side) which was off support
	No ponding in all 4 drainfield observation ports
2/3/2014	Sample Event No. 3
	No ponding in all 4 drainfield observation ports
2/4/2014	Sample Event No. 4
	No ponding in all 4 drainfield observation ports
2/5/2014	Sample Event No. 5
	No ponding in all 4 drainfield observation ports
2/6/2014	Sample Event No. 6
	No ponding in all 4 drainfield observation ports
2/7/2014	Sample Event No. 7
	No ponding in all 4 drainfield observation ports