

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task B.7

B-HS2 Field System Monitoring Report No. 1

Progress Report

January 2013



HAZEN AND SAWYER Environmental Engineers & Scientists In association with



OTIS ENVIRONMENTAL CONSULTANTS, LLC

Florida Onsite Sewage Nitrogen Reduction Strategies Study

TASK B.7 PROGRESS REPORT

B-HS2 Field System Monitoring Report No. 1

Prepared for:

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FDOH Contract CORCL

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Prepared by:



In Association With:





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1.0 Background

Task B of the Florida Onsite Sewage Nitrogen Reduction Strategies Study (FOSNRS) includes performing field experiments to critically evaluate the performance of nitrogen removal technologies that were identified in FOSNRS Task A.9. 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 first sample event of a passive nitrogen reduction system at a home site in Hillsborough County, Florida (site B-HS2).

2.0 Purpose

This monitoring report documents data collected from the first B-HS2 monitoring and sampling event conducted on December 3, 2012. This monitoring event consisted of collecting flow measurements from the household water use meter and the treatment system internal water meters, recording electricity use, monitoring of field parameters, collection of water samples from five points in the treatment system, and sample analyses by a NELAC certified laboratory.

3.0 Materials and Methods

3.1 Project Site

The B-HS2 field site is located in Hillsborough County, FL. The nitrogen reducing onsite treatment system for the single family residence was installed in September 2012. Design and construction details were presented previously in the Task B.6 document. The B-HS2 system consists of a 1,050 gallon two chamber concrete primary tank; 300 gallon concrete recirculation tank; 900 gallon concrete Stage 1 unsaturated media biofilter; 300 gallon concrete pump tank; and 1,500 gallon two chamber concrete Stage 2 saturated media biofilter. The denitrified treated effluent is discharged into the soil via the existing mounded drainfield (P.T.I.[™] bundles). Based on measured average wastewater flow

and tank volumes, there is over a ten day transit time through the treatment system prior to dispersal. 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.

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Figure 1 B-HS2 System Schematic

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NOTE: HGL SHOWN IS FOR RECIRCULATION TANK MODE OF OPERATION



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3.2 Monitoring and Sample Locations and Identification

The five main monitoring points for this sample event are shown in Figure 3. Household wastewater enters the 1st chamber of the primary tank and exits the second chamber as septic tank effluent through an effluent screen into the recirculation tank. The first monitoring point, B-HS2-STE, is the effluent sampled approximately 1.5 feet below the surface of the second chamber of the primary tank (Figure 4), which is referred to as primary effluent or septic tank effluent (STE). Samples from monitoring point B-HS2-STE are the whole household wastewater after it has had some residence time in the primary tank; they represent the influent to the remainder of the onsite nitrogen reduction system.





Figure 4 Second chamber of Primary Tank (B-HS2-STE sample)

The recirculation 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. The second sampling point (B-HS2-DBOX) is taken approximately 6 inches below the surface of the distribution box (Figure 5), which contains a mixture of primary effluent (STE) and recirculated effluent from the Stage 1 biofilter. In the Stage 1 biofilter, wastewater proceeds downward through the expanded clay media where nitrification occurs. Stage 1 biofilter effluent flows into the pump tank (which contains the pump and float switches). The third sampling point is a sample port on the pump discharge line (B-HS2-PUMP) and represents the Stage 1 biofilter effluent (Figure 6).

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Figure 5 Distribution Box within Stage 1 Unsaturated Biofilter (B-HS2-DBOX sample)



Figure 6 Pump discharge line sample port (B-HS2-PUMP sample)

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The pump tank discharge is split via two throttling globe valves which allow for a portion of the Stage 1 biofilter effluent to be sent back for recirculation with the rest proceeding to the Stage 2 biofilter. The system was designed with two recirculation modes of operation. The first option (which is currently being tested) is to have the recirculated effluent return to the recirculation tank for mixing with incoming septic tank effluent. The second option is to have the recirculated effluent return to the top of the Stage 1 biofilter, dispersed by three spray nozzles. Effluent from the unsaturated (Stage 1) media tank enters the denitrification (Stage 2) biofilter into a standing water column lying above the media in the first chamber (lignocellulosic media), flows downward through the media, moves laterally 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. The fourth sampling point is a stainless steel drivepoint positioned at the bottom of the lignocellulosic media (B-HS2-LIGNO-0"). This sample represents the lignocellulosic media effluent (Figure 7). A collection pipe along the bottom transfers the first chamber effluent to the second chamber, which contains 24-inches of elemental sulfur mixed with oyster shell media. The fifth sampling point, B-HS2-ST2, is in the second chamber of the Stage 2 biofilter, effluent is sampled approximately 1 foot below the surface of the effluent baffle tee within the second chamber of the Stage 2 biofilter. 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 8).



Figure 7 First chamber of Stage 2 biofilter (B-HS2-LIGNO-0" sample)

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Figure 8 Second chamber of Stage 2 biofilter (B-HS2-ST2 sample)

3.3 Operational Monitoring

Start-up of the system occurred on September 25, 2012 (Experimental Day 0) and the system has operated continually since that date. Preliminary sampling for several key parameters was conducted October 11, 2012 (Experimental Day 16), October 23, 2012 (Experimental Day 28), and October 30, 2012 (Experimental Day 35) to evaluate start-up performance. The first formal sampling event was conducted December 3, 2012 (Experimental Day 69). For this first formal sampling event, the water meter for the house and the treatment system flow meters were read and recorded on December 3, 2012. As previously discussed, the pump tank discharge is split via two throttling globe valves which allow for a portion of the Stage 1 biofilter effluent to be sent back for recirculation with the rest proceeding to the Stage 2 biofilter. The combined flow meter is located on the pump tank discharge line prior to the split, and records the cumulative flow in gallons pumped from the pump chamber. Therefore the measurement of the combined flow meter includes both the forward wastewater flow from the household and the recirculation flow. The Stage 2 flow meter is located following the split on the line from the pump tank to the Stage 2 biofilter of the split on the line from the pump tank to the Stage 2 biofilter and records the cumulative flow in gallons pumped form the pump tank to the combined flow meter is located following the split on the line from the pump tank to the stage 2 biofilter and records the cumulative flow in gallons pumped to the

Stage 2 biofilter. The control panel includes telemetry where reports are generated regarding alarms, pump cycles, and other information using a Vericomm panel system.

3.4 Energy, Chemical and/or Additives 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 recirculation pump in the pump chamber, although a small amount of power is used by the control panel itself. There are no chemicals added to the system. However, the Stage 2 biofilter media (lignocellulosic and sulfur) are "reactive" media which will be consumed during operation. The Stage 2 biofilter was initially filled with 42 inches of lignocellulosic media and 24 inches of sulfur media, which ostensibly will last for many years without replenishment or replacement.

3.5 Water Quality Sample Collection and Analyses

Preliminary start-up sampling was conducted on October 11, 2012 (Experimental Day 16), October 23, 2012 (Experimental Day 28), and October 30, 2012 (Experimental Day 35) and consisted of monitoring the nitrogen transformation through the system. A full suite of influent, intermediate and effluent water quality samples from the system were collected for the first formal sample event on December 3, 2012 for water quality analysis. Samples were collected at each of the five monitoring points described in Section 3.2: B-HS2-STE, B-HS2-DBOX, B-HS2-PUMP, B-HS2-LIGNO-0" and B-HS2-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.

In addition, equipment blank (EB) and tap water blank (TAP) were taken. The equipment blank was collected by pumping deionized water through the cleaned pump tubing. This sample was then analyzed for the same parameters as the monitoring samples. One tap water sample was also collected to analyze for sulfate.

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, 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), fecal coliform (fecal), and E.coli. All analyses were performed by independent and fully NELAC certified analytical laboratories (Southern Analytical Laboratory, Pace Analytical and Benchmark EnviroAnalytical Inc.). Table 1 lists the analytical parameters, analytical methods, and detection limits for these analyses.

Analytical Parameters, Method of Analysis, and Detection Limits												
Analytical Parameter	Method of Analysis	Method Detection Limit (mg/L)										
Total Alkalinity as CaCO ₃	SM 2320B	2 mg/L										
Chemical Oxygen Demand (COD)	EPA 410.4	10 mg/L										
Total Kjeldahl Nitrogen (TKN-N)	EPA 351.2	0.05 mg/L										
Ammonia Nitrogen (NH ₃ -N)	EPA 350.1	0.005 mg/L										
Nitrate Nitrogen (NO ₃ -N)	EPA 300.0	0.01 mg/L										
Nitrite Nitrogen (NO ₂ -N)	EPA 300.0	0.01 mg/L										
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)	SM 2540E	1 mg/L										
Fecal Coliform (fecal)	SM9222D	2 ct/100mL										
E.coli	EPA1603	2 ct/100mL										

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

4.0 Results and Discussion

4.1 Operational Monitoring

Table 2 provides a summary of the household water use since water meter installation on March 6, 2012. The treatment system flow meter readings and corresponding recirculation ratio for the B-HS2 field site are summarized in Table 3. The operation and maintenance log which includes actions taken since start-up is provided in Appendix B. Summary tables of the Vericomm PLC recorded data are provided in Appendix C. These include daily and cumulative pump runtime and system alarms that are used to check general pump operation and performance.

Summary of Household Water Use											
Date	Cumulative Volume (gallons)	Average Daily Household Flow, Q (gpd)									
3/6/2012	7,790	INSTALLED									
4/3/2012	11,490	132									
5/1/2012	14,960	124									
6/5/2012	19,560	131									
7/3/2012	23,120	127									
8/7/2012	26,730	103									
9/4/2012	29,800	110									
10/2/2012	33,240	123									
11/6/2012	36,510	93									
12/4/2012	40,080	128									
Total average start-up to 12/4/12		118.3									

Table 2 Summary of Household Water Us

Table 3 Summary of System Flow

Date and Time Read	Combined Pumped Flow, Q Water Meter Reading (F+R)	Average Daily Com- bined, Q Flow	Stage 2, F Flow Meter Reading	Average Daily Stage 2, F Flow	Average Daily, R Flow	Average Recycle Ratio
	Cumulative Volume (gallons)	Gallons/ day	Cumulative Volume (gallons)	Gallons/ Day	Gallons/ Day	Recycle: Forward Flow
9/25/2012 11:00	351.9	Installed	102.2	Installed		
9/27/2012 9:45	570.5	Valves set	149.5	Valves set		
10/5/2012 8:07	3,898.3	419.5	880.6	92.2	327.4	3.55
10/11/2012 7:55	7,888.5	525.6	1,716.6	112.5	413.0	3.67
10/23/2012 9:00	15,092.9	559.2	3,228.2	118.6	440.7	3.72
10/30/2012 14:30	18,090.1	527.7	3,904.7	113.1	414.6	3.67
11/13/2012 14:00	22,944.4	474.3	5,007.3	103.0	371.3	3.61
12/3/2012 8:00	35,555.0	522.7	7,886.8	115.6	407.1	3.52
Total average start-up to		E04 9		100.2	205.7	262.1
12/3/12		504.8		109.2	395.7	3.02 . 1

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The two throttling globe valves control the fraction of Stage 1 effluent that is recirculated and the fraction sent to the Stage 2 biofilter. The globe valves were initially set so that 3.5 parts went back to the recirculation tank and 1 part went to the Stage 2 tank (3.5:1 recycle ratio). The household flow average was 118.3 gallons per day with periods of higher and lower flows. The average combined pumped flow (recirculation and forward flow to the Stage 2 biofilter) was 504.8 gallons per day, and the average forward flow to the Stage 2 biofilter was 109.2 gallons per day. Therefore, the average recirculation flow was 395.7 gallons per day, with a corresponding average recirculation ratio of 3.62:1.

4.2 Energy, Chemical and/or Additives Consumption

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

Date and Time Read	Electrical Meter Reading	Average Daily Electrical Use	Average Electrical Use per Gallon Pumped
	Cumulative (kWh)	(kWh/day)	(kWh/gal)
9/25/2012 11:05	0.2	Installed	
9/27/2012 9:58	0.3	Start-up	
10/5/2012 8:07	2.6	0.29	0.0007
10/11/2012 7:55	5.0	0.40	0.0008
10/23/2012 9:00	9.5	0.37	0.0007
10/30/2012 14:30	11.8	0.32	0.0006
11/9/2012 8:00	13.2	0.14	0.0008
11/13/2012 14:00	14.8	0.38	0.0007
12/3/2012 8:00	22.8	0.41	0.0008
Total average start-up to 12/3/12		0.33	0.0007

 Table 4

 Summary of System Electrical Use

The total average electrical use through December 3, 2012 was 0.33 kWh per day. The average electrical use per gallon pumped is 0.0007 kWh per gallon, and this parameter appears fairly stable since start-up.

4.3 Water Quality

Water quality analytical results and raw analytical data for the preliminary start-up sampling conducted on October 11, 2012 (Experimental Day 16), October 23, 2012 (Experimental Day 28), and October 30, 2012 (Experimental Day 35) are included in Appendix A. The TKN (Figure 9) and NOx-N (Figure 10) results are graphically represented in the following figures for the preliminary sample events.



Graphical Representation of Preliminary Sampling TKN Results



Figure 10 Graphical Representation of Preliminary Sampling NOX-N Results

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Water quality analytical results, for Sample Event No.1, are listed 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. The nitrogen results are graphically displayed in Figure 11.



Figure 11

Graphical Representation of Nitrogen Results

Septic Tank Effluent (STE) Quality: The water quality characteristics of STE collected in Sample Event 1 were within the typical range generally expected for domestic STE. The measured STE total nitrogen (TN) concentration was 49 mg/L, which is within the range that has been typically reported for Florida single family residence STE.

DBOX and Stage 1 Effluent (DBOX and Pump): The DBOX and Stage 1 effluent NH_3 -N levels were 11 mg/L and 0.29 mg/L, respectively with a DO level at 4.89 mg/L in the Stage 1 effluent (Table 5). TSS was equal to or below 15 mg/L, and the DBOX $CBOD_5$ was 35 mg/L while the Stage 1 effluent $CBOD_5$ was 5 mg/L. The DBOX NO_x -N was 0.02 mg/L, and the Stage 1 effluent NO_x -N was 13 mg/L. These results indicate significant pre-denitrification (approximately 69% reduction of STE nitrogen) was occurring as the effluent was recirculated back into the recirculation tank. The Stage 1 biofilter showed nearly complete nitrification with an NH_3 -N concentration of 0.29 mg/L and TKN of 2.3 mg/L.

Stage 2 Biofilter Effluent (LIGNO-0" and ST2): Effluent NO_x-N from the Stage 2 biofilter was below the method detection limit of 0.02 mg/L. The low NO_x-N was accompanied by a measured 0.07 mg/L DO and -343 mV ORP. The lignocellulosic media effluent NO_x-N was also below the method detection limit. The Stage 2 system produced a highly reducing environment and achieved essentially complete NO_x-N reduction. Final total nitrogen (TN) in the treatment system effluent was 5.6 mg/L, and it appears that there is an increase in nitrogen through the Stage 2 lignocellulosic media and potentially the sulfur media. Increases in CBOD₅ and TN have been reported previously for lignocellulosic denitrification during start-up, and it will be interesting to track these results as the system matures. The Stage 2 biofilter lignocellulosic effluent CBOD₅ was 96 mg/L and the sulfur effluent was 110 mg/L. It is anticipated that the CBOD₅ concentration will decrease over time. The Stage 2 effluent sulfate concentration was 170 mg/L.

Table 5Water Quality Analytical Results

Sample ID	Sample Date/Time	рН	Temp (°C)	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	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)
BHS2-STE	12/3/12 11:40	7.32	23.0	1,398	0.12	-360.0	510	36	32	140	400	49.03	49	1	48	0.03	0.01	0.03	48.03	5.7	3.5	59	17	54	800	2420
BHS2-DBOX	12/3/12 11:10	7.14	22.9	1,245	0.08	-181.8	300	14	14	35	100	16.02	16	5	11	0.01	0.01	0.02	11.02	3.7	1.1				1000	2420
BHS2-PUMP	12/3/12 12:10	6.86	23.2	1,226	4.89	50.8	250	15	10	5	13	15.3	2.3	2.01	0.29	12	0.26	13	13.29	3.7	0.72				6	3
BHS2-PUMP-SPLIT	12/3/12 12:10	6.86	23.2	1,226	4.89	50.8	253	5		2	14.4	16.4	1.3	1.09	0.21	14.7	0.38	15.1	15.31	3.4	3.7					
BHS2-LIGNO-0"	12/3/12 10:50	7.06	22.4	1,228	0.15	-356.9	440	5	4	96	220	4.52	4.5	1.8	2.7	0.01	0.01	0.02	2.72	3	2.2	86	18	40	64	40
BHS2-ST2	12/3/12 10:30	6.99	22.3	1,234	0.07	-342.9	410	6	4	110	230	5.62	5.6	1.5	4.1	0.01	0.01	0.02	4.12	4.8	4.1	170	15	32	150	29
BHS2-TAP	12/3/12 1:15	7.07	22.9	812	5.64	45.8									2 		5 5	J				240	0.01	0.01		
BHS2-EB	12/3/12 1:00	7.83	24.7	2	8.74	23.3	2.1	1	1	6	10	0.07	0.05	0.041	0.009	0.01	0.01	0.02	0.029	0.01	0.012	0.2	0.01	0.01	32	1
Notes:																										
¹ Total Nitrogen (TN) is a calculate	d value (equal to	the sum of TK	N and N	0 _{x.}																				
² Organic Nitrogen (ON) is a calcul	ated val	ue equa	to the differe	nce of T	KN and	NH _{3.}																			
³ Total Inorganic Nit	rogen (TIN) is	a calcula	ted valu	e equal to the	sum of	NH ₃ and	NO _{x.}																			
Gray-shaded data po	ints indicate va	alues belo	ow metho	d detection lev	el (mdl),	mdl valu	e used for	statistica	al analys	es.																

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.

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5.0 B-HS2 Sample Event No. 1: Summary and Recommendations

5.1 Summary

The results of the first sampling event indicate that the system is operating well and no adjustments are recommended at this time. The Sample Event No. 1 results indicate that:

- Septic tank effluent (STE) quality is characteristic of typical household STE quality. The total nitrogen concentration of 49 mg/L is within the range of values typically reported for Florida single family residence STE.
- The Stage 1 biofilter was effective in converting ammonium to oxidized nitrogen; effluent contained 2.3 mg/L TKN, of which 0.29 mg/L was ammonia.
- The Stage 2 biofilter was effective in producing a reducing environment and effluent NO_x-N was below the method detection limit.
- The total nitrogen concentration in the final effluent from the total treatment system was approximately 6 mg/L, an approximately 89% reduction from STE.

5.2 Recommendations

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

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Appendix A: Laboratory Report

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Sample ID	Sample Date/Time	SST Drivepoint location	Temp (°C)	рН	DO (mg/ L)	Specific Conduct ance (µS)	TSS (mg/L)	CBOD₅ (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH₃-N (mg/L N)	NOx (mg/L N)	TIN (mg/L N) ³	Sulfate (mg/L)	Hydrogen Sulfide (Unionized)	Sulfide
1ST PRELIMINARY SAM	PLE EVENT, 16 EXPER	IMENTAL DAYS															
B-HS2-STE	10/11/2012 9:30		26.4	7.66	0.1	1353		67	52.0	52	14.0	38	0.04	38.0			
B-HS2-DBOX	10/11/2012 9:20		25.6	7.36	0.4	1255			20.3	15	9.6	5.4	5.3	10.7			
B-HS2-PUMP	10/11/2012 8:40		24.2	6.84	5.1	1272			17.2	2.2	2.1	0.079	15	15.1			
B-HS2-ST2	10/11/2012 8:50		26.5	6.41	0.2	2220			26.1	26	19.6	6.4	0.13	6.5	75	74	96
2ND PRELIMINARY SAM	IPLE EVENT, 28 EXPE	RIMENTAL DAYS															
B-HS2-STE	10/23/2012 10:30		25.8	7.50	0.1	1399	20	130	75.0	75	23.0	52	0.03	52.0			
B-HS2-DBOX	10/23/2012 10:15		25.5	7.30	0.5	1233			20.6	20	11.5	8.5	0.61	9.1			
B-HS2-PUMP	10/23/2012 10:45		25.4	7.00	5.9	1198			10.1	2.5	2.5	0.038	7.6	7.6			
B-HS2-ST2	10/23/2012 10:00		25.5	6.50	0.2	1549			11.1	11	7.7	3.3	0.09	3.4	160	180	230
3RD PRELIMINARY SAM	PLE EVENT, 35 EXPE	RIMENTAL DAYS														•	•
B-HS2-STE	10/30/2012 15:15		23.7	7.50	0.1	1411	10	170	68.1	68	23.0	45	0.09	45.1			
B-HS2-DBOX	10/30/2012 15:15		23.4	8.00	0.1	1214			18.0	18	8.0	10	0.01	10.0			
B-HS2-PUMP	10/30/2012 15:15		23.5	7.60	6.8	1180			23.4	6.4	5.6	0.84	17	17.8			
B-HS2-ST2-LIGNO-18"	10/30/2012 14:25	Stage 2 - 18" from bottom	23.6	6.86	1.1	1149			8.1	8.1	7.6	0.53	0.03	0.6			
B-HS2-ST2-LIGNO-0"	10/30/2012 14:30	Stage 2 - bottom of ligno	23.2	6.72	0.7	1169			8.4	8.4	7.2	1.2	0.02	1.2			
B-HS2-ST2-SULFUR-3"	10/30/2012 14:10	Stage 2 - 3" from bottom	23.4	6.41	0.2	1369			14.1	14	9.6	4.4	0.06	4.5	44	190	250
B-HS2-ST2-SULFUR-12"	10/30/2012 14:00	Stage 2 - 12" from bottom	23.4	6.35	0.3	1457			13.1	13	9.1	3.9	0.07	4.0	3.5	250	320
B-HS2-ST2	10/30/2012 15:15	Stage 2 effluent	24.0	6.50	0.1	1504			15.2	15	11.4	3.6	0.2	3.8	250	120	150
Natas																	

Table A.1Preliminary Start-up Sampling Results

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.

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS2 MONITORING REPORT NO. 1

PRELIMINARY START-UP SAMPLE EVENT NO. 1

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

October 23, 2012 Work Order: 1211955

Laboratory Report

Project Name		Hillsboroug	h County B-HS2	2				
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Dil	lution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-STE Wastewater 1211955-01 10/11/12 09:30 Josephine Edeback 10/11/12 11:30	-Hirst					
Inorganics								
Ammonia as N	mg/L	38	EPA 350.1	0.80	0.19		10/18/12 11:10	20
Ammonium as NH4	mg/L	48	EPA 350.1	0.01	0.005	10/19/12 12:47	10/19/12 12:48	1
Carbonaceous BOD	mg/L	67	SM 5210B	2	2	10/12/12 07:33	10/17/12 16:06	1
Nitrate+Nitrite (N)	mg/L	0.04	EPA 353.2	0.04	0.01		10/18/12 13:04	1
Total Kjeldahl Nitrogen	mg/L	52	EPA 351.2	0.20	0.05	10/16/12 08:16	10/18/12 12:44	20.83
Total Suspended Solids	mg/L	18	SM 2540D	1	1	10/12/12 08:53	10/12/12 16:28	1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-DBOX Wastewater 1211955-02 10/11/12 09:20 Josephine Edeback 10/11/12 11:30	-Hirst					
Inorganics								
Ammonia as N	mg/L	5.4	EPA 350.1	0.80	0.19		10/18/12 11:15	20
Ammonium as NH4	mg/L	6.8	EPA 350.1	0.01	0.005	10/19/12 12:47	10/19/12 12:48	1
Nitrate+Nitrite (N)	mg/L	5.3	EPA 353.2	0.79	0.20		10/18/12 13:06	19.79
Total Kjeldahl Nitrogen	mg/L	15	EPA 351.2	0.20	0.05	10/16/12 08:16	10/18/12 12:46	20.83
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-PUMP Wastewater 1211955-03 10/11/12 08:40 Josephine Edeback 10/11/12 11:30	:-Hirst					
Inorganics								
Ammonia as N	mg/L	0.079	EPA 350.1	0.040	0.009		10/18/12 10:26	1
Ammonium as NH4	mg/L	0.10	EPA 350.1	0.01	0.005	10/19/12 12:47	10/19/12 12:48	1
Nitrate+Nitrite (N)	mg/L	15	EPA 353.2	0.79	0.20		10/18/12 13:08	19.79
Total Kjeldahl Nitrogen	mg/L	2.2	EPA 351.2	0.20	0.05	10/16/12 08:16	10/18/12 12:47	1

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

October 23, 2012 Work Order: 1211955

Laboratory Report

Project Name Hillsborough County B-HS2												
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Di	lution				
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-ST2 Wastewater 1211955-04 10/11/12 08:50 Josephine Edeback 10/11/12 11:30	(-Hirst									
Inorganics												
Hydrogen Sulfide (Unionized)	mg/L	74	SM 4550SF	0.04	0.01		10/15/12 15:28	1				
Ammonia as N	mg/L	6.4	EPA 350.1	0.80	0.19		10/18/12 11:17	20				
Ammonium as NH4	mg/L	8.2	EPA 350.1	0.01	0.005	10/19/12 12:47	10/19/12 12:48	1				
Nitrate+Nitrite (N)	mg/L	0.13	EPA 353.2	0.04	0.01		10/18/12 13:10	1				
Sulfate	mg/L	75	EPA 300.0	0.60	0.20		10/16/12 01:23	1				
Sulfide	mg/L	96	SM 4500SF	0.40	0.10		10/12/12 13:00	1				
Total Kjeldahl Nitrogen	mg/L	26	EPA 351.2	0.20	0.05	10/16/12 08:16	10/18/12 12:56	20.83				

Sone Corona

October 23, 2012

Work Order: 1211955

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 :

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

or to Client Services (clientservices@southernanalyticallabs.com).

Finder

12 11955 SAL Project No.

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Client	Name	and Sa	wver										Contac	t / Phone:	813-	630	-44	4 8			
Proje	ct Name / Location	<u>unu</u>																			
Samp	Hillsbor	rough C	Joun	ty B-HS2																	
	your the	·										PARAN	IETER	/ CONTAI	NER DES		N			r -, -	
SAL Use Only	Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water			0	ix i	iposite		Cool DD, TSS	nL P, H₂SO₄ , NH₄, NOX	Cool	, NaOH, Zn Acetate			d Temperature	Hd b	d Conductivity	Оар				
Sample No.	Sample Description	Date		Time	Matr	Co Co	Grat	CBC.	1KN	1LP SQ4	1LP H ₂ S			Fiel	Fiel	Fiel	Fiel				
01	B-HS2-STE	10/11/	12	9:3000	• ww		x	1	1		}			26.4	7.66	1353	0.14				
02	B-HS2-DBOX	1		9:20an	∼ww		x		1					25.6	7.36	1255	0.4				
03	B-HS2-PUMP			8:40ar	• ww		x		1					24.2	6.84	1272	3.9				
04	B-HS2-ST2	V		R: 500		[x		1	1	1			26.5	6.41	2220	0.2		1		
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PRELIMINARY START-UP SAMPLE EVENT NO. 2

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

November 2, 2012 Work Order: 1212410

Laboratory Report

Project Name		Hillsboroug	n County B-HS2	2				
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Dil	lution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-STE Wastewater 1212410-01 10/23/12 10:30 Josephine Edeback 10/23/12 16:45	-Hirst					
Inorganics								
Ammonia as N	mg/L	52	EPA 350.1	4.0	0.95		10/31/12 14:03	100
Ammonium as NH4	mg/L	66	EPA 350.1	0.05	0.01		10/31/12 14:47	1
Carbonaceous BOD	mg/L	130	SM 5210B	2	2	10/24/12 07:15	10/29/12 15:37	1
Nitrate+Nitrite (N)	mg/L	0.03 I	EPA 353.2	0.04	0.01		10/24/12 14:52	1
Total Kjeldahl Nitrogen	mg/L	75	EPA 351.2	0.20	0.05	10/26/12 08:10	10/29/12 14:39	20.83
Total Suspended Solids	mg/L	20	SM 2540D	1	1	10/24/12 14:38	10/25/12 13:54	1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-DBOX Wastewater 1212410-02 10/23/12 10:15 Josephine Edeback 10/23/12 16:45	-Hirst					
Inorganics								
Ammonia as N	mg/L	8.5	EPA 350.1	0.40	0.095		10/31/12 13:35	10
Ammonium as NH4	mg/L	11	EPA 350.1	0.05	0.01		10/31/12 14:47	1
Nitrate+Nitrite (N)	mg/L	0.61	EPA 353.2	0.04	0.01		10/24/12 14:54	1
Total Kjeldahl Nitrogen	mg/L	20	EPA 351.2	0.20	0.05	10/26/12 08:10	10/29/12 14:13	9.62
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-PUMP Wastewater 1212410-03 10/23/12 10:45 Josephine Edeback 10/23/12 16:45	-Hirst					
Inorganics								
Ammonia as N	mg/L	0.038 I	EPA 350.1	0.040	0.009		10/31/12 12:28	1
Ammonium as NH4	mg/L	0.05	EPA 350.1	0.05	0.01		10/31/12 14:47	1
Nitrate+Nitrite (N)	mg/L	7.6	EPA 353.2	0.20	0.05		10/24/12 15:29	5
Total Kieldahl Nitrogen	ma/L	2.5	EPA 351.2	0.20	0.05	10/26/12 08:10	10/29/12 13:18	1

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



November 2, 2012

Work Order: 1212410

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name Hillsborough County B-HS2												
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	ilution				
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-ST2 Wastewater 1212410-04 10/22/12 00:00-10/2 Josephine Edeback 10/23/12 16:45	3/12 10:00 -Hirst									
Inorganics												
Hydrogen Sulfide (Unionized)	mg/L	180	SM 4550SF	0.04	0.01		10/25/12 14:0	0 1				
Ammonia as N	mg/L	3.3	EPA 350.1	0.40	0.095		10/31/12 13:3	7 10				
Ammonium as NH4	mg/L	4.3	EPA 350.1	0.05	0.01		10/31/12 14:4	7 1				
Nitrate+Nitrite (N)	mg/L	0.09	EPA 353.2	0.04	0.01		10/24/12 14:58	B 1				
Sulfate	mg/L	160	EPA 300.0	0.60	0.20		10/29/12 15:5	7 1				
Sulfide	mg/L	230	SM 4500SF	0.40	0.10		10/25/12 14:0	0 1				
Total Kjeldahl Nitrogen	mg/L	11	EPA 351.2	0.20	0.05	10/26/12 08:10	10/29/12 14:14	4 9.62				

AND IN ACCORDANCE

November 2, 2012

Work Order: 1212410

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

or to Client Services (clientservices@southernanalyticallabs.com).

Finbail



SAL Project No.

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Mient N	Name Hazen	and Sawye	r									Contac	t / Phone:	813-	630-	449	8			
poject	Name / Location Hillsbor	ough Cour	ity B-HS2																	
ample	ers: (Signature)										PARAN	AFTER				N				
SAL Use Only	Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water	σ	Φ	ix	nposite	٩	, Cool DD, TSS	mL P, H ₂ SO4 4, NH4, NOX	, Cool	, NaOH, Zn Acetate			d Temperature	Hap	d Conductivity	OGP				
Sample Description			Li1	Ma	Ö	Gra	E H	250 TKI	S II	H ₂ S			т. Т	ц. Ц	Fiel	Fiel	[<u> </u>	\square	
01	B-HS2-STE	10/23/12	10:30	ww		x	1	1					32.8	7.5	1399	0,1		<u> </u>		
02	B-HS2-DBOX	10/23/12	10:15	ww		x		1					25.5	7.3	1233	0,5				
03	B-HS2-PUMP	10/23/12	10:45	ww		x		1					2511	7.0	1198	5,9				
04	B-HS2-ST2	10/23/12	10-00	ww		x		1	1	1			25.5	6.5	1549	0.2	 			
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Chain of Custody

PRELIMINARY START-UP SAMPLE EVENT NO. 3

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

November 8, 2012 Work Order: 1212666

Laboratory Report

Project Name Hillsborough County B-HS2											
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-STE Wastewater 1212666-01 10/30/12 15:15 Josephine Edeback 10/30/12 16:40	Hirst								
Inorganics											
Ammonia as N	ma/L	45	EPA 350.1	4.0	0.95		11/07/12 12:47	MMF			
Ammonium as NH4	ma/L	56	EPA 350.1	0.05	0.01	11/07/12 15:00	11/07/12 15:01	MMF			
Carbonaceous BOD	ma/L	170	SM 5210B	2	2	10/31/12 07:44	11/05/12 12:56	TJH			
Nitrate+Nitrite (N)	mg/L	0.09	EPA 353.2	0.04	0.01		11/06/12 10:38	MMF			
Total Kjeldahl Nitrogen	mg/L	68	EPA 351.2	0.20	0.05	11/02/12 09:51	11/06/12 11:10	MMF			
Total Suspended Solids	mg/L	10	SM 2540D	1	1	11/05/12 08:38	11/06/12 16:03	RFC			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-DBOX Wastewater 1212666-02 10/30/12 15:00 Josephine Edeback 10/30/12 16:40	Hirst								
Inorganics											
Ammonia as N	mg/L	10	EPA 350.1	0.40	0.095		11/07/12 12:49	MMF			
Ammonium as NH4	mg/L	13	EPA 350.1	0.05	0.01	11/07/12 15:00	11/07/12 15:01	MMF			
Nitrate+Nitrite (N)	mg/L	0.01 U	EPA 353.2	0.04	0.01		11/06/12 10:40	MMF			
Total Kjeldahl Nitrogen	mg/L	18	EPA 351.2	0.20	0.05	11/02/12 09:51	11/06/12 11:18	MMF			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-PUMP Wastewater 1212666-03 10/30/12 14:55 Josephine Edeback 10/30/12 16:40	Hirst								
Inorganico											
Ammonia as N	ma/l	0.84	FPA 350 1	0.040	0 000		11/07/12 11.26				
	mg/L	1 1	EPA 350.1	0.040	0.009	11/07/12 15:00	11/07/12 14.30				
Nitrate+Nitrite (N)	mg/L	17	EPA 353 2	0.00	0.01	11/07/12 15:00	11/06/12 11:3/				
Total Kieldahl Nitrogen	mg/L	6.4	EPA 351.2	0.20	0.05	11/02/12 09:51	11/06/12 11:20	MMF			

SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

November 8, 2012 Work Order: 1212666

Laboratory Report

Project Name		Hillsborough (County B-HS2	2				
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву
Sample Description		B-HS2-ST2						
Matrix		Wastewater						
SAL Sample Number		1212666-04						
Date/Time Collected		10/30/12 13:45						
Collected by		Josephine Edeback-H	irst					
Date/Time Received		10/30/12 16:40						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	120	SM 4550SF	0.04	0.01		11/01/12 09:17	TJH
Ammonia as N	mg/L	3.6	EPA 350.1	0.40	0.095		11/07/12 12:53	MMF
Ammonium as NH4	mg/L	4.6	EPA 350.1	0.05	0.01	11/07/12 15:00	11/07/12 15:01	MMF
Nitrate+Nitrite (N)	mg/L	0.20	EPA 353.2	0.04	0.01		11/06/12 13:00	MMF
Sulfate	mg/L	250	EPA 300.0	0.60	0.20		10/31/12 16:28	JAG
Sulfide	mg/L	150	SM 4500SF	0.40	0.10		10/31/12 10:37	TJH
Total Kjeldahl Nitrogen	mg/L	15	EPA 351.2	0.20	0.05	11/02/12 09:51	11/06/12 11:22	MMF
Sample Description		B-HS2-ST2-Sulfur-12"						
Matrix		Wastewater						
SAL Sample Number		1212666-05						
Date/Time Collected		10/30/12 14:00						
Collected by		Josephine Edeback-H	irst					
Date/Time Received		10/30/12 16:40						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	250	SM 4550SF	0.04	0.01	11/01/12 14:12	11/01/12 14:13	TJH
Ammonia as N	mg/L	3.9	EPA 350.1	0.40	0.095		11/07/12 12:55	MMF
Ammonium as NH4	mg/L	5.0	EPA 350.1	0.05	0.01	11/07/12 15:00	11/07/12 15:01	MMF
Nitrate+Nitrite (N)	mg/L	0.07	EPA 353.2	0.04	0.01		11/06/12 13:02	MMF
Sulfate	mg/L	3.5	EPA 300.0	0.60	0.20		11/02/12 00:20	JAG
Sulfide	mg/L	320	SM 4500SF	0.40	0.10		11/01/12 14:00	TJH
Total Kjeldahl Nitrogen	mg/L	13	EPA 351.2	0.20	0.05	11/02/12 09:51	11/06/12 11:23	MMF
Sample Description		B-HS2-ST2-Sulfur-3"						
Matrix		Wastewater						
SAL Sample Number		1212666-06						
Date/Time Collected		10/30/12 14:10						
Collected by		Josephine Edeback-H	irst					
Date/Time Received		10/30/12 16:40						
Inorganics								
Hydrogen Sulfide (Unionized)	ma/L	190	SM 4550SF	0.04	0.01	11/01/12 14:12	11/01/12 14:13	TJH
Ammonia as N	ma/L	4.4	EPA 350.1	0.40	0.095		11/07/12 12:57	MMF
Ammonium as NH4	ma/L	5.6	EPA 350.1	0.05	0.01	11/07/12 15:00	11/07/12 15:01	MMF
Nitrate+Nitrite (N)	ma/L	0.06	EPA 353.2	0.04	0.01		11/06/12 13:04	MMF
Sulfate	ma/L	44	EPA 300.0	0.60	0.20		11/02/12 16:12	JAG
Sulfide	ma/l	250	SM 4500SF	0.40	0.10		11/01/12 14:00	T.IH
		200		0.10	0.10			

Francis I. Daniels, Laboratory Director Leslie C. Boardman, Q.A. Manager
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218



November 8, 2012

Work Order: 1212666

Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		Hillsborough C	ounty B-HS2	2				
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-ST2-Sulfur-3" Wastewater 1212666-06 10/30/12 14:10 Josephine Edeback-Hin 10/30/12 16:40	rst					
Total Kjeldahl Nitrogen	mg/L	14	EPA 351.2	0.20	0.05	11/02/12 09:51	11/06/12 11:24	MMF
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-ST2-LIGNO-0" Wastewater 1212666-07 10/30/12 14:30 Josephine Edeback-Hit 10/30/12 16:40	rst					
Inorganics								
Ammonia as N	mg/L	1.2	EPA 350.1	0.40	0.095		11/07/12 12:59	MMF
Ammonium as NH4	mg/L	1.6	EPA 350.1	0.05	0.01	11/07/12 15:00	11/07/12 15:01	MMF
Nitrate+Nitrite (N)	mg/L	0.02 I	EPA 353.2	0.04	0.01		11/06/12 13:06	MMF
Total Kjeldahl Nitrogen	mg/L	8.4	EPA 351.2	0.20	0.05	11/02/12 09:51	11/06/12 11:25	MMF
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		B-HS2-ST2-LIGNO-18" Wastewater 1212666-08 10/30/12 14:25 Josephine Edeback-Hin 10/30/12 16:40	rst					
Inorganics								
Ammonia as N	mg/L	0.53	EPA 350.1	0.040	0.009		11/07/12 14:38	MMF
Ammonium as NH4	mg/L	0.68	EPA 350.1	0.05	0.01	11/07/12 15:00	11/07/12 15:01	MMF
Nitrate+Nitrite (N)	mg/L	0.03 I	EPA 353.2	0.04	0.01		11/06/12 13:09	MMF
Total Kjeldahl Nitrogen	mg/L	8.1	EPA 351.2	0.20	0.05	11/02/12 09:51	11/06/12 11:27	MMF

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November 8, 2012

Work Order: 1212666

Hazen and Sawyer

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Analvte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
		_								
Batch BJ23107 - Ion Chromato	graphy 300.0	Prep								
Blank (BJ23107-BLK1)					Prepared 8	Analyzed:	10/31/12			
Sulfate	0.20 U	0.60	0.20	mg/L						
LCS (BJ23107-BS1)					Prepared 8	Analyzed:	10/31/12			
Sulfate	9.10	0.60	0.20	mg/L	9.0		101	85-115		
LCS Dup (BJ23107-BSD1)					Prepared 8	Analyzed:	10/31/12			
Sulfate	9.03	0.60	0.20	mg/L	9.0		100	85-115	0.8	200
Matrix Spike (BJ23107-MS1)		Source: 1	212633-02		Prepared 8	Analyzed:	10/31/12			
Sulfate	143	0.60	0.20	mg/L	90	47.5	106	85-115		
Matrix Spike (BJ23107-MS2)		Source: 1	212666-04		Prepared 8	Analyzed:	10/31/12			
Sulfate	343	0.60	0.20	mg/L	90	250	103	85-115		
Batch BJ23126 - Sulfide prep										
Blank (BJ23126-BLK1)					Prepared 8	Analyzed:	10/31/12			
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BJ23126-BS1)					Prepared 8	Analyzed:	10/31/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0		96	85-115		
Matrix Spike (BJ23126-MS1)		Source: 1	212351-02		Prepared 8	Analyzed:	10/31/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0	ND	96	85-115		
Matrix Spike Dup (BJ23126-MSD1)		Source: 1	212351-02		Prepared 8	Analyzed:	10/31/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0	ND	96	85-115	0	14

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November 8, 2012

Work Order: 1212666

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Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BK20101 - BOD										
Blank (BK20101-BLK1)					Prepared:	10/31/12 Ar	nalyzed: 11/	05/12		
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BK20101-BS1)					Prepared:	10/31/12 Ar	nalyzed: 11/	05/12		
Carbonaceous BOD	194	2	2	mg/L	200		97	85-115		
LCS Dup (BK20101-BSD1)					Prepared:	10/31/12 Ar	nalyzed: 11/	05/12		
Carbonaceous BOD	198	2	2	mg/L	200		99	85-115	2	200
Duplicate (BK20101-DUP1)		Source: 1	212629-01		Prepared:	10/31/12 Ar	nalyzed: 11/	05/12		
Carbonaceous BOD	170	2	2	mg/L		170			0	25
Batch BK20121 - Ion Chromat	ography 300.0	Prep								
Blank (BK20121-BLK1)					Prepared &	Analyzed:	11/02/12			
Sulfate	0.20 U	0.60	0.20	mg/L						
LCS (BK20121-BS1)					Prepared 8	Analyzed:	11/02/12			
Sulfate	8.96	0.60	0.20	mg/L	9.0		100	85-115		
LCS Dup (BK20121-BSD1)					Prepared &	Analyzed:	11/02/12			
Sulfate	8.99	0.60	0.20	mg/L	9.0		100	85-115	0.3	200
Matrix Spike (BK20121-MS1)		Source: 1	212666-06		Prepared &	Analyzed:	11/02/12			
Sulfate	55.4 J5	0.60	0.20	mg/L	9.0	42.2	147	85-115		
Matrix Spike (BK20121-MS2)		Source: 1	212688-01		Prepared &	Analyzed:	11/02/12			
Sulfate	152	0.60	0.20	mg/L	90	61.1	101	85-115		

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November 8, 2012

Work Order: 1212666

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BK20124 - Sulfide prep										
Blank (BK20124-BLK1)					Prepared 8	Analyzed:	11/01/12			
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BK20124-BS1)					Prepared &	Analyzed:	11/01/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0		96	85-115		
Matrix Spike (BK20124-MS1)		Source: 1	212688-01		Prepared &	Analyzed:	11/01/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0	ND	96	85-115		
Matrix Spike Dup (BK20124-MSD1))	Source: 1	212688-01		Prepared &	Analyzed:	11/01/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0	ND	96	85-115	0	14
Batch BK20213 - Digestion for	TKN by EPA	351.2								
Blank (BK20213-BLK1)					Prepared:	11/02/12 Ar	nalyzed: 11/	06/12		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BK20213-BS1)					Prepared:	11/02/12 Ar	nalyzed: 11/	06/12		
Total Kjeldahl Nitrogen	2.70	0.20	0.05	mg/L	2.5		107	90-110		
Matrix Spike (BK20213-MS1)		Source: 1	212665-02		Prepared:	11/02/12 Ar	nalyzed: 11/	06/12		
Total Kjeldahl Nitrogen	3.48	0.20	0.05	mg/L	2.5	1.11	93	90-110		
Matrix Spike (BK20213-MS2)		Source: 1	212701-01		Prepared:	11/02/12 Ar	nalyzed: 11/	06/12		
Total Kjeldahl Nitrogen	3.75	0.20	0.05	mg/L	2.5	1.30	97	90-110		
Matrix Spike Dup (BK20213-MSD1))	Source: 1	212665-02		Prepared:	11/02/12 Ar	nalyzed: 11/	06/12		
Total Kjeldahl Nitrogen	3.85	0.20	0.05	mg/L	2.5	1.11	108	90-110	10	20

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November 8, 2012

Work Order: 1212666

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Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BK20213 - Digestion fo	r TKN by EPA	351.2								
Matrix Spike Dup (BK20213-MSD)	2)	Source: 1	212701-01		Prepared:	11/02/12 Ar	alyzed: 11/	06/12		
Total Kjeldahl Nitrogen	3.60	0.20	0.05	mg/L	2.5	1.30	91	90-110	4	20
Batch BK20223 - Ion Chromat	ography 300.0	Prep								
Blank (BK20223-BLK1)					Prepared 8	Analyzed:	11/02/12			
Sulfate	0.20 U	0.60	0.20	mg/L						
LCS (BK20223-BS1)					Prepared 8	Analyzed:	11/02/12			
Sulfate	9.08	0.60	0.20	mg/L	9.0		101	85-115		
LCS Dup (BK20223-BSD1)					Prepared 8	Analyzed:	11/02/12			
Sulfate	9.14	0.60	0.20	mg/L	9.0		102	85-115	0.7	200
Matrix Spike (BK20223-MS1)		Source: 1	212756-01		Prepared 8	Analyzed:	11/02/12			
Sulfate	86.1	0.60	0.20	mg/L	9.0	76.5	107	85-115		
Matrix Spike (BK20223-MS2)		Source: 1	212679-03		Prepared 8	Analyzed:	11/02/12			
Sulfate	93.0	0.60	0.20	mg/L	90	3.03	100	85-115		
Batch BK20505 - TSS prep										
Blank (BK20505-BLK1)					Prepared:	11/05/12 Ar	alyzed: 11/	06/12		
Total Suspended Solids	1 U	1	1	mg/L						
LCS (BK20505-BS1)					Prepared:	11/05/12 Ar	alyzed: 11/	06/12		
Total Suspended Solids	51.0	1	1	mg/L	50		102	85-115		

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November 8, 2012

Work Order: 1212666

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BK20505 - TSS prep										
Duplicate (BK20505-DUP1)		Source: 1	212657-01		Prepared:	11/05/12 Ar	nalyzed: 11/	06/12		
Total Suspended Solids	1 U	1	1	mg/L		ND				30
Duplicate (BK20505-DUP2)		Source: 1	212666-01		Prepared:	11/05/12 Ar	nalyzed: 11/	06/12		
Total Suspended Solids	11.5	1	1	mg/L		10.0			14	30
Batch BK20518 - Ammonia by S	EAL									
Blank (BK20518-BLK1)					Prepared &	Analyzed:	11/07/12			
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BK20518-BS1)					Prepared &	Analyzed:	11/07/12			
Ammonia as N	0.52	0.040	0.009	mg/L	0.50		103	90-110		
Matrix Spike (BK20518-MS1)		Source: 1	212594-07		Prepared &	Analyzed:	11/07/12			
Ammonia as N	0.57	0.040	0.009	mg/L	0.50	0.040	107	90-110		
Matrix Spike (BK20518-MS2)		Source: 1	212701-01		Prepared &	Analyzed:	11/07/12			
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	0.039	96	90-110		
Matrix Spike Dup (BK20518-MSD1)		Source: 1	212594-07		Prepared &	Analyzed:	11/07/12			
Ammonia as N	0.53	0.040	0.009	mg/L	0.50	0.040	98	90-110	8	10
Matrix Spike Dup (BK20518-MSD2)		Source: 1	212701-01		Prepared &	Analyzed:	11/07/12			
Ammonia as N	0.51	0.040	0.009	mg/L	0.50	0.039	95	90-110	0.9	10
Batch BK20602 - Nitrate 353.2 b	y seal									
Blank (BK20602-BLK1)					Prepared &	& Analyzed:	11/06/12			
Nitrate+Nitrite (N)	0.01 U	0.04	0.01	mg/L						

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November 8, 2012

Work Order: 1212666

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 BK20602 - Nitrate 3	53.2 by seal										
LCS (BK20602-BS1)					Prepared 8	& Analyzed:	11/06/12				
Nitrate+Nitrite (N)	0.833	0.04	0.01	mg/L	0.80		104	90-110			
Matrix Spike (BK20602-MS1)		Source: 1	212701-01		Prepared &	Analyzed:	11/06/12				
Nitrate+Nitrite (N)	1.32	0.04	0.01	mg/L	1.0	0.255	107	90-110			
Matrix Spike (BK20602-MS2)		Source: 1	212701-03		Prepared &	Analyzed:	11/06/12				
Nitrate+Nitrite (N)	1.28	0.04	0.01	mg/L	1.0	0.256	103	90-110			
Matrix Spike Dup (BK20602-M	ISD1)	Source: 1	212701-01		Prepared &	Analyzed:	11/06/12				
Nitrate+Nitrite (N)	1.35	0.04	0.01	mg/L	1.0	0.255	110	90-110	2	20	
Matrix Spike Dup (BK20602-M	ISD2)	Source: 1	212701-03	ł	Prepared &	Analyzed:	11/06/12				
Nitrate+Nitrite (N)	1.35	0.04	0.01	mg/L	1.0	0.256	109	90-110	5	20	

A DIED IN ACCORDANCE

November 8, 2012

Work Order: 1212666

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 Client Services at 813-855-1844.



SAL Project No. 1212666

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

Client	Name	Hazen a	and Sa	awyer					·····					Conta	ct / Phone:	813	8-630	2-44	98	- *		
Projec	Name / Location			_																		
Samo	lers: (Signature)	Hillsbor	rough (Count	y B-HS2																	
	40,00	the	ظ 									······	PARA	METER		NER DE	SCRIPTIO	N	·			
SAL Lise Only Sample	Matrix Codes: DW-Drinking Water WW-Wast SW-SurfaceWater SL-Sludge GW-Groundwater SA-Saline Water R-Reagent Water Sample Description	ewater 60-Soil • O-Other	ate		lime	Matrix	Composite	Srab	ILP, Cool CBOD, TSS	250mL P, H ₂ SO4 FKN, NH4, NOX	1LP, Cool SO4	ILP, NaOH, Zn Acetate H ₂ S			Field Temperature	Field pH	Field Conductivity	Field DO				
01	B-HS2-STE	,	10/2	rohn	ISAC			x	1	1					237	7.5	1411	0.1	1		1	1
02	B-HS2-DBOX				15:00	ww		x	· · · · · · · · · · · · · · · · · · ·	1					33,4	8.0	1214	0,1	1+		1	1
03	B-HS2-PUMP				14:55	ww		x	· · · · ·	1					27.5	7.6	1180	6.8			1	1
04	B-HS2-ST2		11		13:45	ww		x		1	1	1			24.0	6.5	1504	0,1			1	1
05	B-HSZSTA - SULFUR	?-12"	\square		14:00	LN		Y		1	ĩ	1			23.4	6.4	1457	0.3			1	-
06	B-HS2ST2-SULFUR	2-3"	V		14:10	ww		X		1	1	\bigcirc			23.4	6.4	1369	0.2				
DA	A TSZ STILLER	2.4.81	+)									6	need	ks ,	arese	verti	he!!	L				
198	B-HS2 - ST2-LIGNE	D- 0"	10 3	0/12	14:30	Va			_	1					23.2	6.7	1169	0.7			1	-
, 09	0-452-572-LIGA	10-18"	10/34	0/1-	14:25	ww		У		8					27.6	6.9	1149	1.0				
																						-
Contain Belingu Belingu Refingu	I Dat ished: ished: ished: Delt ished: Delt Del	te/Time: 0 - / - / 3 1 - 2 - 0 5 te/Time: te/Time: (Receiver Rec			o efe	Date/ Lú Date/ Date/ LO	Time $\frac{1}{2}$ Time $\frac{3}{2}$	112 130/2	1:00	p~ 538	Seal Sam Rece Prop	intact? ples intac eived on i er prese	tupon ; ce? Ter vatives	arrival? mp_20_ indicated?	Qn Qn Qn Qn Qn	NVA NVA NVA NVA	Instructio	ns / Rem	arks:		_
Reling	ished: Dat	te/Time: te/Time:	Receiv	ved: ved:			Date/	Time:				Vola Prop	a within f tiles rec'o er contai	fw/outi	headspace? ed?	y n y ni Q n						

Chain of Custody x/s Rev.Date 11/19/01

Chain of Custody

FORMAL SAMPLE EVENT NO. 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

December 18, 2012 Work Order: 1213822

Laboratory Report

Project Name		B-H	S2 SE#1					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Di	lution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-STE Wastewater 1213822-01 12/03/12 11:40 Josephine Edeback 12/03/12 16:00	-Hirst					
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	17	SM 4550SF	0.04	0.01	12/06/12 13:10	12/06/12 13:11	1
Ammonia as N	mg/L	48	EPA 350.1	4.0	0.95		12/10/12 12:40	100
Ammonia-Unionized as N	mg/L	0.49	SOP-10-3-83	0.01	0.005	12/10/12 15:49	12/10/12 15:50	1
Carbonaceous BOD	mg/L	140	SM 5210B	2	2	12/05/12 08:30	12/10/12 12:04	1
Chemical Oxygen Demand	mg/L	400	EPA 410.4	250	100	12/07/12 13:00	12/07/12 15:20	10
Nitrate (as N)	mg/L	0.03	EPA 300.0	0.04	0.01		12/04/12 16:57	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	1
Orthophosphate as P	mg/L	3.5	EPA 300.0	0.040	0.010		12/04/12 16:57	1
Phosphorous - Total as P	mg/L	5.7	SM 4500P-E	0.20	0.050	12/04/12 12:37	12/06/12 11:10	5
Sulfate	mg/L	59	EPA 300.0	0.60	0.20		12/04/12 16:57	1
Sulfide	mg/L	54	SM 4500SF	0.40	0.10		12/04/12 10:15	1
Total Alkalinity	mg/L	510	SM 2320B	8.0	2.0		12/04/12 11:46	1
Total Kjeldahl Nitrogen	mg/L	49	EPA 351.2	0.20	0.05	12/05/12 08:09	12/06/12 15:14	100
Total Organic Carbon	mg/L	81	SM 5310B	1.0	0.50		12/03/12 16:45	1
Total Suspended Solids	mg/L	36	SM 2540D	1	1	12/05/12 07:57	12/05/12 16:25	1
Volatile Suspended Solids	mg/L	32	EPA 160.4**	1	1	12/04/12 08:03	12/05/12 16:48	1
Nitrate+Nitrite (N)	mg/L	0.03	EPA 300.0	0.08	0.02		12/04/12 16:57	1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-DBOX Wastewater 1213822-02 12/03/12 11:10 Josephine Edeback 12/03/12 16:00	-Hirst					
Inorganics								
Ammonia as N	mg/L	11	EPA 350.1	0.80	0.19		12/10/12 11:33	20
Ammonia-Unionized as N	mg/L	0.07	SOP-10-3-83	0.01	0.005	12/10/12 15:49	12/10/12 15:50	1
Carbonaceous BOD	mg/L	35	SM 5210B	2	2	12/05/12 08:30	12/10/12 12:04	1
Chemical Oxygen Demand	mg/L	100	EPA 410.4	50	20	12/07/12 13:00	12/07/12 15:20	2
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	1
Orthophosphate as P	mg/L	1.1	EPA 300.0	0.040	0.010		12/04/12 16:57	1
Phosphorous - Total as P	ma/L	3.7	SM 4500P-E	0.20	0.050	12/04/12 12:37	12/06/12 11:11	5
Total Alkalinity	ma/L	300	SM 2320B	8.0	2.0		12/04/12 11:46	1
Total Kieldahl Nitrogen	ma/L	16	EPA 351.2	0.20	0.05	12/05/12 08:09	12/06/12 14:36	9.62
Total Organic Carbon	mg/L	31	SM 5310B	1.0	0.50		12/03/12 16:45	1

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



December 18, 2012

Work Order: 1213822

Hazen and Sawyer

10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

Laboratory Report

Project Name		B-HS2	2 SE#1					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	ilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-DBOX Wastewater 1213822-02 12/03/12 11:10 Josephine Edeback-H 12/03/12 16:00	lirst					
Total Suspended Solids	mg/L	14	SM 2540D	1	1	12/05/12 07:57	12/05/12 16:25	5 1
Volatile Suspended Solids	mg/L	14	EPA 160.4**	1	1	12/04/12 08:03	12/05/12 16:48	3 1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		12/04/12 16:57	7 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-PUMP Wastewater 1213822-03 12/03/12 12:10 Josephine Edeback-H 12/03/12 16:00	lirst					
Inorganics								
Ammonia as N	ma/L	0.29	EPA 350.1	0.040	0.009		12/10/12 12:41	I 1
Ammonia-Unionized as N	ma/L	0.01 U	SOP-10-3-83	0.01	0.005	12/10/12 15:49	12/10/12 15:50) 1
Carbonaceous BOD	ma/L	5	SM 5210B	2	2	12/05/12 08:30	12/10/12 12:04	i 1
Chemical Oxygen Demand	ma/L	13	EPA 410.4	25	10	12/07/12 13:00	12/07/12 15:20) 1
Nitrate (as N)	ma/L	12 Q	EPA 300.0	0.04	0.01		12/06/12 01:47	7 1
Nitrite (as N)	ma/L	0.26 Q	EPA 300.0	0.04	0.01		12/06/12 01:47	7 1
Orthophosphate as P	ma/L	0.72 Q	EPA 300.0	0.040	0.010		12/06/12 01:47	7 1
Phosphorous - Total as P	ma/L	3.7	SM 4500P-E	0.20	0.050	12/07/12 14:18	12/10/12 13:16	6 5
Total Alkalinity	ma/L	250	SM 2320B	8.0	2.0		12/10/12 09:14	i 1
Total Kieldahl Nitrogen	ma/L	2.3	EPA 351.2	0.20	0.05	12/07/12 09:27	12/11/12 10:19) 1
Total Organic Carbon	mg/L	14	SM 5310B	1.0	0.50		12/10/12 14:35	5 1
Total Suspended Solids	mg/L	15	SM 2540D	1	1	12/07/12 10:32	12/08/12 14:00) 1
Volatile Suspended Solids	mg/L	10	EPA 160.4**	1	1	12/07/12 08:06	12/09/12 15:06	5 1
Nitrate+Nitrite (N)	mg/L	13	EPA 300.0	0.08	0.02		12/06/12 01:47	7 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-LIGNO-0inch Wastewater 1213822-04 12/03/12 10:50 Josephine Edeback-H 12/03/12 16:00	lirst					
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	18	SM 4550SF	0.04	0.01	12/06/12 13:10	12/06/12 13:11	1
Ammonia as N	mg/L	2.7	EPA 350.1	0.40	0.095		12/10/12 11:46	6 10
Ammonia-Unionized as N	mg/L	0.01	SOP-10-3-83	0.01	0.005	12/10/12 15:49	12/10/12 15:50) 1

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December 18, 2012 Work Order: 1213822

Laboratory Report

Project Name		B-HS2	2 SE#1					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Di	lution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-LIGNO-0inch Wastewater 1213822-04 12/03/12 10:50 Josephine Edeback-H 12/03/12 16:00	lirst					
Carbonaceous BOD	mg/L	96	SM 5210B	2	2	12/05/12 08:30	12/10/12 12:04	1
Chemical Oxygen Demand	mg/L	220	EPA 410.4	50	20	12/07/12 13:00	12/07/12 15:20	2
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	1
Orthophosphate as P	mg/L	2.2	EPA 300.0	0.040	0.010		12/04/12 16:57	1
Phosphorous - Total as P	mg/L	3.0	SM 4500P-E	0.20	0.050	12/04/12 12:37	12/06/12 11:12	5
Sulfate	mg/L	86	EPA 300.0	0.60	0.20		12/04/12 16:57	1
Sulfide	mg/L	40	SM 4500SF	0.40	0.10		12/04/12 10:15	1
Total Alkalinity	mg/L	440	SM 2320B	8.0	2.0		12/04/12 11:46	1
Total Kjeldahl Nitrogen	mg/L	4.5	EPA 351.2	0.20	0.05	12/05/12 08:09	12/06/12 13:44	1
Total Organic Carbon	mg/L	36	SM 5310B	1.0	0.50		12/03/12 16:45	1
Total Suspended Solids	mg/L	5	SM 2540D	1	1	12/05/12 07:57	12/05/12 16:25	1
Volatile Suspended Solids	mg/L	4	EPA 160.4**	1	1	12/04/12 08:03	12/05/12 16:48	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		12/04/12 16:57	1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-ST2 Wastewater 1213822-05 12/03/12 10:30 Josephine Edeback-H 12/03/12 16:00	lirst					
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	15	SM 4550SF	0.04	0.01	12/06/12 13:10	12/06/12 13:11	1
Ammonia as N	mg/L	4.1	EPA 350.1	0.40	0.095		12/10/12 11:48	10
Ammonia-Unionized as N	mg/L	0.02	SOP-10-3-83	0.01	0.005	12/10/12 15:49	12/10/12 15:50	1
Carbonaceous BOD	mg/L	110	SM 5210B	2	2	12/05/12 08:30	12/10/12 12:04	1
Chemical Oxygen Demand	ma/L	230	EPA 410.4	50	20	12/07/12 13:00	12/07/12 15:20	2
Nitrate (as N)	ma/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	1
Nitrite (as N)	ma/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	1
Orthophosphate as P	ma/L	4.1 Q	SM 4500P-E	0.040	0.012	12/11/12 11:44	12/11/12 13:31	1
Phosphorous - Total as P	ma/l	48	SM 4500P-E	0.20	0.050	12/04/12 12:37	12/12/12 11.13	5
Sulfate	ma/L	170	EPA 300.0	0.60	0.20		12/07/12 01:40	1
Sulfide	ma/L	32	SM 4500SF	0.40	0.10		12/04/12 10:15	1
Total Alkalinity	ma/L	410	SM 2320B	8.0	2.0		12/04/12 11:46	1
Total Kjeldahl Nitrogen	ma/L	5.6	EPA 351.2	0.20	0.05	12/05/12 08:09	12/06/12 14:37	9.62
Total Organic Carbon	ma/L	36	SM 5310B	1.0	0.50		12/03/12 16:45	1
Total Suspended Solids	mg/L	6	SM 2540D	1	1	12/05/12 07:57	12/05/12 16:25	1

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December 18, 2012

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Laboratory Report

Project Name		B-HS	2 SE#1					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	ilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-ST2 Wastewater 1213822-05 12/03/12 10:30 Josephine Edeback-I 12/03/12 16:00	Hirst					
Volatile Suspended Solids	mg/L	4	EPA 160.4**	1	1	12/04/12 08:03	12/05/12 16:48	81
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		12/04/12 16:5	7 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-TAP Drinking Water 1213822-06 12/03/12 13:15 Josephine Edeback-I 12/03/12 16:00	Hirst					
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	12/06/12 13:10	12/06/12 13:1	1 1
Sulfate	mg/L	240	EPA 300.0	0.60	0.20		12/07/12 01:40	01
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		12/04/12 10:1	5 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS2-EB Reagent Water 1213822-07 12/03/12 13:00 Josephine Edeback-I 12/03/12 16:00	Hirst					
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	12/06/12 13:10	12/06/12 13:11	1 1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		12/10/12 11:50	D 1
Ammonia-Unionized as N	mg/L	0.01 U	SOP-10-3-83	0.01	0.005	12/10/12 15:49	12/10/12 15:50	0 1
Carbonaceous BOD	mg/L	6	SM 5210B	2	2	12/05/12 08:30	12/10/12 12:04	4 1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	12/07/12 13:00	12/07/12 15:20	0 1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	71
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		12/04/12 16:57	71
Orthophosphate as P	mg/L	0.012 U,Q	SM 4500P-E	0.040	0.012	12/11/12 11:44	12/11/12 13:37	1 1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	12/04/12 12:37	12/06/12 14:1	51
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		12/04/12 16:57	7 1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		12/04/12 10:1	51
Total Alkalinity	mg/L	2.1 I	SM 2320B	8.0	2.0		12/04/12 11:46	3 1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	12/05/12 08:09	12/06/12 13:48	81
Total Organic Carbon	mg/L	3.4	SM 5310B	1.0	0.50		12/03/12 16:4	51
Total Suspended Solids	ma/l	1	SM 2540D	1	1	10/05/10 07:57	10/05/10 16:00	- 1

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Laboratory Report

Project Name		B-HS	S2 SE#1					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-EB						
Matrix		Reagent Water						
SAL Sample Number		1213822-07						
Date/Time Collected		12/03/12 13:00						
Collected by		Josephine Edeback	-Hirst					
Date/Time Received		12/03/12 16:00						
Volatile Suspended Solids	mg/L	1 U	EPA 160.4**	1	1	12/04/12 08:03	12/05/12 16:4	48 1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		12/04/12 16:5	57 1

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Analyte	Result	POI	MDI	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
, indifie	Rooun			Onico	2010	rtoout	<i>,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Linito		Linin
Batch BL20334 - TOC prep										
Blank (BL20334-BLK1)					Prepared &	Analyzed:	12/03/12			
Total Organic Carbon	0.50 U	1.0	0.50	mg/L						
LCS (BL20334-BS1)					Prepared &	Analyzed:	12/03/12			
Total Organic Carbon	9.39	1.0	0.50	mg/L	10		94	90-110		
Matrix Spike (BL20334-MS1)		Source: 1	213368-76	i	Prepared &	Analyzed:	12/03/12			
Total Organic Carbon	11.2	1.0	0.50	mg/L	10	ND	112	85-115		
Matrix Spike Dup (BL20334-MSD1)		Source: 1	213368-76		Prepared &	Analyzed:	12/03/12			
Total Organic Carbon	11.2	1.0	0.50	mg/L	10	ND	112	85-115	0.2	10
Batch BL20401 - TVS Prep										
Blank (BL20401-BLK1)					Prepared:	12/04/12 Ar	nalyzed: 12	/05/12		
Volatile Suspended Solids	1 U	1		mg/L						
Duplicate (BL20401-DUP1)		Source: 1	213822-07		Prepared:	12/04/12 Ar	nalyzed: 12	/05/12		
Volatile Suspended Solids	1 U	1		mg/L		ND				20
Batch BL20406 - Sulfide prep										
Blank (BL20406-BLK1)					Prepared &	& Analyzed:	12/04/12			
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BL20406-BS1)					Prepared &	Analyzed:	12/04/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0		96	85-115		

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20406 - Sulfide prep										
Matrix Spike (BL20406-MS1)		Source: 1	213822-07		Prepared 8	Analyzed:	12/04/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0	ND	96	85-115		
Matrix Spike Dup (BL20406-MSD	1)	Source: 1	213822-07		Prepared &	& Analyzed:	12/04/12			
Sulfide	4.78	0.40	0.10	mg/L	5.0	ND	96	85-115	0	14
Batch BL20409 - Ion Chromat	ography 300.0	Prep								
Blank (BL20409-BLK1)					Prepared 8	Analyzed:	12/04/12			
Sulfate	0.20 U	0.60	0.20	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
LCS (BL20409-BS1)					Prepared &	Analyzed:	12/04/12			
Sulfate	8.80	0.60	0.20	mg/L	9.0		98	85-115		
Nitrate (as N)	1.71	0.04	0.01	mg/L	1.7		101	85-115		
Orthophosphate as P	0.856	0.040	0.010	mg/L	0.90		95	85-115		
Nitrite (as N)	1.26	0.04	0.01	mg/L	1.4		90	85-115		
LCS Dup (BL20409-BSD1)					Prepared &	Analyzed:	12/04/12			
Sulfate	8.80	0.60	0.20	mg/L	9.0		98	85-115	0	200
Nitrite (as N)	1.26	0.04	0.01	mg/L	1.4		90	85-115	0	200
Orthophosphate as P	0.916	0.040	0.010	mg/L	0.90		102	85-115	7	200
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	0.6	200
Matrix Spike (BL20409-MS1)		Source: 1	213822-01		Prepared &	Analyzed:	12/04/12			
Nitrate (as N)	1.83	0.04	0.01	mg/L	1.7	0.0278	106	85-115		
Sulfate	68.3	0.60	0.20	mg/L	9.0	59.0	103	85-115		
Orthophosphate as P	4.50	0.040	0.010	mg/L	0.90	3.51	110	85-115		
Nitrite (as N)	1.35	0.04	0.01	mg/L	1.4	ND	96	85-115		

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20409 - Ion Chromat	ography 300.0	Prep								
Matrix Spike (BL20409-MS2)		Source: 1	213828-05		Prepared &	& Analyzed:	12/04/12			
Nitrate (as N)	1.84	0.04	0.01	mg/L	1.7	0.140	100	85-115		
Orthophosphate as P	1.01	0.040	0.010	mg/L	0.90	0.0863	103	85-115		
Sulfate	88.9	0.60	0.20	mg/L	9.0	80.8	90	85-115		
Nitrite (as N)	1.29	0.04	0.01	mg/L	1.4	ND	92	85-115		
Batch BL20420 - Digestion fo	r TP by EPA 36	5.2/SM4500	PE							
Blank (BL20420-BLK1)					Prepared:	12/04/12 Ar	nalyzed: 12	/06/12		
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BL20420-BS1)					Prepared:	12/04/12 Ar	nalyzed: 12	/06/12		
Phosphorous - Total as P	0.800	0.040	0.010	mg/L	0.80		100	90-110		
Matrix Spike (BL20420-MS1)		Source: 1	213780-07		Prepared:	12/04/12 Ar	nalyzed: 12	/06/12		
Phosphorous - Total as P	1.20	0.040	0.010	mg/L	1.0	0.160	104	90-110		
Matrix Spike (BL20420-MS2)		Source: 1	213784-02		Prepared:	12/04/12 Ar	nalyzed: 12	/06/12		
Phosphorous - Total as P	0.979	0.040	0.010	mg/L	1.0	0.0498	93	90-110		
Matrix Spike Dup (BL20420-MSD	1)	Source: 1	213780-07		Prepared:	12/04/12 Ar	nalyzed: 12	/06/12		
Phosphorous - Total as P	1.15	0.040	0.010	mg/L	1.0	0.160	99	90-110	4	25
Matrix Spike Dup (BL20420-MSD	2)	Source: 1	213784-02		Prepared:	12/04/12 Ar	nalyzed: 12	/06/12		
Phosphorous - Total as P	0.966	0.040	0.010	mg/L	1.0	0.0498	92	90-110	1	25
Batch BL20439 - alkalinity										
Blank (BL20439-BLK1)					Prepared &	& Analyzed:	12/04/12			
Total Alkalinity	2.0 U	8.0	2.0	mg/L						

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20439 - alkalinity										
Blank (BL20439-BLK2)					Prepared &	Analyzed:	12/04/12			
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
Blank (BL20439-BLK3)					Prepared &	& Analyzed:	12/04/12			
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BL20439-BS1)					Prepared &	Analyzed:	12/04/12			
Total Alkalinity	120	8.0	2.0	mg/L	120		100	90-110		
LCS (BL20439-BS2)					Prepared &	Analyzed:	12/04/12			
Total Alkalinity	120	8.0	2.0	mg/L	120		100	90-110		
LCS (BL20439-BS3)					Prepared &	Analyzed:	12/04/12			
Total Alkalinity	120	8.0	2.0	mg/L	120		100	90-110		
Matrix Spike (BL20439-MS1)		Source: 1	213368-52		Prepared &	Analyzed:	12/04/12			
Total Alkalinity	120	8.0	2.0	mg/L	120	2.1	98	80-120		
Matrix Spike (BL20439-MS2)		Source: 1	213720-01		Prepared &	Analyzed:	12/04/12			
Total Alkalinity	220	8.0	2.0	mg/L	120	93	100	80-120		
Matrix Spike (BL20439-MS3)		Source: 1	213828-07		Prepared &	Analyzed:	12/04/12			
Total Alkalinity	270	8.0	2.0	mg/L	120	150	100	80-120		
Matrix Spike Dup (BL20439-MSD1)		Source: 1	213368-52		Prepared &	Analyzed:	12/04/12			
Total Alkalinity	120	8.0	2.0	mg/L	120	2.1	98	80-120	0	26
Matrix Spike Dup (BL20439-MSD2)		Source: 1	213720-01		Prepared &	Analyzed:	12/04/12			
Total Alkalinity	220	8.0	2.0	mg/L	120	93	100	80-120	0	26

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20439 - alkalinity										
Matrix Spike Dup (BL20439-MSD3)		Source: 1	213828-07		Prepared &	& Analyzed:	12/04/12			
Total Alkalinity	270	8.0	2.0	mg/L	120	150	100	80-120	0	26
Batch BL20502 - TSS prep										
Blank (BL20502-BLK1)					Prepared &	Analyzed:	12/05/12			
Total Suspended Solids	1 U	1	1	mg/L						
Blank (BL20502-BLK2)					Prepared &	Analyzed:	12/05/12			
Total Suspended Solids	1 U	1	1	mg/L						
LCS (BL20502-BS1)					Prepared &	Analyzed:	12/05/12			
Total Suspended Solids	44.2	1	1	mg/L	50		88	85-115		
LCS (BL20502-BS2)					Prepared &	Analyzed:	12/05/12			
Total Suspended Solids	43.2	1	1	mg/L	50		86	85-115		
Duplicate (BL20502-DUP1)		Source: 1	213679-07		Prepared &	Analyzed:	12/05/12			
Total Suspended Solids	1 U	1	1	mg/L		ND				30
Duplicate (BL20502-DUP2)		Source: 1	213679-06		Prepared &	Analyzed:	12/05/12			
Total Suspended Solids	1 U	1	1	mg/L		ND				30
Batch BL20504 - Digestion for 1	KN by EPA	351.2								
Blank (BL20504-BLK1)					Prepared:	12/05/12 Ar	nalyzed: 12	/06/12		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						

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December 18, 2012

Work Order: 1213822

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 BL20504 - Digestion fo	or TKN by EPA	351.2								
LCS (BL20504-BS1)					Prepared:	12/05/12 Ar	nalyzed: 12	/06/12		
Total Kjeldahl Nitrogen	2.59	0.20	0.05	mg/L	2.5		102	90-110		
Matrix Spike (BL20504-MS1)		Source: 1	213368-40		Prepared:	12/05/12 Ar	nalyzed: 12	/06/12		
Total Kjeldahl Nitrogen	3.62	0.20	0.05	mg/L	2.5	1.25	94	90-110		
Matrix Spike (BL20504-MS2)		Source: 1	213368-53		Prepared:	12/05/12 Ar	nalyzed: 12	/06/12		
Total Kjeldahl Nitrogen	4.44	0.20	0.05	mg/L	2.5	1.83	103	90-110		
Matrix Spike Dup (BL20504-MSD	91)	Source: 1	213368-40		Prepared:	12/05/12 Ar	nalyzed: 12	/06/12		
Total Kjeldahl Nitrogen	3.81	0.20	0.05	mg/L	2.5	1.25	101	90-110	5	20
Matrix Spike Dup (BL20504-MSD)2)	Source: 1	213368-53		Prepared:	12/05/12 Ar	nalyzed: 12	/06/12		
Total Kjeldahl Nitrogen	4.26	0.20	0.05	mg/L	2.5	1.83	96	90-110	4	20
Batch BL20519 - Ion Chroma	tography 300.0	Prep								
Blank (BL20519-BLK1)					Prepared &	Analyzed:	12/06/12			
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						
LCS (BL20519-BS1)					Prepared &	Analyzed:	12/06/12			
Nitrite (as N)	1.26	0.04	0.01	mg/L	1.4		90	85-115		
Orthophosphate as P	0.886	0.040	0.010	mg/L	0.90		98	85-115		
Nitrate (as N)	1.69	0.04	0.01	mg/L	1.7		99	85-115		
LCS Dup (BL20519-BSD1)					Prepared &	Analyzed:	12/06/12			
Orthophosphate as P	0.879	0.040	0.010	mg/L	0.90		98	85-115	0.8	200
Nitrite (as N)	1.26	0.04	0.01	mg/L	1.4		90	85-115	0	200
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115	0.6	200

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20519 - Ion Chroma	tography 300.0	Prep								
Matrix Spike (BL20519-MS1)		Source: 1	213907-03		Prepared &	& Analyzed:	12/06/12			
Orthophosphate as P	0.928	0.040	0.010	mg/L	0.90	0.0866	93	85-115		
Nitrite (as N)	1.31	0.04	0.01	mg/L	1.4	ND	94	85-115		
Nitrate (as N)	2.37	0.04	0.01	mg/L	1.7	0.631	102	85-115		
Matrix Spike (BL20519-MS2)		Source: 1	213927-01		Prepared &	& Analyzed:	12/06/12			
Orthophosphate as P	2.11	0.040	0.010	mg/L	0.90	1.24	97	85-115		
Nitrite (as N)	1.34	0.04	0.01	mg/L	1.4	ND	96	85-115		
Nitrate (as N)	15.0	0.04	0.01	mg/L	1.7	13.2	106	85-115		
Batch BL20534 - BOD										
Blank (BL20534-BLK1)					Prepared:	12/05/12 Ar	nalyzed: 12	/10/12		
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BL20534-BLK2)					Prepared:	12/05/12 Ar	nalyzed: 12	/10/12		
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BL20534-BS1)					Prepared:	12/05/12 Ar	nalyzed: 12	/10/12		
Carbonaceous BOD	188	2	2	mg/L	200		94	85-115		
LCS (BL20534-BS2)					Prepared:	12/05/12 Ar	nalyzed: 12	/10/12		
Carbonaceous BOD	197	2	2	mg/L	200		98	85-115		
LCS Dup (BL20534-BSD1)					Prepared:	12/05/12 Ar	nalyzed: 12	/10/12		
Carbonaceous BOD	196	2	2	mg/L	200		98	85-115	4	200
LCS Dup (BL20534-BSD2)					Prepared:	12/05/12 Ar	nalyzed: 12	/10/12		
Carbonaceous BOD	203	2	2	mg/L	200		101	85-115	3	200

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20534 - BOD										
Duplicate (BL20534-DUP1)		Source: 1	213368-78		Prepared:	12/05/12 A	nalyzed: 12	/10/12		
Carbonaceous BOD	39	2	2	mg/L		38			3	25
Duplicate (BL20534-DUP2)		Source: 1	213869-01		Prepared:	12/05/12 Ai	nalyzed: 12	/10/12		
Carbonaceous BOD	110	2	2	mg/L		100			6	25
Batch BL20617 - Ion Chroma	tography 300.0	Prep								
Blank (BL20617-BLK1)					Prepared 8	Analyzed:	12/07/12			
Sulfate	0.20 U	0.60	0.20	mg/L						
LCS (BL20617-BS1)					Prepared &	Analyzed:	12/07/12			
Sulfate	8.83	0.60	0.20	mg/L	9.0		98	85-115		
LCS Dup (BL20617-BSD1)					Prepared &	Analyzed:	12/07/12			
Sulfate	8.77	0.60	0.20	mg/L	9.0		97	85-115	0.7	200
Matrix Spike (BL20617-MS1)		Source: 1	213822-06		Prepared &	Analyzed:	12/07/12			
Sulfate	338	0.60	0.20	mg/L	90	244	104	85-115		
Matrix Spike (BL20617-MS2)		Source: 1	213862-04		Prepared &	Analyzed:	12/07/12			
Sulfate	949	0.60	0.20	mg/L	900	53.9	99	85-115		
Batch BL20706 - Digestion fo	r TKN by EPA	351.2								
Blank (BL20706-BLK1)					Prepared:	12/07/12 A	nalyzed: 12	/11/12		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20706 - Digestion fo	r TKN by EPA	351.2								
LCS (BL20706-BS1)					Prepared:	12/07/12 Ar	nalyzed: 12	/11/12		
Total Kjeldahl Nitrogen	2.67	0.20	0.05	mg/L	2.5		106	90-110		
Matrix Spike (BL20706-MS1)		Source: 1	213866-01		Prepared:	12/07/12 Ar	nalyzed: 12	/11/12		
Total Kjeldahl Nitrogen	3.57	0.20	0.05	mg/L	2.5	0.957	103	90-110		
Matrix Spike (BL20706-MS2)		Source: 1	213866-04		Prepared:	12/07/12 Ar	nalyzed: 12	/11/12		
Total Kjeldahl Nitrogen	3.55	0.20	0.05	mg/L	2.5	0.910	104	90-110		
Matrix Spike Dup (BL20706-MSD	1)	Source: 1	213866-01		Prepared:	12/07/12 Ar	nalyzed: 12	/11/12		
Total Kjeldahl Nitrogen	3.65	0.20	0.05	mg/L	2.5	0.957	106	90-110	2	20
Matrix Spike Dup (BL20706-MSD)	2)	Source: 1	213866-04		Prepared:	12/07/12 Ar	nalyzed: 12	/11/12		
Total Kjeldahl Nitrogen	3.52	0.20	0.05	mg/L	2.5	0.910	103	90-110	0.7	20
Batch BL20715 - TSS prep										
Blank (BL20715-BLK1)					Prepared:	12/07/12 Ar	nalyzed: 12	/08/12		
Total Suspended Solids	1 U	1	1	mg/L						
Blank (BL20715-BLK2)					Prepared:	12/07/12 Ar	nalyzed: 12	/08/12		
Total Suspended Solids	1 U	1	1	mg/L						
LCS (BL20715-BS1)					Prepared:	12/07/12 Ar	nalyzed: 12	/08/12		
Total Suspended Solids	50.0	1	1	mg/L	50		100	85-115		
LCS (BL20715-BS2)					Prepared:	12/07/12 Ar	nalyzed: 12	/08/12		
Total Suspended Solids	49.2	1	1	mg/L	50		98	85-115		

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20715 - TSS prep										
Duplicate (BL20715-DUP1)		Source: 1	213676-02		Prepared:	12/07/12 Ar	nalyzed: 12/	/08/12		
Total Suspended Solids	5.00	1	1	mg/L		5.00			0	30
Duplicate (BL20715-DUP2)		Source: 1	213678-04		Prepared:	12/07/12 Ar	nalyzed: 12/	/08/12		
Total Suspended Solids	3.50	1	1	mg/L		3.50			0	30
Batch BL20717 - TOC prep										
Blank (BL20717-BLK1)					Prepared 8	Analyzed:	12/10/12			
Total Organic Carbon	0.50 U	1.0	0.50	mg/L						
LCS (BL20717-BS1)					Prepared &	Analyzed:	12/10/12			
Total Organic Carbon	9.76	1.0	0.50	mg/L	10		98	90-110		
Matrix Spike (BL20717-MS1)		Source: 1	214029-01		Prepared &	Analyzed:	12/10/12			
Total Organic Carbon	8.68	1.0	0.50	mg/L	10	ND	87	85-115		
Matrix Spike Dup (BL20717-MSD1)		Source: 1	214029-01		Prepared &	Analyzed:	12/10/12			
Total Organic Carbon	10.8 J3	1.0	0.50	mg/L	10	ND	108	85-115	22	10
Batch BL20728 - COD prep										
Blank (BL20728-BLK1)					Prepared 8	Analyzed:	12/07/12			
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BL20728-BS1)					Prepared &	Analyzed:	12/07/12			
Chemical Oxygen Demand	47	25	10	mg/L	50		94	90-110		

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL20728 - COD prep										
Matrix Spike (BL20728-MS1)		Source: 1	213822-07		Prepared &	& Analyzed:	12/07/12			
Chemical Oxygen Demand	47	25	10	mg/L	50	ND	94	85-115		
Matrix Spike Dup (BL20728-MSD1)	Source: 1	213822-07		Prepared &	& Analyzed:	12/07/12			
Chemical Oxygen Demand	47	25	10	mg/L	50	ND	94	85-115	0	32
Batch BL20735 - Digestion for	TP by EPA 36	5.2/SM4500	PE							
Blank (BL20735-BLK1)					Prepared:	12/07/12 Ar	nalyzed: 12	/10/12		
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BL20735-BS1)					Prepared:	12/07/12 Ar	nalyzed: 12	/10/12		
Phosphorous - Total as P	0.807	0.040	0.010	mg/L	0.80		101	90-110		
Matrix Spike (BL20735-MS1)		Source: 1	213866-01		Prepared:	12/07/12 Ar	nalyzed: 12	/10/12		
Phosphorous - Total as P	1.34	0.040	0.010	mg/L	1.0	0.344	100	90-110		
Matrix Spike (BL20735-MS2)		Source: 1	213887-03		Prepared:	12/07/12 Ar	nalyzed: 12	/10/12		
Phosphorous - Total as P	1.07	0.040	0.010	mg/L	1.0	0.101	97	90-110		
Matrix Spike Dup (BL20735-MSD1)	Source: 1	213866-01		Prepared:	12/07/12 Ar	nalyzed: 12	/10/12		
Phosphorous - Total as P	1.36	0.040	0.010	mg/L	1.0	0.344	102	90-110	1	25
Matrix Spike Dup (BL20735-MSD2)	Source: 1	213887-03		Prepared:	12/07/12 Ar	nalyzed: 12	/10/12		
Phosphorous - Total as P	1.03	0.040	0.010	mg/L	1.0	0.101	93	90-110	3	25
Batch BL21003 - Ammonia by	SEAL									
Blank (BL21003-BLK1)					Prepared &	& Analyzed:	12/10/12			
Ammonia as N	0.009 U	0.040	0.009	mg/L						

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL21003 - Ammonia by S	EAL									
LCS (BL21003-BS1)					Prepared 8	Analyzed:	12/10/12			
Ammonia as N	0.51	0.040	0.009	mg/L	0.50		102	90-110		
Matrix Spike (BL21003-MS1)		Source: 1	213779-01		Prepared &	Analyzed:	12/10/12			
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	ND	105	90-110		
Matrix Spike (BL21003-MS2)		Source: 1	213860-03		Prepared &	Analyzed:	12/10/12			
Ammonia as N	0.89	0.040	0.009	mg/L	0.50	0.43	92	90-110		
Matrix Spike Dup (BL21003-MSD1)		Source: 1	213779-01		Prepared &	Analyzed:	12/10/12			
Ammonia as N	0.51	0.040	0.009	mg/L	0.50	ND	103	90-110	2	10
Matrix Spike Dup (BL21003-MSD2)		Source: 1	213860-03		Prepared &	Analyzed:	12/10/12			
Ammonia as N	0.90	0.040	0.009	mg/L	0.50	0.43	93	90-110	0.6	10
Batch BL21015 - alkalinity										
Blank (BL21015-BLK1)					Prepared &	Analyzed:	12/10/12			
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BL21015-BS1)					Prepared &	Analyzed:	12/10/12			
Total Alkalinity	120	8.0	2.0	mg/L	120		100	90-110		
Matrix Spike (BL21015-MS1)		Source: 1	213680-03		Prepared &	Analyzed:	12/10/12			
Total Alkalinity	230	8.0	2.0	mg/L	120	100	100	80-120		
Matrix Spike Dup (BL21015-MSD1)		Source: 1	213680-03		Prepared &	Analyzed:	12/10/12			
Total Alkalinity	230	8.0	2.0	mg/L	120	100	100	80-120	0	26

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BL21103 - TVS Prep										
Blank (BL21103-BLK1)					Prepared:	12/07/12 Ai	nalyzed: 12/	09/12		
Volatile Suspended Solids	1 U	1		mg/L						
Duplicate (BL21103-DUP1)		Source: 1	214049-02		Prepared:	12/07/12 Ar	nalyzed: 12/	09/12		
Volatile Suspended Solids	2,800	1		mg/L		2900			4	20
Batch BL21112 - Ortho phospho	orus SM4500	P-E by seal								
Blank (BL21112-BLK1)					Prepared &	& Analyzed:	12/11/12			
Orthophosphate as P	0.012 U	0.040	0.012	mg/L						
Blank (BL21112-BLK2)					Prepared &	& Analyzed:	12/11/12			
Orthophosphate as P	0.012 U	0.040	0.012	mg/L						
LCS (BL21112-BS1)					Prepared &	& Analyzed:	12/11/12			
Orthophosphate as P	0.813	0.040	0.012	mg/L	0.80		102	90-110		
LCS (BL21112-BS2)					Prepared &	& Analyzed:	12/11/12			
Orthophosphate as P	0.828	0.040	0.012	mg/L	0.80		103	90-110		
Matrix Spike (BL21112-MS1)		Source: 1	213675-02		Prepared 8	& Analyzed:	12/11/12			
Orthophosphate as P	0.967	0.040	0.012	mg/L	1.0	0.0358	93	90-110		
Matrix Spike (BL21112-MS2)		Source: 1	213950-01		Prepared &	& Analyzed:	12/11/12			
Orthophosphate as P	1.17	0.040	0.012	mg/L	1.0	0.180	99	90-110		
Matrix Spike Dup (BL21112-MSD1)		Source: 1	213675-02		Prepared &	& Analyzed:	12/11/12			
Orthophosphate as P	0.970	0.040	0.012	mg/L	1.0	0.0358	93	90-110	0.3	25

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Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BL21112 - Ortho phosp	horus SM4500	P-E by seal								
Matrix Spike Dup (BL21112-MSD2	2)	Source: 1	213950-01		Prepared &	& Analyzed:	12/11/12			
Orthophosphate as P	1.15	0.040	0.012	mg/L	1.0	0.180	97	90-110	2	25

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December 18, 2012

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* Qualifiers, Notes and Definitions

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

Q Sample held beyond the accepted holding time.

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

Kathryn@southernanalyticallabs.com



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Clien	Name											Contac	t / Phone:							
Proje	t Name / Location	and Sawy	er																	
	B-HS2	SE#1								_	_									
Sam	lers: (Signature)														00:07/01					_
SAL Use Only Sampio	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	Grab	1LP, Cool Total Alkalinity, TSS, VSS, CBOD, Nox, OP, SO4	250mL P, H ₂ SO ₄ COD, TKN, NH ₄ , TP	1LP, NaOH, Zn Acetate H ₂ S	40mLaV, HCI TOC	1LP, Cool Total Alkalinity, TSS, VSS, 2 CBOD, NOx, OP	1LP, Cool SO4	Field Temperature	Field pH	Field Conductivity	Field DO				
01	BHS2-STE	12/5/1	2 1/40	ww		х	1	1	1	2			23.0	7.32	1398	0.12				
02	BHS2-DBOX		1110	ww		x		_ 1		2	1		22.9	7.14	1245	0.08		ŀ		
03	BHS2-PUMP		1210	ww		x		1		2	1		27.2	6.86	1226	429				
04	BHS2-LIGNO-0"		1050	ww		x	1	1	1	2			22.4	7.0Ce	1228	0.15				
05	BHS2-ST2		1030	ww		x	1	1	1	2			22.3	6.99	1234	0.07			\square	
06	BHS2-TAP		1315	DW		x			1			1	22.9	7.07	812	5.64			\square	
07	BHS2-EB		1700			x	1	1	1	2			1970	783	2.42	8.74			\square	
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Chain of Custody.xls Rev.Date 11/19/01

Chain of Custody

12/3822 SAL Project No.___



December 12, 2012

Ms. Josefin Edebeck-Hirst Hazen and Sawyer, P.C 10002 Princess Palm Avenue Suite 200 Tampa, FL 33619

RE: Project: FDOH Pace Project No.: 3576019

Dear Ms. Edebeck-Hirst:

Enclosed are the analytical results for sample(s) received by the laboratory on December 04, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

San m. ma

Sakina Mckenzie

sakina.mckenzie@pacelabs.com Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS



Pace Analytical Services, Inc. 8 East Tower Circle Ormond Beach, FL 32174 (386)672-5668

CERTIFICATIONS

Project:	FDOH
Pace Project No.:	3576019

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174 Alabama Certification #: 41320 Arizona Certification #: AZ0735 Colorado Certification: FL NELAC Reciprocity Connecticut Certification #: PH-0216 Florida Certification #: E83079 Georgia Certification #: 955 Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity Illinois Certification #: 200068 Indiana Certification: FL NELAC Reciprocity Kansas Certification #: E-10383 Kentucky Certification #: 90050 Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007 Maine Certification #: FL01264 Massachusetts Certification #: M-FL1264 Michigan Certification #: 9911 Mississippi Certification: FL NELAC Reciprocity Missouri Certification #: 236

Montana Certification #: Cert 0074 Nevada Certification: FL NELAC Reciprocity New Hampshire Certification #: 2958 New Jersey Certification #: FL765 New York Certification #: 11608 North Carolina Environmental Certificate #: 667 North Carolina Certification #: 12710 Pace Analytical Services - Ormond certification number E83509 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 Tennessee Certification #: FL01264 Tennessee Certification #: TN02974 Texas Certification: FL NELAC Reciprocity US Virgin Islands Certification: FL NELAC Reciprocity Virginia Environmental Certification #: 460165 Washington Certification #: 2955 West Virginia Certification #: 399079670 Wyoming (EPA Region 8): FL NELAC Reciprocity

REPORT OF LABORATORY ANALYSIS



SAMPLE SUMMARY

Project: FDOH Pace Project No.: 3576019

Lab ID	Sample ID	Matrix	Date Collected	Date Received
3576019001	B-HS2-STE	Water	12/03/12 11:40	12/04/12 03:10
3576019002	B-HS2-DBOX	Water	12/03/12 11:10	12/04/12 03:10
3576019003	B-HS2-PUMP	Water	12/03/12 11:10	12/04/12 03:10
3576019004	B-HS2-LIGNO-O	Water	12/03/12 10:50	12/04/12 03:10
3576019005	B-HS2-ST2	Water	12/03/12 10:30	12/04/12 03:10
3576019006	B-HS2-EQB	Water	12/03/12 13:00	12/04/12 03:10

REPORT OF LABORATORY ANALYSIS



SAMPLE ANALYTE COUNT

Project: FDOH Pace Project No.: 3576019

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3576019003	B-HS2-PUMP	SM 2320B	AMD	1	PASI-O
		SM 2540D	AGS	1	PASI-O
		SM 5210B	KHC	1	PASI-O
		EPA 300.0	IRL	4	PASI-O
		EPA 350.1	SOA	2	PASI-O
		EPA 351.2	MSM	1	PASI-O
		EPA 365.4	MSM	1	PASI-O
		EPA 410.4	AIS	1	PASI-O

REPORT OF LABORATORY ANALYSIS



ANALYTICAL RESULTS

Project: FDOH

Pace Project No.: 3576019

Sample: B-HS2-PUMP	Lab ID:	3576019003	Collecte	d: 12/03/12	2 11:10	Received: 12/04/12 03:10 Matrix: Water				
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
Field Data	Analytical	Method:								
Field pH	6.9 S	Std. Units	0.10	0.10	1		12/04/12 13:38			
Field Temperature	23.0 d	leg C	0.50	0.50	1		12/04/12 13:38			
Field Specific Conductance	1226 u	imhos/cm	1.0	1.0	1		12/04/12 13:38			
2320B Alkalinity	Analytical	Method: SM 2	320B							
Alkalinity, Total as CaCO3	253 n	ng/L	5.0	5.0	1		12/04/12 20:18			
2540D Total Suspended Solids	Analytical	Method: SM 2	540D							
Total Suspended Solids	5.0U n	ng/L	5.0	5.0	1		12/07/12 11:30			
5210B BOD, 5 day	Analytical	Method: SM 5	210B							
BOD, 5 day	2.0U n	ng/L	2.0	2.0	1	12/05/12 09:00	12/10/12 15:23			
300.0 IC Anions	Analytical	Method: EPA	300.0							
Nitrate as N	14.7 n	ng/L	0.10	0.050	2		12/04/12 18:05	14797-55-8		
Nitrite as N	0.38 n	ng/L	0.10	0.050	2		12/04/12 18:05	14797-65-0		
Nitrogen, NO2 plus NO3	15.1 n	ng/L	0.10	0.050	2		12/04/12 18:05			
Orthophosphate as P	3.7 n	ng/L	0.20	0.10	2		12/04/12 18:05			
350.1 Ammonia	Analytical	Method: EPA	350.1							
Nitrogen, Ammonia	0.21 n	ng/L	0.050	0.020	1		12/06/12 10:40	7664-41-7		
Nitrogen, Ammonium	0.20 n	ng/L	0.050	0.020	1		12/06/12 10:40	7764-41-7	N2	
351.2 Total Kjeldahl Nitrogen	Analytical	Method: EPA	351.2 Prepa	aration Meth	nod: EP	A 351.2				
Nitrogen, Kjeldahl, Total	1.3 n	ng/L	0.50	0.086	1	12/06/12 07:40	12/06/12 17:20	7727-37-9		
365.4 Phosphorus, Total	Analytical	Method: EPA	365.4 Prepa	aration Meth	nod: EP	A 365.4				
Phosphorus, Total (as P)	3.4 n	ng/L	0.10	0.050	1	12/06/12 07:40	12/06/12 17:20	7723-14-0		
410.4 COD	Analytical	Method: EPA	410.4							
Chemical Oxygen Demand	14.4 I n	ng/L	20.0	12.5	1		12/07/12 11:59			

REPORT OF LABORATORY ANALYSIS


Project:	FDOH							
Pace Project No.:	3576019							
QC Batch:	WET/16482		Analysis Me	ethod: S	SM 2320B			
QC Batch Method:	SM 2320B		Analysis De	escription: 2	2320B Alkalinit	у		
Associated Lab Sar	mples: 35760190	003						
METHOD BLANK:	519343		Matrix	c Water				
Associated Lab Sar	mples: 35760190	003						
Parar	neter	Units	Blank Result	Reporting Limit	Analyze	d Quali	fiers	
Alkalinity, Total as C	CaCO3	mg/L	5.0U	5.0	0 12/04/12 1	7:56		
LABORATORY CO	NTROL SAMPLE:	519344						
Parar	neter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers	
Alkalinity, Total as C	CaCO3	mg/L	250	243	97	90-110		
SAMPLE DUPLICA	TE: 519345							
			3575604002	Dup		Max		
Parar	neter	Units	Result	Result	RPD	RPD	Qualifiers	
Alkalinity, Total as C	CaCO3	mg/L	217	219	9	.9	20	
SAMPLE DUPLICA	TE: 519346							
_		11.5	3575797001	Dup	205	Max		
Parar	neter	Units	Result	Result			Qualifiers	
Alkalinity, Total as C	CaCO3	mg/L	38.5	39.0	0	1	20	



Project:	FDOH							
Pace Project No.:	3576019							
QC Batch:	WET/16512		Analysis M	ethod:	SM 2540D			
QC Batch Method:	SM 2540D		Analysis De	escription:	2540D Total Su	spended Solids	;	
Associated Lab Sam	ples: 35760190	003						
METHOD BLANK:	520924		Matrix	x: Water				
Associated Lab Sam	ples: 35760190	003						
			Blank	Reporting				
Param	eter	Units	Result	Limit	Analyzed	l Qualif	iers	
Total Suspended So	lids	mg/L	5.00	J 5	5.0 12/07/12 11	:30		
LABORATORY CON	TROL SAMPLE:	520925						
			Spike	LCS	LCS	% Rec		
Param	eter	Units	Conc.	Result	% Rec	Limits	Qualifiers	
Total Suspended So	lids	mg/L	100	96.0	96	90-110		
SAMPLE DUPLICAT	E: 520926							
			3575937001	Dup		Max		
Param	eter	Units	Result	Result	RPD	RPD	Qualifiers	
Total Suspended So	lids	mg/L	NE	5.0	U		20	
SAMPLE DUPLICAT	E: 520927							
			3575942001	Dup		Max		
Param	eter	Units	Result	Result	RPD	RPD	Qualifiers	
Total Suspended So	lids	mg/L	NE	5.0			20	



Project:	FDOH						
Pace Project No.:	3576019						
QC Batch:	WET/16486		Analysis M	lethod:	SM 5210B		
QC Batch Method:	SM 5210B		Analysis D	escription:	5210B BOD, 5	day	
Associated Lab Sar	mples: 3576019	003					
METHOD BLANK:	519618		Matri	x: Water			
Associated Lab Sar	mples: 3576019	003					
			Blank	Reporting			
Para	neter	Units	Result	Limit	Analyze	d Qualit	ïers
BOD, 5 day		mg/L	2.00	J	2.0 12/10/12 1	5:23	
LABORATORY CO	NTROL SAMPLE:	519619					
			Spike	LCS	LCS	% Rec	
Para	neter	Units	Conc.	Result	% Rec	Limits	Qualifiers
BOD, 5 day		mg/L	198	180	91	85-115	
SAMPLE DUPLICA	TE: 519620						
			3575935001	Dup		Max	
Para	neter	Units	Result	Result	RPD	RPD	Qualifiers
BOD, 5 day		mg/L	N		2.0		20



Project: FDO	Н							
Pace Project No.: 3576	6019							
QC Batch: WE	TA/22133	Anal	ysis Meth	hod: E	PA 300.0			
QC Batch Method: EP	A 300.0	Anal	ysis Des	cription: 3	00.0 IC Anion	S		
Associated Lab Samples:	3576019003							
METHOD BLANK: 5194	104		Matrix:	Water				
Associated Lab Samples:	3576019003							
		Bla	ink	Reporting				
Parameter	I	Units Res	sult	Limit	Analyze	d Quali	fiers	
Nitrate as N	mg/L		0.025U	0.050	12/04/12 1	5:51		
Nitrite as N	mg/L		0.025U	0.050) 12/04/12 1	5:51		
Nitrogen, NO2 plus NO3	mg/L		0.025U	0.050) 12/04/12 1	5:51		
Orthophosphate as P	mg/L		0.050U	0.10) 12/04/12 1	5:51		
LABORATORY CONTRO	L SAMPLE: 51940	5						
		Spike		LCS	LCS	% Rec		
Parameter	I	Units Conc.	R	Result	% Rec	Limits	Qualifiers	
Nitrate as N	mg/L		5	4.9	99	90-110		-
Nitrite as N	mg/L		5	5.0	100	90-110		
Nitrogen, NO2 plus NO3	mg/L		10	9.9	99	90-110		
Orthophosphate as P	mg/L		10	10.1	101	90-110		

MATRIX SPIKE & MATRIX SPI	KE DUPLICAT	E: 51940	6		519407							
			MS	MSD								
	35	76001002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Nitrate as N	mg/L	0.27	5	5	4.9	4.9	92	92	90-110	.2	20	
Nitrite as N	mg/L	<0.025	5	5	4.7	4.8	95	96	90-110	.5	20	
Nitrogen, NO2 plus NO3	mg/L	0.27	10	10	9.6	9.6	94	94	90-110	.2	20	
Orthophosphate as P	mg/L	<0.050	10	10	9.8	10.0	98	100	90-110	3	20	



Project: FDOH	4							
Pace Project No.: 35760	019							
QC Batch: WE	TA/22176		Analysis Me	thod:	EPA 350.1			
QC Batch Method: EPA	350.1		Analysis Des	scription:	350.1 Ammonia			
Associated Lab Samples:	35760190	003						
METHOD BLANK: 52075	52		Matrix:	Water				
Associated Lab Samples:	35760190	003						
Parameter		Units	Blank Result	Reporting Limit	Analyzed	Qualif	iers	
Nitrogen, Ammonia		mg/L	0.020U	0.05	0 12/06/12 10:	32		
LABORATORY CONTROL	SAMPLE:	520753						
Parameter		Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers	
Nitrogen, Ammonia		mg/L	1	1.0	102	90-110		
MATRIX SPIKE SAMPLE:		520755						
			3576335002	Spike	MS	MS	% Rec	
Parameter		Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Nitrogen, Ammonia		mg/L	2	1.2 1	5.2	9	5 90-110	
SAMPLE DUPLICATE: 5	20754							
Parameter		Units	3576335002 Result	Dup Result	RPD	Max RPD	Qualifiers	
Nitrogen, Ammonia		mg/L	4.2	4.	2 .0	3	20	-



Project:	FDOH							
Pace Project No.:	3576019							
QC Batch:	WETA/22185		Analysis M	ethod: E	EPA 351.2			
QC Batch Method:	EPA 351.2		Analysis De	escription: 3	351.2 TKN			
Associated Lab San	nples: 35760190	003						
METHOD BLANK:	520881		Matrix	k: Water				
Associated Lab San	nples: 35760190	003						
			Blank	Reporting				
Paran	neter	Units	Result	Limit	Analyzed	Qualifie	ers	
Nitrogen, Kjeldahl, T	ōtal	mg/L	0.086L	0.50	0 12/06/12 16:	51		
LABORATORY COM	ITROL SAMPLE:	520882						
			Spike	LCS	LCS	% Rec		
Paran	neter	Units	Conc.	Result	% Rec	Limits	Qualifiers	
Nitrogen, Kjeldahl, T	otal	mg/L	20	20.6	103	90-110		
MATRIX SPIKE SAM	MPLE:	520884						
			357615500	1 Spike	MS	MS	% Rec	
Paran	neter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Nitrogen, Kjeldahl, T	ōtal	mg/L		1.8 20	21.9	101	90-110	
SAMPLE DUPLICA	TE: 520883							
			3576155001	Dup		Max		
Paran	neter	Units	Result	Result	RPD	RPD	Qualifiers	_
Nitrogen, Kjeldahl, T	otal	mg/L	1.8	3 1.5	5 1	6	20	-



Project:	FDOH							
Pace Project No.:	3576019							
QC Batch:	WETA/22186		Analysis M	ethod:	EPA 365.4			
QC Batch Method:	EPA 365.4		Analysis De	escription:	365.4 Phosphoru	JS		
Associated Lab San	nples: 35760190	003						
METHOD BLANK:	520885		Matrix	k: Water				
Associated Lab San	nples: 35760190	003						
			Blank	Reporting				
Paran	neter	Units	Result	Limit	Analyzed	Qualifi	ers	
Phosphorus, Total (a	as P)	mg/L	0.050L	J 0.	10 12/06/12 19:	35		
LABORATORY COM	NTROL SAMPLE:	520886						
			Spike	LCS	LCS	% Rec		
Paran	neter	Units	Conc.	Result	% Rec	Limits	Qualifiers	
Phosphorus, Total (a	as P)	mg/L	4	3.9	99	90-110		
MATRIX SPIKE SAM	MPLE:	520888						
			357615500	1 Spike	MS	MS	% Rec	
Paran	neter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Phosphorus, Total (a	as P)	mg/L		3.1 4	7.1	100	80-120	
SAMPLE DUPLICA	TE: 520887							
			3576155001	Dup		Max		
Paran	neter	Units	Result	Result	RPD	RPD	Qualifiers	
Phosphorus, Total (a	as P)	mg/L	3.1	3	3.2	2	20	-



Project: FDC	ЭН							
Pace Project No.: 357	6019							
QC Batch: W	ETA/22216		Analysis Me	thod:	EPA 410.4			
QC Batch Method: EF	PA 410.4		Analysis De	scription:	410.4 COD			
Associated Lab Samples	: 35760190	003						
METHOD BLANK: 521	333		Matrix	Water				
Associated Lab Samples	: 35760190	003						
Parameter		Units	Blank Result	Reporting Limit	Analyzed	Qualifi	ers	
Chemical Oxygen Dema	nd	mg/L	12.5U	20.	0 12/07/12 11:	59		
LABORATORY CONTRO	DL SAMPLE:	521334						
Parameter		Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers	
Chemical Oxygen Dema	nd	mg/L	500	510	102	90-110		
MATRIX SPIKE SAMPLE	:	521336						
Parameter		Units	3576001001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Dema	nd	mg/L	<12	2.5 500	502	10	0 90-110	
SAMPLE DUPLICATE:	521335							
Parameter		Units	3576001001 Result	Dup Result	RPD	Max RPD	Qualifiers	
Chemical Oxygen Dema	nd	mg/L	<12.5	12.5	U		20	-



QUALIFIERS

Project:	FDOH
Pace Project No.:	3576019

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-O Pace Analytical Services - Ormond Beach

ANALYTE QUALIFIERS

I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

N2 The lab does not hold TNI accreditation for this parameter.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: FDOH Pace Project No.: 3576019

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
3576019003	B-HS2-PUMP		FLD/		
3576019003	B-HS2-PUMP	SM 2320B	WET/16482		
3576019003	B-HS2-PUMP	SM 2540D	WET/16512		
3576019003	B-HS2-PUMP	SM 5210B	WET/16486	SM 5210B	WET/16594
3576019003	B-HS2-PUMP	EPA 300.0	WETA/22133		
3576019003	B-HS2-PUMP	EPA 350.1	WETA/22176		
3576019003	B-HS2-PUMP	EPA 351.2	WETA/22185	EPA 351.2	WETA/22202
3576019003	B-HS2-PUMP	EPA 365.4	WETA/22186	EPA 365.4	WETA/22203
3576019003	B-HS2-PUMP	EPA 410.4	WETA/22216		

REPORT OF LABORATORY ANALYSIS

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BENCHMARK EnviroAnalytical Inc.



NELAC Certification # E84167

ANALYTICAL TEST REPORT THESE RESULTS MEET NELAC STANDARDS

		Submiss	ion Number :		1212005	53			
Pace Analytical Ser 8 East Tower Circle Ormond Beach, Fl	rvices, Inc. e 32174		Proj Date Tim	ject Na e Recei e Recei	me : ved : ved :	WASTE WATER 12/03/2012 1540	ANALYSIS		
Sakına Mckenzie						·			
Submission Numl	ber 121	20053							-
Sample Number:	001		Sample Descri	ption: E	3-HS2-ST	E			
Sample Date:	12/03/2012		Sample Metho	d: Gr	ab				
Sample Time:	1140								
		Dosult	Unito			Drooduro	Analy	ysis	
		Result	Units	MDL	FUL	Frocedure	Date	Time	Analys
FECAL COLIFORM		800 Z	#/100 ML	4	4	SM9222D	12/03/2012	15:50	MR
E-COLI BY MPN		2420 Z	#/100 ML	1	1	SM9223B	12/03/2012	15:50	MR
Submission Num	ber 121	20053							
Sample Number:	002		Sample Descri	ption:	3-HS2-DE	BOX			
Sample Date:	12/03/2012		Sample Metho	d: Gr	ab				
Sample Time:	1110								
Daramatar		Dosult	Unito	MDI		Broaduro	Anal	ysis	Anobye
	· .	Result	Units		ryr	rioceaure	Date	Time	Anarys
FECAL COLIFORM		1000 Z	#/100 ML	5	5	SM9222D	12/03/2012	15:50	MR
E-COLI BY MPN		2420 Z	#/100 ML	1	1	SM9223B	12/03/2012	15:50	MR

1711 12th Street East * Palmetto; FL 34221 * Phone (941) 723-9986 * Fax (941) 723-6061

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NELAC Certification # E84167

Sample Number	003		Sample Descri	intion B	-HS2-PUM	1P			
Sample Number.	12/02/2012		Sample Desch	di Gr	-1102-1 010 ab				
Sample Date.	12/03/2012		Sample Metho		aD				
Sample Time:	1210								
 Daramatar	<u></u>	Result		MDL	POL	Procedure	Analy	sis	Analys
						Troccure	Date	Time	
FECAL COLIFORM		6	#/100 ML	1	1	SM9222D	12/03/2012	15:50	MR
E-COLI BY MPN		3	#/100 ML	1	1	SM9223B	12/03/2012	15:50	MR
Submission Num	ber 1212	20053							
Sample Number:	004		Sample Descr	iption: B	-HS2-LIN	GO-0"			
Sample Date:	12/03/2012		Sample Metho	d: Gra	ab				
Sample Time:	1050							,	
Parameter	, <u>, , , , , , , , , , , , , , , , , , </u>	Result	Units	MDL	PQL	Procedure	Analysis		Analys
		64	#/100 MI			SM0222D	Date	Time	MD
		64	#/100 ML	1	1	SM9222D	12/03/2012	15.50	
E-COLI BY MPN		40	#/100 ML	1	1	SM9223B	12/03/2012	15:50	MR
Submission Num	ber 1212	20053							
Submission Num Sample Number:	ber 1212 005	20053	Sample Descr	iption: E	-HS2-ST2	!			
Submission Num Sample Number: Sample Date:	ber 1212 005 12/03/2012	20053	Sample Descr Sample Metho	iption: E d: Gr	-HS2-ST2 ab				
Submission Num Sample Number: Sample Date: Sample Time:	ber 1212 005 12/03/2012 1030	20053	Sample Descr Sample Metho	iption: E d: Gr	-HS2-ST2 ab		•		
Submission Num Sample Number: Sample Date: Sample Time: Parameter	ber 1212 005 12/03/2012 1030	Result	Sample Descr Sample Metho Units	iption: E bd: Gra MDL	-HS2-ST2 ab PQL	Procedure	Anal	ysis	Analys
Submission Num Sample Number: Sample Date: Sample Time: Parameter	ber 1212 005 12/03/2012 1030	20053 Result	Sample Descr Sample Metho Units	iption: E od: Gra MDL	-HS2-ST2 ab PQL	Procedure	Analy Date	ysis Time	Analys
Submission Num Sample Number: Sample Date: Sample Time: Parameter FECAL COLIFORM	ber 1212 005 12/03/2012 1030	Result	Sample Descr Sample Metho Units #/100 ML	iption: E od: Gra MDL 2	-HS2-ST2 ab PQL	Procedure SM9222D	Anal Date 12/03/2012	ysis <u>Time</u> 15:50	Analy MR

BENCHMARK EnviroAnalytical Inc.



NELAC Certification # E84167

Sample Number: 006 Sample Date: 12/0 Sample Time: 1300	S 3/2012 S)	ample Descrip ample Methoc	otion: E I: Gr	3-HS2-EQI ab	В			
Parameter	Result	Units	MDL	PQL	Procedure	Analy	/sis	Analys
	32	#/100 MI	1	1	SM9222D	Date 12/03/2012	<u>Time</u>	MR
E-COLI BY MPN	1 U	#/100 ML	1	1	SM9223B	12/03/2012	15:50	MR ·
-Tulou Dir	Nor	12/07/2012						
Dale D. Dixon / Laboratory D	Director	Date	-					
Fülay Tanrisever/ QC Officer								
lennifer Jordan / QC Officer								
DATA QUALIFIERS THAT MAY	APPLY:				7			
. = Value reported is an average of two or n	nore determinations.		N = Pres	umptive evide	nce of presence of mate	ial.	•	
= Results based upon colony counts outsi	de the ideal range.		O = Sam	pied, but anal	ysis lost or not performed	1.		
I = Value based on field kit determination. F	Results may not be accurate.		Q = Sam	ple held beyo	nd accepted hold time.			
= Reported value is between the laboratory	MDL and the PQL.		T = Valu	e reported is <	MDL. Reported for infor	mational purpose	s only and sh	all not be
= Estimated value.				uto opplyzod k	ysis.	luo indicatod		
1 = Est. value surrogate recovery limits exc	eeded.		V = Anal	yte detected in	n sample and method bla	nk.Results for this	s analyte in a	ssociated
2 = Est. value. No quality control criteria ex	ists for component.		samples limits. Re	may be biase	d high. Standard , Duplic re usable	ate and Spike val	ues are within	n control
3 = Est. value quality control criteria for pre	cision or accuracy not met.		Y = Anal	vsis performed	d on an improperly prese	rved sample. Data	a may be inac	curate.
4 = Est. value. Sample matrix interference :	suspected.		Z = Too volume.	many colonies	s were present (TNTC).	The numeric valu	e represents	the filtration
5 = Est, value, Data questionable due to im	proper lab or field protocols] = Data	deviate from h	nistorically established co	ncentration range	S.	
C = Off-scale low. Value is known to be < the	e value reported.		? = Data	rejected and	should not be used. Som	e or all of QC data	a were outsid	e criteria,
= Off-scale high. Value is known to be > th	e value reported		and the l	resence or a	psence of the analyte ca	inol de determine	a nom the da	ita.
NOTES:			• = Not r	eported due to	o interrerence.	1111		
QL = 4xMDL.				t Detected at a	or above adjusted reporti	ng limit.		
IBAS calculated as LAS; molecular weight	= 348.			•				
K = Value exceed MCI								

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Cace Analytica

DOY / Analytical Request Document DOCUMENT. All relevant fields must be completed accurately.

Pace Analytica WO#	:35760	19	DDY / Analytical Request DOCUMENT. All relevant fields must be co	Document mpleted accurately.	
www.pacelabs.co Section A Populard Clost Information:		HII	a nu n C	Page	e: of
Company: HARA GARE CONT			Attention:		1569577
Address: 1000 2 Princest Pales De Copy To:			Company Name:		
Wile 100 Tange f			Address:		
Email To: Wirst a hale and Kinderen Purchase	se Order No.:		Pace Quote		
Phone: Project N	Name:		Reference:	Site Location	
Requested Due Date/TAT: Project N	Number:	••	Manager: Pace Profile #:	STATE: FL	
			Reque	sted Analysis Filtered (Y/N)	
Section D Matrix Codes					
Required Client Information MATRIX / CODE		COLLECTED	Preservatives		
Water DW Water WT Waste Water WW Product P	COMPO COMPO COMPO STAR	SITE COMPOSITE ES		Bruce Bru	(Ž)
		Ö			ле ()
(A-Z, 0-9 / ,-) Air AR	E E	AP A	JUNE OF CONTRACTOR		hlori
Other OT					a C
*) 2	MPL	WPLE	Le nai en al construction de la	1202 120	sidu
	DATE			022 390	Pace Project No./ Lab I.D.
1 B-HSZ-JTE	WW G	<u> </u>		7.3 1313 De	
2 B-HSZ - DBDX			┣━┼┼┼┾┿┼┼┼┨╵┣┯┿┙	1.1 1215 C.1	
3 B-HS2 - PUMP		1210 240		VVV 6.9 104 48	
4 B-AS2 - LIGNU - DU		1050 24		7.1 1228 0.1	
5 5-1152 - Joz	WW G	(030 Cls	┝─┼┼┼┼┼┼┤╽ <mark>┊</mark> ┢┶╆	7.6129 0.	╶╂┟┅╴╌╌╸╴╽
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11					
12					
ADDITIONAL COMMENTS	RELINQUISHED BY /	AFFILIATION DATE	TIME ACCEPTED BY / AFFILIAT	ON DATE TIME	SAMPLE CONDITIONS
ENPA CNIGINIONS	30 CO	Asix 11-28-12	1230 gosebas the	Has 11/28/12 12:30	
Drash Hty > (Josep - Hand	HAS 12/3/12	2:00 pm 8 1 france	12/s/1/ iton	6.0 CE=0 TP-14
- Jumpre Li-	Bilt	12/3/12	1450 B2Q Aur	12312 1480	Rea x ~ Y
	BSC	12/2/12	2200 Wielu	12-4-12-03:0	1.9
· · · · · · · · · · · · · · · · · · ·		SAMPLER NAME AND SIGNATUR	E		
. ORIGIN	9/2.1_	PRINT Name of SAMPLER:	Jordon Hout	THE	p in *
		SIGNATURE of SAMPLER	Aprilas in DATE SI	17: 12312	Tem Rece Ice Saampir ()

.....

Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receip	ot Form (SCUR) Table Number:
Pace Analytical Client Name: Hazel	4 Sawyer Project # 35760(9
Courier: Fed Ex UPS USPS	□ Pace □ Other
Tracking #	
Custody Seal on Cooler/Box Present: yes no Seals	s intact: Uyes I no Date and Initials of person examining
Packing Material: Bubble Wrap Bubble Bags None	Other contents: K(1) (17 3 12
Thermometer Used IP-11 JP-14 Type of Ice: X V	Vet 🔲 Blue 🔲 None
Cooler Temperature °C $(\underline{\varrho}, \underline{\circ}, \underline{\circ})$ Visual $\underline{\circ}, \underline{\circ}, \underline{\circ}$ Correction F	Factor $(2 \cdot O)$ Actual If below 0°C, then was sample frozen?
	□Yes □ No
Receipt of samples satisfactory: X Yes 🗆 №	Rush TAT requested on COC:
If yes, then all conditions below were met:	If no, then mark box & describe issue (use comments area if necessary)
Chain of Custody Present	
Chain of Custody Filled Out	
Relinquished Signature & Sampler Name COC	E Fecal (Oliform & E. Coli
	Subped to Benchmark
Sufficient Volume	
Correct Containers Used	
Sample Labels match COC (sample IDs & date/time of collection)	
	No Labels: 🔲 No Time/Date on Labels: 📮
All containers needing preservation are found to be in compliance with EPA recommendation.	
No Headspace in VOA Vials (>6mm):	
Client Notification/ Resolution:	. <u> </u>
Person Contacted: Date	/Time:
Comments/ Resolution (use back for additional comments):	
· · · · · · · · · · · · · · · · · · ·	
	······································
	· · · · · · · · · · · · · · · · · · ·
	,,
	//
	12/4/202
Project Manager Review:	Date:
Finished Product I	nformation Only
F.P. Sample ID:	Size & Qty of Bottles Received
	x 5 Gal
Froduction Code;	x 2.5 Gai
Date/Time Opened:	x 1 Liter
Number of Linopened Bottles Remaining	X 500 mL x 250 ml
	x Other:
Extra Sample in Shed: Yes No	

100

Pace Analytical	Document Name Sample Condition Upon Re	eceipt Form	Document Revised: September 23, 2011	· · · · · · · · · · · · · · · · · · ·
<u> </u>	F-FL-C-007 rev. (04	Pace Florida Quality Office	
Sam	ple Condition Upon Recei	ipt Form (SCUR)	Table Number:	
	Client Name: <u>Haz</u>	and Sunyer	Project #5760(*	<u>}</u>
Courier: 🔲 Fed Ex 🗌 UPS [USPS Client Commerci	al 🗋 Pace	Other	
Tracking #				
Custody Seal on Cooler/Box P	resent: 🗌 yes 📑 no 🛛 Sea	als intact: 🛛 yes 🖾 no	Date and initials of person examining	3
Packing Material: 📋 Bubble V	Vrap 🥃 Bags 🔲 None	Other	contents: <u>us</u> 12-12	
Thermometer Used	-113 Type of Ice: W	et Blue None		
Cooler Temperature'C_ <u>l-</u>	(Visual) 0-0 (Correctio	n Factor) <u>i. 4</u>	(Temp should be above freezing to 6°C (Actual) sample frozen?). If below 0°C, then was
		_	□Yes □No	
Receipt of samples satisfac	tory: 🏾 Yes 대체		Rush TAT requested on COC:	
If yes, then all conditions belo	w were met:	If no, then mark b	ox & describe issue (use comments area if r	iecessary):
Chain of Custody Present				
Chain of Custody Filled Out		_ <u>_</u>		
Samples Arrived within Hold Tim	e Name COC		<u> </u>	
Sufficient Volume	······			
Correct Containers Used	• • •	<u>a</u>		
Containers intact	,		12/3/1	2 12:50
Sample Labels match COC (sam	ple IDs & date/time of collection)	0 Son	DE 03-BHSD-PUMPI	Terd
	· ·	No Labels		ON COC
All containers needing preservation a	re found to be in			(LPU
compliance with EPA recommendation	חאַ			
				BFSS
Client Notification/ Resolution:		- 	- <u>····································</u>	- DEgHX2
Person Contacted:	Date	e/Time:		a.
Comments/ Resolution (use back	for additional comments):	ogged	03-BHSZ-PUMP INI	<u>La</u> se
TELON OF	ECOL DEVES	SENT 10	25 Notimer C	
03-BHS2 -	Pump-rec. bu	1 mistake	- Samples needed	to
Ship	to Southern ()	analytica	1 12/4/2012 SM.	
* 				
Project Manager Review:			Date: 2/4/201	8
	Eininhad Braduat I	nformation Only		
	rinsheu Producti	monnauon Oni	y	— .
F.P. Sample ID:			Size & Qty of Bottles Received	
Production Code:			x 3.5 Gal	
			x 1 Gal	
Date/Time Opened:			x 1 Liter x 500 mL	
Number of Unopened Bottles Re	emaining:		x 250 mL	
Extra Sample in She	ed: Yes No		X Otner:	



Appendix B: Operation & Maintenance Log

Table B.1 **Operation and Maintenance Log** Description Date Existing system evaluation performed. Septic tank was pumped out. 7/31/12 8/15/2012 Local DOH performed site evaluation 9/10/2012 System construction started 9/25/2012 System start-up 9/27/2012 Globe valves were set at 3.5:1 recirculation ratio 10/5/2012 Tanks full 10/11/2012 Preliminary sample event 1 10/23/2012 Preliminary sample event 2 10/30/2012 Preliminary sample event 3 Low level in pump tank 11/7/2012 Very high level in pump tank. Pulled float tree up (reset floats), and pump immediately came on. 11/13/2012 Water level below top float in pump tank 12/3/2012 Sample Event No. 1

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Appendix C: Vericomm PLC Data

Syster	n Status		12/3/2012	11/8/2012	10/4/2012	9/25/2012
Point	Description	Status	Value	Value	Value	Value
1	Alarm Status	Automatic	OK	PmpFail	OK	OK
2	Alert Status	Automatic	OK	OK	OK	OK
- 3	System Mode	Automatic	Normal	Normal	Normal	Normal
5	Timer Mode	Automatic	Normal	Overide	Normal	Off
0	Asther Off These	Automatio	FO O Manufact	45.0 Minutes	50.0 Mandas	
6	Active Off Time	Automatic	58.8 Minutes	15.0 Minutes	58.8 Minutes	60.0 Minutes
7	Active On Time	Automatic	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.8 Minutes
9	Pump Mode	Automatic	OffCycl	OffCycl	OffCycl	Off
10	Pump Status	Automatic	Off	Off	Off	Off
12	Pump Cycles Today	Automatic	13.0 Cycles	1.0 Cycles	10.0 Cycles	0.0 Cycles
13	Override Cycles Today	Automatic	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles
14	Pump Run Time Today	Automatic	15.8 Minutes	2.0 Minutes	12.1 Minutes	0.0 Minutes
Setting	gs					
Point	Description	Status	Value	Value	Value	Value
17	Off Cycle Time	Constant/Setpoint	58.8 Minutes	58.8 Minutes	58.8 Minutes	60.0 Minutes
18	On Cycle Time	Constant/Setpoint	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.8 Minutes
19	Override Off Cycle Time	Constant/Setpoint	15.0 Minutes	15.0 Minutes	30.0 Minutes	30.0 Minutes
20	Override On Cycle Time	Constant/Setpoint	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.8 Minutes
21	Minimum Override Cycles	Automatic	3.0 Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles
23	Override Cycle Limit per Day	Automatic	7.0 Cycles	7.0 Cycles	7.0 Cycles	7.0 Cycles
24	Time Limit per Day	Constant/Setpoint	40.0 Minutes	40.0 Minutes	30.0 Minutes	16.0 Minutes
25	High Level Pump Test	Automatic	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes
28	Alarm Update Interval	Automatic	120.0 Minutes	240.0 Minutes	240.0 Minutes	120.0 Minutes
29	Page Delay	Automatic	960.0 Minutes	960.0 Minutes	960.0 Minutes	960.0 Minutes
30	Page Interval	Automatic	30.0 Minutes	30.0 Minutes	30.0 Minutes	30.0 Minutes
31	Local Alarm Delay	Constant/Setpoint	1140.0 Minutes	1140.0 Minutes	1140.0 Minutes	1140.0 Minutes
32	Local Reactivate Delay	Automatic	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes
Troubl	eshooting					
Point	Description	Status	Value	Value	Value	Value
33	Top Float Status	Automatic	OK	ОК	OK	OK
34	Middle Float Status	Automatic	ОК	ОК	ОК	ОК
35	Bottom Float Status	Automatic	OK	ОК	OK	ОК
37	Contactor Status	Automatic	ОК	ОК	OK	OK
38	Pump Status	Automatic	ОК	PmpFail	ОК	ОК
40	Filter Status	Automatic	ОК	ОК	ОК	ОК
41	Tank Status	Automatic	OK	ОК	OK	ОК
43	Power Status	Automatic	OK	ОК	OK	OK
Flow D	ata					
Point	Description	Status	Value	Value	Value	Value
49	Pump Run Time Today	Automatic	15.8 Minutes	2.0 Minutes	12.1 Minutes	0.0 Minutes
50	Override Cycles Today	Automatic	0	0	0	0
51	Pump Cycles Today	Automatic	13.0 Cycles	1.0 Cycles	10.0 Cycles	0.0 Cycles
52	Average Run Time per Cycle	Automatic	1.2 Minutes	2.0 Minutes	1.2 Minutes	0.0 Minutes
54	Brownouts Today	Automatic	0	0	0	0
- 34		ratomatio	U U			

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS2 MONITORING REPORT NO. 1

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Appendix C

			12/3/2012	11/8/2012	10/4/2012	9/25/2012
30-Day	/ History Data					
Point	Description	Status	Value	Value	Value	Value
65	30 Day Average Run Time per Day	Automatic	30.0 Minutes	23.3 Minutes	9.1 Minutes	0.0 Minutes
66	30 Day Average Override Cycles per Day	Automatic	6.4 Cycles	3.3 Cycles	0.0 Cycles	0.0 Cycles
67	30 Day Average Cycles per Day	Automatic	24.9 Cycles	19.3 Cycles	7.5 Cycles	0.0 Cycles
68	30 Day Average Run Time per Cycle	Automatic	1.2 Minutes	1.2 Minutes	1.2 Minutes	0.0 Minutes
71	30 Day Total Pump Run Time	Automatic	899.1 Minutes	698.4 Minutes	210.2 Minutes	0.0 Minutes
72	30 Day Total Override Cycles	Automatic	191.0 Cycles	99.0 Cycles	1.0 Cycles	0.0 Cycles
73	30 Day Total Cycles	Automatic	746.0 Cycles	580.0 Cycles	173.0 Cycles	0.0 Cycles
76	30 Day Total Brownouts	Automatic	0	0	0	0
Totaliz	ed Pump Data					
Point	Description	Status	Value	Value	Value	Value
82	Pump Total Run Time	Automatic	32.1 Hours	17.5 Hours	3.7 Hours	0.0 Hours
83	Pump Total Cycles	Automatic	1599.0 Cycles	870.0 Cycles	183.0 Cycles	0.0 Cycles
Miscel	laneous					
Point	Description	Status	Value	Value	Value	Value
145	Pump On Auto	Automatic	Off	Off	Off	Off
147	Pump Test Today	Automatic	Off	On	Off	Off
148	Pump Check Enable	Automatic	Off	Off	Off	Off
149	Total Override Cycles	Automatic	0	28	0	0
150	High Level Condition	Automatic	Off	Off	Off	Off
151	Leak Check Enable	Automatic	On	On	On	Off
152	Brownout State	Automatic	Off	Off	Off	Off
153	Test Mode	Automatic	Off	Off	Off	Off
Alarm	Points					
Point	Description	Status	Value	Value	Value	Value
161	General Alarm	Automatic	Off	On	Off	Off
162	New Alarm	Automatic	Off	On	Off	Off
163	Update Central Enable	Automatic	On	On	On	On
167	Page Alarm Start	Automatic	Off	Off	Off	Off
168	Pager Signal	Override Off	Off	Off	Off	Off
169	Local Alarm Start	Automatic	Off	Off	Off	Off
170	Local Alarm Silence	Automatic	Off	Off	Off	Off
Inputs	& Outputs					
Point	Description	Status	Value	Value	Value	Value
177	High Level/Override Timer Float Input	Automatic	Off	On	Off	Off
178	Timer Float Input	Automatic	On	On	On	Off
179	Redundant Off Float & Low Level Alarm Input	Automatic	On	On	On	On
181	Push To Silence Input	Automatic	Off	Off	Off	Off
182	Auxiliary Contact Input	Automatic	Off	Off	Off	Off
186	Pump Output	Automatic	Off	Off	Off	Off
188	Alarm Light Output	Automatic	Off	Off	Off	Off
189	Audible Alarm Output	Automatic	Off	Off	Off	Off

PAGE C-2 HAZEN AND SAWYER, P.C.