



# Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task B.7

## **B-HS2 Field System Monitoring Report No. 8**

### **Progress Report**

April 2014

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Environmental Engineers & Scientists

In association with:



**AET**  
Applied Environmental Technology

**Otis Environmental  
Consultants, LLC**

# **Florida Onsite Sewage Nitrogen Reduction Strategies Study**

## **TASK B.7 PROGRESS REPORT**

### **B-HS2 Field System Monitoring Report No. 8**

#### **Prepared for:**

Florida Department of Health  
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Bureau of Environmental Health  
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FDOH Contract CORCL

**April 2014**

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### **1.0 Background**

Task B of the Florida Onsite Sewage Nitrogen Reduction Strategies Study (FOSNRS) includes performing field experiments to critically evaluate the performance of nitrogen removal technologies that were identified in FOSNRS Task A.9 and pilot tested in PNRS II. To meet this objective, full scale treatment systems are being installed at various residential sites in Florida and monitored over an extended timeframe under actual onsite conditions. The Task B Quality Assurance Project Plan (Task B.5) documents the objectives, monitoring framework, sample frequency and duration, and analytical methods to be used at the home sites. This report documents the eighth sample event of the passive nitrogen reduction system at a home site B-HS2 in Hillsborough County, Florida.

### **2.0 Purpose**

This monitoring report documents data collected from the eighth B-HS2 monitoring and sampling event conducted on March 10, 2014 (Experimental Day 531). This monitoring event consisted of conducting 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 chemical analyses of water samples by a NELAC certified laboratory. In addition, daily samples were collected March 11th through March 14th, 2014 to evaluate daily variation of the treatment system.

### **3.0 Materials and Methods**

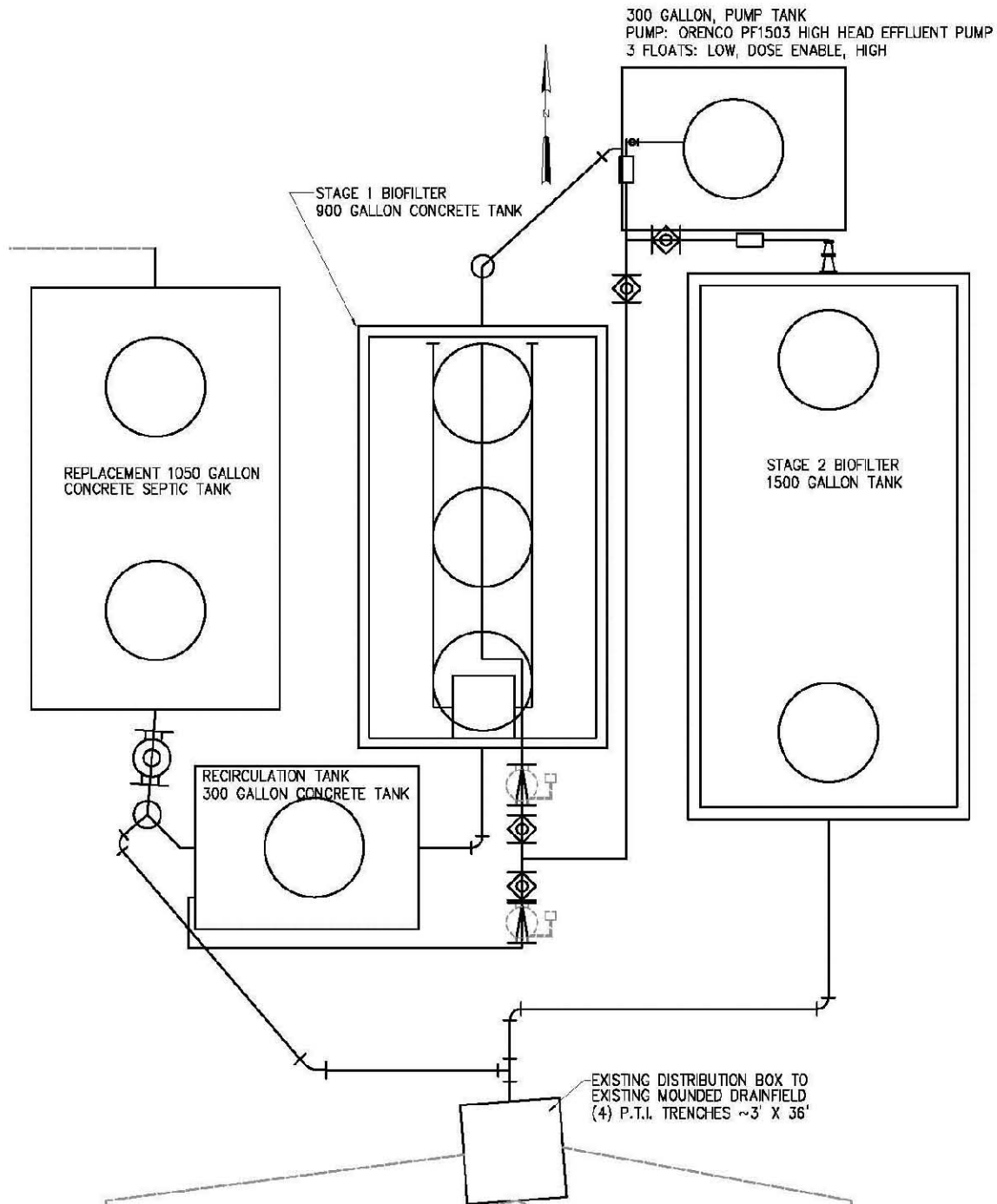
#### **3.1 Project Site**

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. Figure 1 is a system schematic showing the system components and layout of the installation. A flow schematic of the system is shown in Figure 2. The B-HS2 system

tankage 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. Based on measured average wastewater flow and tank volumes, there is over a ten day transit time through the treatment system prior to dispersal. The denitrified treated effluent is discharged into the soil via the existing mounded drainfield (P.T.I.<sup>TM</sup> bundles).

### **3.2 PNRS System Modification**

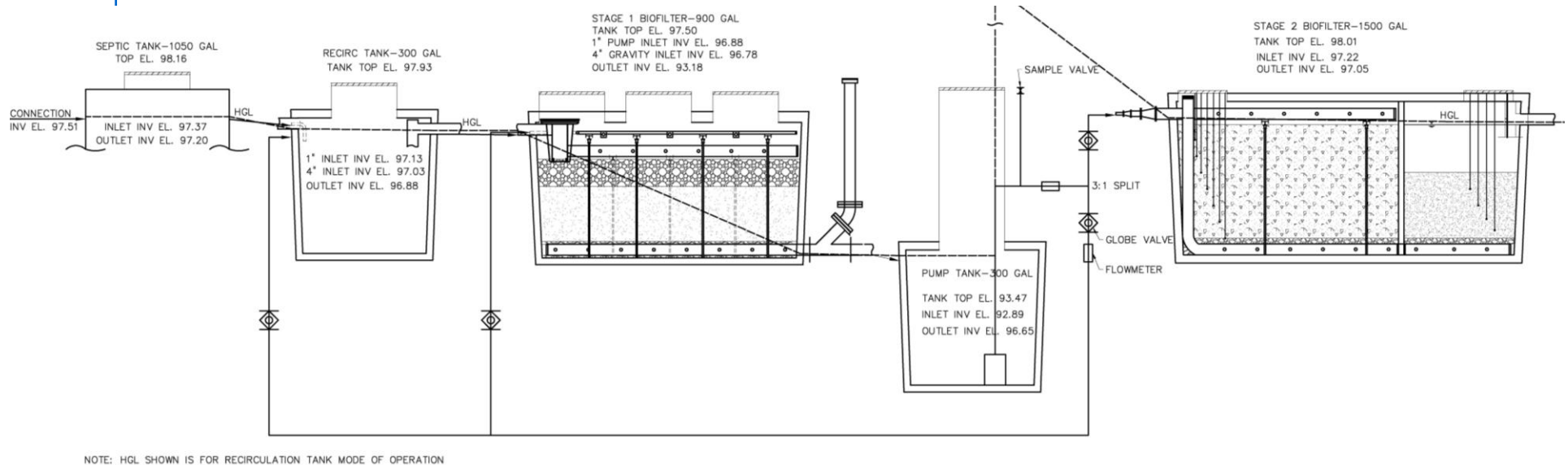
As recommended in the fifth sample event report, the recirculation mode of operation was modified prior to the sixth sample event. The pump tank discharge is split via two throttling globe valves which allow for a portion of the Stage 1 biofilter effluent to be sent back for recirculation with the rest proceeding to the Stage 2 biofilter. The system was designed with two recirculation modes of operation. The first option (which was initially tested) is to have the recirculated effluent return to the recirculation tank for mixing with incoming septic tank effluent. Following the fifth sample event, the recirculation mode of operation was modified to test the second option. In the second option, recirculated effluent does not pass through the recirculation tank, but is dispersed by three spray nozzles directly to the top of the Stage 1 biofilter along with recirculation tank effluent (STE).



**Figure 1**  
**Plan view of B-HS2 System Layout**

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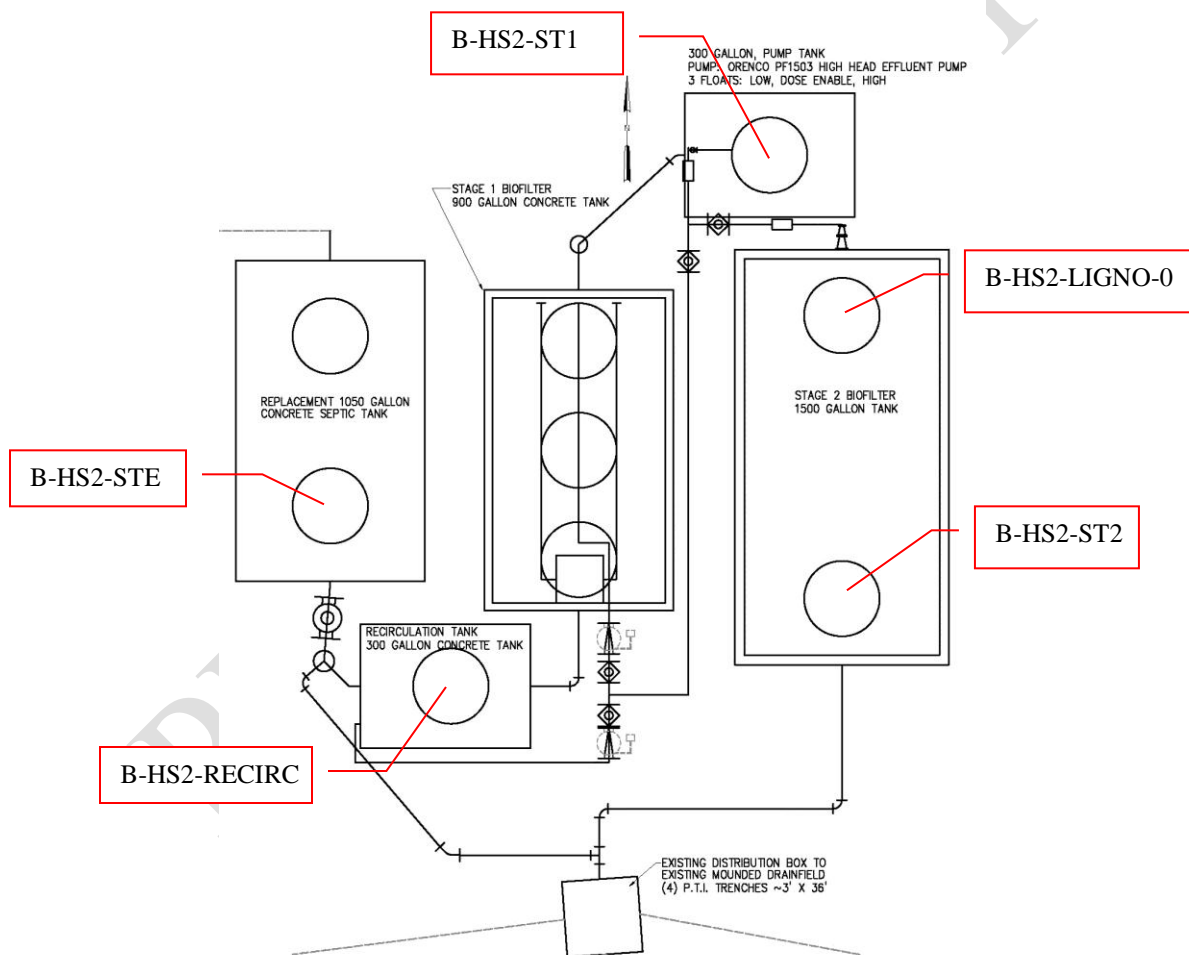


**Figure 2**  
**Flow Schematic of B-HS2 PNRS Installed in Hillsborough County**

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### 3.3 Monitoring and Sample Locations and Identification

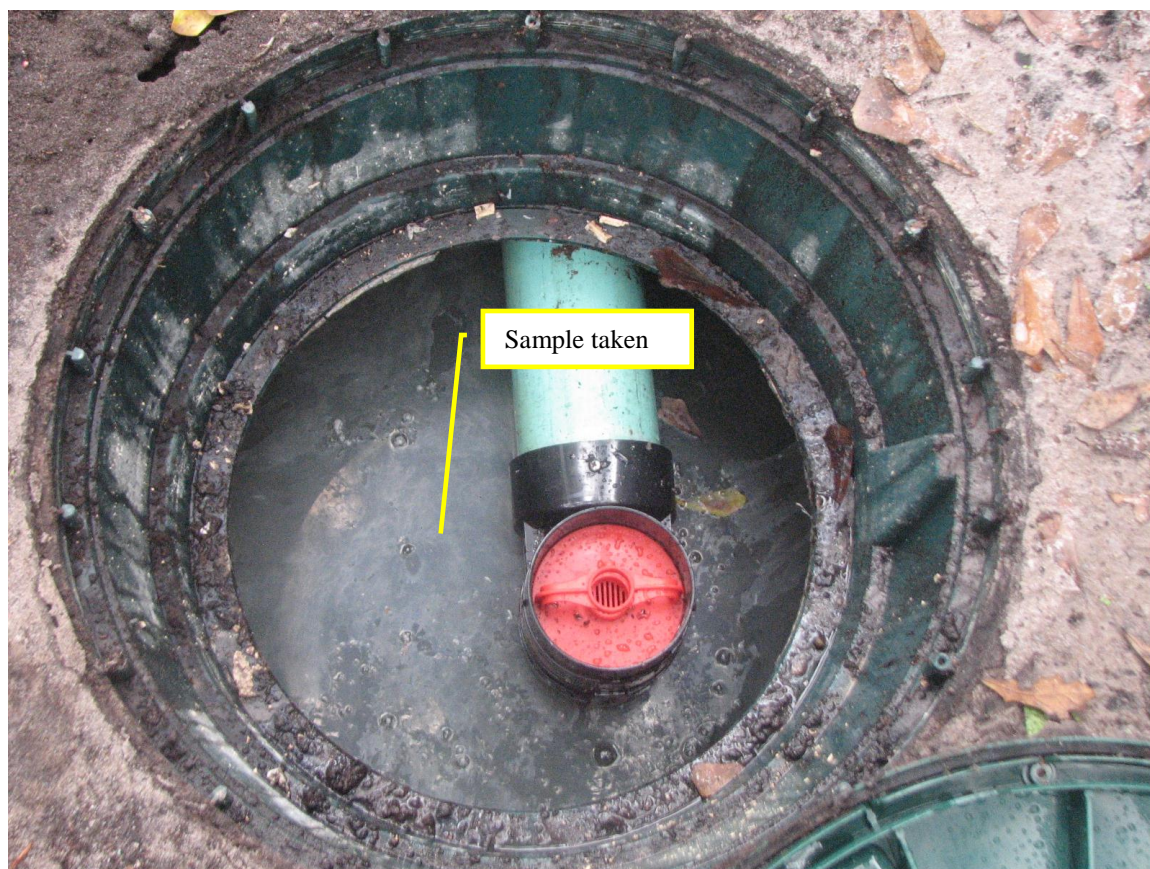
The five primary monitoring points for this sample event are shown in Figure 3. Household wastewater enters the 1<sup>st</sup> chamber of the primary tank and exits the second chamber as septic tank effluent through an effluent screen into the recirculation tank. The first primary monitoring point, B-HS2-STE, 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.



**Figure 3**  
**B-HS2 Sample and Monitoring Locations**

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

Following the modification to the recirculation mode of operation, the recirculation tank only receives septic tank effluent. Therefore, the recirculation tank currently provides additional residence time for STE, before it enters the Stage 1 biofilter. The second primary monitoring point, B-HS2-RECIRC, represents the household wastewater after passage through the septic tank and recirculation tank.

Recirculation tank effluent is discharged by gravity to a distribution box located inside the Stage 1 biofilter, which splits the flow between two perforated distribution pipes along the top of the unsaturated Stage 1 biofilter media. In the Stage 1 biofilter, wastewater percolates downward through the unsaturated expanded clay media where nitrification occurs. Stage 1 biofilter effluent flows into the pump tank (which contains the pump and float switches). The third primary monitoring point, B-HS2-ST1, is the Stage 1 effluent sampled approximately 1.5 feet below the surface of the pump tank (Figure 5).





**Figure 5**  
**Stage 1 effluent sample taken in pump tank (B-HS2-ST1 sample)**

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 was initially tested) is to have the recirculated effluent return to the recirculation tank for mixing with incoming septic tank effluent. The second option, which is currently being tested, 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 saturated denitrification (Stage 2) biofilter into a standing water column lying above the media in the first chamber (lignocellulosic

media), flows downward through the media, moves laterally in a perforated 4-inch pipe through the baffle wall to the bottom of the second chamber, and upward through the media in the second chamber (elemental sulfur and oyster shell).

The first chamber of the Stage 2 biofilter contains 42-inches of lignocellulosic media. Stainless steel samplers are positioned at 6-inch increments for vertical profiling throughout the lignocellulosic media. The fourth primary sampling point is a stainless steel sampler positioned at the bottom of the lignocellulosic media (B-HS2-LIGNO-0). The B-HS2-LIGNO-0 sample represents the lignocellulosic media effluent (Figure 6).

A collection pipe along the bottom transfers the first chamber (lignocellulosic media) effluent to the second chamber, which contains 24-inches of elemental sulfur mixed with oyster shell media. The fifth primary sampling point, B-HS2-ST2, is the second chamber of the Stage 2 biofilter effluent which is sampled approximately 1 foot below the surface of the effluent baffle tee. This sample location is after passage through the sulfur media; it is the final effluent from the treatment system prior to being discharged to the existing soil infiltration system, or drainfield (Figure 7).



**Figure 6**  
**First Chamber of Stage 2 Biofilter (B-HS2-LIGNO-0 Sample)**



**Figure 7**  
**Second Chamber of Stage 2 Biofilter (B-HS2-ST2 Sample)**



### 3.4 Operational Monitoring

Start-up of the system occurred on September 25, 2012 (Experimental Day 0) and the system has operated continually since that date. For this eighth formal sampling event, the water meter for the house and the treatment system flow meters were read and recorded on March 10, 2014 (Experimental Day 531). 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 and records the cumulative forward flow in gallons pumped to the Stage 2 biofilter. The control panel includes telemetry where reports are generated regarding alarms, pump cycles, and other information using a Vericomm control panel system.

### 3.5 Energy Consumption

Energy consumption was monitored using an electrical meter installed between the main power box for the house and the control panel. The electrical meter records the cumulative power usage of the system in kilowatt-hours. The power usage of the system is primarily due to the single 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.

### 3.6 Water Quality Sample Collection and Analyses

A full suite of influent, intermediate and effluent water quality samples from the system were collected for the eighth formal sample event on March 10, 2014 for water quality analysis. Samples were collected at each of the five monitoring points described in Section 3.2: B-HS2-STE, B-HS2-RECIRC, 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 (B-HS2-EB) sample was 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.



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

Field parameters were measured using portable electronic probes and included temperature (Temp), dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, and specific conductance. The field parameters were measured by placing the analytical probes in a container overflowing with sample water. The influent, intermediate, and effluent samples were analyzed by the laboratory for: total alkalinity, chemical oxygen demand (COD), total Kjeldahl nitrogen (TKN), ammonia nitrogen ( $\text{NH}_3\text{-N}$ ), nitrate nitrogen ( $\text{NO}_3\text{-N}$ ), nitrite nitrogen ( $\text{NO}_2\text{-N}$ ), total phosphorus (TP), orthophosphate (Ortho P), total suspended solids (TSS), volatile suspended solids (VSS), total organic carbon (TOC), fecal coliform (fecal), and E.coli. The influent and sulfur media samples included sulfate, sulfide, and hydrogen sulfide (unionized). All analyses were performed by independent and fully NELAC certified analytical laboratory (Southern Analytical Laboratory). Table 1 lists the analytical parameters, analytical methods, and detection limits for laboratory analyses.

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

<b>Analytical Parameter</b>	<b>Method of Analysis</b>	<b>Method Detection Limit (mg/L)</b>
Total Alkalinity as CaCO <sub>3</sub>	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 <sub>3</sub> -N)	EPA 350.1	0.005 mg/L
Nitrate Nitrogen (NO <sub>3</sub> -N)	EPA 300.0	0.01 mg/L
Nitrite Nitrogen (NO <sub>2</sub> -N)	EPA 300.0	0.01 mg/L
Nitrate+Nitrite Nitrogen (NOX-N)	EPA 300.0	0.02 mg/L
Total Phosphorus (TP)	SM 4500P-E	0.01 mg/L
Orthophosphate as P (Ortho P)	EPA 300.0	0.01 mg/L
Carbonaceous Biological Oxygen Demand (CBOD <sub>5</sub> )	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
Total Organic Carbon (TOC)	SM5310B	0.06 mg/L
Sulfate	EPA 300.0	2.0 mg/L
Sulfide	SM 4500SF	0.10 mg/L
Hydrogen Sulfide (unionized)	SM 4550SF	0.01 mg/L
Fecal Coliform (fecal)	SM9222D	2 ct/100mL
E.coli	SM9223B	2 ct/100mL

Similar methods were used for the daily sample collection and analysis that was conducted on March 11th through March 14th, 2014.

## 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.

**Table 2**  
**Summary of Household Water Use**

Date	Cumulative Volume (gallons)	Average Daily Household Flow btwn readings, 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
1/1/13	43,240	113
2/5/13	47,741	129
3/5/2013	50,000	81
4/16/2013	54,010	95
5/7/2013	55,940	92
5/28/2013	57,620	80
6/11/2013	58,620	71
7/24/2013	62,422	88
8/7/2013	63,964	109
Avg. during R to recirc tank operation		108.1
9/7/2013	66,830	94
10/7/2013	69,070	73
11/5/2013	71,600	89
11/27/2013	73,925	106
12/3/2013	75,360	239
12/5/2013	75,674	157
12/17/2013	76,646	81
12/24/2013	77,600	136
1/7/2014	79,020	101
1/14/2014	79,870	121
1/21/2014	80,390	74
1/28/2014	81,000	87
2/4/2014	81,610	87
2/13/2014	82,588	109
3/10/2014	84,541	78
3/14/2014	84,884	86
Avg. during R to Stage 1 sprayers operation		95.8
Total average start-up to 3/14/14		104.5

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**Table 3**  
**Summary of System Flow**

Date and Time Read	Combined Pumped Flow, Q+R Water Meter Reading	Average Daily Combined, Q+R Flow, btwn readings	Stage 2, Q Flow Meter Reading	Average Daily Stage 2, Q Flow, btwn readings	Average Daily, R Flow btwn readings	Average Recycle Ratio
	Cumulative Volume (gallons)	gpd	Cumulative Volume (gallons)	gpd	gpd	Recycle: Forward Flow
Recirculation mode of operation: to recirculation tank						
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	666.0	1,716.6	139.5	526.4	3.77
10/23/2012 9:00	15,092.9	598.1	3,228.2	125.5	472.6	3.77
10/30/2012 14:30	18,090.1	414.6	3,904.7	93.6	321.0	3.43
11/13/2012 14:00	22,944.4	347.3	5,007.3	78.9	268.4	3.40
12/3/2012 8:00	35,555.0	638.5	7,886.8	145.8	492.7	3.38
1/3/2013 8:00	51,563.3	516.4	11,542.3	117.9	398.5	3.38
2/5/2013 8:23	72,069.0	621.1	16,185.3	140.6	480.5	3.42
2/27/2013 11:00	81,937.3	446.3	18,441.6	102.1	344.3	3.37
4/16/13 10:15	105,376.0	488.6	23,809.3	111.9	376.7	3.37
6/4/13 7:30	126,085.7	423.6	28,513.7	96.2	327.4	3.40
7/8/2013 8:30	140,549.5	424.9	31,800.5	96.6	328.3	3.40
7/24/2013 8:39	145,987.7	339.8	33,032.0	76.9	262.8	3.42
8/7/2013 7:45	152,531.6	468.7	34,570.7	110.2	358.5	3.25
Average when R to recirc tank operation (8/7/13)		484.1		109.7	374.4	3.41:1
Recirculation mode of operation: to Stage 1 sprayers						
8/7/2013 13:04	152,720.1		34,616.4			
9/6/2013 9:15	163,910.2	375.0	37,404.3	93.4	281.6	3.01
10/7/2013 10:10	174,601.7	344.5	40,102.7	86.9	257.5	2.96
11/27/2013 9:40	195,934.7	418.5	45,595.0	107.7	310.7	2.88
12/3/2013 11:37	201,887.3	978.8	47,181.4	260.9	718.0	2.75
12/5/2013 8:50	203,129.2	659.2	47,518.9	179.1	480.1	2.68
12/30/2013 12:15	215,153.5	478.2	50,799.2	130.5	347.8	2.67
2/13/2014 8:20	231,849.7	372.4	55,393.9	102.5	269.9	2.63
3/10/2014 8:30	239,504.8	306.1	57,528.7	85.4	220.8	2.59
3/11/2014 10:15	239,723.5	203.8	57,589.8	57.0	146.8	2.58
3/12/2014 7:50	239,903.2	199.9	57,640.1	55.9	144.0	2.58

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**Table 3 (continued)**  
**Summary of System Flow**

3/13/2014 9:00	240,262.8	342.9	57,741.0	96.2	246.7	2.56
3/14/2014 9:30	240,604.5	334.7	57,836.8	93.9	240.8	2.56
Average when R to Stage 1 spray- ers operation (3/14/14)		401.6		106.1	295.5	2.78:1
Total average start-up to 3/14/14		450.4		108.2	342.1	3.16:1

The two throttling globe valves control the fraction of Stage 1 effluent that is recirculated and the fraction sent to the Stage 2 biofilter. As previously discussed, the recirculation mode of operation was modified following the fifth sample event (August 7, 2013). The globe valves were set so that 3 parts went back to the Stage 1 sprayers and 1 part went to the Stage 2 tank (3:1 recycle ratio). From start-up to March 14, 2014, the household flow average was 104.5 gallons per day with periods of higher and lower flows (Table 2). The average combined pumped flow (recirculation and forward flow to the Stage 2 biofilter) following the modification to the recirculation mode of operation to the Stage 1 sprayers was 401.6 gallons per day, and the average forward flow to the Stage 2 biofilter was 106.1 gallons per day. Therefore, the average recirculation flow was 305.4 gallons per day, with a corresponding average recirculation ratio of 2.88:1 following the modification to the recirculation mode of operation.

## 4.2 Energy Consumption

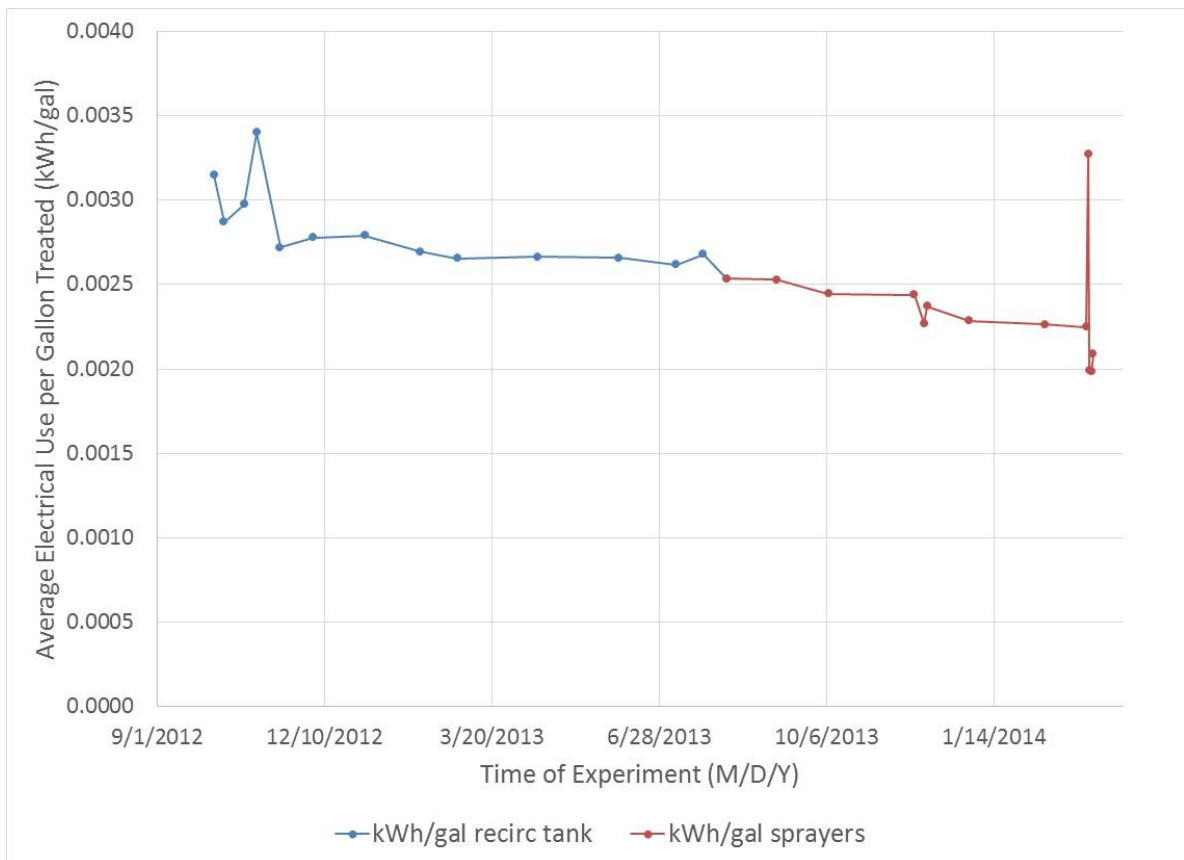
Energy consumption is monitored using an electrical meter installed between the main power box for the house and the control panel to record cumulative power usage of the pump in kilowatt-hours. The recorded electrical use for the system is summarized in Table 4.

**Table 4**  
**Summary of System Electrical Use**

Date and Time Read	Electrical Meter Reading	Average Daily Electrical Use btwn readings	Average Electrical Use per Gallon Treated	Average Electrical Use per 1,000 Gallon Treated
	Cumulative (kWh)	(kWh/day)	(kWh/gal)	(kWh/ 1,000 gal)
<b>Recirculation mode of operation: to recirculation tank</b>				
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	0.0031	3.15
10/11/2012 7:55	5.0	0.40	0.0029	2.87
10/23/2012 9:00	9.5	0.37	0.0030	2.98
10/30/2012 14:30	11.8	0.32	0.0034	3.40
11/13/2012 14:00	14.8	0.21	0.0027	2.72
12/3/2012 8:00	22.8	0.41	0.0028	2.78
1/3/2013 8:00	33.0	0.33	0.0028	2.79
2/5/2013 7:45	45.5	0.38	0.0027	2.69
2/27/2013 11:00	51.5	0.27	0.0027	2.66
4/16/2013 10:15	65.8	0.30	0.0027	2.66
6/4/2013 9:00	78.3	0.26	0.0027	2.66
7/8/2013 8:30	86.9	0.25	0.0026	2.62
7/24/2013 8:39	90.2	0.21	0.0027	2.68
8/7/2013 7:45	94.1	0.28	0.0025	2.53
Average when R to recirc tank (8/7/13)		0.30	0.0028	2.80
<b>Recirculation mode of operation: to Stage 1 sprayers</b>				
9/6/2013 9:15	101.2	0.24	0.0025	2.53
10/7/2013 10:10	107.8	0.21	0.0024	2.45
11/27/2013 9:40	121.2	0.26	0.0024	2.44
12/3/2013 11:37	124.8	0.59	0.0023	2.27
12/5/2013 8:50	125.6	0.42	0.0024	2.37
12/30/2013 12:15	133.1	0.30	0.0023	2.29
2/13/2014 8:20	143.5	0.23	0.0023	2.26
3/10/2014 8:30	148.3	0.19	0.0022	2.25
3/11/2014 10:15	148.5	0.19	0.0033	3.27
3/12/2014 7:50	148.6	0.11	0.0020	1.99
3/13/2014 9:00	148.8	0.19	0.0020	1.98
3/14/2014 9:30	149.0	0.20	0.0021	2.09
Average when R to Stage 1 sprayers (3/14/14)		0.25	0.0024	2.36
Total average start-up to 3/14/14		0.28	0.0027	2.58

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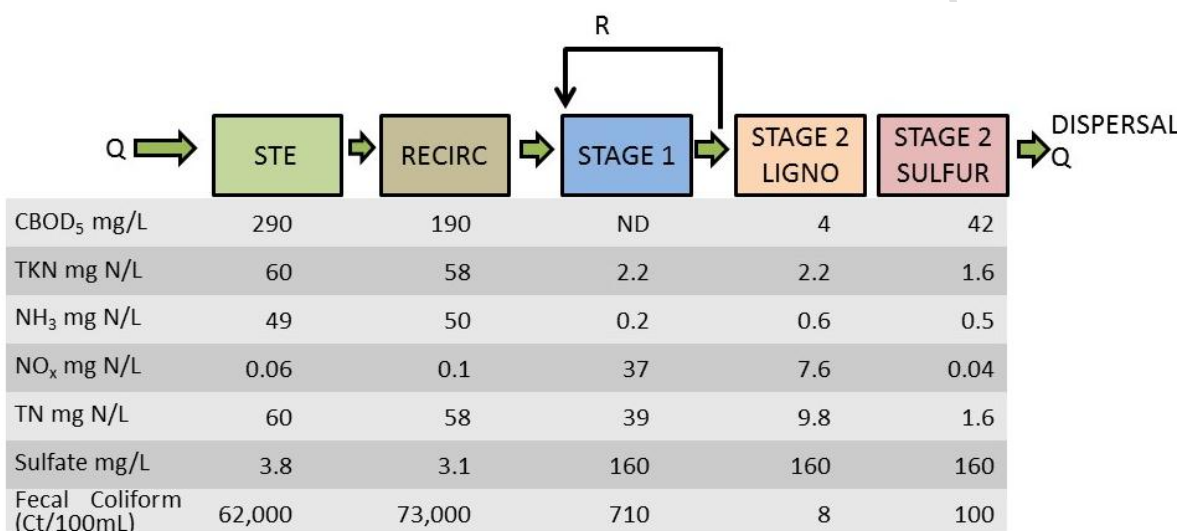
The total average electrical use through March 14, 2014 was 0.28 kWh per day. The higher daily electrical use, prior to changing the recirculation operating mode from tank to the Stage 1 sprayers is attributed to the higher recirculation ratio. The average electrical use per gallon treated since start-up was 0.0027 kWh per gallon treated, and this parameter has been fairly stable since start-up. Figure 8 shows a plot of the average electrical use per gallon treated versus time of experiment.



**Figure 8**  
**Plot of Average Electrical Use per Gallon Treated**

### 4.3 Water Quality

Water quality analytical results for Sample Event No. 8 (Experimental Day 531) are listed in Table 5. Nitrogen results are graphically displayed in Figure 9. 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,  $\text{NH}_3\text{-N}$ , and  $\text{NO}_x\text{-N}$ ), as well as supporting water quality parameters.



**Figure 9**  
**Graphical Representation of Nitrogen Results**  
**Sample Event No. 8, March 10, 2014 (Experimental Day 531)**

**Septic Tank Effluent (STE) Quality:** The water quality characteristics of STE collected in Sample Event 8 were within the typical range generally expected for domestic STE. The measured STE total nitrogen (TN) concentration was 60 mg/L, which is within the range that has been typically reported for Florida single family residence STE.

**Recirculation Tank (RECIRC):** As previously discussed, following the modification to the recirculation mode of operation, the recirculation tank only receives septic tank effluent. Therefore, the recirculation tank currently provides some additional residence time for the STE. The measured total nitrogen (TN) concentration in the recirculation tank effluent was 58 mg/L, which was similar to TN in the STE sample.



**Stage 1 Effluent (ST1):** The Stage 1 effluent  $\text{NH}_3\text{-N}$  levels was 0.2 mg/L with a DO level at 4.8 mg/L in the Stage 1 effluent (Table 5). The Stage 1 effluent TSS and  $\text{CBOD}_5$  concentrations were below the method detection limit of 2 mg/L. The Stage 1 biofilter showed fairly complete nitrification with an effluent  $\text{NH}_3\text{-N}$  concentration of 0.2 mg/L and TKN of 2.2 mg/L. The Stage 1 effluent  $\text{NO}_x\text{-N}$  was 37 mg/L. The Stage 1 effluent TN of 39 mg/L was 35% lower than that in STE, suggesting denitrification in the Stage 1 biofilter.

**Stage 2 Biofilter Effluent (LIGNO-0 and ST2):** The Stage 2 system produced a highly reducing environment and achieved essentially complete  $\text{NO}_x\text{-N}$  reduction. Effluent  $\text{NO}_x\text{-N}$  from the Stage 2 biofilter monitoring point was 0.04 mg/L. The low  $\text{NO}_x\text{-N}$  was accompanied by a measured 0.22 mg/L DO and -332.70 mV ORP. The lignocellulosic media effluent  $\text{NO}_x\text{-N}$  was 7.6 mg/L. Final total nitrogen (TN) in the treatment system effluent was 1.64 mg/L. The Stage 2 biofilter lignocellulosic media effluent  $\text{CBOD}_5$  was 4 mg/L and the sulfur media effluent was 42 mg/L. The Stage 2 effluent sulfate concentration was 160 mg/L.

**Equipment Blank (EB):** The equipment blank (EB) was collected by pumping deionized water through the cleaned pump tubing. This sample was then analyzed for the same parameters as the monitoring samples. As expected, all parameters measured were at or below the method detection limit.

In addition during this monitoring event, daily samples were collected from the nitrogen reducing onsite treatment system to evaluate the variability of daily data. Water quality analytical results, for Sample Events No. 9 through 12 are summarized in Appendix A, Table A.1 through Table A.4. Key parameter mean and standard deviations for these five sample events are provided in Figure 10. In addition, the total nitrogen time series for these five sample events are graphically displayed in Figure 11 for the treatment sample locations.

**Table 5**  
**Water Quality Analytical Results**

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD <sub>5</sub> (mg/L)	COD (mg/L)	TN (mg/L N) <sup>1</sup>	TKN (mg/L N)	Organic N (mg/L N) <sup>2</sup>	NH <sub>3</sub> -N (mg/L N)	NO <sub>3</sub> -N (mg/L N)	NO <sub>2</sub> -N (mg/L N)	NO <sub>x</sub> (mg/L N)	TIN (mg/L N) <sup>3</sup>	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BHS2-STE	3/10/14 10:00	22.0	7.18	1410	0.03	-364.9	560	30	12	290	410	60.06	60	11	49	0.06	0.01	0.06	49.06	7.4	3.2	3.8	28	66	62000	10000	120
BHS2-STE-FILTERED	3/10/14 10:05	22.0	7.18	1410	0.03	-364.9				160		55.06	55	10	45	0.06	0.01	0.06	45.06								
BHS2-RECIRC	3/10/14 9:50	21.5	7.34	1432	0.08	-366.5	600	20	18	190	270	58.1	58	8	50	0.1	0.01	0.1	50.1	6.8	6	3.1	19	56	73000	10000	59
BHS2-ST1	3/10/14 9:21	20.3	7.05	1216	4.80	83.5	220	1	1	2	18	39.2	2.2	1.99	0.21	37	0.01	37	37.21	4	3.8	160	0.4	0.8	710	610	10
BHS2-ST1-DUP	3/10/14 9:26	20.3	7.05	1216	4.80	83.5	220	1	1	2	20	39	2	1.78	0.22	37	0.01	37	37.22	4	3.8	150	0.3	0.6	740	730	11
BHS2-ST1-FILTERED	3/10/14 9:26	20.3	7.05	1216	4.80	83.5				2		40.7	2.7	2.5	0.2	38	0.01	38	38.2								
BHS2-LIGNO-0	3/10/14 9:02	20.6	7.01	1217	0.35	-267.7	330	2	1	4	25	9.77	2.2	1.65	0.55	6.7	0.87	7.57	7.5	3.5	3.3	160	1.2	2.2	8	7.5	14
BHS2-LIGNO-0-FILTERED	3/10/14 9:07	20.6	7.01	1217	0.35	-267.7				3		11.08	2.7	2.43	0.27	7.7	0.68	8.38	8.65								
BHS2-ST2	3/10/14 8:45	20.5	7.04	1209	0.22	-332.7	340	3	3	42	100	1.64	1.6	1.12	0.48	0.04	0.01	0.04	0.52	3.7	3.6	160	17	34	100	2	15
BHS2-ST2-FILTERED	3/10/14 8:50	20.5	7.04	1209	0.22	-332.7				14		1.22	1.2	0.84	0.36	0.01	0.01	0.02	0.38			160					
BHS2-EB	3/10/14 10:15	18.7	7.09	1.24	7.68	91.7	2	1	1	2	10	0.07	0.05	0.041	0.009	0.01	0.01	0.02	0.029	0.01	0.012	0.2	0.01	0.1	1	2	0.06

<sup>1</sup>Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO<sub>x</sub>.

<sup>2</sup>Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH<sub>3</sub>.

<sup>3</sup>Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH<sub>3</sub> and NO<sub>x</sub>.

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

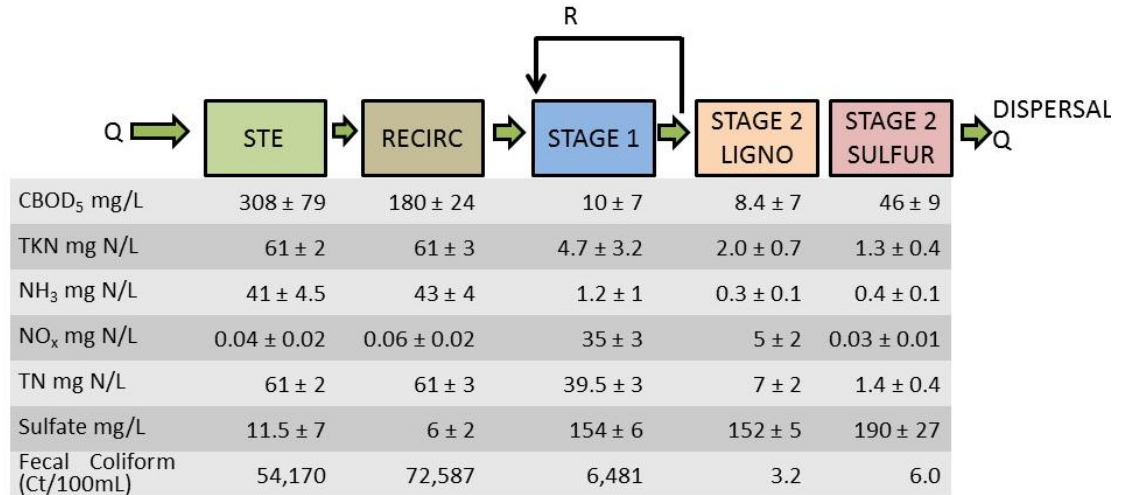
Yellow-shaded data points indicate the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit, value used for statistical analysis.

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

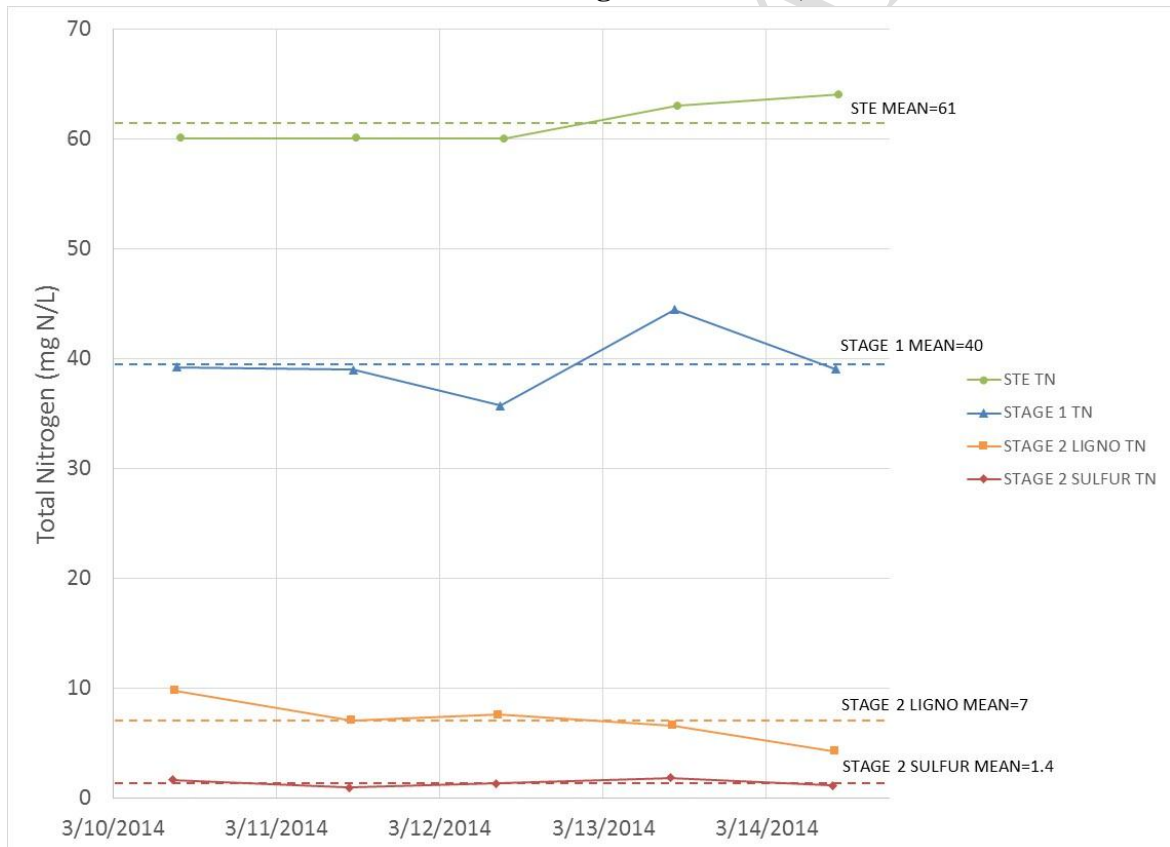
Results based on colony counts outside the ideal range.

Recirculation mode = to Stage 1 sprayers

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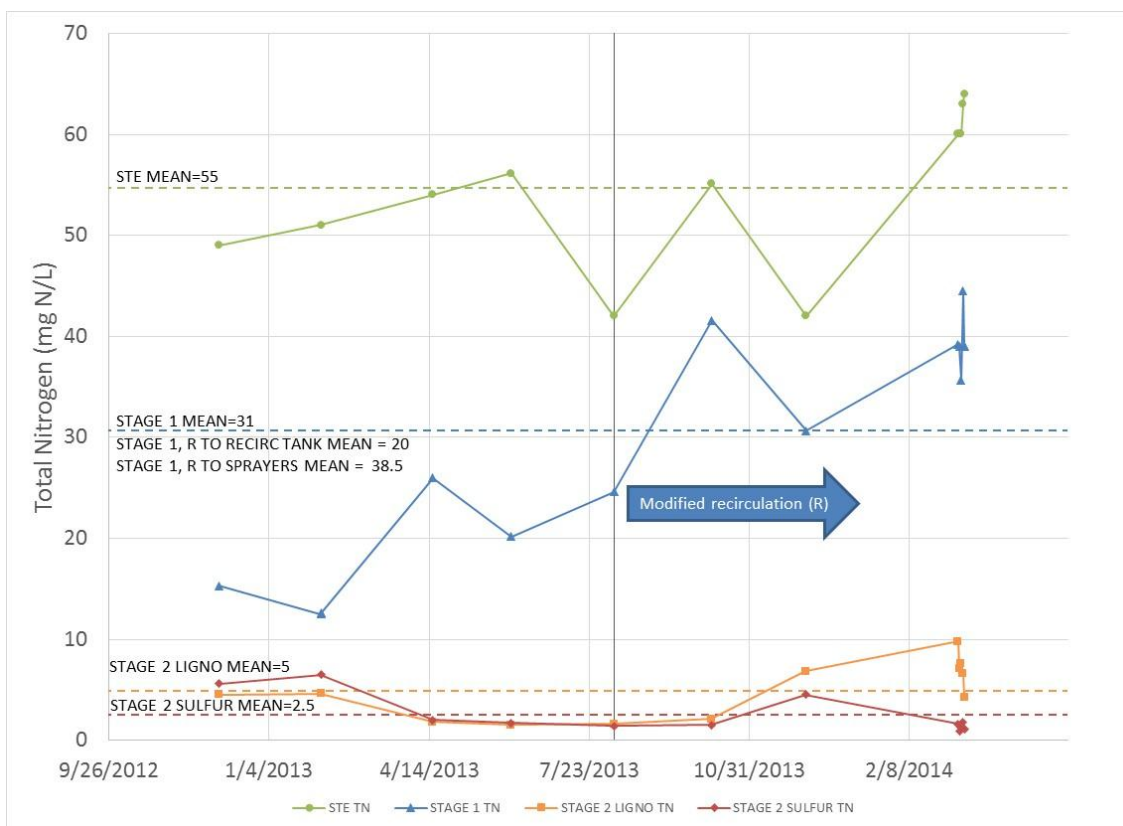
**Figure 10**  
**Mean and Standard Deviations from Daily Sample Events**  
**March 10th through March 14th, 2014**



**Figure 11**  
**Graphical Representation of Total Nitrogen Time Series**  
**March 10th through March 14th, 2014**

#### 4.4 Water Quality Monitoring Summary

A summary of the water quality data collected for the test system is presented in Table 6. Figure 12 provides a time series of influent and effluent TN over the study period. Figures 13 through 19 show box and whisker plots of the various monitoring points for the key parameters measured during the study period.



**Figure 12**  
**Total Nitrogen Time Series Graph**  
**Sample Events No. 1 through 12**  
**December 3, 2012 through March 14, 2014**



**Table 6**  
**Summary of Water Quality Analytical Results**

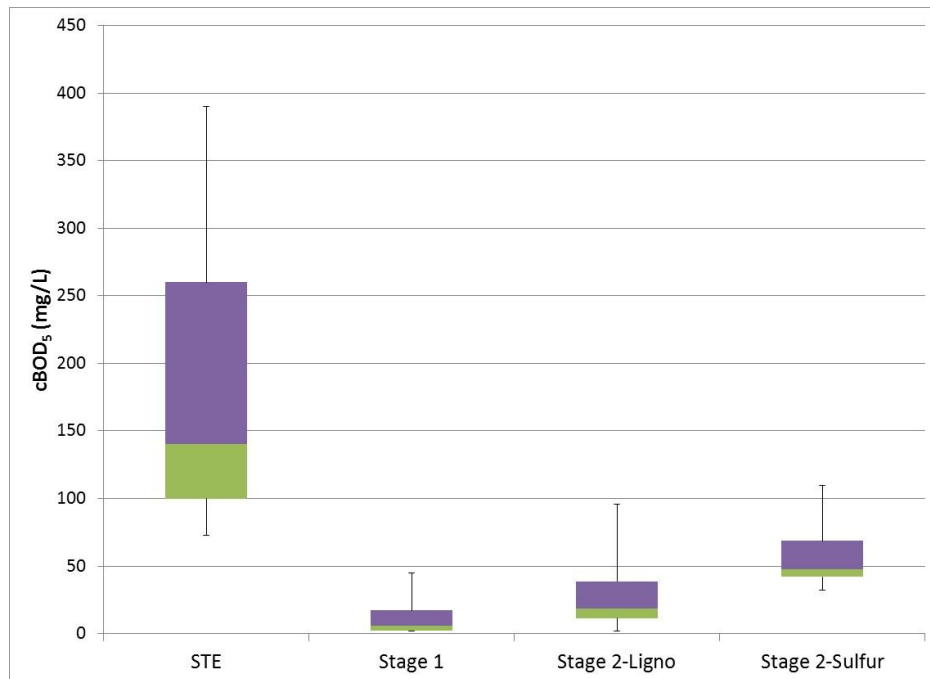
Sample ID	Statistical Parameter	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD <sub>5</sub> (mg/L)	COD (mg/L)	TN (mg/L N) <sup>1</sup>	TKN (mg/L N)	Organic N (mg/L N) <sup>2</sup>	NH <sub>3</sub> -N (mg/L N)	NO <sub>3</sub> -N (mg/L N)	NO <sub>2</sub> -N (mg/L N)	NO <sub>x</sub> (mg/L N)	TIN (mg/L N) <sup>3</sup>	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
Septic tank effluent (STE)	n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10
	MEAN	23.3	7.2	1381.4	0.1	-371.0	568.3	64.3	21.3	192.3	338.3	54.7	54.7	13.3	41.3	0.05	0.01	0.05	41.4	8.5	3.8	53.6	18.1	50.0	90159.5	59313.8	79.7
	STD. DEV.	2.7		59.9	0.2	10.6	206.1	147.6	14.2	114.1	99.3	7.5	7.5	8.8	6.5	0.04	0.00	0.03	6.5	4.4	1.6	48.5	5.6	12.4			35.1
	MIN	18.8	7.0	1248.0	0.0	-392.5	410.0	10.0	8.0	73.0	150.0	42.0	42.0	1.0	30.0	0.01	0.01	0.02	30.0	4.8	0.7	3.8	9.5	26.0	800	2,420	31.0
	MAX	27.8	7.6	1430.0	0.6	-360.0	1200.0	532.0	58.0	390.0	450.0	64.0	64.0	25.0	53.0	0.13	0.01	0.13	53.1	18.0	6.6	150.0	28.0	66.0	1,600,000	1,200,000	120.0
Stage 1 effluent (all events)	n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	5	5	5	11	11	10
	MEAN	22.3	6.9	1,212	4.0	-48.6	225.8	12.4	6.3	11.3	19.9	30.7	3.9	3.0	0.9	26.5	0.3	26.8	27.7	5.5	2.8	154.0	0.10	0.3	1,297	762	13.2
	STD. DEV.	2.8		34.2	1.2	78.9	18.8	21.5	9.8	12.7	7.8	10.8	2.4	1.6	1.1	10.5	0.3	10.4	10.1	2.6	1.4	5.5	0.17	0.3			3.5
	MIN	16.1	6.5	1,137	2.0	-180.0	190.0	1.0	1.0	2.0	10.0	12.5	1.6	1.3	0.1	6.3	0.01	6.3	9.9	3.5	0.7	150.0	0.01	0.1	6	3	8.3
	MAX	26.9	7.2	1,267	5.7	83.5	250.0	68	35	45	36	44.5	10.0	7.6	3.6	38.0	0.8	38.0	38.2	12.0	5.8	160.0	0.40	0.8	68,000	24,000	19.0
Stage 2 lignocellulosic effluent (LIGNO-0)	n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	12	9
	MEAN	22.5	7.0	1165.3	0.5	-288.8	361.7	8.1	7.8	27.5	69.9	4.9	2.5	1.5	1.1	2.1	0.2	2.3	3.3	4.8	2.6	155.5	5.8	13.9	18.9	13	59.4
	STD. DEV.	2.2		50.9	0.4	53.9	42.2	9.1	9.3	26.8	56.6	2.7	1.3	0.5	1.1	2.5	0.3	2.7	2.4	2.8	1.0	32.8	7.0	15.7			131.5
	MIN	18.7	6.7	1112.0	0.1	-362.1	290.0	1.0	1.0	2.0	22.0	1.5	1.4	1.0	0.3	0.01	0.01	0.02	0.4	2.6	0.7	86.0	0.3	0.6	1.0	1.0	12.0
	MAX	26.7	7.1	1230.0	1.2	-207.3	440.0	30.0	30.0	96.0	220.0	9.8	4.6	2.8	3.3	6.7	0.9	7.6	7.5	12.0	4.9	220.0	19.0	40.0	8,000	7,800	410
Stage 2 sulfur effluent (ST2)	n	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	12	10
	MEAN	21.9	6.9	1,211	0.1	-335.5	337.5	4.3	3.0	60.2	123	2.5	2.5	1.2	1.3	0.01	0.01	0.02	1.3	4.5	2.8	202	19.2	36.6	30.50	14.86	17.7
	STD. DEV.	2.8		47.9	0.1	45.5	47.3	4.0	2.1	27.8	78	1.9	1.9	0.4	1.7	0.01	0.00	0.01	1.7	2.4	1.2	44.1	11.2	22.2			4.1
	MIN	16.5	6.3	1,134	0.1	-372.0	220.0	1.0	1.0	32.0	10	0.9	0.9	0.6	0.3	0.01	0.01	0.02	0.3	2.4	0.9	160	6	7	1	1	13.0
	MAX	26.1	7.1	1,303	0.2	-218.8	410.0	15.0	8.0	110	260	6.5	6.5	1.8	5.0	0.04	0.01	0.04	5.0	11.0	5.1	320	40	83	20,000	9,600	25.0

Notes:

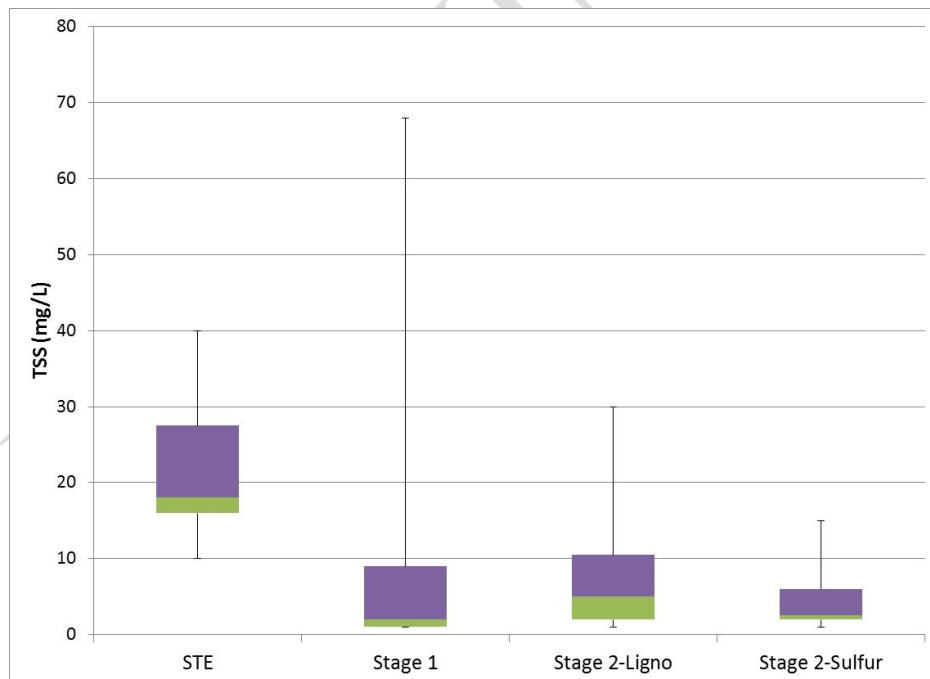
<sup>1</sup>Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO<sub>x</sub>

<sup>2</sup>Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH<sub>3</sub>

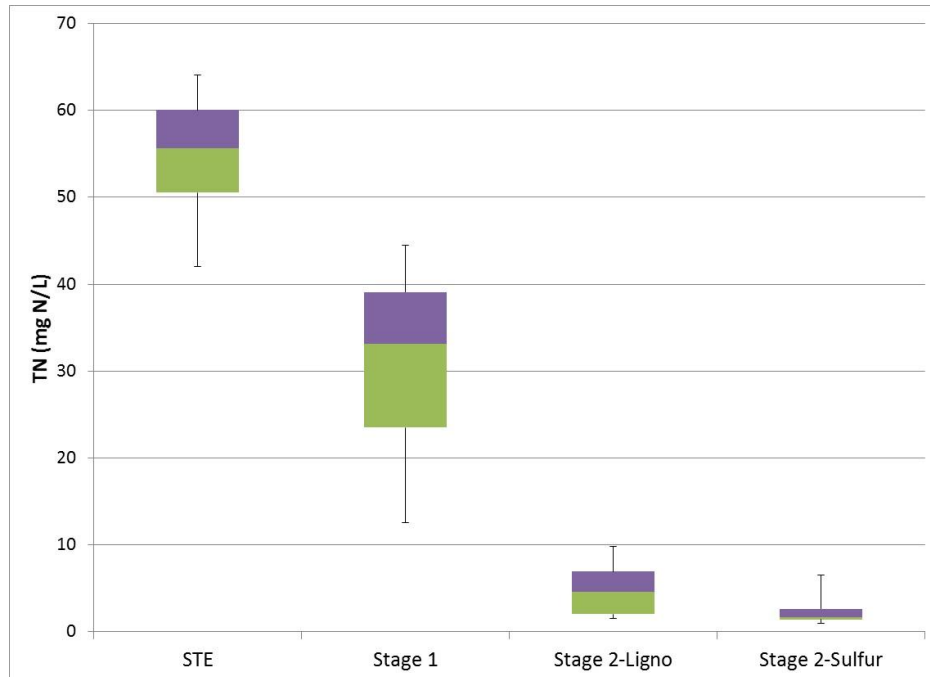
<sup>3</sup>Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH<sub>3</sub> and NO<sub>x</sub>



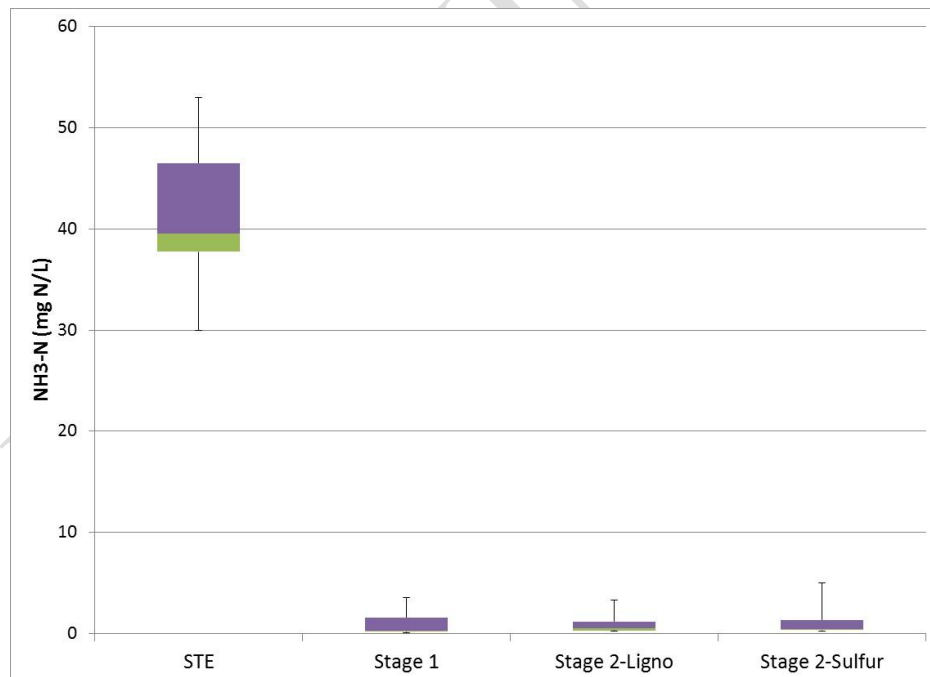
**Figure 13**  
**CBOD<sub>5</sub> Box and Whisker Plot**



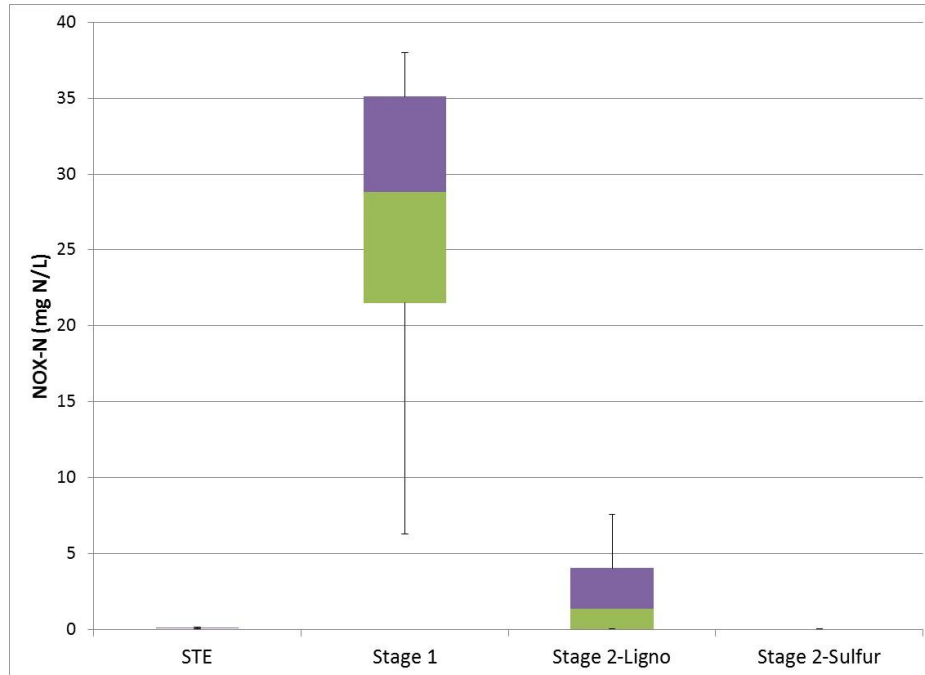
**Figure 14**  
**TSS Box and Whisker Plot**



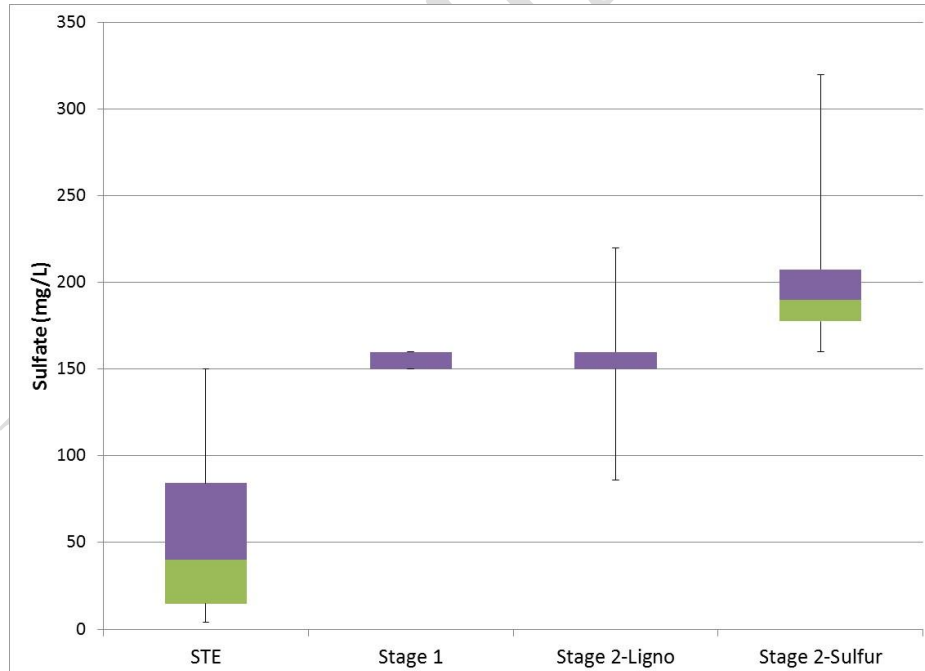
**Figure 15**  
**Total Nitrogen (TN) Box and Whisker Plot**



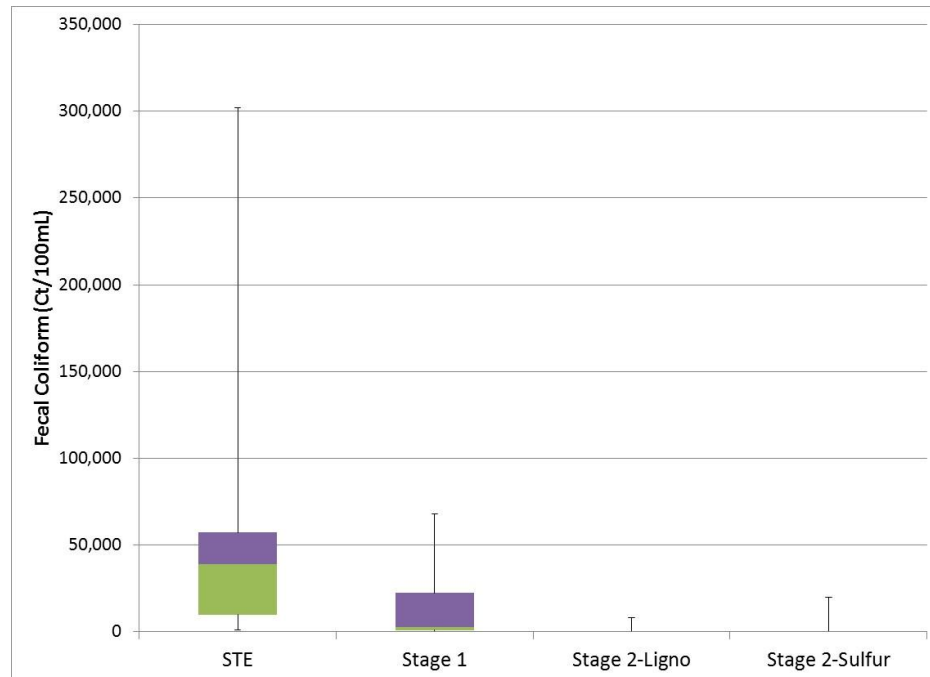
**Figure 16**  
**Ammonia N (NH<sub>3</sub>-N) Box and Whisker Plot**



**Figure 17**  
**Nitrate+Nitrite Nitrogen (NO<sub>x</sub>-N) Box and Whisker Plot**



**Figure 18**  
**Sulfate (SO<sub>4</sub>) Box and Whisker Plot**



**Figure 19**  
**Fecal Coliform Box and Whisker Plot**

#### 4.5 Performance Comparison of Recirculation Mode of Operation

As previously discussed, the recirculation mode of operation was modified prior to the sixth sample event. The system was designed with two recirculation modes of operation. The first option (which was initially tested) is to have the recirculated effluent return to the recirculation tank for mixing with incoming septic tank effluent. A summary of the water quality data collected for the test system during testing of the first option (which was initially tested) is presented in Table 7. Following the fifth sample event, the recirculation mode of operation was modified to test the second option. In the second option, recirculated effluent does not pass through the recirculation tank, but is dispersed by three spray nozzles directly to the top of the Stage 1 biofilter along with recirculation tank effluent (STE). A summary of the water quality data collected for the test system during testing of the second option is presented in Table 8. A comparison of the two recirculation modes of operation for key parameters is provided in Table 9.



April 2014

**Table 7**  
**Summary of Water Quality Data**  
**Option 1: Recirculation to Recirc Tank**

Sample ID	Statistical Parameter	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD <sub>5</sub> (mg/L)	COD (mg/L)	TN (mg/L N) <sup>1</sup>	TKN (mg/L N)	Organic N (mg/L N) <sup>2</sup>	NH <sub>3</sub> -N (mg/L N)	NO <sub>3</sub> -N (mg/L N)	NO <sub>2</sub> -N (mg/L N)	NOx (mg/L N)	TIN (mg/L N) <sup>3</sup>	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
Septic tank effluent (STE)	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
	MEAN	23.8	7.3	1,360.0	0.2	(370.1)	462.0	28.2	24.6	105.6	320.0	50.5	50.4	8.8	41.6	0.05	0.01	0.05	41.7	8.2	3.9	83.4	14.8	53.4	115,416	118,949	48.3
	STD. DEV.	3.3	-	48.3	0.2	13.2	39.6	9.4	8.5	25.5	109.3	5.4	5.4	7.7	5.3	0.05	-	0.04	5.3	5.5	0.4	44.6	2.9	10.0			23.4
	MIN	18.8	7.2	1,296.0	0.1	(392.5)	410.0	18.0	15.0	73.0	150.0	42.0	42.0	1.0	36.0	0.01	0.01	0.02	36.0	4.8	3.5	31.0	10.0	41.0	800	2,420	31.0
	MAX	27.8	7.6	1,398.0	0.6	(360.0)	510.0	40.0	35.0	140.0	430.0	56.1	56.0	18.0	48.0	0.13	0.01	0.13	48.0	18.0	4.3	150.0	17.0	65.0	1,600,000	1,200,000	82.0
Recirculation tank (DBOX)	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0	0	5	5	4
	MEAN	23.2	7.0	1,217.6	1.0	(127.9)	286.0	20.6	16.0	25.2	69.6	18.9	12.8	3.8	9.0	5.52	1.08	6.13	15.1	6.0	2.3	-	-	-	38,350	34,064	19.3
	STD. DEV.	3.8	0.2	32.1	0.8	43.2	18.2	11.2	13.8	31.9	40.9	5.3	2.8	1.8	1.9	5.97	1.26	6.34	4.6	4.0	1.1	-	-	-			8.4
	MIN	17.4	6.8	1,173.0	0.1	(181.8)	270.0	12.0	6.0	2.0	10.0	14.4	8.8	0.7	7.1	0.01	0.01	0.02	11.0	3.7	1.1	-	-	-	1,000	2,420	11.0
	MAX	27.7	7.2	1,245.0	1.8	(71.2)	310.0	40.0	40.0	77.0	110.0	26.0	16.0	5.0	11.0	14.00	2.80	14.00	21.1	13.0	3.6	-	-	-	790,000	345,000	31.0
Stage 1 effluent (ST1 and PUMP)	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0	0	4	4	4
	MEAN	22.7	6.8	1,209.4	3.6	(86.1)	232.0	27.2	12.8	15.2	22.8	19.7	3.1	2.1	0.9	16.26	0.28	16.66	17.6	5.6	1.6	-	-	-	269	141	12.3
	STD. DEV.	4.0	0.2	47.5	1.7	88.0	14.8	28.4	13.1	18.6	10.6	5.8	1.9	0.6	1.5	7.26	0.30	7.33	6.2	3.6	0.7	-	-	-			3.6
	MIN	16.1	6.7	1,137.0	2.0	(180.0)	210.0	1.0	1.0	2.0	11.0	12.5	1.6	1.3	0.1	6.30	0.01	6.30	9.9	3.5	0.7	-	-	-	6	3	8.3
	MAX	26.9	7.1	1,259.0	5.7	50.8	250.0	68.0	35.0	45.0	36.0	26.0	6.2	2.7	3.6	24.00	0.77	24.00	24.1	12.0	2.6	-	-	-	4,200	4,611	17.0
Stage 2 lignocellulosic effluent (LIGNO-0)	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	3
	MEAN	22.9	7.0	1,193.2	0.5	(332.4)	386.0	9.2	8.8	47.6	118.6	2.8	2.8	1.3	1.5	0.01	0.01	0.02	1.5	5.0	2.0	159.2	12.8	28.9	38	21	18.7
	STD. DEV.	3.0	-	45.1	0.3	33.2	56.8	11.8	11.9	30.1	57.9	1.6	1.6	0.3	1.4	0.01	-	0.00	1.4	4.0	0.8	53.8	7.0	13.1	-	-	2.3
	MIN	18.7	6.8	1,141.0	0.2	(362.1)	290.0	1.0	1.0	20.0	81.0	1.5	1.5	1.0	0.4	0.01	0.01	0.02	0.4	2.6	0.7	86.0	4.2	7.3	10	1	16.0
	MAX	26.7	7.1	1,230.0	0.8	(279.4)	440.0	30.0	30.0	96.0	220.0	4.6	4.6	1.8	3.3	0.03	0.01	0.03	3.3	12.0	2.7	220.0	19.0	40.0	1,300	1,986	20.0
Stage 2 sulfur effluent (ST2)	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	4
	MEAN	22.5	6.8	1,222.0	0.1	(323.3)	334.0	6.8	4.2	67.6	170.0	3.5	3.4	1.3	2.2	0.01	0.01	0.02	2.2	4.9	2.5	192.0	24.8	41.8	53	25	22.0
	STD. DEV.	3.7	-	65.5	0.1	61.5	76.7	5.2	2.5	32.3	101.7	2.4	2.4	0.2	2.2	-	-	-	2.2	3.5	1.3	27.7	12.5	21.2			2.2
	MIN	16.5	6.5	1,135.0	0.1	(372.0)	220.0	2.0	2.0	32.0	10.0	1.4	1.4	1.0	0.4	0.01	0.01	0.02	0.4	2.4	0.9	170.0	14.0	23.0	10	1	20.0
	MAX	26.1	7.0	1,303.0	0.2	(218.8)	410.0	15.0	8.0	110.0	260.0	6.5	6.5	1.5	5.0	0.01	0.01	0.02	5.0	11.0	4.1	240.0	40.0	73.0	300	155	25.0

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**Table 8**  
**Summary of Water Quality Data**  
**Option 2: Recirculation to Stage 1 Sprayers**

Sample ID	Statistical Parameter	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD <sub>5</sub> (mg/L)	COD (mg/L)	TN (mg/L N) <sup>1</sup>	TKN (mg/L N)	Organic N (mg/L N) <sup>2</sup>	NH <sub>3</sub> -N (mg/L N)	NO <sub>3</sub> -N (mg/L N)	NO <sub>2</sub> -N (mg/L N)	NO <sub>x</sub> (mg/L N)	TIN (mg/L N) <sup>3</sup>	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
Septic tank effluent (STE)	n	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
	MEAN	22.9	7.2	1,396.7	0.0	(371.6)	644.3	90.0	18.9	254.3	351.4	57.8	57.7	16.6	41.1	0.05	0.01	0.05	41.2	8.7	3.7	32.4	20.5	47.6	75,579	36,082	100.7
	STD. DEV.	2.4	0.1	66.1	0.0	9.5	246.4	195.0	17.5	112.7	98.2	7.5	7.5	8.5	7.6	0.03	-	0.03	7.6	3.8	2.2	41.5	6.0	14.1	-	-	23.8
	MIN	20.7	7.0	1,248.0	0.0	(390.9)	500.0	10.0	8.0	100.0	190.0	42.0	42.0	2.0	30.0	0.01	0.01	0.02	30.0	6.5	0.7	3.8	9.5	26.0	27,000	10,000	56.0
	MAX	27.0	7.2	1,430.0	0.1	(363.4)	1,200.0	532.0	58.0	390.0	450.0	64.0	64.0	25.0	53.0	0.11	0.01	0.11	53.1	17.0	6.6	120.0	28.0	66.0	302,000	240,000	120.0
Recirculation tank	n	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	MEAN	21.8	7.2	1,398.2	0.1	(370.9)	585.0	13.5	12.8	171.7	273.3	58.6	58.5	17.2	41.3	0.05	0.01	0.06	41.4	6.0	4.5	8.1	20.7	49.7	92,508	24,760	69.2
	STD. DEV.	1.4	0.2	53.1	0.0	6.0	28.8	6.4	6.1	29.3	32.0	5.8	5.8	5.7	4.9	0.03	-	0.03	4.9	0.7	1.8	5.3	10.1	13.4	-	-	15.5
	MIN	20.5	6.9	1,292.0	0.0	(382.5)	530.0	4.0	4.0	130.0	230.0	48.0	48.0	8.0	35.0	0.01	0.01	0.02	35.0	4.7	1.6	3.1	15.0	39.0	51,000	10,000	53.0
	MAX	24.5	7.3	1,432.0	0.1	(366.5)	610.0	21.0	21.0	200.0	310.0	63.1	63.0	23.0	50.0	0.10	0.01	0.10	50.1	6.8	6.0	18.0	41.0	74.0	311,000	240,000	93.0
Stage 1 effluent (ST1 and PUMP)	n	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5	5	5	7	7	6
	MEAN	22.0	7.0	1,213.1	4.2	(21.7)	221.4	1.9	1.6	8.4	17.9	38.5	4.5	3.6	0.9	33.86	0.24	34.05	35.0	5.4	3.6	154.0	0.1	0.3	4,997	2,548	13.8
	STD. DEV.	2.0	0.2	25.1	0.7	65.1	21.2	1.1	0.8	6.6	5.1	4.4	2.7	1.9	0.9	4.22	0.26	4.03	4.0	1.8	1.2	5.5	0.2	0.3	-	-	3.6
	MIN	20.3	6.5	1,197.0	3.3	(80.7)	190.0	1.0	1.0	2.0	10.0	30.7	2.0	1.8	0.2	26.00	0.01	26.65	26.9	3.8	2.2	150.0	0.0	0.1	100	31	9.9
	MAX	25.6	7.2	1,267.0	4.9	83.5	250.0	4.0	3.0	18.0	23.0	44.5	10.0	7.6	2.4	38.00	0.65	38.00	38.2	7.6	5.8	160.0	0.4	0.8	68,000	24,000	19.0
Stage 2 lignocellulosic effluent (LIGNO-0)	n	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
	MEAN	22.2	6.9	1,145.4	0.5	(257.6)	344.3	7.3	7.1	13.1	35.1	6.3	2.4	1.6	0.7	3.54	0.42	3.96	4.6	4.6	3.0	152.9	1.9	3.2	11	9	79.8
	STD. DEV.	1.7	0.1	47.7	0.4	43.1	16.2	7.7	7.8	11.8	16.0	2.5	1.1	0.6	0.9	2.26	0.26	2.50	2.2	2.0	1.0	4.9	2.5	4.0	-	-	161.8
	MIN	20.6	6.7	1,112.0	0.1	(323.7)	330.0	1.0	1.0	2.0	22.0	2.1	1.4	1.1	0.3	0.40	0.01	0.40	1.1	3.4	1.9	150.0	0.3	0.6	1	1	12.0
	MAX	25.5	7.1	1,217.0	1.2	(207.3)	370.0	18.0	18.0	36.0	67.0	9.8	4.6	2.8	2.7	6.70	0.87	7.57	7.5	7.9	4.9	160.0	7.4	12.0	8,000	7,800	410.0
Stage 2 sulfur effluent (ST2)	n	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
	MEAN	21.4	6.9	1,203.7	0.1	(344.1)	340.0	2.4	2.1	54.9	88.7	1.8	1.8	1.1	0.7	0.02	0.01	0.02	0.8	4.3	3.0	208.6	16.1	32.8	21	10	14.8
	STD. DEV.	2.1	0.3	34.5	0.1	32.7	12.9	1.7	1.5	25.4	30.1	1.2	1.2	0.4	0.9	0.01	-	0.01	0.9	1.5	1.2	54.0	9.9	23.8	-	-	1.6
	MIN	20.0	6.3	1,134.0	0.1	(368.6)	320.0	1.0	1.0	38.0	35.0	0.9	0.9	0.6	0.3	0.01	0.01	0.02	0.3	3.0	1.7	160.0	5.7	6.8	1	1	13.0
	MAX	25.8	7.1	1,250.0	0.2	(275.5)	360.0	6.0	5.0	110.0	130.0	4.5	4.5	1.8	2.7	0.04	0.01	0.04	2.7	6.5	5.1	320.0	37.0	83.0	20,000	9,600	17.0

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**Table 9**  
**Comparison of Water Quality Data**

Sample ID	Statistical Parameter	Total Alkalinity (mg/L)		TSS (mg/L)		CBOD5 (mg/L)		TN (mg/L N)		TKN (mg/L N)		Organic N (mg/L N)		NH3-N (mg/L N)		NOx (mg/L N)		TIN (mg/L N)		TP (mg/L)		Sulfate (mg/L)	
		Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers	Recirc tank	Sprayers
Septic tank effluent (STE)	n	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7
	MEAN	462.0	644.3	28.2	90.0	105.6	254.3	50.5	57.8	50.4	57.7	8.8	16.6	41.6	41.1	0.05	0.05	41.7	41.2	8.2	8.7	83.4	32.4
	STD. DEV.	39.6	246.4	9.4	195.0	25.5	112.7	5.4	7.5	5.4	7.5	7.7	8.5	5.3	7.6	0.04	0.03	5.3	7.6	5.5	3.8	44.6	41.5
	MIN	410.0	500.0	18.0	10.0	73.0	100.0	42.0	42.0	42.0	42.0	1.0	2.0	36.0	30.0	0.02	0.02	36.0	30.0	4.8	6.5	31.0	3.8
	MAX	510.0	1,200.0	40.0	532.0	140.0	390.0	56.1	64.0	56.0	64.0	18.0	25.0	48.0	53.0	0.13	0.11	48.0	53.1	18.0	17.0	150.0	120.0
Recirculation tank	n	5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	0	6
	MEAN	286.0	585.0	20.6	13.5	25.2	171.7	18.9	58.6	12.8	58.5	3.8	17.2	9.0	41.3	6.13	0.06	15.1	41.4	6.0	6.0	-	8.1
	STD. DEV.	18.2	28.8	11.2	6.4	31.9	29.3	5.3	5.8	2.8	5.8	1.8	5.7	1.9	4.9	6.34	0.03	4.6	4.9	4.0	0.7	-	5.3
	MIN	270.0	530.0	12.0	4.0	2.0	130.0	14.4	48.0	8.8	48.0	0.7	8.0	7.1	35.0	0.02	0.02	11.0	35.0	3.7	4.7	-	3.1
	MAX	310.0	610.0	40.0	21.0	77.0	200.0	26.0	63.1	16.0	63.0	5.0	23.0	11.0	50.0	14.00	0.10	21.1	50.1	13.0	6.8	-	18.0
Stage 1 effluent	n	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	0	5
	MEAN	232.0	221.4	27.2	1.9	15.2	8.4	19.7	38.5	3.1	4.5	2.1	3.6	0.9	0.9	16.66	34.05	17.6	35.0	5.6	5.4	-	154.0
	STD. DEV.	14.8	21.2	28.4	1.1	18.6	6.6	5.8	4.4	1.9	2.7	0.6	1.9	1.5	0.9	7.33	4.03	6.2	4.0	3.6	1.8	-	5.5
	MIN	210.0	190.0	1.0	1.0	2.0	2.0	12.5	30.7	1.6	2.0	1.3	1.8	0.1	0.2	6.30	26.65	9.9	26.9	3.5	3.8	-	150.0
	MAX	250.0	250.0	68.0	4.0	45.0	18.0	26.0	44.5	6.2	10.0	2.7	7.6	3.6	2.4	24.00	38.00	24.1	38.2	12.0	7.6	-	160.0
Stage 2 lignocellulosic effluent	n	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7
	MEAN	386.0	344.3	9.2	7.3	47.6	13.1	2.8	6.3	2.8	2.4	1.3	1.6	1.5	0.7	0.02	3.96	1.5	4.6	5.0	4.6	159.2	152.9
	STD. DEV.	56.8	16.2	11.8	7.7	30.1	11.8	1.6	2.5	1.6	1.1	0.3	0.6	1.4	0.9	0.00	2.50	1.4	2.2	4.0	2.0	53.8	4.9
	MIN	290.0	330.0	1.0	1.0	20.0	2.0	1.5	2.1	1.5	1.4	1.0	1.1	0.4	0.3	0.02	0.40	0.4	1.1	2.6	3.4	86.0	150.0
	MAX	440.0	370.0	30.0	18.0	96.0	36.0	4.6	9.8	4.6	4.6	1.8	2.8	3.3	2.7	0.03	7.57	3.3	7.5	12.0	7.9	220.0	160.0
Stage 2 sulfur effluent	n	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7
	MEAN	334.0	340.0	6.8	2.4	67.6	54.9	3.5	1.8	3.4	1.8	1.3	1.1	2.2	0.7	0.02	0.02	2.2	0.8	4.9	4.3	192.0	208.6
	STD. DEV.	76.7	12.9	5.2	1.7	32.3	25.4	2.4	1.2	2.4	1.2	0.2	0.4	2.2	0.9	-	0.01	2.2	0.9	3.5	1.5	27.7	54.0
	MIN	220.0	320.0	2.0	1.0	32.0	38.0	1.4	0.9	1.4	0.9	1.0	0.6	0.4	0.3	0.02	0.02	0.4	0.3	2.4	3.0	170.0	160.0
	MAX	410.0	360.0	15.0	6.0	110.0	110.0	6.5	4.5	6.5	4.5	1.5	1.8	5.0	2.7	0.02	0.04	5.0	2.7	11.0	6.5	240.0	320.0

## 5.0 B-HS2 Sample Event No. 8: Summary and Recommendations

### 5.1 Summary

The eighth and final sampling results indicate that:

- Septic tank effluent (STE) quality is characteristic of typical household STE quality. The total nitrogen concentration of 60 mg/L is within the range of values typically reported for Florida single family residence STE.
- The Stage 1 biofilter converted most of the ammonia N to oxidized nitrogen; effluent contained 2.2 mg/L TKN, of which 0.21 mg/L was ammonia.
- The Stage 2 biofilter effluent NO<sub>x</sub>-N was 0.04 mg N/L.
- The total nitrogen concentration in the final effluent from the total treatment system was 1.64 mg/L, an approximately 97% reduction in STE TN.

### 5.2 Conclusions

Sample Event 8 was the last funded sample event for the B-HS2 treatment system. Section 4.4 summarized the water quality data collected over the 1.5 year monitoring period for this system. These results indicate that:

- The septic tank effluent average total nitrogen concentration of 54.7 mg/L is in the upper range of values typically reported for Florida single family residence STE.
- The Stage 1 biofilter with recirculation provided significant nitrification with an average NH<sub>3</sub>-N concentration of 0.9 mg/L and average TKN of 3.9 mg/L. The Stage 1 biofilter effluent average NO<sub>x</sub>-N was 26.8 mg/L. These results indicate significant denitrification (approximately 44% total nitrogen reduction) was occurring.
- The Stage 2 biofilter was effective in producing a reducing environment and achieving the NO<sub>x</sub>-N reduction goals (average NO<sub>x</sub>-N concentration of 0.02 mg/L). The average final total nitrogen (TN) in the treatment system effluent was 2.5 mg/L, primarily TKN (average TKN concentration of 2.5 mg/L).

Further analysis of the results obtained at this site will occur as Task B results are compiled and summarized. The results of the data collected to date have provided insights into the performance of a full-scale passive nitrogen reduction system monitored over an extended timeframe (535 experimental days) under actual onsite conditions.

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## **Appendix A: Laboratory Report**

PRELIMINARY

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**Table A.1**  
**Water Quality Analytical Results**  
**March 11, 2014**

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD <sub>5</sub> (mg/L)	COD (mg/L)	TN (mg/L N) <sup>1</sup>	TKN (mg/L N)	Organic N (mg/L N) <sup>2</sup>	NH <sub>3</sub> -N (mg/L N)	NO <sub>3</sub> -N (mg/L N)	NO <sub>2</sub> -N (mg/L N)	NO <sub>x</sub> (mg/L N)	TIN (mg/L N) <sup>3</sup>	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BHS2-STE	3/11/14 11:45	21.8	7.15	1425	0.03	-365.5	570	16	15	390	450	60.05	60	20	40	0.05	0.01	0.05	40.05	7.2	6.5	4.9	22	50	27000	24000	120
BHS2-RECIRC	3/11/14 11:30	21.8	7.28	1430	0.07	-367.2	580	12	12	150	270	57.05	57	17	40	0.05	0.01	0.05	40.05	6.4	5.9	3.9	17	45	51000	10000	71
BHS2-ST1	3/11/14 11:15	20.7	6.91	1197	4.64	-37.6	220	2	1	17	14	39	2	1.76	0.24	37	0.01	37	37.24	4.1	3.8	160	0.01	0.1	2030	2000	15
BHS2-LIGNO-0	3/11/14 11:00	20.8	7.04	1115	0.12	-288.0	330	2	2	15	29	7.07	1.4	1.09	0.31	5.1	0.57	5.67	5.98	3.4	3.3	150	0.6	1.2	2	2	12
BHS2-ST2	3/11/14 10:40	20.4	7.01	1210	0.15	-368.6	340	2	2	44	35	0.93	0.91	0.61	0.3	0.01	0.01	0.02	0.32	3.5	3.4	170	15	28	1	2	13
BHS2-ST2-DUP	3/11/14 10:45	20.4	7.01	1210	0.15	-368.6	330	2	2	43	31	0.9	0.88	0.55	0.33	0.01	0.01	0.02	0.35	3.5	3.4	170	17	32	1	2	14
BHS2-EB	3/11/14 10:30	22.7	6.24	1.4	6.88	104.8	2	1	1	2	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	0.1	1	2	0.06

<sup>1</sup>Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO<sub>x</sub>.

<sup>2</sup>Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH<sub>3</sub>.

<sup>3</sup>Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH<sub>3</sub> and NO<sub>x</sub>.

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

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

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

Results based on colony counts outside the ideal range.

Recirculation mode = to Stage 1 sprayers

**Table A.2**  
**Water Quality Analytical Results**  
**March 12, 2014**

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD <sub>5</sub> (mg/L)	COD (mg/L)	TN (mg/L N) <sup>1</sup>	TKN (mg/L N)	Organic N (mg/L N) <sup>2</sup>	NH <sub>3</sub> -N (mg/L N)	NO <sub>3</sub> -N (mg/L N)	NO <sub>2</sub> -N (mg/L N)	NO <sub>x</sub> (mg/L N)	TIN (mg/L N) <sup>3</sup>	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BHS2-STE	3/12/14 9:30	21.9	7.20	1411	0.01	-375.4	550	16	16	390	390	60.02	60	21	39	0.01	0.01	0.02	39.02	6.7	6.6	15	21	52	43000	24000	98
BHS2-RECIRC	3/12/14 9:15	21.6	7.25	1418	0.04	-371.8	590	14	13	200	310	63.05	63	23	40	0.05	0.01	0.05	40.05	6.2	5.9	7.8	15	39	66000	20000	58
BHS2-ST1	3/12/14 8:55	21.8	7.09	1215	4.85	-70.9	240	2	2	18	23	35.7	4.7	3.1	1.6	31	0.32	31	32.6	4	3.9	150	0.01	0.1	11300	10000	9.9
BHS2-LIGNO-0	3/12/14 8:35	21.4	7.08	1116	1.19	-207.3	340	1	1	17	25	7.56	1.7	1.42	0.28	5.4	0.46	5.86	6.14	3.6	3.3	150	0.28	0.6	1	2	410
BHS2-ST2	3/12/14 8:15	20.5	6.96	1208	0.06	-358.5	320	2	1	61	93	1.32	1.3	0.92	0.38	0.01	0.01	0.02	0.4	3.6	3.4	230	12	23	1	2	13
BHS2-ST2-DUP	3/12/14 8:20	20.5	6.96	1208	0.06	-358.5	320	1	1	65	97	1.34	1.3	0.93	0.37	0.04	0.01	0.04	0.41	3.5	3.4	210	14	26	1	2	13
BHS2-EB	3/12/14 8:00	19.0	6.55	1.7	7.10	109.8	2	1	1	2	10	0.27	0.25	0.241	0.009	0.01	0.01	0.02	0.029	0.05	0.012	0.2	0.01	0.1	1	2	0.06

<sup>1</sup>Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO<sub>x</sub>.

<sup>2</sup>Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH<sub>3</sub>.

<sup>3</sup>Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH<sub>3</sub> and NO<sub>x</sub>.

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

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

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

Results based on colony counts outside the ideal range.

Recirculation mode = to Stage 1 sprayers

**Table A.3**  
**Water Quality Analytical Results**  
**March 13, 2014**

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD <sub>5</sub> (mg/L)	COD (mg/L)	TN (mg/L N) <sup>1</sup>	TKN (mg/L N)	Organic N (mg/L N) <sup>2</sup>	NH <sub>3</sub> -N (mg/L N)	NO <sub>3</sub> -N (mg/L N)	NO <sub>2</sub> -N (mg/L N)	NOx (mg/L N)	TIN (mg/L N) <sup>3</sup>	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BHS2-STE	3/13/14 10:55	20.7	7.17	1428	0.03	-370.1	550	10	8	220	420	63.04	63	25	38	0.04	0.01	0.04	38.04	6.6	3.4	20	24	55	36000	24000	110
BHS2-RECIRC	3/13/14 10:40	20.5	7.22	1415	0.05	-368.4	600	4	4	160	250	62.05	62	21	41	0.05	0.01	0.05	41.05	6	3.7	7.9	15	39	59000	20000	81
BHS2-ST1	3/13/14 10:30	20.4	7.10	1202	3.25	-80.7	250	4	3	8	22	44.48	10	7.6	2.4	34	0.48	34.48	36.88	7.6	5.8	150	0.09	0.2	26000	24000	16
BHS2-LIGNO-0	3/13/14 10:15	22.0	7.01	1120	0.88	-220.6	360	18	18	2	22	6.58	3.1	2.81	0.29	3.2	0.28	3.48	3.77	7.1	4.9	150	0.84	1.6	2	2	14
BHS2-ST2	3/13/14 9:55	20.2	7.05	1210	0.09	-364.9	340	6	5	38	97	1.82	1.8	1.51	0.29	0.01	0.01	0.02	0.31	6.2	5.1	200	12	24	1	2	16
BHS2-ST2-DUP	3/13/14 10:00	20.2	7.05	1210	0.09	-364.9	340	6	4	39	99	1.82	1.8	1.5	0.3	0.01	0.01	0.02	0.32	6.5	5.2	200	14	27	1	2	16
BHS2-EB	3/13/14 9:25	15.2	7.04	1.81	9.21	96.8	2	1	1	2	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	0.1	1	2	0.06

<sup>1</sup>Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO<sub>x</sub>.

<sup>2</sup>Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH<sub>3</sub>.

<sup>3</sup>Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH<sub>3</sub> and NO<sub>x</sub>.

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

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

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

Results based on colony counts outside the ideal range.

Recirculation mode = to Stage 1 sprayers

**Table A.4**  
**Water Quality Analytical Results**  
**March 14, 2014**

Sample ID	Sample Date/Time	Temp (°C)	pH	Specific Conductance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD <sub>5</sub> (mg/L)	COD (mg/L)	TN (mg/L N) <sup>1</sup>	TKN (mg/L N)	Organic N (mg/L N) <sup>2</sup>	NH <sub>3</sub> -N (mg/L N)	NO <sub>3</sub> -N (mg/L N)	NO <sub>2</sub> -N (mg/L N)	NOx (mg/L N)	TIN (mg/L N) <sup>3</sup>	TP (mg/L)	Ortho P (mg/L P)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)	TOC (mg/L)
BHS2-STE	3/14/14 10:40	21.2	7.15	1430	0.02	-370.8	580	16	13	250	360	64.03	64	25	39	0.03	0.01	0.03	39.03	6.5	3.4	14	23	53	180000	24000	100
BHS2-RECIRC	3/14/14 10:25	20.8	7.27	1402	0.04	-368.7	610	21	21	200	310	63.06	63	21	42	0.06	0.01	0.06	42.06	5.9	3.8	7.9	17	45	139000	24000	93
BHS2-ST1	3/14/14 10:15	21.5	7.16	1198	3.32	-77.4	230	2	2	6	23	39.03	4.8	3.2	1.6	34	0.23	34.23	35.83	3.8	2.9	150	0.01	0.1	27000	24000	19
BHS2-LIGNO-0	3/14/14 10:00	22.2	7.02	1112	0.60	-218.9	350	18	18	4	33	4.27	1.8	1.54	0.26	2.1	0.37	2.47	2.73	3.4	1.9	150	0.92	1.8	10	8.5	14
BHS2-ST2	3/14/14 9:42	20.0	7.09	1205	0.07	-362.7	360	2	2	47	66	1.13	1.1	0.72	0.38	0.03	0.01	0.03	0.41	3	1.9	190	14	31	80	72	15
BHS2-ST2-DUP	3/14/14 9:47	20.0	7.09	1205	0.07	-362.7	350	2	2	42	72	1.12	1.1	0.72	0.38	0.01	0.01	0.02	0.4	3.1	1.7	210	14	31	60	52	15
BHS2-EB	3/14/14 9:15	16.8	7.05	1.39	8.35	101.4	2	1	1	2	10	0.07	0.05	0.041	0.009	0.01	0.01	0.02	0.029	0.01	0.01	0.2	0.01	0.1	1	2	0.06

<sup>1</sup>Total Nitrogen (TN) is a calculated value equal to the sum of TKN and NO<sub>x</sub>.

<sup>2</sup>Organic Nitrogen (ON) is a calculated value equal to the difference of TKN and NH<sub>3</sub>.

<sup>3</sup>Total Inorganic Nitrogen (TIN) is a calculated value equal to the sum of NH<sub>3</sub> and NO<sub>x</sub>.

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

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

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

Results based on colony counts outside the ideal range.

Recirculation mode = to Stage 1 sprayers

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**Tampa, FL 33619**

**March 28, 2014**  
**Work Order: 1402492**

## Laboratory Report

Project Name		B-HS2 SE#8						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-STE						
Matrix		Wastewater						
SAL Sample Number		1402492-01						
Date/Time Collected		03/10/14 10:00						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	28	SM 4550SF	0.04	0.01	03/11/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	49	EPA 350.1	2.0	0.47		03/18/14 12:18	50
Carbonaceous BOD	mg/L	290	SM 5210B	2	2	03/12/14 08:41	03/17/14 12:45	1
Chemical Oxygen Demand	mg/L	410	EPA 410.4	25	10	03/10/14 12:17	03/11/14 16:37	1
Nitrate (as N)	mg/L	0.06	EPA 300.0	0.04	0.01		03/11/14 14:06	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 14:06	1
Orthophosphate as P	mg/L	3.2	EPA 300.0	0.040	0.010		03/11/14 14:06	1
Phosphorous - Total as P	mg/L	7.4	SM 4500P-E	0.80	0.20	03/10/14 14:31	03/11/14 14:28	20
Sulfate	mg/L	3.8	EPA 300.0	0.60	0.20		03/11/14 14:06	1
Sulfide	mg/L	66	SM 4500SF	0.40	0.10		03/11/14 17:16	1
Total Alkalinity	mg/L	560	SM 2320B	8.0	2.0		03/18/14 10:54	1
Total Kjeldahl Nitrogen	mg/L	60	EPA 351.2	4.0	1.0	03/10/14 14:31	03/11/14 14:28	20
Total Organic Carbon	mg/L	120	SM 5310B	1.0	0.060		03/13/14 15:29	1
Total Suspended Solids	mg/L	30	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	12	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.06 I	EPA 300.0	0.08	0.02		03/11/14 14:06	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	10,000	SM 9223B	2.0	2.0	03/10/14 13:47	03/11/14 09:45	1
Fecal Coliforms	CFU/100 ml	62,000	SM 9222D	1	1	03/10/14 13:43	03/11/14 12:45	1
Sample Description		BHS2-STE-FILTERED						
Matrix		Wastewater						
SAL Sample Number		1402492-02						
Date/Time Collected		03/10/14 10:05						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganic, Dissolved</u></b>								
Ammonia as N	mg/L	45	EPA 350.1	2.0	0.47		03/21/14 09:48	50
Carbonaceous BOD	mg/L	160	SM 5210B	2	2	03/12/14 08:42	03/17/14 12:52	1
Nitrate (as N)	mg/L	0.06	EPA 300.0	0.04	0.01		03/11/14 14:17	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 14:17	1
Total Kjeldahl Nitrogen	mg/L	55	EPA 351.2	0.20	0.050	03/12/14 09:30	03/17/14 10:32	20
Nitrate+Nitrite (N)	mg/L	0.06 I	EPA 300.0	0.08	0.02		03/11/14 14:17	1
Lab filtration for diss. analytes							03/12/14 14:07	

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**March 28, 2014**  
**Work Order: 1402492**

## Laboratory Report

Project Name		B-HS2 SE#8						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-RECIRC						
Matrix		Wastewater						
SAL Sample Number		1402492-03						
Date/Time Collected		03/10/14 09:50						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	19	SM 4550SF	0.04	0.01	03/11/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	50	EPA 350.1	2.0	0.47		03/18/14 12:19	50
Carbonaceous BOD	mg/L	190	SM 5210B	2	2	03/12/14 08:41	03/17/14 12:45	1
Chemical Oxygen Demand	mg/L	270	EPA 410.4	25	10	03/10/14 12:17	03/11/14 16:37	1
Nitrate (as N)	mg/L	0.10	EPA 300.0	0.04	0.01		03/11/14 14:29	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 14:29	1
Orthophosphate as P	mg/L	6.0	SM 4500P-E	0.20	0.060		03/11/14 09:24	5
Phosphorous - Total as P	mg/L	6.8	SM 4500P-E	0.40	0.10	03/10/14 14:31	03/11/14 14:29	10
Sulfate	mg/L	3.1	EPA 300.0	0.60	0.20		03/11/14 14:29	1
Sulfide	mg/L	56	SM 4500SF	0.40	0.10		03/11/14 17:16	1
Total Alkalinity	mg/L	600	SM 2320B	8.0	2.0		03/18/14 11:10	1
Total Kjeldahl Nitrogen	mg/L	58	EPA 351.2	4.0	1.0	03/10/14 14:31	03/11/14 14:29	20
Total Organic Carbon	mg/L	59	SM 5310B	1.0	0.060		03/13/14 15:29	1
Total Suspended Solids	mg/L	20	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	18	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.10	EPA 300.0	0.08	0.02		03/11/14 14:29	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	10,000	SM 9223B	2.0	2.0	03/10/14 13:47	03/11/14 09:45	1
Fecal Coliforms	CFU/100 ml	73,000	SM 9222D	1	1	03/10/14 13:43	03/11/14 12:45	1
Sample Description		BHS2-ST1						
Matrix		Wastewater						
SAL Sample Number		1402492-04						
Date/Time Collected		03/10/14 09:21						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.40	SM 4550SF	0.04	0.01	03/11/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.21	EPA 350.1	0.040	0.009		03/14/14 15:17	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/12/14 08:41	03/17/14 12:45	1
Chemical Oxygen Demand	mg/L	18 I	EPA 410.4	25	10	03/10/14 12:17	03/11/14 16:37	1
Nitrate (as N)	mg/L	37	EPA 300.0	0.40	0.10		03/11/14 14:40	10
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 14:40	1
Orthophosphate as P	mg/L	3.8	SM 4500P-E	0.20	0.060		03/11/14 09:24	5
Phosphorous - Total as P	mg/L	4.0	SM 4500P-E	0.20	0.050	03/10/14 14:31	03/11/14 14:30	5
Sulfate	mg/L	160	EPA 300.0	6.0	2.0		03/12/14 19:24	10

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**March 28, 2014**  
**Work Order: 1402492**

## Laboratory Report

Project Name		B-HS2 SE#8						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST1						
Matrix		Wastewater						
SAL Sample Number		1402492-04						
Date/Time Collected		03/10/14 09:21						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
Sulfide	mg/L	0.80	SM 4500SF	0.40	0.10		03/11/14 17:16	1
Total Alkalinity	mg/L	220	SM 2320B	8.0	2.0		03/18/14 11:17	1
Total Kjeldahl Nitrogen	mg/L	2.2	EPA 351.2	1.0	0.25	03/10/14 14:31	03/11/14 14:30	5
Total Organic Carbon	mg/L	10	SM 5310B	1.0	0.060		03/13/14 15:29	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	37	EPA 300.0	0.44	0.11		03/11/14 14:40	10
Microbiology								
E. Coli	MPN/100 mL	610	SM 9223B	2.0	2.0	03/10/14 13:47	03/11/14 09:45	1
Fecal Coliforms	CFU/100 ml	710	SM 9222D	1	1	03/10/14 13:43	03/11/14 12:45	1
Sample Description		BHS2-ST1-DUP						
Matrix		Wastewater						
SAL Sample Number		1402492-05						
Date/Time Collected		03/10/14 09:26						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	0.30	SM 4550SF	0.04	0.01	03/11/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.22	EPA 350.1	0.040	0.009		03/14/14 15:19	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/12/14 08:41	03/17/14 12:45	1
Chemical Oxygen Demand	mg/L	20 I	EPA 410.4	25	10	03/10/14 12:17	03/11/14 16:37	1
Nitrate (as N)	mg/L	37	EPA 300.0	0.40	0.10		03/11/14 14:52	10
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 14:52	1
Orthophosphate as P	mg/L	3.8	SM 4500P-E	0.20	0.060		03/11/14 09:24	5
Phosphorous - Total as P	mg/L	4.0	SM 4500P-E	0.20	0.050	03/10/14 14:31	03/11/14 14:31	5
Sulfate	mg/L	150	EPA 300.0	6.0	2.0		03/12/14 19:35	10
Sulfide	mg/L	0.60	SM 4500SF	0.40	0.10		03/11/14 17:16	1
Total Alkalinity	mg/L	220	SM 2320B	8.0	2.0		03/18/14 12:28	1
Total Kjeldahl Nitrogen	mg/L	2.0	EPA 351.2	1.0	0.25	03/10/14 14:31	03/11/14 14:31	5
Total Organic Carbon	mg/L	11	SM 5310B	1.0	0.060		03/13/14 15:29	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	37	EPA 300.0	0.44	0.11		03/11/14 14:52	10
Microbiology								
E. Coli	MPN/100 mL	730	SM 9223B	2.0	2.0	03/10/14 13:47	03/11/14 09:45	1
Fecal Coliforms	CFU/100 ml	740	SM 9222D	1	1	03/10/14 13:43	03/11/14 12:45	1



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**Tampa, FL 33619**

**March 28, 2014**  
**Work Order: 1402492**

## Laboratory Report

Project Name		B-HS2 SE#8						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST1-FILTERED						
Matrix		Wastewater						
SAL Sample Number		1402492-06						
Date/Time Collected		03/10/14 09:26						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganic, Dissolved</u></b>								
Ammonia as N	mg/L	0.20	EPA 350.1	0.040	0.009		03/21/14 09:50	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/12/14 08:42	03/17/14 12:52	1
Nitrate (as N)	mg/L	38	EPA 300.0	0.40	0.10		03/11/14 15:03	10
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 15:03	1
Total Kjeldahl Nitrogen	mg/L	2.7	EPA 351.2	0.20	0.050	03/12/14 09:30	03/17/14 10:33	5
Nitrate+Nitrite (N)	mg/L	38	EPA 300.0	0.44	0.11		03/11/14 15:03	10
Lab filtration for diss. analytes							03/12/14 14:07	
Sample Description		BHS2-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1402492-07						
Date/Time Collected		03/10/14 09:02						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	1.2	SM 4550SF	0.04	0.01	03/11/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.55	EPA 350.1	0.040	0.009		03/14/14 15:21	1
Carbonaceous BOD	mg/L	4	SM 5210B	2	2	03/12/14 08:41	03/17/14 12:45	1
Chemical Oxygen Demand	mg/L	25	EPA 410.4	25	10	03/10/14 12:17	03/11/14 16:37	1
Nitrate (as N)	mg/L	6.7	EPA 300.0	0.04	0.01		03/11/14 15:14	1
Nitrite (as N)	mg/L	0.87	EPA 300.0	0.04	0.01		03/11/14 15:14	1
Orthophosphate as P	mg/L	3.3	SM 4500P-E	0.20	0.060		03/11/14 09:24	5
Phosphorous - Total as P	mg/L	3.5	SM 4500P-E	0.20	0.050	03/10/14 14:31	03/11/14 14:32	5
Sulfate	mg/L	160	EPA 300.0	6.0	2.0		03/12/14 20:40	10
Sulfide	mg/L	2.2	SM 4500SF	0.40	0.10		03/11/14 17:16	1
Total Alkalinity	mg/L	330	SM 2320B	8.0	2.0		03/18/14 12:36	1
Total Kjeldahl Nitrogen	mg/L	2.2	EPA 351.2	1.0	0.25	03/10/14 14:31	03/11/14 14:32	5
Total Organic Carbon	mg/L	14	SM 5310B	1.0	0.060		03/13/14 15:29	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	7.5	EPA 300.0	0.08	0.02		03/11/14 15:14	1
<b><u>Microbiology</u></b>								
Total Coliform	CFU/100 ml	9	SM 9222B	1	1	03/10/14 13:46	03/11/14 12:40	1
E. Coli	MPN/100 mL	7.5	SM 9223B	2.0	2.0	03/10/14 13:47	03/11/14 09:45	1
Fecal Coliforms	CFU/100 ml	8	SM 9222D	1	1	03/10/14 13:43	03/11/14 12:45	1

**Hazen and Sawyer**  
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**Tampa, FL 33619**

**March 28, 2014**  
**Work Order: 1402492**

## Laboratory Report

Project Name		B-HS2 SE#8						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-LIGNO-0-FILTERED						
Matrix		Wastewater						
SAL Sample Number		1402492-08						
Date/Time Collected		03/10/14 09:07						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganic, Dissolved</u></b>								
Ammonia as N	mg/L	0.27	EPA 350.1	0.040	0.009		03/21/14 09:52	1
Carbonaceous BOD	mg/L	3	SM 5210B	2	2	03/12/14 08:42	03/17/14 12:52	1
Nitrate (as N)	mg/L	7.7	EPA 300.0	0.04	0.01		03/11/14 15:26	1
Nitrite (as N)	mg/L	0.68	EPA 300.0	0.04	0.01		03/11/14 15:26	1
Total Kjeldahl Nitrogen	mg/L	2.7	EPA 351.2	0.20	0.050	03/12/14 09:30	03/17/14 10:34	5
Nitrate+Nitrite (N)	mg/L	8.4	EPA 300.0	0.08	0.02		03/11/14 15:26	1
Lab filtration for diss. analytes							03/12/14 14:07	
Sample Description		BHS2-ST2						
Matrix		Wastewater						
SAL Sample Number		1402492-09						
Date/Time Collected		03/10/14 08:45						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	17	SM 4550SF	0.04	0.01	03/11/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.48	EPA 350.1	0.040	0.009		03/14/14 15:23	1
Carbonaceous BOD	mg/L	42	SM 5210B	2	2	03/12/14 08:41	03/17/14 12:45	1
Chemical Oxygen Demand	mg/L	100	EPA 410.4	25	10	03/10/14 12:17	03/11/14 16:37	1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		03/11/14 16:46	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 16:46	1
Orthophosphate as P	mg/L	3.6	SM 4500P-E	0.20	0.060		03/11/14 09:24	5
Phosphorous - Total as P	mg/L	3.7	SM 4500P-E	0.40	0.10	03/10/14 14:31	03/11/14 14:33	10
Sulfate	mg/L	160	EPA 300.0	6.0	2.0		03/12/14 20:51	10
Sulfide	mg/L	34	SM 4500SF	0.40	0.10		03/11/14 17:16	1
Total Alkalinity	mg/L	340	SM 2320B	8.0	2.0		03/18/14 12:45	1
Total Kjeldahl Nitrogen	mg/L	1.6 I	EPA 351.2	2.0	0.50	03/10/14 14:31	03/11/14 14:33	10
Total Organic Carbon	mg/L	15	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	3	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.04 I	EPA 300.0	0.08	0.02		03/11/14 16:46	1
<b><u>Microbiology</u></b>								
Total Coliform	CFU/100 ml	180	SM 9222B	1	1	03/10/14 13:46	03/11/14 12:40	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/10/14 13:47	03/11/14 09:45	1
Fecal Coliforms	CFU/100 ml	100	SM 9222D	1	1	03/10/14 13:43	03/11/14 12:45	1

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**Tampa, FL 33619**

**March 28, 2014**  
**Work Order: 1402492**

## Laboratory Report

Project Name		B-HS2 SE#8						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST2-FILTERED						
Matrix		Wastewater						
SAL Sample Number		1402492-10						
Date/Time Collected		03/10/14 08:50						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganics</u></b>								
Sulfate	mg/L	160	EPA 300.0	6.0	2.0		03/12/14 21:10	10
<b><u>Inorganic, Dissolved</u></b>								
Ammonia as N	mg/L	0.36	EPA 350.1	0.040	0.009		03/21/14 10:45	1
Carbonaceous BOD	mg/L	14	SM 5210B	2	2	03/12/14 08:42	03/17/14 12:52	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 16:57	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 16:57	1
Total Kjeldahl Nitrogen	mg/L	1.2	EPA 351.2	0.20	0.050	03/12/14 09:30	03/17/14 10:35	5
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/11/14 16:57	1
Lab filtration for diss. analytes							03/12/14 14:07	
Sample Description		BHS2-EB						
Matrix		Reagent Water						
SAL Sample Number		1402492-11						
Date/Time Collected		03/10/14 10:15						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	03/11/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		03/14/14 16:29	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/12/14 08:41	03/17/14 12:45	1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	03/10/14 12:17	03/11/14 16:37	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 17:08	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 17:08	1
Orthophosphate as P	mg/L	0.012 U	SM 4500P-E	0.040	0.012		03/11/14 09:24	1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	03/10/14 14:31	03/11/14 14:36	1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		03/13/14 06:19	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		03/11/14 17:16	1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		03/18/14 12:49	1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	03/10/14 14:31	03/11/14 14:36	1
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/11/14 17:08	1
<b><u>Microbiology</u></b>								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/10/14 13:46	03/11/14 12:40	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/10/14 13:47	03/11/14 09:45	1

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March 28, 2014  
Work Order: 1402492

**Laboratory Report**

Project Name		B-HS2 SE#8						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-EB						
Matrix		Reagent Water						
SAL Sample Number		1402492-11						
Date/Time Collected		03/10/14 10:15						
Collected by		Sean Schmidt						
Date/Time Received		03/10/14 11:40						
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/10/14 13:43	03/11/14 12:45	1

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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March 28, 2014  
Work Order: 1402492

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41026 - COD prep</b>										
<b>Blank (BC41026-BLK1)</b>					Prepared: 03/10/14 Analyzed: 03/11/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						
<b>LCS (BC41026-BS1)</b>					Prepared: 03/10/14 Analyzed: 03/11/14					
Chemical Oxygen Demand	49	25	10	mg/L	50		98	90-110		
<b>Matrix Spike (BC41026-MS1)</b>					Source: 1402492-11 Prepared: 03/10/14 Analyzed: 03/11/14					
Chemical Oxygen Demand	50	25	10	mg/L	50	ND	100	85-115		
<b>Matrix Spike Dup (BC41026-MSD1)</b>					Source: 1402492-11 Prepared: 03/10/14 Analyzed: 03/11/14					
Chemical Oxygen Demand	49	25	10	mg/L	50	ND	98	85-115	2	32
<b>Batch BC41038 - Digestion for TP and TKN</b>										
<b>Blank (BC41038-BLK1)</b>					Prepared: 03/10/14 Analyzed: 03/11/14					
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
<b>LCS (BC41038-BS1)</b>					Prepared: 03/10/14 Analyzed: 03/11/14					
Total Kjeldahl Nitrogen	0.964	0.20	0.05	mg/L	1.0		96	90-110		
Phosphorous - Total as P	0.538	0.040	0.010	mg/L	0.50		108	90-110		
<b>Matrix Spike (BC41038-MS1)</b>					Source: 1402491-03 Prepared: 03/10/14 Analyzed: 03/11/14					
Total Kjeldahl Nitrogen	0.969	0.20	0.05	mg/L	1.0	ND	97	90-110		
Phosphorous - Total as P	0.546	0.040	0.010	mg/L	0.50	ND	109	90-110		
<b>Matrix Spike Dup (BC41038-MSD1)</b>					Source: 1402491-03 Prepared: 03/10/14 Analyzed: 03/11/14					
Phosphorous - Total as P	0.535	0.040	0.010	mg/L	0.50	ND	107	90-110	2	25
Total Kjeldahl Nitrogen	0.985	0.20	0.05	mg/L	1.0	ND	99	90-110	2	20



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March 28, 2014  
Work Order: 1402492

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41043 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41043-BLK1)</b>					Prepared & Analyzed: 03/11/14					
Sulfate	0.20 U	0.60	0.20	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>LCS (BC41043-BS1)</b>					Prepared & Analyzed: 03/11/14					
Nitrite (as N)	1.44	0.04	0.01	mg/L	1.4		103	85-115		
Orthophosphate as P	0.903	0.040	0.010	mg/L	0.90		100	85-115		
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115		
Sulfate	9.10	0.60	0.20	mg/L	9.0		101	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS Dup (BC41043-BSD1)</b>					Prepared & Analyzed: 03/11/14					
Orthophosphate as P	0.900	0.040	0.010	mg/L	0.90		100	85-115	0.3	200
Sulfate	9.03	0.60	0.20	mg/L	9.0		100	85-115	0.8	200
Nitrite (as N)	1.43	0.04	0.01	mg/L	1.4		102	85-115	0.6	200
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115	0.9	200
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		

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March 28, 2014  
Work Order: 1402492

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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### Batch BC41043 - Ion Chromatography 300.0 Prep

Matrix Spike (BC41043-MS1)		Source: 1402508-01			Prepared & Analyzed: 03/11/14					
Nitrite (as N)	2.85	0.04	0.01	mg/L	1.4	1.31	110	85-115		
Sulfate	32.1	0.60	0.20	mg/L	9.0	23.2	99	85-115		
Orthophosphate as P	2.48	0.040	0.010	mg/L	0.90	1.54	104	85-115		
Nitrate (as N)	10.3	0.04	0.01	mg/L	1.7	8.74	92	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		

Matrix Spike (BC41043-MS2)		Source: 1402492-08			Prepared & Analyzed: 03/11/14					
Nitrate (as N)	9.45	0.04	0.01	mg/L	1.7	7.74	101	85-115		
Nitrite (as N)	2.06	0.04	0.01	mg/L	1.4	0.685	98	85-115		
Orthophosphate as P	2.53	0.040	0.010	mg/L	0.90	1.64	99	85-115		
Sulfate	90.0 L	0.60	0.20	mg/L	9.0	145	NR	85-115		
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	90-115		
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	90-115		
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	90-115		
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	90-115		

### Batch BC41044 - Ion Chromatography 300.0 Prep

Blank (BC41044-BLK1)		Prepared & Analyzed: 03/11/14								
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		

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March 28, 2014  
Work Order: 1402492

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41044 - Ion Chromatography 300.0 Prep</b>										
<b>LCS (BC41044-BS1)</b>					Prepared & Analyzed: 03/11/14					
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115		
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		103	85-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
<b>LCS Dup (BC41044-BS1)</b>					Prepared & Analyzed: 03/11/14					
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		103	85-115	0	200
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	0.9	200
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
<b>Matrix Spike (BC41044-MS1)</b>					<b>Source: 1402047-01</b>		Prepared & Analyzed: 03/12/14			
Nitrate (as N)	17.1	0.40	0.10	mg/L	17	ND	101	85-115		
Nitrite (as N)	14.5	0.40	0.10	mg/L	14	ND	104	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>Matrix Spike (BC41044-MS2)</b>					<b>Source: 1402322-01</b>		Prepared & Analyzed: 03/11/14			
Nitrite (as N)	142	4.0	1.0	mg/L	140	3.00	100	85-115		
Nitrate (as N)	179	4.0	1.0	mg/L	170	7.60	101	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>Batch BC41131 - Sulfide prep</b>										
<b>Blank (BC41131-BLK1)</b>					Prepared & Analyzed: 03/11/14					
Sulfide	0.10 U	0.40	0.10	mg/L						

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

March 28, 2014  
Work Order: 1402492

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41131 - Sulfide prep</b>										
<b>LCS (BC41131-BS1)</b>					Prepared & Analyzed: 03/11/14					
Sulfide	5.03	0.40	0.10	mg/L	5.0		101	85-115		
<b>Matrix Spike (BC41131-MS1)</b>					Source: 1402492-11 Prepared & Analyzed: 03/11/14					
Sulfide	4.83	0.40	0.10	mg/L	5.0	ND	97	85-115		
<b>Matrix Spike Dup (BC41131-MSD1)</b>					Source: 1402492-11 Prepared & Analyzed: 03/11/14					
Sulfide	5.03	0.40	0.10	mg/L	5.0	ND	101	85-115	4	14
<b>Batch BC41213 - TOC prep</b>										
<b>Blank (BC41213-BLK1)</b>					Prepared & Analyzed: 03/13/14					
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
<b>LCS (BC41213-BS1)</b>					Prepared & Analyzed: 03/13/14					
Total Organic Carbon	10.4	1.0	0.060	mg/L	10		104	90-110		
<b>Matrix Spike (BC41213-MS1)</b>					Source: 1402377-01 Prepared & Analyzed: 03/13/14					
Total Organic Carbon	10.1	1.0	0.060	mg/L	10	ND	101	85-115		
<b>Matrix Spike Dup (BC41213-MSD1)</b>					Source: 1402377-01 Prepared & Analyzed: 03/13/14					
Total Organic Carbon	10.3	1.0	0.060	mg/L	10	ND	103	85-115	2	10
<b>Batch BC41219 - BOD</b>										
<b>Blank (BC41219-BLK1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Carbonaceous BOD	2 U	2	2	mg/L						

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March 28, 2014  
Work Order: 1402492

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41219 - BOD</b>										
<b>LCS (BC41219-BS1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Carbonaceous BOD	207	2	2	mg/L	200		104	85-115		
<b>LCS Dup (BC41219-BS1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Carbonaceous BOD	202	2	2	mg/L	200		101	85-115	2	200
<b>Duplicate (BC41219-DUP1)</b>					<b>Source: 1402533-01</b>		Prepared: 03/12/14 Analyzed: 03/17/14			
Carbonaceous BOD	220	2	2	mg/L		220			0.9	25
<b>Batch BC41221 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41221-BLK1)</b>					Prepared & Analyzed: 03/12/14					
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS (BC41221-BS1)</b>					Prepared & Analyzed: 03/12/14					
Nitrate (as N)	1.69	0.04	0.01	mg/L	1.7		99	85-115		
Sulfate	9.15	0.60	0.20	mg/L	9.0		102	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS Dup (BC41221-BS1)</b>					Prepared & Analyzed: 03/12/14					
Sulfate	9.17	0.60	0.20	mg/L	9.0		102	85-115	0.2	200
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	0.6	200
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		

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March 28, 2014  
Work Order: 1402492

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41221 - Ion Chromatography 300.0 Prep</b>										
<b>Matrix Spike (BC41221-MS1)</b>		<b>Source: 1402492-06</b>			Prepared & Analyzed: 03/12/14					
Nitrate (as N)	56.2	0.40	0.10	mg/L	17	37.6	109	85-115		
Sulfate	255	6.0	2.0	mg/L	90	157	109	85-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
<b>Matrix Spike (BC41221-MS2)</b>		<b>Source: 1402141-01</b>			Prepared & Analyzed: 03/12/14					
Sulfate	98.6	6.0	2.0	mg/L	90	5.99	103	85-115		
Nitrate (as N)	17.2	0.40	0.10	mg/L	17	ND	101	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Batch BC41224 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41224-BLK1)</b>		Prepared & Analyzed: 03/13/14								
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
<b>LCS (BC41224-BS1)</b>		Prepared & Analyzed: 03/13/14								
Nitrate (as N)	1.74	0.04	0.01	mg/L	1.7		102	85-115		
Sulfate	9.28	0.60	0.20	mg/L	9.0		103	85-115		
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4		106	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		



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March 28, 2014  
Work Order: 1402492

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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### Batch BC41224 - Ion Chromatography 300.0 Prep

#### LCS Dup (BC41224-BSD1)

Prepared & Analyzed: 03/13/14

Sulfate	9.24	0.60	0.20	mg/L	9.0		103	85-115	0.4	200
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7		102	85-115	0.6	200
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4		106	85-115	0.1	200
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		

#### Matrix Spike (BC41224-MS1)

Source: 1402084-04

Prepared & Analyzed: 03/13/14

Nitrite (as N)	1.44	0.04	0.01	mg/L	1.4	ND	103	85-115		
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7	ND	99	85-115		
Sulfate	84.7	0.60	0.20	mg/L	9.0	75.9	99	85-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		

### Batch BC41233 - VSS Prep

#### Blank (BC41233-BLK1)

Prepared: 03/12/14 Analyzed: 03/14/14

Volatile Suspended Solids	1 U	1		mg/L						
Total Suspended Solids	1 U	1	1	mg/L						

#### LCS (BC41233-BS1)

Prepared: 03/12/14 Analyzed: 03/14/14

Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
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#### Duplicate (BC41233-DUP1)

Source: 1402492-01

Prepared: 03/12/14 Analyzed: 03/14/14

Total Suspended Solids	30.0	1	1	mg/L		30.0			0	30
Volatile Suspended Solids	10.2	1		mg/L		12.2			18	20

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March 28, 2014  
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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41301 - Ortho phosphorus SM4500P-E by seal</b>										
<b>Blank (BC41301-BLK1)</b>					Prepared & Analyzed: 03/11/14					
Orthophosphate as P	0.012 U	0.040	0.012	mg/L						
<b>LCS (BC41301-BS1)</b>					Prepared & Analyzed: 03/11/14					
Orthophosphate as P	0.824	0.040	0.012	mg/L	0.80		103	90-110		
<b>Matrix Spike (BC41301-MS1)</b>					<b>Source: 1402492-11</b>		Prepared & Analyzed: 03/11/14			
Orthophosphate as P	1.04	0.040	0.012	mg/L	1.0	ND	104	90-110		
<b>Matrix Spike Dup (BC41301-MSD1)</b>					<b>Source: 1402492-11</b>		Prepared & Analyzed: 03/11/14			
Orthophosphate as P	1.06	0.040	0.012	mg/L	1.0	ND	106	90-110	2	20
<b>Batch BC41334 - Ammonia by SEAL</b>										
<b>Blank (BC41334-BLK1)</b>					Prepared & Analyzed: 03/14/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
<b>LCS (BC41334-BS1)</b>					Prepared & Analyzed: 03/14/14					
Ammonia as N	0.51	0.040	0.009	mg/L	0.50		102	90-110		
<b>Matrix Spike (BC41334-MS1)</b>					<b>Source: 1401222-11</b>		Prepared & Analyzed: 03/14/14			
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	97	90-110		
<b>Matrix Spike (BC41334-MS2)</b>					<b>Source: 1402484-01</b>		Prepared & Analyzed: 03/14/14			
Ammonia as N	0.49	0.040	0.009	mg/L	0.50	ND	98	90-110		
<b>Matrix Spike Dup (BC41334-MSD1)</b>					<b>Source: 1401222-11</b>		Prepared & Analyzed: 03/14/14			
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	ND	103	90-110	7	10

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March 28, 2014  
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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BC41334 - Ammonia by SEAL										
Matrix Spike Dup (BC41334-MSD2)		Source: 1402484-01			Prepared & Analyzed: 03/14/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	ND	105	90-110	6	10
Batch BC41343 - TOC prep										
Blank (BC41343-BLK1)				Prepared & Analyzed: 03/14/14						
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
LCS (BC41343-BS1)				Prepared & Analyzed: 03/14/14						
Total Organic Carbon	10.4	1.0	0.060	mg/L	10		104	90-110		
Matrix Spike (BC41343-MS1)		Source: 1402613-03			Prepared & Analyzed: 03/14/14					
Total Organic Carbon	18.3 J5	1.0	0.060	mg/L	10	9.87	85	85-115		
Matrix Spike Dup (BC41343-MSD1)		Source: 1402613-03			Prepared & Analyzed: 03/14/14					
Total Organic Carbon	18.7	1.0	0.060	mg/L	10	9.87	89	85-115	2	10
Batch BC41801 - Ammonia by SEAL										
Blank (BC41801-BLK1)				Prepared & Analyzed: 03/18/14						
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BC41801-BS1)				Prepared & Analyzed: 03/18/14						
Ammonia as N	0.52	0.040	0.009	mg/L	0.50		105	90-110		
Matrix Spike (BC41801-MS1)		Source: 1402550-07			Prepared & Analyzed: 03/18/14					
Ammonia as N	0.50	0.040	0.009	mg/L	0.50	ND	99	90-110		

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BC41801 - Ammonia by SEAL										
Matrix Spike (BC41801-MS2)		Source: 1402684-07			Prepared & Analyzed: 03/18/14					
Ammonia as N	0.49	0.040	0.009	mg/L	0.50	0.044	90	90-110		
Matrix Spike Dup (BC41801-MSD1)		Source: 1402550-07			Prepared & Analyzed: 03/18/14					
Ammonia as N	0.51	0.040	0.009	mg/L	0.50	ND	102	90-110	3	10
Matrix Spike Dup (BC41801-MSD2)		Source: 1402684-07			Prepared & Analyzed: 03/18/14					
Ammonia as N	0.51	0.040	0.009	mg/L	0.50	0.044	94	90-110	4	10
Batch BC41812 - alkalinity										
Blank (BC41812-BLK1)					Prepared & Analyzed: 03/18/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BC41812-BS1)					Prepared & Analyzed: 03/18/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		101	90-110		
LCS (BC41812-BS2)					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		98	90-110		
LCS (BC41812-BS3)					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		100	90-110		
LCS (BC41812-BS4)					Prepared & Analyzed: 03/18/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		100	90-110		
LCS (BC41812-BS5)					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		99	90-110		

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41812 - alkalinity</b>										
<b>Matrix Spike (BC41812-MS1)</b>		<b>Source: 1402550-07</b>			Prepared & Analyzed: 03/18/14					
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	104	80-120		
<b>Matrix Spike Dup (BC41812-MSD1)</b>		<b>Source: 1402550-07</b>			Prepared & Analyzed: 03/18/14					
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	106	80-120	1	26

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## Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41043 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41043-BLK1)</b>					Prepared & Analyzed: 03/11/14					
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>LCS (BC41043-BS1)</b>					Prepared & Analyzed: 03/11/14					
Nitrite (as N)	1.44	0.04	0.01	mg/L	1.4		103	85-115		
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS Dup (BC41043-BSD1)</b>					Prepared & Analyzed: 03/11/14					
Nitrite (as N)	1.43	0.04	0.01	mg/L	1.4		102	85-115	0.6	200
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115	0.9	200
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>Matrix Spike (BC41043-MS1)</b>					<b>Source: 1402508-01</b>		Prepared & Analyzed: 03/11/14			
Nitrate (as N)	10.3	0.04	0.01	mg/L	1.7	8.74	92	85-115		
Nitrite (as N)	2.85	0.04	0.01	mg/L	1.4	1.31	110	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>Matrix Spike (BC41043-MS2)</b>					<b>Source: 1402492-08</b>		Prepared & Analyzed: 03/11/14			
Nitrite (as N)	2.06	0.04	0.01	mg/L	1.4	0.685	98	85-115		
Nitrate (as N)	9.45	0.04	0.01	mg/L	1.7	7.74	101	85-115		
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	90-115		
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	90-115		



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## Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41044 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41044-BLK1)</b>					Prepared & Analyzed: 03/11/14					
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
<b>LCS (BC41044-BS1)</b>					Prepared & Analyzed: 03/11/14					
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115		
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		103	85-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
<b>LCS Dup (BC41044-BSD1)</b>					Prepared & Analyzed: 03/11/14					
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		103	85-115	0	200
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	0.9	200
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
<b>Matrix Spike (BC41044-MS1)</b>					<b>Source: 1402047-01</b>		Prepared & Analyzed: 03/12/14			
Nitrite (as N)	14.5	0.40	0.10	mg/L	14	ND	104	85-115		
Nitrate (as N)	17.1	0.40	0.10	mg/L	17	ND	101	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>Matrix Spike (BC41044-MS2)</b>					<b>Source: 1402322-01</b>		Prepared & Analyzed: 03/11/14			
Nitrate (as N)	179	4.0	1.0	mg/L	170	7.60	101	85-115		
Nitrite (as N)	142	4.0	1.0	mg/L	140	3.00	100	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

March 28, 2014  
Work Order: 1402492

## Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41202 - Digestion for TP and TKN</b>										
<b>Blank (BC41202-BLK1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Total Kjeldahl Nitrogen	0.050 U	0.20	0.050	mg/L						
<b>LCS (BC41202-BS1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Total Kjeldahl Nitrogen	0.924	0.20	0.050	mg/L	1.0		92	90-110		
<b>Matrix Spike (BC41202-MS1)</b>					Source: 1402599-02 Prepared: 03/12/14 Analyzed: 03/17/14					
Total Kjeldahl Nitrogen	1.97	0.20	0.050	mg/L	1.0	0.927	104	90-110		
<b>Matrix Spike (BC41202-MS2)</b>					Source: 1402613-07 Prepared: 03/12/14 Analyzed: 03/17/14					
Total Kjeldahl Nitrogen	0.974	0.20	0.050	mg/L	1.0	ND	97	90-110		
<b>Matrix Spike Dup (BC41202-MSD1)</b>					Source: 1402599-02 Prepared: 03/12/14 Analyzed: 03/17/14					
Total Kjeldahl Nitrogen	2.02	0.20	0.050	mg/L	1.0	0.927	109	90-110	3	20
<b>Matrix Spike Dup (BC41202-MSD2)</b>					Source: 1402613-07 Prepared: 03/12/14 Analyzed: 03/17/14					
Total Kjeldahl Nitrogen	1.03	0.20	0.050	mg/L	1.0	ND	103	90-110	5	20
<b>Batch BC41220 - BOD Dissolved</b>										
<b>Blank (BC41220-BLK1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Carbonaceous BOD	2 U	2	2	mg/L						
<b>LCS (BC41220-BS1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Carbonaceous BOD	196	2	2	mg/L	200		98	85-115		
<b>LCS Dup (BC41220-BSD1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Carbonaceous BOD	194	2	2	mg/L	200		97	85-115	1	200

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March 28, 2014  
Work Order: 1402492

## Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41220 - BOD Dissolved</b>										
<b>Duplicate (BC41220-DUP1)</b>		<b>Source: 1402492-10</b>			Prepared: 03/12/14 Analyzed: 03/17/14					
Carbonaceous BOD	14	2	2	mg/L		14			4	25
<b>Batch BC41221 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41221-BLK1)</b>		Prepared & Analyzed: 03/12/14								
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS (BC41221-BS1)</b>		Prepared & Analyzed: 03/12/14								
Nitrate (as N)	1.69	0.04	0.01	mg/L	1.7		99	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS Dup (BC41221-BSD1)</b>		Prepared & Analyzed: 03/12/14								
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	0.6	200
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>Matrix Spike (BC41221-MS1)</b>		<b>Source: 1402492-06</b>			Prepared & Analyzed: 03/12/14					
Nitrate (as N)	56.2	0.40	0.10	mg/L	17	37.6	109	85-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
<b>Matrix Spike (BC41221-MS2)</b>		<b>Source: 1402141-01</b>			Prepared & Analyzed: 03/12/14					
Nitrate (as N)	17.2	0.40	0.10	mg/L	17		101	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Batch BC42102 - Ammonia by SEAL</b>										
<b>Blank (BC42102-BLK1)</b>		Prepared & Analyzed: 03/21/14								
Ammonia as N	0.009 U	0.040	0.009	mg/L						

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March 28, 2014  
Work Order: 1402492

## Inorganic, Dissolved - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC42102 - Ammonia by SEAL</b>										
<b>LCS (BC42102-BS1)</b>					Prepared & Analyzed: 03/21/14					
Ammonia as N	0.50	0.040	0.009	mg/L	0.50		100	90-110		
<b>Matrix Spike (BC42102-MS1)</b>					<b>Source: 1402492-08</b> Prepared & Analyzed: 03/21/14					
Ammonia as N	0.76	0.040	0.009	mg/L	0.50	0.27	97	90-110		
<b>Matrix Spike Dup (BC42102-MSD1)</b>					<b>Source: 1402492-08</b> Prepared & Analyzed: 03/21/14					
Ammonia as N	0.78	0.040	0.009	mg/L	0.50	0.27	102	90-110	3	10

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Work Order: 1402492

## Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41032 - FC-MF</b>										
<b>Blank (BC41032-BLK1)</b>					Prepared: 03/10/14 Analyzed: 03/11/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
<b>Duplicate (BC41032-DUP1)</b>					Source: 1402480-02 Prepared: 03/10/14 Analyzed: 03/11/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
<b>Batch BC41033 - TC-MF</b>										
<b>Blank (BC41033-BLK1)</b>					Prepared: 03/10/14 Analyzed: 03/11/14					
Total Coliform	1 U	1	1	CFU/100 ml						
<b>Duplicate (BC41033-DUP1)</b>					Source: 1402492-07 Prepared: 03/10/14 Analyzed: 03/11/14					
Total Coliform	10.0	1	1	CFU/100 ml		9.00			11	200

**Hazen and Sawyer**  
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**March 28, 2014**  
**Work Order: 1402492**

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**\* Qualifiers, Notes and Definitions**

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

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

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

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

L Off-scale high. Result exceeded highest calibration standard.  
J5 Matrix spike of this sample was outside typical range. All other QC criteria were acceptable.

Questions regarding this report should be directed to :

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



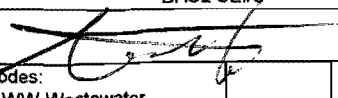
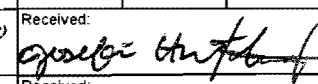



## SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No.

1402492

Client Name Hazan and Sawyer										Contact / Phone: Josefin Hirst 813-630-4498									
Project Name / Location BHS2 SE#8																			
Samplers: (Signature) 										PARAMETER / CONTAINER DESCRIPTION									
Matrix Codes: DW-Drinking Water WW-Wastewater SW-Surface Water SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water																			
SAL Use Only	Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT	1LP, Cool Total Alkalinity, TSS, VSS, CBOD, NOx, OP, SO <sub>4</sub>	125mLP, H <sub>2</sub> SO <sub>4</sub> COD, TKN, NH <sub>3</sub> , TP	500mLP, NaOH, Zn Acetate H <sub>2</sub> S	40mLaV, HCl TOC	1LP, Cool Lab Filtered: CBOD, TKN, NH <sub>3</sub> , NOx	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT, TC-MF (Non-potable)	1LP, Cool Lab Filtered: CBOD, TKN, NH <sub>3</sub> , NOx, SO <sub>4</sub>	DO	pH	Temperature	Conductivity
	01	BHS2-STE	3/10/14	1000	WW		X	4	1	1	1	2				0.03	7.18	22.0	1410
	02	BHS2-STE-FILTERED		1005	WW		X						1			1	1	1	1
	03	BHS2-RECIRC		0950	WW		X	4	1	1	1	2				0.08	7.34	21.5	1432
	04	BHS2-ST1		0921	WW		X	4	1	1	1	2				4.80	7.05	20.3	1216
	05	BHS2-ST1-DUP		0926	WW		X	4	1	1	1	2				1	1	1	1
	06	BHS2-ST1-FILTERED		0926	WW		X						1			1	1	1	1
	07	BHS2-LIGNO-0		0902	WW		X		1	1	1	2		6		0.35	7.01	20.6	1217
	08	BHS2-LIGNO-0-FILTERED		0907	WW		X						1			1	1	1	1
	09	BHS2-ST2		0845	WW		X		1	1	1	2		6		0.22	7.04	20.5	1209
	10	BHS2-ST2-FILTERED		0850	WW		X							1		1	1	1	1
	11	BHS2-EB		1015	R		X		1	1	1	2		6		7.68	7.09	18.7	1.24
Containers Prepared/ Relinquished:		Date/Time: 1-29-14 1200	Received: 		Date/Time: 1-30-14 10:30		Seal intact? <input checked="" type="radio"/> N N/A		Samples intact upon arrival? <input checked="" type="radio"/> N N/A		Received on ice? Temp _____ <input checked="" type="radio"/> N N/A  Proper preservatives indicated? <input checked="" type="radio"/> N N/A Rec'd within holding time? <input checked="" type="radio"/> N N/A  Volatiles rec'd w/out headspace: Y <input checked="" type="radio"/> N N/A Proper containers used? <input checked="" type="radio"/> N N/A		Instructions / Remarks						
Relinquished:		Date/Time: 1140	Received: 		Date/Time: 1140														
Relinquished:		Date/Time: 3/10/14	Received:		Date/Time:														
Relinquished:		Date/Time:	Received:		Date/Time:														
Relinquished:		Date/Time:	Received:		Date/Time:														

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

Chain of Custody

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

**March 27, 2014**  
**Work Order: 1402550**

## Laboratory Report

Project Name		B-HS2 SE#9						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-STE						
Matrix		Wastewater						
SAL Sample Number		1402550-01						
Date/Time Collected		03/11/14 11:45						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
<b><u>Client Provided Field Data</u></b>								
pH		7.15						
Temperature		21.8 °C						
Conductivity		1425 umhos						
Dissolved Oxygen		0.03 mg/L						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	22	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	40	EPA 350.1	2.0	0.47		03/20/14 09:31	50
Carbonaceous BOD	mg/L	390	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	450	EPA 410.4	25	10	03/13/14 09:00	03/14/14 09:13	1
Nitrate (as N)	mg/L	0.05	EPA 300.0	0.04	0.01		03/11/14 22:16	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 22:16	1
Orthophosphate as P	mg/L	6.5	SM 4500P-E	0.20	0.060		03/13/14 10:31	5
Phosphorous - Total as P	mg/L	7.2	SM 4500P-E	0.80	0.20	03/11/14 16:45	03/13/14 13:55	20
Sulfate	mg/L	4.9	EPA 300.0	0.60	0.20		03/11/14 22:16	1
Sulfide	mg/L	50	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	570	SM 2320B	8.0	2.0		03/18/14 13:12	1
Total Kjeldahl Nitrogen	mg/L	60	EPA 351.2	4.0	1.0	03/11/14 16:45	03/13/14 13:55	20
Total Organic Carbon	mg/L	120	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	16	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	15	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.05 I	EPA 300.0	0.08	0.02		03/11/14 22:16	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	24,000	SM 9223B	2.0	2.0	03/11/14 14:41	03/12/14 10:07	1
Fecal Coliforms	CFU/100 ml	27,000	SM 9222D	1	1	03/11/14 14:41	03/12/14 13:40	1

Sample Description **BHS2-RECIRC**  
 Matrix **Wastewater**  
 SAL Sample Number **1402550-02**  
 Date/Time Collected **03/11/14 11:30**  
 Collected by **Sean Schmidt**  
 Date/Time Received **03/11/14 13:00**

**Client Provided Field Data**

pH 7.28  
 Temperature 21.8 °C  
 Conductivity 1430 umhos  
 Dissolved Oxygen 0.07 mg/L

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**March 27, 2014**  
**Work Order: 1402550**

## Laboratory Report

Project Name		B-HS2 SE#9						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-RECIRC						
Matrix		Wastewater						
SAL Sample Number		1402550-02						
Date/Time Collected		03/11/14 11:30						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	17	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	40	EPA 350.1	2.0	0.47		03/20/14 13:25	50
Carbonaceous BOD	mg/L	150	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	270	EPA 410.4	25	10	03/13/14 09:00	03/14/14 09:13	1
Nitrate (as N)	mg/L	0.05	EPA 300.0	0.04	0.01		03/11/14 22:27	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 22:27	1
Orthophosphate as P	mg/L	5.9	SM 4500P-E	0.20	0.060		03/13/14 10:33	5
Phosphorous - Total as P	mg/L	6.4	SM 4500P-E	0.80	0.20	03/11/14 16:45	03/13/14 13:56	20
Sulfate	mg/L	3.9	EPA 300.0	0.60	0.20		03/11/14 22:27	1
Sulfide	mg/L	45	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	580	SM 2320B	8.0	2.0		03/18/14 13:27	1
Total Kjeldahl Nitrogen	mg/L	57	EPA 351.2	4.0	1.0	03/11/14 16:45	03/13/14 13:56	20
Total Organic Carbon	mg/L	71	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	12	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	12	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.05 I	EPA 300.0	0.08	0.02		03/11/14 22:27	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	10,000	SM 9223B	2.0	2.0	03/11/14 14:41	03/12/14 10:07	1
Fecal Coliforms	CFU/100 ml	51,000	SM 9222D	1	1	03/11/14 14:41	03/12/14 13:40	1

Sample Description **BHS2-ST1**  
 Matrix **Wastewater**  
 SAL Sample Number **1402550-03**  
 Date/Time Collected **03/11/14 11:15**  
 Collected by **Sean Schmidt**  
 Date/Time Received **03/11/14 13:00**

### **Client Provided Field Data**

pH 6.91  
 Temperature 20.7 °C  
 Conductivity 1197 umhos  
 Dissolved Oxygen 4.64 mg/L

<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.24	EPA 350.1	0.040	0.009		03/20/14 09:35	1
Carbonaceous BOD	mg/L	17	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	14 I	EPA 410.4	25	10	03/13/14 09:00	03/14/14 09:13	1

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**Tampa, FL 33619**

**March 27, 2014**  
**Work Order: 1402550**

## Laboratory Report

Project Name		B-HS2 SE#9						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST1						
Matrix		Wastewater						
SAL Sample Number		1402550-03						
Date/Time Collected		03/11/14 11:15						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
Nitrate (as N)	mg/L	37	EPA 300.0	0.40	0.10		03/12/14 21:22	10
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 22:38	1
Orthophosphate as P	mg/L	3.8	SM 4500P-E	0.20	0.060		03/13/14 10:34	5
Phosphorous - Total as P	mg/L	4.1	SM 4500P-E	0.20	0.050	03/11/14 16:45	03/13/14 13:57	5
Sulfate	mg/L	160	EPA 300.0	6.0	2.0		03/12/14 21:22	10
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	220	SM 2320B	8.0	2.0		03/18/14 13:34	1
Total Kjeldahl Nitrogen	mg/L	2.0	EPA 351.2	1.0	0.25	03/11/14 16:45	03/13/14 13:57	5
Total Organic Carbon	mg/L	15	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	37	EPA 300.0	0.44	0.11		03/12/14 21:22	10
<b>Microbiology</b>								
E. Coli	MPN/100 mL	2,000	SM 9223B	2.0	2.0	03/11/14 14:41	03/12/14 10:07	1
Fecal Coliforms	CFU/100 ml	2,030	SM 9222D	1	1	03/11/14 14:41	03/12/14 13:40	1

Sample Description		BHS2-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1402550-04						
Date/Time Collected		03/11/14 11:00						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						

### Client Provided Field Data

pH	7.04
Temperature	20.8 °C
Conductivity	1115 umhos
Dissolved Oxygen	0.12 mg/L

### Inorganics

Hydrogen Sulfide (Unionized)	mg/L	0.60	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.31	EPA 350.1	0.040	0.009		03/20/14 09:37	1
Carbonaceous BOD	mg/L	15	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	29	EPA 410.4	25	10	03/13/14 09:00	03/14/14 09:13	1
Nitrate (as N)	mg/L	5.1	EPA 300.0	0.04	0.01		03/11/14 22:50	1
Nitrite (as N)	mg/L	0.57	EPA 300.0	0.04	0.01		03/11/14 22:50	1
Orthophosphate as P	mg/L	3.3	SM 4500P-E	0.20	0.060		03/13/14 10:35	5
Phosphorous - Total as P	mg/L	3.4	SM 4500P-E	0.20	0.050	03/11/14 16:45	03/13/14 13:58	5
Sulfate	mg/L	150	EPA 300.0	6.0	2.0		03/12/14 21:33	10

**Hazen and Sawyer**  
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**Tampa, FL 33619**

**March 27, 2014**  
**Work Order: 1402550**

## Laboratory Report

Project Name		B-HS2 SE#9						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1402550-04						
Date/Time Collected		03/11/14 11:00						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
Sulfide	mg/L	1.2	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	330	SM 2320B	8.0	2.0		03/18/14 13:42	1
Total Kjeldahl Nitrogen	mg/L	1.4	EPA 351.2	1.0	0.25	03/11/14 16:45	03/13/14 13:58	5
Total Organic Carbon	mg/L	12	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	5.7	EPA 300.0	0.08	0.02		03/11/14 22:50	1
<u>Microbiology</u>								
Total Coliform	CFU/100 ml	2	SM 9222B	1	1	03/11/14 14:31	03/12/14 13:40	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/11/14 14:41	03/12/14 10:07	1
Fecal Coliforms	CFU/100 ml	2	SM 9222D	1	1	03/11/14 14:41	03/12/14 13:40	1
Sample Description		BHS2-ST2						
Matrix		Wastewater						
SAL Sample Number		1402550-05						
Date/Time Collected		03/11/14 10:40						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
<u>Client Provided Field Data</u>								
pH		7.01						
Temperature		20.4 °C						
Conductivity		1210 umhos						
Dissolved Oxygen		0.15 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	15	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.30	EPA 350.1	0.040	0.009		03/20/14 13:27	1
Carbonaceous BOD	mg/L	44	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	35	EPA 410.4	25	10	03/13/14 09:00	03/14/14 09:13	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 23:01	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 23:01	1
Orthophosphate as P	mg/L	3.4	SM 4500P-E	0.20	0.060		03/11/14 13:40	5
Phosphorous - Total as P	mg/L	3.5	SM 4500P-E	0.20	0.050	03/11/14 16:45	03/13/14 13:59	5
Sulfate	mg/L	170	EPA 300.0	6.0	2.0		03/12/14 21:45	10
Sulfide	mg/L	28	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	340	SM 2320B	8.0	2.0		03/18/14 13:50	1
Total Kjeldahl Nitrogen	mg/L	0.91 I	EPA 351.2	1.0	0.25	03/11/14 16:45	03/13/14 13:59	5
Total Organic Carbon	mg/L	13	SM 5310B	1.0	0.060		03/14/14 11:40	1

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**March 27, 2014**  
**Work Order: 1402550**

## Laboratory Report

Project Name		B-HS2 SE#9						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST2						
Matrix		Wastewater						
SAL Sample Number		1402550-05						
Date/Time Collected		03/11/14 10:40						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/11/14 23:01	1
<b><u>Microbiology</u></b>								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/11/14 14:31	03/12/14 13:40	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/11/14 14:41	03/12/14 10:07	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/11/14 14:41	03/12/14 13:40	1
Sample Description		BHS2-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1402550-06						
Date/Time Collected		03/11/14 10:45						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
<b><u>Client Provided Field Data</u></b>								
pH		7.01						
Temperature		20.4 °C						
Conductivity		1210 umhos						
Dissolved Oxygen		0.15 mg/L						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	17	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.33	EPA 350.1	0.040	0.009		03/20/14 13:28	1
Carbonaceous BOD	mg/L	43	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	31	EPA 410.4	25	10	03/13/14 09:00	03/14/14 09:13	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 23:13	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/11/14 23:13	1
Orthophosphate as P	mg/L	3.4	SM 4500P-E	0.20	0.060		03/13/14 10:36	5
Phosphorous - Total as P	mg/L	3.5	SM 4500P-E	0.20	0.050	03/11/14 16:45	03/13/14 14:00	5
Sulfate	mg/L	170	EPA 300.0	6.0	2.0		03/12/14 22:04	10
Sulfide	mg/L	32	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	330	SM 2320B	8.0	2.0		03/18/14 13:59	1
Total Kjeldahl Nitrogen	mg/L	0.88 I	EPA 351.2	1.0	0.25	03/11/14 16:45	03/13/14 14:00	5
Total Organic Carbon	mg/L	14	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/11/14 23:13	1
<b><u>Microbiology</u></b>								



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**March 27, 2014**  
**Work Order: 1402550**

## Laboratory Report

Project Name		B-HS2 SE#9						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1402550-06						
Date/Time Collected		03/11/14 10:45						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/11/14 14:31	03/12/14 13:40	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/11/14 14:41	03/12/14 10:07	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/11/14 14:41	03/12/14 13:40	1
Sample Description		BHS2-EB						
Matrix		Reagent Water						
SAL Sample Number		1402550-07						
Date/Time Collected		03/11/14 10:30						
Collected by		Sean Schmidt						
Date/Time Received		03/11/14 13:00						
<b><u>Client Provided Field Data</u></b>								
pH		6.24						
Temperature		22.7 °C						
Conductivity		1.40 umhos						
Dissolved Oxygen		6.88 mg/L						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		03/18/14 11:01	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	03/13/14 09:00	03/14/14 09:13	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 06:30	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 06:30	1
Orthophosphate as P	mg/L	0.012 U	SM 4500P-E	0.040	0.012		03/11/14 13:40	1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	03/11/14 16:45	03/13/14 14:01	1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		03/13/14 06:30	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		03/18/14 14:02	1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	03/11/14 16:45	03/13/14 14:01	1
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/13/14 06:30	1
<b><u>Microbiology</u></b>								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/11/14 14:31	03/12/14 13:40	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/11/14 14:41	03/12/14 10:07	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/11/14 14:41	03/12/14 13:40	1

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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March 27, 2014  
Work Order: 1402550

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41114 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41114-BLK1)</b>					Prepared & Analyzed: 03/11/14					
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>LCS (BC41114-BS1)</b>					Prepared & Analyzed: 03/11/14					
Nitrate (as N)	1.71	0.04	0.01	mg/L	1.7		101	85-115		
Sulfate	9.22	0.60	0.20	mg/L	9.0		102	85-115		
Nitrite (as N)	1.46	0.04	0.01	mg/L	1.4		104	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS Dup (BC41114-BSD1)</b>					Prepared & Analyzed: 03/11/14					
Sulfate	9.18	0.60	0.20	mg/L	9.0		102	85-115	0.4	200
Nitrite (as N)	1.46	0.04	0.01	mg/L	1.4		104	85-115	0.3	200
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	0.8	200
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>Matrix Spike (BC41114-MS1)</b>					<b>Source: 1402555-02</b>		Prepared & Analyzed: 03/11/14			
Sulfate	13.1	0.60	0.20	mg/L	9.0	3.26	109	85-115		
Nitrite (as N)	1.47	0.04	0.01	mg/L	1.4	ND	105	85-115		
Nitrate (as N)	2.14	0.04	0.01	mg/L	1.7	0.294	108	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41114 - Ion Chromatography 300.0 Prep</b>										
<b>Matrix Spike (BC41114-MS2)</b>		<b>Source: 1402397-02</b>			Prepared & Analyzed: 03/12/14					
Nitrite (as N)	1.67	0.04	0.01	mg/L	1.4	0.366	93	85-115		
Sulfate	12.8	0.60	0.20	mg/L	9.0	3.52	103	85-115		
Nitrate (as N)	1.90	0.04	0.01	mg/L	1.7	0.121	105	85-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
<b>Batch BC41129 - Digestion for TP and TKN</b>										
<b>Blank (BC41129-BLK1)</b>		Prepared: 03/11/14 Analyzed: 03/13/14								
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
<b>LCS (BC41129-BS1)</b>		Prepared: 03/11/14 Analyzed: 03/13/14								
Phosphorous - Total as P	0.508	0.040	0.010	mg/L	0.50		102	90-110		
Total Kjeldahl Nitrogen	1.01	0.20	0.05	mg/L	1.0		101	90-110		
<b>Matrix Spike (BC41129-MS1)</b>		<b>Source: 1402521-07</b>			Prepared: 03/11/14 Analyzed: 03/13/14					
Phosphorous - Total as P	0.706	0.040	0.010	mg/L	0.50	0.199	101	90-110		
Total Kjeldahl Nitrogen	1.76	0.20	0.05	mg/L	1.0	0.733	103	90-110		
<b>Matrix Spike (BC41129-MS2)</b>		<b>Source: 1402550-07</b>			Prepared: 03/11/14 Analyzed: 03/13/14					
Phosphorous - Total as P	0.522	0.040	0.010	mg/L	0.50	ND	104	90-110		
Total Kjeldahl Nitrogen	0.921	0.20	0.05	mg/L	1.0	ND	92	90-110		
<b>Matrix Spike Dup (BC41129-MSD1)</b>		<b>Source: 1402521-07</b>			Prepared: 03/11/14 Analyzed: 03/13/14					
Phosphorous - Total as P	0.700	0.040	0.010	mg/L	0.50	0.199	100	90-110	0.9	25
Total Kjeldahl Nitrogen	1.68	0.20	0.05	mg/L	1.0	0.733	95	90-110	5	20

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March 27, 2014  
Work Order: 1402550

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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### Batch BC41129 - Digestion for TP and TKN

<b>Matrix Spike Dup (BC41129-MSD2)</b>		<b>Source: 1402550-07</b>			Prepared: 03/11/14 Analyzed: 03/13/14					
Phosphorous - Total as P	0.545	0.040	0.010	mg/L	0.50	ND	109	90-110	4	25
Total Kjeldahl Nitrogen	0.933	0.20	0.05	mg/L	1.0	ND	93	90-110	1	20

### Batch BC41130 - COD prep

Blank (BC41130-BLK1)					Prepared: 03/13/14 Analyzed: 03/14/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BC41130-BS1)					Prepared: 03/13/14 Analyzed: 03/14/14					
Chemical Oxygen Demand	52	25	10	mg/L	50		104	90-110		
Matrix Spike (BC41130-MS1)		Source: 1402555-02			Prepared: 03/13/14 Analyzed: 03/14/14					
Chemical Oxygen Demand	52	25	10	mg/L	50	ND	104	85-115		
Matrix Spike Dup (BC41130-MSD1)		Source: 1402555-02			Prepared: 03/13/14 Analyzed: 03/14/14					
Chemical Oxygen Demand	52	25	10	mg/L	50	ND	104	85-115	0	32

### Batch BC41221 - Ion Chromatography 300.0 Prep

Blank (BC41221-BLK1)					Prepared & Analyzed: 03/12/14		
Nitrate (as N)	0.01 U	0.04	0.01	mg/L			
Sulfate	0.20 U	0.60	0.20	mg/L			
Surrogate: Dichloroacetate	1.14			mg/L	1.0	114	90-115
Surrogate: Dichloroacetate	1.14			mg/L	1.0	114	90-115
LCS (BC41221-BS1)					Prepared & Analyzed: 03/12/14		
Nitrate (as N)	1.69	0.04	0.01	mg/L	1.7	99	85-115
Sulfate	9.15	0.60	0.20	mg/L	9.0	102	85-115
Surrogate: Dichloroacetate	1.14			mg/L	1.0	114	90-115
Surrogate: Dichloroacetate	1.14			mg/L	1.0	114	90-115

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March 27, 2014  
Work Order: 1402550

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41221 - Ion Chromatography 300.0 Prep</b>										
<b>LCS Dup (BC41221-BSD1)</b>					Prepared & Analyzed: 03/12/14					
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	0.6	200
Sulfate	9.17	0.60	0.20	mg/L	9.0		102	85-115	0.2	200
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>Matrix Spike (BC41221-MS1)</b>					Source: 1402492-06 Prepared & Analyzed: 03/12/14					
Nitrate (as N)	56.2	0.40	0.10	mg/L	17	37.6	109	85-115		
Sulfate	255	6.0	2.0	mg/L	90	157	109	85-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	90-115		
<b>Matrix Spike (BC41221-MS2)</b>					Source: 1402141-01 Prepared & Analyzed: 03/12/14					
Sulfate	98.6	6.0	2.0	mg/L	90	5.99	103	85-115		
Nitrate (as N)	17.2	0.40	0.10	mg/L	17	ND	101	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Batch BC41224 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41224-BLK1)</b>					Prepared & Analyzed: 03/13/14					
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		

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March 27, 2014  
Work Order: 1402550

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41224 - Ion Chromatography 300.0 Prep</b>										
<b>LCS (BC41224-BS1)</b>					Prepared & Analyzed: 03/13/14					
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4		106	85-115		
Sulfate	9.28	0.60	0.20	mg/L	9.0		103	85-115		
Nitrate (as N)	1.74	0.04	0.01	mg/L	1.7		102	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>LCS Dup (BC41224-BSD1)</b>					Prepared & Analyzed: 03/13/14					
Sulfate	9.24	0.60	0.20	mg/L	9.0		103	85-115	0.4	200
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4		106	85-115	0.1	200
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7		102	85-115	0.6	200
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Matrix Spike (BC41224-MS1)</b>					<b>Source: 1402084-04</b>		Prepared & Analyzed: 03/13/14			
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7	ND	99	85-115		
Nitrite (as N)	1.44	0.04	0.01	mg/L	1.4	ND	103	85-115		
Sulfate	84.7	0.60	0.20	mg/L	9.0	75.9	99	85-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
<b>Batch BC41233 - VSS Prep</b>										
<b>Blank (BC41233-BLK1)</b>					Prepared: 03/12/14 Analyzed: 03/14/14					
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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

March 27, 2014  
Work Order: 1402550

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41233 - VSS Prep</b>										
<b>LCS (BC41233-BS1)</b>					Prepared: 03/12/14 Analyzed: 03/14/14					
Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
<b>Duplicate (BC41233-DUP1)</b>					Source: 1402492-01 Prepared: 03/12/14 Analyzed: 03/14/14					
Total Suspended Solids	30.0	1	1	mg/L		30.0			0	30
Volatile Suspended Solids	10.2	1		mg/L		12.2			18	20
<b>Batch BC41301 - Ortho phosphorus SM4500P-E by seal</b>										
<b>Blank (BC41301-BLK1)</b>					Prepared & Analyzed: 03/11/14					
Orthophosphate as P	0.012 U	0.040	0.012	mg/L						
<b>LCS (BC41301-BS1)</b>					Prepared & Analyzed: 03/11/14					
Orthophosphate as P	0.824	0.040	0.012	mg/L	0.80		103	90-110		
<b>Matrix Spike (BC41301-MS1)</b>					Source: 1402492-11 Prepared & Analyzed: 03/11/14					
Orthophosphate as P	1.04	0.040	0.012	mg/L	1.0	ND	104	90-110		
<b>Matrix Spike Dup (BC41301-MSD1)</b>					Source: 1402492-11 Prepared & Analyzed: 03/11/14					
Orthophosphate as P	1.06	0.040	0.012	mg/L	1.0	ND	106	90-110	2	20
<b>Batch BC41302 - Ortho phosphorus SM4500P-E by seal</b>										
<b>Blank (BC41302-BLK1)</b>					Prepared & Analyzed: 03/13/14					
Orthophosphate as P	0.012 U	0.040	0.012	mg/L						
<b>LCS (BC41302-BS1)</b>					Prepared & Analyzed: 03/13/14					
Orthophosphate as P	0.833	0.040	0.012	mg/L	0.80		104	90-110		



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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41302 - Ortho phosphorus SM4500P-E by seal</b>										
<b>Matrix Spike (BC41302-MS1)</b>		<b>Source: 1402613-07</b>			Prepared & Analyzed: 03/13/14					
Orthophosphate as P	1.05	0.040	0.012	mg/L	1.0	ND	105	90-110		
<b>Matrix Spike (BC41302-MS2)</b>		<b>Source: 1402626-03</b>			Prepared & Analyzed: 03/13/14					
Orthophosphate as P	1.08	0.040	0.012	mg/L	1.0	0.0368	104	90-110		
<b>Matrix Spike Dup (BC41302-MSD1)</b>		<b>Source: 1402613-07</b>			Prepared & Analyzed: 03/13/14					
Orthophosphate as P	1.05	0.040	0.012	mg/L	1.0	ND	105	90-110	0.5	20
<b>Matrix Spike Dup (BC41302-MSD2)</b>		<b>Source: 1402626-03</b>			Prepared & Analyzed: 03/13/14					
Orthophosphate as P	1.08	0.040	0.012	mg/L	1.0	0.0368	105	90-110	0.2	20
<b>Batch BC41314 - BOD</b>										
<b>Blank (BC41314-BLK1)</b>		Prepared: 03/13/14 Analyzed: 03/18/14								
Carbonaceous BOD	2 U	2	2	mg/L						
<b>Blank (BC41314-BLK2)</b>		Prepared: 03/13/14 Analyzed: 03/18/14								
Carbonaceous BOD	2 U	2	2	mg/L						
<b>LCS (BC41314-BS1)</b>		Prepared: 03/13/14 Analyzed: 03/18/14								
Carbonaceous BOD	195	2	2	mg/L	200		98	85-115		
<b>LCS (BC41314-BS2)</b>		Prepared: 03/13/14 Analyzed: 03/18/14								
Carbonaceous BOD	196	2	2	mg/L	200		98	85-115		
<b>LCS Dup (BC41314-BSD1)</b>		Prepared: 03/13/14 Analyzed: 03/18/14								
Carbonaceous BOD	195	2	2	mg/L	200		97	85-115	0.3	200

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March 27, 2014  
Work Order: 1402550

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41314 - BOD</b>										
<b>LCS Dup (BC41314-BSD2)</b>					Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	195	2	2	mg/L	200		97	85-115	0.8	200
<b>Duplicate (BC41314-DUP1)</b>					Source: 1402604-01 Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	390	2	2	mg/L		400			1	25
<b>Duplicate (BC41314-DUP2)</b>					Source: 1402661-01 Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	200	2	2	mg/L		210			3	25
<b>Batch BC41343 - TOC prep</b>										
<b>Blank (BC41343-BLK1)</b>					Prepared & Analyzed: 03/14/14					
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
<b>LCS (BC41343-BS1)</b>					Prepared & Analyzed: 03/14/14					
Total Organic Carbon	10.4	1.0	0.060	mg/L	10		104	90-110		
<b>Matrix Spike (BC41343-MS1)</b>					Source: 1402613-03 Prepared & Analyzed: 03/14/14					
Total Organic Carbon	18.3 J5	1.0	0.060	mg/L	10	9.87	85	85-115		
<b>Matrix Spike Dup (BC41343-MSD1)</b>					Source: 1402613-03 Prepared & Analyzed: 03/14/14					
Total Organic Carbon	18.7	1.0	0.060	mg/L	10	9.87	89	85-115	2	10
<b>Batch BC41801 - Ammonia by SEAL</b>										
<b>Blank (BC41801-BLK1)</b>					Prepared & Analyzed: 03/18/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						

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March 27, 2014  
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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41801 - Ammonia by SEAL</b>										
<b>LCS (BC41801-BS1)</b>					Prepared & Analyzed: 03/18/14					
Ammonia as N	0.52	0.040	0.009	mg/L	0.50		105	90-110		
<b>Matrix Spike (BC41801-MS1)</b>					<b>Source: 1402550-07</b> Prepared & Analyzed: 03/18/14					
Ammonia as N	0.50	0.040	0.009	mg/L	0.50	ND	99	90-110		
<b>Matrix Spike (BC41801-MS2)</b>					<b>Source: 1402684-07</b> Prepared & Analyzed: 03/18/14					
Ammonia as N	0.49	0.040	0.009	mg/L	0.50	0.044	90	90-110		
<b>Matrix Spike Dup (BC41801-MSD1)</b>					<b>Source: 1402550-07</b> Prepared & Analyzed: 03/18/14					
Ammonia as N	0.51	0.040	0.009	mg/L	0.50	ND	102	90-110	3	10
<b>Matrix Spike Dup (BC41801-MSD2)</b>					<b>Source: 1402684-07</b> Prepared & Analyzed: 03/18/14					
Ammonia as N	0.51	0.040	0.009	mg/L	0.50	0.044	94	90-110	4	10
<b>Batch BC41812 - alkalinity</b>										
<b>Blank (BC41812-BLK1)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
<b>LCS (BC41812-BS1)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		101	90-110		
<b>LCS (BC41812-BS2)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		98	90-110		
<b>LCS (BC41812-BS3)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		100	90-110		

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March 27, 2014  
Work Order: 1402550

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41812 - alkalinity</b>										
<b>LCS (BC41812-BS4)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		100	90-110		
<b>LCS (BC41812-BS5)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		99	90-110		
<b>Matrix Spike (BC41812-MS1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	104	80-120		
<b>Matrix Spike Dup (BC41812-MSD1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	106	80-120	1	26
<b>Batch BC41835 - Sulfide prep</b>										
<b>Blank (BC41835-BLK1)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
<b>Blank (BC41835-BLK2)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
<b>LCS (BC41835-BS1)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0		97	85-115		
<b>LCS (BC41835-BS2)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
<b>Matrix Spike (BC41835-MS1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		

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**March 27, 2014**  
**Work Order: 1402550**

**Inorganics - Quality Control**

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BC41835 - Sulfide prep										
Matrix Spike (BC41835-MS2)		Source: 1402721-07			Prepared & Analyzed: 03/18/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike Dup (BC41835-MSD1)		Source: 1402550-07			Prepared & Analyzed: 03/18/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
Matrix Spike Dup (BC41835-MSD2)		Source: 1402721-07			Prepared & Analyzed: 03/18/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
Batch BC41920 - Ammonia by SEAL										
Blank (BC41920-BLK1)					Prepared & Analyzed: 03/20/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BC41920-BS1)										
Ammonia as N	0.47	0.040	0.009	mg/L	0.50		94	90-110		
Matrix Spike (BC41920-MS1)		Source: 1402538-15			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.46	0.040	0.009	mg/L	0.50	ND	92	90-110		
Matrix Spike (BC41920-MS2)		Source: 1402613-07			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110		
Matrix Spike Dup (BC41920-MSD1)		Source: 1402538-15			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110	4	10
Matrix Spike Dup (BC41920-MSD2)		Source: 1402613-07			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110	0.6	10

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March 27, 2014  
Work Order: 1402550

## Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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### Batch BC41117 - TC-MF

Blank (BC41117-BLK1) Prepared: 03/11/14 Analyzed: 03/12/14

Total Coliform	1 U	1	1	CFU/100 ml						
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Duplicate (BC41117-DUP1) Source: 1402550-07 Prepared: 03/11/14 Analyzed: 03/12/14

Total Coliform	1 U	1	1	CFU/100 ml		ND				200
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### Batch BC41118 - FC-MF

Blank (BC41118-BLK1) Prepared: 03/11/14 Analyzed: 03/12/14

Fecal Coliforms	1 U	1	1	CFU/100 ml						
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Duplicate (BC41118-DUP1) Source: 1402550-07 Prepared: 03/11/14 Analyzed: 03/12/14

Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
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**March 27, 2014**  
**Work Order: 1402550**

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**\* Qualifiers, Notes and Definitions**

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

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

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

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

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

Questions regarding this report should be directed to :

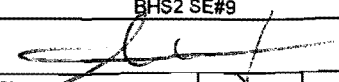

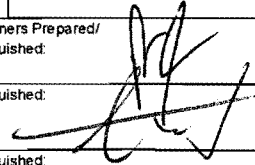
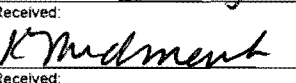
Kathryn Nordmark

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Client Name <b>Hazan and Sawyer</b>										Contact / Phone: <b>Josefin Hirst 813-630-4498</b>									
Project Name / Location <b>BHS2 SE#9</b>																			
Samplers: (Signature) 										PARAMETER / CONTAINER DESCRIPTION									
Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water		Date	Time	Matrix	Composite	Grab	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT	1LP, Cool Total Alkalinity, TSS, VSS, CBOD, NOx, OP, SO <sub>4</sub>	125mLP, H <sub>2</sub> SO <sub>4</sub> COD, TKN, NH <sub>3</sub> , TP	500mLP, NaOH, Zn Acetate H <sub>2</sub> S	40mLaV, HCl TOC	1LP, Cool Lab Filtered: CBOD, TKN, NH <sub>3</sub> , NOx	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT, TC-MF (Non-potable)	1LP, Cool Lab Filtered: CBOD, TKN, NH <sub>3</sub> , NOx, SO <sub>4</sub>	DO	pH	Temperature	Conductivity	
SAL Use Only Sample No.	Sample Description																		
01	BHS2-STE	3/11/14	1145	WW		X	4	1	1	1	2				0.03	7.15	21.8	1425	
02	BHS2-RECIRC		1130	WW		X	4	1	1	1	2				0.07	7.28	21.8	1430	
03	BHS2-ST1		1115	WW		X	4	1	1	1	2				4.64	6.91	20.7	1197	
04	BHS2-LIGNO-0		1100	WW		X		1	1	1	2		6		0.12	7.04	20.8	1115	
05	BHS2-ST2		1040	WW		X		1	1	1	2		6		0.15	7.01	20.4	1210	
06	BHS2-ST2-DUP		1045	WW		X		1	1	1	2		6		1	1	1	1	
07	BHS2-EB		1030	R		X		1	1	1	2		6		6.88	6.25	22.7	1.40	
Containers Prepared/Relinquished:		Date/Time: 1209 1-29-14	Received: 		Date/Time: 1200 1/29/14		Seal intact? <input checked="" type="radio"/> N N/A												
Relinquished: 		Date/Time: 1300 3/11/14	Received: 		Date/Time: 1300 3/11/14		Samples intact upon arrival? <input checked="" type="radio"/> N N/A												
Relinquished:		Date/Time:	Received:		Date/Time:		Received on ice? Temp <input checked="" type="radio"/> N N/A												
Relinquished:		Date/Time:	Received:		Date/Time:		Proper preservatives indicated? <input checked="" type="radio"/> N N/A												
Relinquished:		Date/Time:	Received:		Date/Time:		Rec'd within holding time? <input checked="" type="radio"/> N N/A												
Relinquished:		Date/Time:	Received:		Date/Time:		Volatiles rec'd w/out headspace? <input checked="" type="radio"/> N N/A												
Relinquished:		Date/Time:	Received:		Date/Time:		Proper containers used? <input checked="" type="radio"/> N N/A												
Instructions / Remarks																			

**Hazen and Sawyer**  
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**Tampa, FL 33619**

**March 27, 2014**  
**Work Order: 1402613**

## Laboratory Report

Project Name		B-HS2 SE#10						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-STE						
Matrix		Wastewater						
SAL Sample Number		1402613-01						
Date/Time Collected		03/12/14 09:30						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
<b><u>Client Provided Field Data</u></b>								
pH		7.20						
Temperature		21.9 °C						
Conductivity		1411 umhos						
Dissolved Oxygen		0.01 mg/L						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	21	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	39	EPA 350.1	2.0	0.47		03/20/14 09:52	50
Carbonaceous BOD	mg/L	390	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	390	EPA 410.4	25	10	03/13/14 14:00	03/14/14 16:45	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 04:02	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 04:02	1
Orthophosphate as P	mg/L	6.6	SM 4500P-E	0.20	0.060		03/13/14 10:36	5
Phosphorous - Total as P	mg/L	6.7	SM 4500P-E	0.80	0.20	03/12/14 09:30	03/17/14 10:45	20
Sulfate	mg/L	15	EPA 300.0	0.60	0.20		03/13/14 04:02	1
Sulfide	mg/L	52	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	550	SM 2320B	8.0	2.0		03/18/14 14:41	1
Total Kjeldahl Nitrogen	mg/L	60	EPA 351.2	4.0	1.0	03/12/14 09:30	03/17/14 10:45	20
Total Organic Carbon	mg/L	98	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	16	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	16	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/13/14 04:02	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	24,000	SM 9223B	2.0	2.0	03/12/14 12:57	03/13/14 09:17	1
Fecal Coliforms	CFU/100 ml	43,000	SM 9222D	1	1	03/12/14 12:55	03/13/14 12:38	1

Sample Description **BHS2-RECIRC**  
 Matrix **Wastewater**  
 SAL Sample Number **1402613-02**  
 Date/Time Collected **03/12/14 09:15**  
 Collected by **Sean Schmidt**  
 Date/Time Received **03/12/14 11:30**

**Client Provided Field Data**

pH 7.25  
 Temperature 21.6 °C  
 Conductivity 1418 umhos  
 Dissolved Oxygen 0.04 mg/L

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

**March 27, 2014**  
**Work Order: 1402613**

## Laboratory Report

Project Name		B-HS2 SE#10						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-RECIRC						
Matrix		Wastewater						
SAL Sample Number		1402613-02						
Date/Time Collected		03/12/14 09:15						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	15	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	40	EPA 350.1	2.0	0.47		03/20/14 13:30	50
Carbonaceous BOD	mg/L	200	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	310	EPA 410.4	25	10	03/13/14 14:00	03/14/14 16:45	1
Nitrate (as N)	mg/L	0.05	EPA 300.0	0.04	0.01		03/13/14 04:14	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 04:14	1
Orthophosphate as P	mg/L	5.9	SM 4500P-E	0.20	0.060		03/13/14 10:37	5
Phosphorous - Total as P	mg/L	6.2	SM 4500P-E	0.80	0.20	03/12/14 09:30	03/17/14 10:46	20
Sulfate	mg/L	7.8	EPA 300.0	0.60	0.20		03/13/14 04:14	1
Sulfide	mg/L	39	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	590	SM 2320B	8.0	2.0		03/18/14 14:57	1
Total Kjeldahl Nitrogen	mg/L	63	EPA 351.2	4.0	1.0	03/12/14 09:30	03/17/14 10:46	20
Total Organic Carbon	mg/L	58	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	14	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	13	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.05 I	EPA 300.0	0.08	0.02		03/13/14 04:14	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	20,000	SM 9223B	2.0	2.0	03/12/14 12:57	03/13/14 09:17	1
Fecal Coliforms	CFU/100 ml	66,000	SM 9222D	1	1	03/12/14 12:55	03/13/14 12:38	1

Sample Description **BHS2-ST1**  
 Matrix **Wastewater**  
 SAL Sample Number **1402613-03**  
 Date/Time Collected **03/12/14 08:55**  
 Collected by **Sean Schmidt**  
 Date/Time Received **03/12/14 11:30**

### **Client Provided Field Data**

pH 7.09  
 Temperature 21.8 °C  
 Conductivity 1215 umhos  
 Dissolved Oxygen 4.85 mg/L

<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	1.6	EPA 350.1	0.040	0.009		03/20/14 09:56	1
Carbonaceous BOD	mg/L	18	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	23 I	EPA 410.4	25	10	03/13/14 14:00	03/14/14 16:45	1

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**Tampa, FL 33619**

**March 27, 2014**  
**Work Order: 1402613**

## Laboratory Report

Project Name		B-HS2 SE#10						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST1						
Matrix		Wastewater						
SAL Sample Number		1402613-03						
Date/Time Collected		03/12/14 08:55						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
Nitrate (as N)	mg/L	31	EPA 300.0	0.04	0.01		03/13/14 04:25	1
Nitrite (as N)	mg/L	0.32	EPA 300.0	0.04	0.01		03/13/14 04:25	1
Orthophosphate as P	mg/L	3.9	SM 4500P-E	0.20	0.060		03/13/14 10:38	5
Phosphorous - Total as P	mg/L	4.0	SM 4500P-E	0.20	0.050	03/12/14 09:30	03/17/14 10:47	5
Sulfate	mg/L	150	EPA 300.0	6.0	2.0		03/25/14 11:44	10
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	240	SM 2320B	8.0	2.0		03/18/14 15:04	1
Total Kjeldahl Nitrogen	mg/L	4.7	EPA 351.2	1.0	0.25	03/12/14 09:30	03/17/14 10:47	5
Total Organic Carbon	mg/L	9.9	SM 5310B	1.0	0.060		03/14/14 11:40	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	31	EPA 300.0	0.08	0.02		03/13/14 04:25	1
<u>Microbiology</u>								
E. Coli	MPN/100 mL	10,000	SM 9223B	2.0	2.0	03/12/14 12:57	03/13/14 09:17	1
Fecal Coliforms	CFU/100 ml	11,300	SM 9222D	1	1	03/12/14 12:55	03/13/14 12:38	1
Sample Description		BHS2-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1402613-04						
Date/Time Collected		03/12/14 08:35						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
<u>Client Provided Field Data</u>								
pH		7.08						
Temperature		21.4 °C						
Conductivity		1116 umhos						
Dissolved Oxygen		1.19 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.28	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.28	EPA 350.1	0.040	0.009		03/20/14 09:58	1
Carbonaceous BOD	mg/L	17	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	25	EPA 410.4	25	10	03/13/14 14:00	03/14/14 16:45	1
Nitrate (as N)	mg/L	5.4	EPA 300.0	0.04	0.01		03/13/14 04:37	1
Nitrite (as N)	mg/L	0.46	EPA 300.0	0.04	0.01		03/13/14 04:37	1
Orthophosphate as P	mg/L	3.3	SM 4500P-E	0.20	0.060		03/13/14 10:39	5
Phosphorous - Total as P	mg/L	3.6	SM 4500P-E	0.20	0.050	03/12/14 09:30	03/17/14 10:48	5
Sulfate	mg/L	150	EPA 300.0	6.0	2.0		03/24/14 21:18	10

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**March 27, 2014**  
**Work Order: 1402613**

## Laboratory Report

Project Name		B-HS2 SE#10						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1402613-04						
Date/Time Collected		03/12/14 08:35						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
Sulfide	mg/L	0.60	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	340	SM 2320B	8.0	2.0		03/25/14 12:59	1
Total Kjeldahl Nitrogen	mg/L	1.7	EPA 351.2	1.0	0.25	03/12/14 09:30	03/17/14 10:48	5
Total Organic Carbon	mg/L	410	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	1	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	5.9	EPA 300.0	0.08	0.02		03/13/14 04:37	1
Microbiology								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/12/14 12:56	03/13/14 12:33	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/12/14 12:57	03/13/14 09:17	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/12/14 12:55	03/13/14 12:38	1
Sample Description		BHS2-ST2						
Matrix		Wastewater						
SAL Sample Number		1402613-05						
Date/Time Collected		03/12/14 08:15						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
Client Provided Field Data								
pH		6.96						
Temperature		20.5 °C						
Conductivity		1208 umhos						
Dissolved Oxygen		0.06 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	12	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.38	EPA 350.1	0.040	0.009		03/20/14 13:32	1
Carbonaceous BOD	mg/L	61	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	93	EPA 410.4	25	10	03/13/14 14:00	03/14/14 16:45	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 04:48	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 04:48	1
Orthophosphate as P	mg/L	3.4	SM 4500P-E	0.20	0.060		03/13/14 10:40	5
Phosphorous - Total as P	mg/L	3.6	SM 4500P-E	0.20	0.050	03/12/14 09:30	03/17/14 10:49	5
Sulfate	mg/L	230	EPA 300.0	6.0	2.0		03/24/14 21:27	10
Sulfide	mg/L	23	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	320	SM 2320B	8.0	2.0		03/25/14 13:08	1
Total Kjeldahl Nitrogen	mg/L	1.3	EPA 351.2	1.0	0.25	03/12/14 09:30	03/17/14 10:49	5
Total Organic Carbon	mg/L	13	SM 5310B	1.0	0.060		03/17/14 14:05	1

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**March 27, 2014**  
**Work Order: 1402613**

## Laboratory Report

Project Name		B-HS2 SE#10						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST2						
Matrix		Wastewater						
SAL Sample Number		1402613-05						
Date/Time Collected		03/12/14 08:15						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/13/14 04:48	1
<u>Microbiology</u>								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/12/14 12:56	03/13/14 12:33	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/12/14 12:57	03/13/14 09:17	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/12/14 12:55	03/13/14 12:38	1
Sample Description		BHS2-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1402613-06						
Date/Time Collected		03/12/14 08:20						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
<u>Client Provided Field Data</u>								
pH		6.96						
Temperature		20.5 °C						
Conductivity		1208 umhos						
Dissolved Oxygen		0.06 mg/L						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	14	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.37	EPA 350.1	0.040	0.009		03/20/14 13:33	1
Carbonaceous BOD	mg/L	65	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	97	EPA 410.4	25	10	03/13/14 14:00	03/14/14 16:45	1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		03/13/14 04:59	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 04:59	1
Orthophosphate as P	mg/L	3.4	SM 4500P-E	0.20	0.060		03/13/14 10:41	5
Phosphorous - Total as P	mg/L	3.5	SM 4500P-E	0.20	0.050	03/12/14 09:30	03/17/14 10:52	5
Sulfate	mg/L	210	EPA 300.0	6.0	2.0		03/25/14 12:03	10
Sulfide	mg/L	26	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	320	SM 2320B	8.0	2.0		03/25/14 13:17	1
Total Kjeldahl Nitrogen	mg/L	1.3	EPA 351.2	1.0	0.25	03/12/14 09:30	03/17/14 10:52	5
Total Organic Carbon	mg/L	13	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	1	SM 2540D	1	1	03/12/14 15:00	03/14/14 09:06	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/12/14 15:00	03/14/14 09:06	1
Nitrate+Nitrite (N)	mg/L	0.04 I	EPA 300.0	0.08	0.02		03/13/14 04:59	1
<u>Microbiology</u>								

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**March 27, 2014**  
**Work Order: 1402613**

## Laboratory Report

Project Name		B-HS2 SE#10						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1402613-06						
Date/Time Collected		03/12/14 08:20						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/12/14 12:56	03/13/14 12:33	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/12/14 12:57	03/13/14 09:17	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/12/14 12:55	03/13/14 12:38	1
Sample Description		BHS2-EB						
Matrix		Reagent Water						
SAL Sample Number		1402613-07						
Date/Time Collected		03/12/14 08:00						
Collected by		Sean Schmidt						
Date/Time Received		03/12/14 11:30						
<b><u>Client Provided Field Data</u></b>								
pH		6.55						
Temperature		19.0 °C						
Conductivity		1.70 umhos						
Dissolved Oxygen		7.10 mg/L						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		03/20/14 10:04	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/13/14 10:28	03/18/14 12:21	1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	03/13/14 14:00	03/14/14 16:45	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 06:08	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/13/14 06:08	1
Orthophosphate as P	mg/L	0.012 U	SM 4500P-E	0.040	0.012		03/13/14 10:10	1
Phosphorous - Total as P	mg/L	0.050 U	SM 4500P-E	0.20	0.050	03/12/14 09:30	03/17/14 10:53	5
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		03/13/14 06:08	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		03/25/14 13:20	1
Total Kjeldahl Nitrogen	mg/L	0.25 U	EPA 351.2	1.0	0.25	03/12/14 09:30	03/17/14 10:53	5
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/13/14 06:08	1
<b><u>Microbiology</u></b>								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/12/14 12:56	03/13/14 12:33	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/12/14 12:57	03/13/14 09:17	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/12/14 12:55	03/13/14 12:38	1



# SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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10002 Princess Palm Ave, Suite 200  
Tampa, FL 33619

March 27, 2014  
Work Order: 1402613

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41202 - Digestion for TP and TKN</b>										
<b>Blank (BC41202-BLK1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
<b>LCS (BC41202-BS1)</b>					Prepared: 03/12/14 Analyzed: 03/17/14					
Total Kjeldahl Nitrogen	0.924	0.20	0.05	mg/L	1.0		92	90-110		
Phosphorous - Total as P	0.525	0.040	0.010	mg/L	0.50		105	90-110		
<b>Matrix Spike (BC41202-MS1)</b>					<b>Source: 1402599-02</b>		Prepared: 03/12/14 Analyzed: 03/17/14			
Total Kjeldahl Nitrogen	1.97	0.20	0.05	mg/L	1.0	0.927	104	90-110		
Phosphorous - Total as P	0.618	0.040	0.010	mg/L	0.50	0.0969	104	90-110		
<b>Matrix Spike (BC41202-MS2)</b>					<b>Source: 1402613-07</b>		Prepared: 03/12/14 Analyzed: 03/17/14			
Total Kjeldahl Nitrogen	0.974	0.20	0.05	mg/L	1.0	ND	97	90-110		
Phosphorous - Total as P	0.533	0.040	0.010	mg/L	0.50	ND	107	90-110		
<b>Matrix Spike Dup (BC41202-MSD1)</b>					<b>Source: 1402599-02</b>		Prepared: 03/12/14 Analyzed: 03/17/14			
Phosphorous - Total as P	0.600	0.040	0.010	mg/L	0.50	0.0969	101	90-110	3	25
Total Kjeldahl Nitrogen	2.02	0.20	0.05	mg/L	1.0	0.927	109	90-110	3	20
<b>Matrix Spike Dup (BC41202-MSD2)</b>					<b>Source: 1402613-07</b>		Prepared: 03/12/14 Analyzed: 03/17/14			
Total Kjeldahl Nitrogen	1.03	0.20	0.05	mg/L	1.0	ND	103	90-110	5	20
Phosphorous - Total as P	0.521	0.040	0.010	mg/L	0.50	ND	104	90-110	2	25
<b>Batch BC41223 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41223-BLK1)</b>					Prepared & Analyzed: 03/12/14					
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

March 27, 2014  
Work Order: 1402613

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41223 - Ion Chromatography 300.0 Prep</b>										
<b>LCS (BC41223-BS1)</b>					Prepared & Analyzed: 03/12/14					
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4		105	85-115		
Sulfate	9.26	0.60	0.20	mg/L	9.0		103	85-115		
Nitrate (as N)	1.74	0.04	0.01	mg/L	1.7		102	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>LCS Dup (BC41223-BSD1)</b>					Prepared & Analyzed: 03/13/14					
Nitrate (as N)	1.70	0.04	0.01	mg/L	1.7		100	85-115	2	200
Nitrite (as N)	1.46	0.04	0.01	mg/L	1.4		105	85-115	0.7	200
Sulfate	9.19	0.60	0.20	mg/L	9.0		102	85-115	0.7	200
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
<b>Matrix Spike (BC41223-MS1)</b>					<b>Source: 1402429-05</b>		Prepared & Analyzed: 03/13/14			
Sulfate	132	6.0	2.0	mg/L	90	43.8	98	85-115		
Nitrite (as N)	14.7	0.40	0.10	mg/L	14	ND	105	85-115		
Nitrate (as N)	17.2	0.40	0.10	mg/L	17	0.590	98	85-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
<b>Matrix Spike (BC41223-MS2)</b>					<b>Source: 1402442-04</b>		Prepared & Analyzed: 03/13/14			
Sulfate	29.7	0.60	0.20	mg/L	9.0	20.3	104	85-115		
Nitrite (as N)	1.36	0.04	0.01	mg/L	1.4	ND	97	85-115		
Nitrate (as N)	1.82	0.04	0.01	mg/L	1.7	0.0400	105	85-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		

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March 27, 2014  
Work Order: 1402613

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41224 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41224-BLK1)</b>					Prepared & Analyzed: 03/13/14					
Sulfate	0.20 U	0.60	0.20	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
Surrogate: Dichloroacetate	1.10			mg/L	1.0		110	90-115		
<b>LCS (BC41224-BS1)</b>					Prepared & Analyzed: 03/13/14					
Sulfate	9.28	0.60	0.20	mg/L	9.0		103	85-115		
Nitrate (as N)	1.74	0.04	0.01	mg/L	1.7		102	85-115		
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4		106	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>LCS Dup (BC41224-BSD1)</b>					Prepared & Analyzed: 03/13/14					
Sulfate	9.24	0.60	0.20	mg/L	9.0		103	85-115	0.4	200
Nitrite (as N)	1.48	0.04	0.01	mg/L	1.4		106	85-115	0.1	200
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7		102	85-115	0.6	200
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Matrix Spike (BC41224-MS1)</b>					<b>Source: 1402084-04</b>		Prepared & Analyzed: 03/13/14			
Sulfate	84.7	0.60	0.20	mg/L	9.0	75.9	99	85-115		
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7	ND	99	85-115		
Nitrite (as N)	1.44	0.04	0.01	mg/L	1.4	ND	103	85-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		

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March 27, 2014  
Work Order: 1402613

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41233 - VSS Prep</b>										
<b>Blank (BC41233-BLK1)</b>					Prepared: 03/12/14 Analyzed: 03/14/14					
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						
<b>LCS (BC41233-BS1)</b>					Prepared: 03/12/14 Analyzed: 03/14/14					
Total Suspended Solids	48.5	1	1	mg/L	50		97	85-115		
<b>Duplicate (BC41233-DUP1)</b>					<b>Source: 1402492-01</b>		Prepared: 03/12/14 Analyzed: 03/14/14			
Volatile Suspended Solids	10.2	1		mg/L		12.2			18	20
Total Suspended Solids	30.0	1	1	mg/L		30.0			0	30
<b>Batch BC41302 - Ortho phosphorus SM4500P-E by seal</b>										
<b>Blank (BC41302-BLK1)</b>					Prepared & Analyzed: 03/13/14					
Orthophosphate as P	0.012 U	0.040	0.012	mg/L						
<b>LCS (BC41302-BS1)</b>					Prepared & Analyzed: 03/13/14					
Orthophosphate as P	0.833	0.040	0.012	mg/L	0.80		104	90-110		
<b>Matrix Spike (BC41302-MS1)</b>					<b>Source: 1402613-07</b>		Prepared & Analyzed: 03/13/14			
Orthophosphate as P	1.05	0.040	0.012	mg/L	1.0	ND	105	90-110		
<b>Matrix Spike (BC41302-MS2)</b>					<b>Source: 1402626-03</b>		Prepared & Analyzed: 03/13/14			
Orthophosphate as P	1.08	0.040	0.012	mg/L	1.0	0.0368	104	90-110		
<b>Matrix Spike Dup (BC41302-MSD1)</b>					<b>Source: 1402613-07</b>		Prepared & Analyzed: 03/13/14			
Orthophosphate as P	1.05	0.040	0.012	mg/L	1.0	ND	105	90-110	0.5	20

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BC41302 - Ortho phosphorus SM4500P-E by seal										
Matrix Spike Dup (BC41302-MSD2)		Source: 1402626-03			Prepared & Analyzed: 03/13/14					
Orthophosphate as P	1.08	0.040	0.012	mg/L	1.0	0.0368	105	90-110	0.2	20
Batch BC41308 - COD prep										
Blank (BC41308-BLK1)					Prepared: 03/13/14 Analyzed: 03/14/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BC41308-BS1)					Prepared: 03/13/14 Analyzed: 03/14/14					
Chemical Oxygen Demand	50	25	10	mg/L	50		100	90-110		
Matrix Spike (BC41308-MS1)		Source: 1402626-01			Prepared: 03/13/14 Analyzed: 03/14/14					
Chemical Oxygen Demand	83	25	10	mg/L	50	35	96	85-115		
Matrix Spike Dup (BC41308-MSD1)		Source: 1402626-01			Prepared: 03/13/14 Analyzed: 03/14/14					
Chemical Oxygen Demand	81	25	10	mg/L	50	35	92	85-115	2	32
Batch BC41314 - BOD										
Blank (BC41314-BLK1)					Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	2 U	2	2	mg/L						
Blank (BC41314-BLK2)					Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BC41314-BS1)					Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	195	2	2	mg/L	200		98	85-115		

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41314 - BOD</b>										
<b>LCS (BC41314-BS2)</b>					Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	196	2	2	mg/L	200		98	85-115		
<b>LCS Dup (BC41314-BSD1)</b>					Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	195	2	2	mg/L	200		97	85-115	0.3	200
<b>LCS Dup (BC41314-BSD2)</b>					Prepared: 03/13/14 Analyzed: 03/18/14					
Carbonaceous BOD	195	2	2	mg/L	200		97	85-115	0.8	200
<b>Duplicate (BC41314-DUP1)</b>					<b>Source: 1402604-01</b>		Prepared: 03/13/14 Analyzed: 03/18/14			
Carbonaceous BOD	390	2	2	mg/L		400			1	25
<b>Duplicate (BC41314-DUP2)</b>					<b>Source: 1402661-01</b>		Prepared: 03/13/14 Analyzed: 03/18/14			
Carbonaceous BOD	200	2	2	mg/L		210			3	25
<b>Batch BC41343 - TOC prep</b>										
<b>Blank (BC41343-BLK1)</b>					Prepared & Analyzed: 03/14/14					
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
<b>LCS (BC41343-BS1)</b>					Prepared & Analyzed: 03/14/14					
Total Organic Carbon	10.4	1.0	0.060	mg/L	10		104	90-110		
<b>Matrix Spike (BC41343-MS1)</b>					<b>Source: 1402613-03</b>		Prepared & Analyzed: 03/14/14			
Total Organic Carbon	18.3 J5	1.0	0.060	mg/L	10	9.87	85	85-115		
<b>Matrix Spike Dup (BC41343-MSD1)</b>					<b>Source: 1402613-03</b>		Prepared & Analyzed: 03/14/14			
Total Organic Carbon	18.7	1.0	0.060	mg/L	10	9.87	89	85-115	2	10

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41712 - VSS Prep</b>										
<b>Blank (BC41712-BLK1)</b>					Prepared: 03/17/14 Analyzed: 03/18/14					
Volatile Suspended Solids	1 U	1		mg/L						
Total Suspended Solids	1 U	1	1	mg/L						
<b>LCS (BC41712-BS1)</b>					Prepared: 03/17/14 Analyzed: 03/18/14					
Total Suspended Solids	48.0	1	1	mg/L	50		96	85-115		
<b>Duplicate (BC41712-DUP1)</b>					<b>Source: 1402569-02</b>		Prepared: 03/17/14 Analyzed: 03/18/14			
Total Suspended Solids	5,590	1	1	mg/L		5460			2	30
Volatile Suspended Solids	4,770	1		mg/L		4640			3	20
<b>Batch BC41718 - TOC prep</b>										
<b>Blank (BC41718-BLK1)</b>					Prepared & Analyzed: 03/17/14					
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
<b>LCS (BC41718-BS1)</b>					Prepared & Analyzed: 03/17/14					
Total Organic Carbon	10.0	1.0	0.060	mg/L	10		100	90-110		
<b>Matrix Spike (BC41718-MS1)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/17/14			
Total Organic Carbon	10.4	1.0	0.060	mg/L	10	ND	104	85-115		
<b>Matrix Spike Dup (BC41718-MSD1)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/17/14			
Total Organic Carbon	10.5	1.0	0.060	mg/L	10	ND	105	85-115	0.6	10
<b>Batch BC41812 - alkalinity</b>										
<b>Blank (BC41812-BLK1)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41812 - alkalinity</b>										
<b>LCS (BC41812-BS1)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		101	90-110		
<b>LCS (BC41812-BS2)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		98	90-110		
<b>LCS (BC41812-BS3)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		100	90-110		
<b>LCS (BC41812-BS4)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	130	8.0	2.0	mg/L	120		100	90-110		
<b>LCS (BC41812-BS5)</b>					Prepared & Analyzed: 03/18/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		99	90-110		
<b>Matrix Spike (BC41812-MS1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	104	80-120		
<b>Matrix Spike Dup (BC41812-MSD1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	106	80-120	1	26
<b>Batch BC41835 - Sulfide prep</b>										
<b>Blank (BC41835-BLK1)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
<b>Blank (BC41835-BLK2)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	0.10 U	0.40	0.10	mg/L						



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Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41835 - Sulfide prep</b>										
<b>LCS (BC41835-BS1)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0		97	85-115		
<b>LCS (BC41835-BS2)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
<b>Matrix Spike (BC41835-MS1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
<b>Matrix Spike (BC41835-MS2)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
<b>Matrix Spike Dup (BC41835-MSD1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
<b>Matrix Spike Dup (BC41835-MSD2)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
<b>Batch BC41920 - Ammonia by SEAL</b>										
<b>Blank (BC41920-BLK1)</b>					Prepared & Analyzed: 03/20/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
<b>LCS (BC41920-BS1)</b>					Prepared & Analyzed: 03/20/14					
Ammonia as N	0.47	0.040	0.009	mg/L	0.50		94	90-110		
<b>Matrix Spike (BC41920-MS1)</b>					<b>Source: 1402538-15</b>		Prepared & Analyzed: 03/20/14			
Ammonia as N	0.46	0.040	0.009	mg/L	0.50	ND	92	90-110		

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41920 - Ammonia by SEAL</b>										
<b>Matrix Spike (BC41920-MS2)</b>		<b>Source: 1402613-07</b>			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110		
<b>Matrix Spike Dup (BC41920-MSD1)</b>		<b>Source: 1402538-15</b>			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110	4	10
<b>Matrix Spike Dup (BC41920-MSD2)</b>		<b>Source: 1402613-07</b>			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110	0.6	10
<b>Batch BC42428 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC42428-BLK1)</b>		Prepared & Analyzed: 03/25/14								
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	0.967			mg/L	1.0		97	90-115		
<b>LCS (BC42428-BS1)</b>		Prepared & Analyzed: 03/24/14								
Sulfate	8.98	0.60	0.20	mg/L	9.0		100	85-115		
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
<b>LCS Dup (BC42428-BSD1)</b>		Prepared & Analyzed: 03/25/14								
Sulfate	9.00	0.60	0.20	mg/L	9.0		100	85-115	0.3	200
Surrogate: Dichloroacetate	1.02			mg/L	1.0		102	90-115		
<b>Matrix Spike (BC42428-MS1)</b>		<b>Source: 1402613-03</b>			Prepared & Analyzed: 03/24/14					
Nitrate (as N)	51.1	0.40	0.10	mg/L	17	33.9	101	85-115		
Nitrite (as N)	14.7	0.40	0.10	mg/L	14	0.589	101	85-115		
Sulfate	239	6.0	2.0	mg/L	90	148	101	85-115		
Surrogate: Dichloroacetate	0.963			mg/L	1.0		96	90-115		
Surrogate: Dichloroacetate	0.963			mg/L	1.0		96	90-115		
Surrogate: Dichloroacetate	0.963			mg/L	1.0		96	90-115		

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

March 27, 2014  
Work Order: 1402613

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC42428 - Ion Chromatography 300.0 Prep</b>										
<b>Matrix Spike (BC42428-MS2)</b>		<b>Source: 1402893-02</b>			Prepared & Analyzed: 03/25/14					
Sulfate	128	6.0	2.0	mg/L	90	41.5	97	85-115		
Surrogate: Dichloroacetate	1.00			mg/L	1.0		100	90-115		
<b>Batch BC42512 - alkalinity</b>										
<b>Blank (BC42512-BLK1)</b>					Prepared & Analyzed: 03/25/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
<b>LCS (BC42512-BS1)</b>					Prepared & Analyzed: 03/25/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		97	90-110		
<b>Matrix Spike (BC42512-MS1)</b>		<b>Source: 1402721-07</b>			Prepared & Analyzed: 03/25/14					
Total Alkalinity	120	8.0	2.0	mg/L	120	ND	98	80-120		
<b>Matrix Spike Dup (BC42512-MSD1)</b>		<b>Source: 1402721-07</b>			Prepared & Analyzed: 03/25/14					
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	101	80-120	3	26

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March 27, 2014  
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## Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41226 - FC-MF</b>										
<b>Blank (BC41226-BLK1)</b>					Prepared: 03/12/14 Analyzed: 03/13/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
<b>Duplicate (BC41226-DUP1)</b>					Source: 1402595-02 Prepared: 03/12/14 Analyzed: 03/13/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
<b>Batch BC41227 - TC-MF</b>										
<b>Blank (BC41227-BLK1)</b>					Prepared: 03/12/14 Analyzed: 03/13/14					
Total Coliform	1 U	1	1	CFU/100 ml						
<b>Duplicate (BC41227-DUP1)</b>					Source: 1402613-07 Prepared: 03/12/14 Analyzed: 03/13/14					
Total Coliform	1 U	1	1	CFU/100 ml		ND				200

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**March 27, 2014**  
**Work Order: 1402613**

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**\* Qualifiers, Notes and Definitions**

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

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

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

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

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

Questions regarding this report should be directed to :

Kathryn Nordmark

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

Kathryn@southernanalyticalabs.com



## SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. 1402613

Client Name Hazan and Sawyer										Contact / Phone: Josefin Hirst 813-630-4498									
Project Name / Location BHS2 SE#10																			
Samplers: (Signature) <i>[Signature]</i>										PARAMETER / CONTAINER DESCRIPTION									
Matrix Codes: DW-Drinking Water WW-Wastewater SW-Surface Water SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water																			
SAL Use Only	Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT	1LP, Cool Total Alkalinity, TSS, VSS, CBOD, NOx, OP, SO <sub>4</sub>	125mLP, H <sub>2</sub> SO <sub>4</sub> COD, TKN, NH <sub>3</sub> , TP	500mLP, NaOH, Zn Acetate H <sub>2</sub> S	40mLaV, HCl TOC	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT, TC-MF (Non-potable)			DO	pH	Temperature	Conductivity
	01	BHS2-STE	3/12/14	0930	WW		X	4	1	1	1	2				0.01	7.20	21.9	1911
	02	BHS2-RECIRC	1	0815	WW		X	4	1	1	1	2				0.04	7.25	21.6	1418
	03	BHS2-ST1		0855	WW		X	4	1	1	1	2				9.85	7.09	21.8	1215
	04	BHS2-LIGNO-0		0835	WW		X		1	1	1	2	6			1.19	7.08	21.4	1116
	05	BHS2-ST2		0815	WW		X		1	1	1	2	6			0.06	6.96	20.5	1208
	06	BHS2-ST2-DUP		0820	WW		X		1	1	1	2	6			1	1	1	1
	07	BHS2-EB		0800	R		X		1	1	1	2	6			7.10	6.55	19.0	1.70
Containers Prepared/ Relinquished:		Date/Time: 1000 02/30/14		Received: <i>[Signature]</i>		Date/Time: 1000 1/30/14		Seal intact? <input checked="" type="checkbox"/> N N/A		Instructions / Remarks     									
Relinquished:		Date/Time: 1130 3/12/14		Received: <i>[Signature]</i>		Date/Time: 1130 3-12-14		Samples intact upon arrival? <input checked="" type="checkbox"/> N N/A											
Relinquished:		Date/Time:		Received:		Date/Time:		Received on ice? Temp _____ <input checked="" type="checkbox"/> N N/A											
Relinquished:		Date/Time:		Received:		Date/Time:		Proper preservatives indicated? <input checked="" type="checkbox"/> N N/A											
Relinquished:		Date/Time:		Received:		Date/Time:		Rec'd w/in holding time? <input checked="" type="checkbox"/> N N/A											
Relinquished:		Date/Time:		Received:		Date/Time:		Volatiles rec'd w/out headspace? <input checked="" type="checkbox"/> Y N/A											
Relinquished:		Date/Time:		Received:		Date/Time:		Proper containers used? <input checked="" type="checkbox"/> N N/A											

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

**March 31, 2014**  
**Work Order: 1402686**

## Laboratory Report

Project Name		B-HS2 SE#11						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-STE						
Matrix		Wastewater						
SAL Sample Number		1402686-01						
Date/Time Collected		03/13/14 10:55						
Collected by		Sean Schmidt						
Date/Time Received		03/13/14 14:36						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	24	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	38	EPA 350.1	2.0	0.47		03/20/14 14:35	50
Carbonaceous BOD	mg/L	220	SM 5210B	2	2	03/14/14 11:30	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	420	EPA 410.4	25	10	03/17/14 12:30	03/17/14 16:00	1
Nitrate (as N)	mg/L	0.04	EPA 300.0	0.04	0.01		03/14/14 04:37	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 04:37	1
Orthophosphate as P	mg/L	3.4	SM 4500P-E	0.20	0.060		03/15/14 08:45	5
Phosphorous - Total as P	mg/L	6.6	SM 4500P-E	0.80	0.20	03/13/14 16:01	03/18/14 15:31	20
Sulfate	mg/L	20	EPA 300.0	0.60	0.20		03/14/14 04:37	1
Sulfide	mg/L	55	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	550	SM 2320B	8.0	2.0		03/25/14 13:39	1
Total Kjeldahl Nitrogen	mg/L	63	EPA 351.2	4.0	1.0	03/13/14 16:01	03/18/14 15:31	20
Total Organic Carbon	mg/L	110	SM 5310B	10	0.60		03/17/14 14:05	10
Total Suspended Solids	mg/L	10	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	8	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.04 I	EPA 300.0	0.08	0.02		03/14/14 04:37	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	24,000	SM 9223B	2.0	2.0	03/13/14 15:15	03/14/14 10:12	1
Fecal Coliforms	CFU/100 ml	36,000	SM 9222D	1	1	03/13/14 15:13	03/14/14 14:07	1
Sample Description		BHS2-RECIRC						
Matrix		Wastewater						
SAL Sample Number		1402686-02						
Date/Time Collected		03/13/14 10:40						
Collected by		Sean Schmidt						
Date/Time Received		03/13/14 14:36						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	15	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	41	EPA 350.1	2.0	0.47		03/20/14 17:34	50
Carbonaceous BOD	mg/L	160	SM 5210B	2	2	03/14/14 11:30	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	250	EPA 410.4	25	10	03/17/14 12:30	03/17/14 16:00	1
Nitrate (as N)	mg/L	0.05	EPA 300.0	0.04	0.01		03/14/14 04:48	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 04:48	1
Orthophosphate as P	mg/L	3.7	SM 4500P-E	0.20	0.060		03/15/14 08:46	5
Phosphorous - Total as P	mg/L	6.0	SM 4500P-E	0.80	0.20	03/13/14 16:01	03/18/14 15:32	20
Sulfate	mg/L	7.9	EPA 300.0	0.60	0.20		03/14/14 04:48	1

**Hazen and Sawyer**  
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**Tampa, FL 33619**

**March 31, 2014**  
**Work Order: 1402686**

## Laboratory Report

Project Name		B-HS2 SE#11						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-RECIRC						
Matrix		Wastewater						
SAL Sample Number		1402686-02						
Date/Time Collected		03/13/14 10:40						
Collected by		Sean Schmidt						
Date/Time Received		03/13/14 14:36						
Sulfide	mg/L	39	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	600	SM 2320B	8.0	2.0		03/25/14 13:57	1
Total Kjeldahl Nitrogen	mg/L	62	EPA 351.2	4.0	1.0	03/13/14 16:01	03/18/14 15:32	20
Total Organic Carbon	mg/L	81	SM 5310B	10	0.60		03/17/14 14:05	10
Total Suspended Solids	mg/L	4	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	4	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.05 I	EPA 300.0	0.08	0.02		03/14/14 04:48	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	20,000	SM 9223B	2.0	2.0	03/13/14 15:15	03/14/14 10:12	1
Fecal Coliforms	CFU/100 ml	59,000	SM 9222D	1	1	03/13/14 15:13	03/14/14 14:07	1
Sample Description		BHS2-ST1						
Matrix		Wastewater						
SAL Sample Number		1402686-03						
Date/Time Collected		03/13/14 10:30						
Collected by		Sean Schmidt						
Date/Time Received		03/13/14 14:36						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.09	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	2.4	EPA 350.1	0.20	0.047		03/20/14 16:09	5
Carbonaceous BOD	mg/L	8	SM 5210B	2	2	03/14/14 11:30	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	22 I	EPA 410.4	25	10	03/17/14 12:30	03/17/14 16:00	1
Nitrate (as N)	mg/L	34	EPA 300.0	0.40	0.10		03/15/14 02:10	10
Nitrite (as N)	mg/L	0.48	EPA 300.0	0.04	0.01		03/14/14 05:00	1
Orthophosphate as P	mg/L	5.8	SM 4500P-E	0.20	0.060		03/15/14 09:05	5
Phosphorous - Total as P	mg/L	7.6	SM 4500P-E	0.40	0.10	03/13/14 16:01	03/18/14 15:33	10
Sulfate	mg/L	150	EPA 300.0	6.0	2.0		03/15/14 02:10	10
Sulfide	mg/L	0.20 I	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	250	SM 2320B	8.0	2.0		03/25/14 14:04	1
Total Kjeldahl Nitrogen	mg/L	10	EPA 351.2	2.0	0.50	03/13/14 16:01	03/18/14 15:33	10
Total Organic Carbon	mg/L	16	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	4	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	3	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	34	EPA 300.0	0.44	0.11		03/15/14 02:10	10
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	24,000	SM 9223B	2.0	2.0	03/13/14 15:15	03/14/14 10:12	1
Fecal Coliforms	CFU/100 ml	26,000	SM 9222D	1	1	03/13/14 15:13	03/14/14 14:07	1



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**Tampa, FL 33619**

**March 31, 2014**  
**Work Order: 1402686**

## Laboratory Report

Project Name		B-HS2 SE#11						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1402686-04						
Date/Time Collected		03/13/14 10:15						
Collected by		Sean Schmidt						
Date/Time Received		03/13/14 14:36						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	0.84	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.29	EPA 350.1	0.040	0.009		03/20/14 14:42	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/14/14 11:30	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	22 I	EPA 410.4	25	10	03/17/14 12:30	03/17/14 16:00	1
Nitrate (as N)	mg/L	3.2	EPA 300.0	0.04	0.01		03/14/14 05:11	1
Nitrite (as N)	mg/L	0.28	EPA 300.0	0.04	0.01		03/14/14 05:11	1
Orthophosphate as P	mg/L	4.9	SM 4500P-E	0.20	0.060		03/15/14 09:06	5
Phosphorous - Total as P	mg/L	7.1	SM 4500P-E	0.40	0.10	03/13/14 16:01	03/18/14 15:34	10
Sulfate	mg/L	150	EPA 300.0	6.0	2.0		03/25/14 15:50	10
Sulfide	mg/L	1.6	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		03/25/14 14:19	1
Total Kjeldahl Nitrogen	mg/L	3.1	EPA 351.2	2.0	0.50	03/13/14 16:01	03/18/14 15:34	10
Total Organic Carbon	mg/L	14	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	18	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	18	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	3.5	EPA 300.0	0.08	0.02		03/14/14 05:11	1
<u>Microbiology</u>								
Total Coliform	CFU/100 ml	8	SM 9222B	1	1	03/13/14 15:14	03/14/14 14:04	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/13/14 15:15	03/14/14 10:12	1
Fecal Coliforms	CFU/100 ml	2	SM 9222D	1	1	03/13/14 15:13	03/14/14 14:07	1
Sample Description		BHS2-ST2						
Matrix		Wastewater						
SAL Sample Number		1402686-05						
Date/Time Collected		03/13/14 09:55						
Collected by		Sean Schmidt						
Date/Time Received		03/13/14 14:36						
<u>Inorganics</u>								
Hydrogen Sulfide (Unionized)	mg/L	12	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.29	EPA 350.1	0.040	0.009		03/20/14 17:01	1
Carbonaceous BOD	mg/L	38	SM 5210B	2	2	03/14/14 11:30	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	97	EPA 410.4	25	10	03/17/14 12:30	03/17/14 16:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 05:22	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 05:22	1
Orthophosphate as P	mg/L	5.1	SM 4500P-E	0.20	0.060		03/15/14 09:07	5
Phosphorous - Total as P	mg/L	6.2	SM 4500P-E	0.40	0.10	03/13/14 16:01	03/18/14 15:35	10

**Hazen and Sawyer**  
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**March 31, 2014**  
**Work Order: 1402686**

## Laboratory Report

Project Name		B-HS2 SE#11						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		<b>BHS2-ST2</b>						
Matrix		<b>Wastewater</b>						
SAL Sample Number		<b>1402686-05</b>						
Date/Time Collected		<b>03/13/14 09:55</b>						
Collected by		<b>Sean Schmidt</b>						
Date/Time Received		<b>03/13/14 14:36</b>						
Sulfate	mg/L	200	EPA 300.0	6.0	2.0		03/26/14 00:07	10
Sulfide	mg/L	24	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	340	SM 2320B	8.0	2.0		03/25/14 14:28	1
Total Kjeldahl Nitrogen	mg/L	1.8 I	EPA 351.2	2.0	0.50	03/13/14 16:01	03/18/14 15:35	10
Total Organic Carbon	mg/L	16	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	6	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	5	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/14/14 05:22	1
<b>Microbiology</b>								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/13/14 15:14	03/14/14 14:04	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/13/14 15:15	03/14/14 10:12	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/13/14 15:13	03/14/14 14:07	1
Sample Description		<b>BHS2-ST2-DUP</b>						
Matrix		<b>Wastewater</b>						
SAL Sample Number		<b>1402686-06</b>						
Date/Time Collected		<b>03/13/14 10:00</b>						
Collected by		<b>Sean Schmidt</b>						
Date/Time Received		<b>03/13/14 14:36</b>						
<b>Inorganics</b>								
Hydrogen Sulfide (Unionized)	mg/L	14	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.30	EPA 350.1	0.040	0.009		03/20/14 17:03	1
Carbonaceous BOD	mg/L	39	SM 5210B	2	2	03/14/14 11:30	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	99	EPA 410.4	25	10	03/17/14 12:30	03/17/14 16:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 05:34	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 05:34	1
Orthophosphate as P	mg/L	5.2	SM 4500P-E	0.20	0.060		03/15/14 09:08	5
Phosphorous - Total as P	mg/L	6.5	SM 4500P-E	0.40	0.10	03/13/14 16:01	03/18/14 15:36	10
Sulfate	mg/L	200	EPA 300.0	6.0	2.0		03/25/14 16:09	10
Sulfide	mg/L	27	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	340	SM 2320B	8.0	2.0		03/25/14 14:37	1
Total Kjeldahl Nitrogen	mg/L	1.8 I	EPA 351.2	2.0	0.50	03/13/14 16:01	03/18/14 15:36	10
Total Organic Carbon	mg/L	16	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	6	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	4	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/14/14 05:34	1
<b>Microbiology</b>								

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**Tampa, FL 33619**

**March 31, 2014**  
**Work Order: 1402686**

## Laboratory Report

Project Name		B-HS2 SE#11						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1402686-06						
Date/Time Collected		03/13/14 10:00						
Collected by		Sean Schmidt						
Date/Time Received		03/13/14 14:36						
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/13/14 15:14	03/14/14 14:04	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/13/14 15:15	03/14/14 10:12	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/13/14 15:13	03/14/14 14:07	1
Sample Description		BHS2-EB						
Matrix		Reagent Water						
SAL Sample Number		1402686-07						
Date/Time Collected		03/13/14 09:25						
Collected by		Sean Schmidt						
Date/Time Received		03/13/14 14:36						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		03/20/14 14:56	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/14/14 11:30	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	03/17/14 12:30	03/17/14 16:00	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 05:45	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 05:45	1
Orthophosphate as P	mg/L	0.012 U	SM 4500P-E	0.040	0.012		03/15/14 08:50	1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	03/13/14 16:01	03/18/14 15:37	1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		03/14/14 05:45	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		03/25/14 14:40	1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	03/13/14 16:01	03/18/14 15:37	1
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/14/14 05:45	1
<b><u>Microbiology</u></b>								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/13/14 15:14	03/14/14 14:04	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/13/14 15:15	03/14/14 10:12	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/13/14 15:13	03/14/14 14:07	1

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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Hazen and Sawyer

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Tampa, FL 33619

March 31, 2014

Work Order: 1402686

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41322 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41322-BLK1)</b>					Prepared & Analyzed: 03/14/14					
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
<b>LCS (BC41322-BS1)</b>					Prepared & Analyzed: 03/14/14					
Nitrite (as N)	1.49	0.04	0.01	mg/L	1.4		106	85-115		
Sulfate	9.29	0.60	0.20	mg/L	9.0		103	85-115		
Nitrate (as N)	1.74	0.04	0.01	mg/L	1.7		103	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>LCS Dup (BC41322-BSD1)</b>					Prepared & Analyzed: 03/14/14					
Sulfate	9.28	0.60	0.20	mg/L	9.0		103	85-115	0.2	200
Nitrate (as N)	1.74	0.04	0.01	mg/L	1.7		102	85-115	0.2	200
Nitrite (as N)	1.49	0.04	0.01	mg/L	1.4		106	85-115	0	200
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Matrix Spike (BC41322-MS1)</b>					<b>Source: 1402467-02</b>		Prepared & Analyzed: 03/14/14			
Sulfate	15.5	0.60	0.20	mg/L	9.0	7.01	94	85-115		
Nitrate (as N)	1.85	0.04	0.01	mg/L	1.7	0.112	102	85-115		
Nitrite (as N)	1.44	0.04	0.01	mg/L	1.4	ND	103	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		

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March 31, 2014  
Work Order: 1402686

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41322 - Ion Chromatography 300.0 Prep</b>										
<b>Matrix Spike (BC41322-MS2)</b>		<b>Source: 1402470-01</b>			Prepared & Analyzed: 03/14/14					
Nitrate (as N)	1,700	40	10	mg/L	1700	33.0	98	85-115		
Sulfate	10,700	600	200	mg/L	9000	1250	105	85-115		
Nitrite (as N)	1,510	40	10	mg/L	1400	ND	108	85-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
<b>Batch BC41347 - Digestion for TP and TKN</b>										
<b>Blank (BC41347-BLK1)</b>		Prepared: 03/13/14 Analyzed: 03/18/14								
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
<b>LCS (BC41347-BS1)</b>		Prepared: 03/13/14 Analyzed: 03/18/14								
Phosphorous - Total as P	0.521	0.040	0.010	mg/L	0.50		104	90-110		
Total Kjeldahl Nitrogen	0.971	0.20	0.05	mg/L	1.0		97	90-110		
<b>Matrix Spike (BC41347-MS1)</b>		<b>Source: 1402686-07</b>			Prepared: 03/13/14 Analyzed: 03/18/14					
Phosphorous - Total as P	0.495	0.040	0.010	mg/L	0.50	ND	99	90-110		
Total Kjeldahl Nitrogen	1.01	0.20	0.05	mg/L	1.0	ND	101	90-110		
<b>Matrix Spike (BC41347-MS2)</b>		<b>Source: 1402721-07</b>			Prepared: 03/13/14 Analyzed: 03/18/14					
Phosphorous - Total as P	0.508	0.040	0.010	mg/L	0.50	ND	102	90-110		
Total Kjeldahl Nitrogen	1.05	0.20	0.05	mg/L	1.0	ND	105	90-110		
<b>Matrix Spike Dup (BC41347-MSD1)</b>		<b>Source: 1402686-07</b>			Prepared: 03/13/14 Analyzed: 03/18/14					
Phosphorous - Total as P	0.501	0.040	0.010	mg/L	0.50	ND	100	90-110	1	25
Total Kjeldahl Nitrogen	1.03	0.20	0.05	mg/L	1.0	ND	103	90-110	2	20

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March 31, 2014  
Work Order: 1402686

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41347 - Digestion for TP and TKN</b>										
<b>Matrix Spike Dup (BC41347-MSD2)</b>		<b>Source: 1402721-07</b>			Prepared: 03/13/14 Analyzed: 03/18/14					
Total Kjeldahl Nitrogen	1.11	0.20	0.05	mg/L	1.0	ND	111	90-110	6	20
Phosphorous - Total as P	0.525	0.040	0.010	mg/L	0.50	ND	105	90-110	3	25
<b>Batch BC41402 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41402-BLK1)</b>		Prepared & Analyzed: 03/14/14								
Sulfate	0.20 U	0.60	0.20	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
<b>LCS (BC41402-BS1)</b>		Prepared & Analyzed: 03/14/14								
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115		
Sulfate	9.14	0.60	0.20	mg/L	9.0		102	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS Dup (BC41402-BSD1)</b>		Prepared & Analyzed: 03/14/14								
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115	0.06	200
Sulfate	9.05	0.60	0.20	mg/L	9.0		101	85-115	1	200
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Matrix Spike (BC41402-MS1)</b>		<b>Source: 1402575-10</b>			Prepared & Analyzed: 03/15/14					
Nitrate (as N)	175	4.0	1.0	mg/L	170	ND	103	85-115		
Sulfate	934	60	20	mg/L	900	ND	104	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		

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March 31, 2014  
Work Order: 1402686

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41402 - Ion Chromatography 300.0 Prep</b>										
<b>Matrix Spike (BC41402-MS2)</b>		<b>Source: 1402575-12</b>			Prepared & Analyzed: 03/15/14					
Sulfate	945	60	20	mg/L	900	ND	105	85-115		
Nitrate (as N)	179	4.0	1.0	mg/L	170	ND	105	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Batch BC41417 - BOD</b>										
<b>Blank (BC41417-BLK1)</b>		Prepared: 03/14/14 Analyzed: 03/19/14								
Carbonaceous BOD	2 U	2	2	mg/L						
<b>Blank (BC41417-BLK2)</b>		Prepared: 03/14/14 Analyzed: 03/19/14								
Carbonaceous BOD	2 U	2	2	mg/L						
<b>LCS (BC41417-BS1)</b>		Prepared: 03/14/14 Analyzed: 03/19/14								
Carbonaceous BOD	196	2	2	mg/L	200		98	85-115		
<b>LCS (BC41417-BS2)</b>		Prepared: 03/14/14 Analyzed: 03/19/14								
Carbonaceous BOD	184	2	2	mg/L	200		92	85-115		
<b>LCS Dup (BC41417-BSD1)</b>		Prepared: 03/14/14 Analyzed: 03/19/14								
Carbonaceous BOD	194	2	2	mg/L	200		97	85-115	1	200
<b>LCS Dup (BC41417-BSD2)</b>		Prepared: 03/14/14 Analyzed: 03/19/14								
Carbonaceous BOD	185	2	2	mg/L	200		93	85-115	0.8	200
<b>Duplicate (BC41417-DUP1)</b>		<b>Source: 1402709-01</b>			Prepared: 03/14/14 Analyzed: 03/19/14					
Carbonaceous BOD	210	2	2	mg/L		210			0.5	25

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41417 - BOD</b>										
<b>Duplicate (BC41417-DUP2)</b>		<b>Source: 1402714-01</b>			Prepared: 03/14/14 Analyzed: 03/19/14					
Carbonaceous BOD	160	2	2	mg/L		170			0.6	25
<b>Batch BC41433 - Ortho phosphorus SM4500P-E by seal</b>										
<b>Blank (BC41433-BLK1)</b>		Prepared & Analyzed: 03/15/14								
Orthophosphate as P	0.012 U	0.040	0.012	mg/L						
<b>LCS (BC41433-BS1)</b>		Prepared & Analyzed: 03/15/14								
Orthophosphate as P	0.759	0.040	0.012	mg/L	0.80		95	90-110		
<b>Matrix Spike (BC41433-MS1)</b>		<b>Source: 1402686-07</b>			Prepared & Analyzed: 03/15/14					
Orthophosphate as P	0.952	0.040	0.012	mg/L	1.0	ND	95	90-110		
<b>Matrix Spike Dup (BC41433-MSD1)</b>		<b>Source: 1402686-07</b>			Prepared & Analyzed: 03/15/14					
Orthophosphate as P	0.951	0.040	0.012	mg/L	1.0	ND	95	90-110	0.1	20
<b>Batch BC41705 - COD prep</b>										
<b>Blank (BC41705-BLK1)</b>		Prepared & Analyzed: 03/17/14								
Chemical Oxygen Demand	10 U	25	10	mg/L						
<b>LCS (BC41705-BS1)</b>		Prepared & Analyzed: 03/17/14								
Chemical Oxygen Demand	47	25	10	mg/L	50		94	90-110		
<b>Matrix Spike (BC41705-MS1)</b>		<b>Source: 1402686-07</b>			Prepared & Analyzed: 03/17/14					
Chemical Oxygen Demand	49	25	10	mg/L	50	ND	98	85-115		



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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BC41705 - COD prep										
Matrix Spike Dup (BC41705-MSD1)		Source: 1402686-07			Prepared & Analyzed: 03/17/14					
Chemical Oxygen Demand	47	25	10	mg/L	50	ND	94	85-115	4	32
Batch BC41712 - VSS Prep										
Blank (BC41712-BLK1)					Prepared: 03/17/14 Analyzed: 03/18/14					
Total Suspended Solids	1 U	1	1	mg/L						
Volatile Suspended Solids	1 U	1		mg/L						
LCS (BC41712-BS1)					Prepared: 03/17/14 Analyzed: 03/18/14					
Total Suspended Solids	48.0	1	1	mg/L	50		96	85-115		
Duplicate (BC41712-DUP1)		Source: 1402569-02			Prepared: 03/17/14 Analyzed: 03/18/14					
Volatile Suspended Solids	4,770	1		mg/L		4640			3	20
Total Suspended Solids	5,590	1	1	mg/L		5460			2	30
Batch BC41718 - TOC prep										
Blank (BC41718-BLK1)					Prepared & Analyzed: 03/17/14					
Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
LCS (BC41718-BS1)					Prepared & Analyzed: 03/17/14					
Total Organic Carbon	10.0	1.0	0.060	mg/L	10		100	90-110		
Matrix Spike (BC41718-MS1)		Source: 1402721-07			Prepared & Analyzed: 03/17/14					
Total Organic Carbon	10.4	1.0	0.060	mg/L	10	ND	104	85-115		

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BC41718 - TOC prep										
Matrix Spike Dup (BC41718-MSD1)		Source: 1402721-07			Prepared & Analyzed: 03/17/14					
Total Organic Carbon	10.5	1.0	0.060	mg/L	10	ND	105	85-115	0.6	10
Batch BC41835 - Sulfide prep										
Blank (BC41835-BLK1)					Prepared & Analyzed: 03/18/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
Blank (BC41835-BLK2)					Prepared & Analyzed: 03/18/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
LCS (BC41835-BS1)					Prepared & Analyzed: 03/18/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0		97	85-115		
LCS (BC41835-BS2)					Prepared & Analyzed: 03/18/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
Matrix Spike (BC41835-MS1)		Source: 1402550-07			Prepared & Analyzed: 03/18/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike (BC41835-MS2)		Source: 1402721-07			Prepared & Analyzed: 03/18/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
Matrix Spike Dup (BC41835-MSD1)		Source: 1402550-07			Prepared & Analyzed: 03/18/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
Matrix Spike Dup (BC41835-MSD2)		Source: 1402721-07			Prepared & Analyzed: 03/18/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41921 - Ammonia by SEAL</b>										
<b>Blank (BC41921-BLK1)</b>					Prepared & Analyzed: 03/20/14					
Ammonia as N	0.009 U	0.040	0.009	mg/L						
<b>LCS (BC41921-BS1)</b>					Prepared & Analyzed: 03/20/14					
Ammonia as N	0.46	0.040	0.009	mg/L	0.50		92	90-110		
<b>Matrix Spike (BC41921-MS1)</b>					Source: 1402686-07 Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110		
<b>Matrix Spike (BC41921-MS2)</b>					Source: 1402721-07 Prepared & Analyzed: 03/20/14					
Ammonia as N	0.49	0.040	0.009	mg/L	0.50	ND	98	90-110		
<b>Matrix Spike Dup (BC41921-MSD1)</b>					Source: 1402686-07 Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	95	90-110	0.6	10
<b>Matrix Spike Dup (BC41921-MSD2)</b>					Source: 1402721-07 Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	97	90-110	2	10
<b>Batch BC42503 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC42503-BLK1)</b>					Prepared & Analyzed: 03/25/14					
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	90-115		
<b>LCS (BC42503-BS1)</b>					Prepared & Analyzed: 03/25/14					
Sulfate	8.80	0.60	0.20	mg/L	9.0		98	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

March 31, 2014  
Work Order: 1402686

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC42503 - Ion Chromatography 300.0 Prep</b>										
<b>LCS Dup (BC42503-BSD1)</b>					Prepared & Analyzed: 03/25/14					
Sulfate	8.78	0.60	0.20	mg/L	9.0		98	85-115	0.3	200
Surrogate: Dichloroacetate	1.06			mg/L	1.0		106	90-115		
<b>Matrix Spike (BC42503-MS1)</b>					<b>Source: 1402721-04</b>		Prepared & Analyzed: 03/25/14			
Sulfate	238	6.0	2.0	mg/L	90	154	94	85-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
<b>Matrix Spike (BC42503-MS2)</b>					<b>Source: 1403001-08</b>		Prepared & Analyzed: 03/25/14			
Sulfate	29.0	0.60	0.20	mg/L	9.0	20.1	99	85-115		
Surrogate: Dichloroacetate	0.978			mg/L	1.0		98	90-115		
<b>Batch BC42512 - alkalinity</b>										
<b>Blank (BC42512-BLK1)</b>					Prepared & Analyzed: 03/25/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
<b>LCS (BC42512-BS1)</b>					Prepared & Analyzed: 03/25/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		97	90-110		
<b>Matrix Spike (BC42512-MS1)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/25/14			
Total Alkalinity	120	8.0	2.0	mg/L	120	ND	98	80-120		
<b>Matrix Spike Dup (BC42512-MSD1)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/25/14			
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	101	80-120	3	26

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Tampa, FL 33619

March 31, 2014  
Work Order: 1402686

## Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41336 - FC-MF</b>										
<b>Blank (BC41336-BLK1)</b>					Prepared: 03/13/14 Analyzed: 03/14/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
<b>Duplicate (BC41336-DUP1)</b>					<b>Source: 1402687-02</b> Prepared: 03/13/14 Analyzed: 03/14/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
<b>Duplicate (BC41336-DUP2)</b>					<b>Source: 1402688-01</b> Prepared: 03/13/14 Analyzed: 03/14/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200
<b>Batch BC41337 - TC-MF</b>										
<b>Blank (BC41337-BLK1)</b>					Prepared: 03/13/14 Analyzed: 03/14/14					
Total Coliform	1 U	1	1	CFU/100 ml						
<b>Duplicate (BC41337-DUP1)</b>					<b>Source: 1402686-07</b> Prepared: 03/13/14 Analyzed: 03/14/14					
Total Coliform	1 U	1	1	CFU/100 ml		ND				200

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**\* Qualifiers, Notes and Definitions**

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

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

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

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

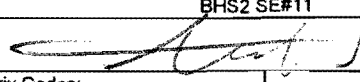
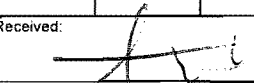
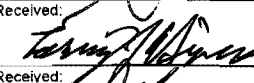

Questions regarding this report should be directed to :

Kathryn Nordmark

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

Kathryn@southernanalyticalabs.com



Client Name <b>Hazan and Sawyer</b>										Contact / Phone: <b>Josefin Hirst 813-630-4498</b>									
Project Name / Location <b>BHS2 SE#11</b>																			
Samplers: (Signature) 																			
<p>Matrix Codes:            DW-Drinking Water WW-Wastewater            SW-SurfaceWater SL-Sludge SO-Soil            GW-Groundwater SA-Saline Water O-Other            R-Reagent Water</p>										PARAMETER / CONTAINER DESCRIPTION									
SAL Use Only	Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT	TLP, Cool Total Alkalinity, TSS, VSS, CBOD, NOx, OP, SO <sub>4</sub>	125mLP, H <sub>2</sub> SO <sub>4</sub> COD, TKN, NH <sub>3</sub> , TP	500mLP, NaOH, Zn Acetate H <sub>2</sub> S	40mLaV, HCl TOC	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT, TC-MF (Non-potable)			DO	pH	Temperature	Conductivity
	01	BHS2-STE	3/13/14	1055	WW		X	4	1	1	1	2				0.03	7.17	20.7	1428
	02	BHS2-RECIRC		1040	WW		X	4	1	1	1	2				0.05	7.22	20.5	1415
	03	BHS2-ST1		1030	WW		X	4	1	1	1	2				2.25	7.10	20.4	1202
	04	BHS2-LIGNO-0		1015	WW		X		1	1	1	2	6			0.88	7.01	22.0	1120
	05	BHS2-ST2		0955	WW		X		1	1	1	2	6			0.09	7.05	20.2	1210
	06	BHS2-ST2-DUP		1000	WW		X		1	1	1	2	6			1	1	1	1
	07	BHS2-EB		0925	R		X		1	1	1	2	6			9.21	7.04	15.2	1.81
Containers Prepared/Relinquished:		Date/Time: 1045 3/13/14		Received: 		Date/Time: 1045 1/30/14		Seal intact? <input checked="" type="radio"/> N <input type="radio"/> NA		Samples intact upon arrival? <input checked="" type="radio"/> N <input type="radio"/> NA  Received on ice? Temp _____ <input checked="" type="radio"/> N <input type="radio"/> NA  Proper preservatives indicated? <input checked="" type="radio"/> N <input type="radio"/> NA Rec'd within holding time? <input checked="" type="radio"/> N <input type="radio"/> NA  Volatiles rec'd w/out headspace? <input type="radio"/> Y <input checked="" type="radio"/> N <input type="radio"/> NA Proper containers used? <input checked="" type="radio"/> N <input type="radio"/> NA		Instructions / Remarks							
Relinquished:		Date/Time: 3/13/14		Received: 		Date/Time: 12:29 3/13/14													
Relinquished:		Date/Time: 2:36 3/13/14		Received: 		Date/Time: 1436 3-13-14													
Relinquished:		Date/Time:		Received:		Date/Time:													
Relinquished:		Date/Time:		Received:		Date/Time:													

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

**March 28, 2014**  
**Work Order: 1402721**

## Laboratory Report

Project Name		B-HS2 SE#12						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-STE						
Matrix		Wastewater						
SAL Sample Number		1402721-01						
Date/Time Collected		03/14/14 10:40						
Collected by		Sean Schmidt						
Date/Time Received		03/14/14 12:03						
<b><u>Client Provided Field Data</u></b>								
pH		7.15						
Temperature		21.2 °C						
Conductivity		1430 umhos						
Dissolved Oxygen		0.02 mg/L						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	23	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	39	EPA 350.1	2.0	0.47		03/20/14 17:39	50
Carbonaceous BOD	mg/L	250	SM 5210B	2	2	03/14/14 14:15	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	360	EPA 410.4	25	10	03/20/14 11:30	03/20/14 15:49	1
Nitrate (as N)	mg/L	0.03 I	EPA 300.0	0.04	0.01		03/15/14 02:21	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/15/14 02:21	1
Orthophosphate as P	mg/L	3.4	EPA 300.0	0.040	0.010		03/15/14 02:21	1
Phosphorous - Total as P	mg/L	6.5	SM 4500P-E	0.80	0.20	03/15/14 23:01	03/18/14 15:44	20
Sulfate	mg/L	14	EPA 300.0	0.60	0.20		03/15/14 02:21	1
Sulfide	mg/L	53	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	580	SM 2320B	8.0	2.0		03/25/14 15:01	1
Total Kjeldahl Nitrogen	mg/L	64	EPA 351.2	4.0	1.0	03/15/14 23:01	03/18/14 15:44	20
Total Organic Carbon	mg/L	100	SM 5310B	10	0.60		03/17/14 14:05	10
Total Suspended Solids	mg/L	16	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	13	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.03 I	EPA 300.0	0.08	0.02		03/15/14 02:21	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	24,000 Z	SM 9223B	2.0	2.0	03/14/14 12:57	03/15/14 11:30	1
Fecal Coliforms	CFU/100 ml	180,000	SM 9222D	1	1	03/14/14 12:56	03/15/14 11:50	1

Sample Description **BHS2-RECIRC**  
 Matrix **Wastewater**  
 SAL Sample Number **1402721-02**  
 Date/Time Collected **03/14/14 10:25**  
 Collected by **Sean Schmidt**  
 Date/Time Received **03/14/14 12:03**

**Client Provided Field Data**

pH 7.27  
 Temperature 20.8 °C  
 Conductivity 1402 umhos  
 Dissolved Oxygen 0.04 mg/L



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## Laboratory Report

Project Name		B-HS2 SE#12						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-RECIRC						
Matrix		Wastewater						
SAL Sample Number		1402721-02						
Date/Time Collected		03/14/14 10:25						
Collected by		Sean Schmidt						
Date/Time Received		03/14/14 12:03						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	17	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	42	EPA 350.1	2.0	0.47		03/20/14 17:40	50
Carbonaceous BOD	mg/L	200	SM 5210B	2	2	03/14/14 14:15	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	310	EPA 410.4	25	10	03/20/14 11:30	03/20/14 15:49	1
Nitrate (as N)	mg/L	0.06	EPA 300.0	0.04	0.01		03/15/14 02:33	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/15/14 02:33	1
Orthophosphate as P	mg/L	3.8	EPA 300.0	0.040	0.010		03/15/14 02:33	1
Phosphorous - Total as P	mg/L	5.9	SM 4500P-E	0.80	0.20	03/15/14 23:01	03/18/14 15:45	20
Sulfate	mg/L	7.9	EPA 300.0	0.60	0.20		03/15/14 02:33	1
Sulfide	mg/L	45	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	610	SM 2320B	8.0	2.0		03/25/14 15:19	1
Total Kjeldahl Nitrogen	mg/L	63	EPA 351.2	4.0	1.0	03/15/14 23:01	03/18/14 15:45	20
Total Organic Carbon	mg/L	93	SM 5310B	10	0.60		03/17/14 14:05	10
Total Suspended Solids	mg/L	21	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	21	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.06 I	EPA 300.0	0.08	0.02		03/15/14 02:33	1
<b><u>Microbiology</u></b>								
E. Coli	MPN/100 mL	24,000 Z	SM 9223B	2.0	2.0	03/14/14 12:57	03/15/14 11:30	1
Fecal Coliforms	CFU/100 ml	139,000	SM 9222D	1	1	03/14/14 12:56	03/15/14 11:50	1

Sample Description **BHS2-ST1**  
 Matrix **Wastewater**  
 SAL Sample Number **1402721-03**  
 Date/Time Collected **03/14/14 10:15**  
 Collected by **Sean Schmidt**  
 Date/Time Received **03/14/14 12:03**

### **Client Provided Field Data**

pH 7.16  
 Temperature 21.5 °C  
 Conductivity 1198 umhos  
 Dissolved Oxygen 3.32 mg/L

<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	1.6	EPA 350.1	0.040	0.009		03/20/14 15:02	1
Carbonaceous BOD	mg/L	6	SM 5210B	2	2	03/14/14 14:15	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	23 I	EPA 410.4	25	10	03/20/14 11:30	03/20/14 15:49	1

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**March 28, 2014**  
**Work Order: 1402721**

## Laboratory Report

Project Name		B-HS2 SE#12						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST1						
Matrix		Wastewater						
SAL Sample Number		1402721-03						
Date/Time Collected		03/14/14 10:15						
Collected by		Sean Schmidt						
Date/Time Received		03/14/14 12:03						
Nitrate (as N)	mg/L	34	EPA 300.0	0.40	0.10		03/14/14 18:27	10
Nitrite (as N)	mg/L	0.23	EPA 300.0	0.04	0.01		03/15/14 02:44	1
Orthophosphate as P	mg/L	2.9	EPA 300.0	0.040	0.010		03/15/14 02:44	1
Phosphorous - Total as P	mg/L	3.8	SM 4500P-E	0.20	0.050	03/15/14 23:01	03/18/14 15:46	5
Sulfate	mg/L	150	EPA 300.0	6.0	2.0		03/14/14 18:27	10
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	230	SM 2320B	8.0	2.0		03/25/14 15:25	1
Total Kjeldahl Nitrogen	mg/L	4.8	EPA 351.2	1.0	0.25	03/15/14 23:01	03/18/14 15:46	5
Total Organic Carbon	mg/L	19	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	34	EPA 300.0	0.44	0.11		03/15/14 02:44	10
<b>Microbiology</b>								
E. Coli	MPN/100 mL	24,000 Z	SM 9223B	2.0	2.0	03/14/14 12:57	03/15/14 11:30	1
Fecal Coliforms	CFU/100 ml	27,000	SM 9222D	1	1	03/14/14 12:56	03/15/14 11:50	1
Sample Description		BHS2-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1402721-04						
Date/Time Collected		03/14/14 10:00						
Collected by		Sean Schmidt						
Date/Time Received		03/14/14 12:03						
<b>Client Provided Field Data</b>								
pH		7.02						
Temperature		22.2 °C						
Conductivity		1112 umhos						
Dissolved Oxygen		0.60 mg/L						
<b>Inorganics</b>								
Hydrogen Sulfide (Unionized)	mg/L	0.92	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.26	EPA 350.1	0.040	0.009		03/20/14 15:04	1
Carbonaceous BOD	mg/L	4	SM 5210B	2	2	03/14/14 14:15	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	33	EPA 410.4	25	10	03/20/14 11:30	03/20/14 15:49	1
Nitrate (as N)	mg/L	2.1	EPA 300.0	0.04	0.01		03/15/14 02:55	1
Nitrite (as N)	mg/L	0.37	EPA 300.0	0.04	0.01		03/15/14 02:55	1
Orthophosphate as P	mg/L	1.9	EPA 300.0	0.040	0.010		03/15/14 02:55	1
Phosphorous - Total as P	mg/L	3.4	SM 4500P-E	0.20	0.050	03/15/14 23:01	03/18/14 15:47	5
Sulfate	mg/L	150	EPA 300.0	6.0	2.0		03/25/14 17:05	10

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**Tampa, FL 33619**

**March 28, 2014**  
**Work Order: 1402721**

## Laboratory Report

Project Name		B-HS2 SE#12						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-LIGNO-0						
Matrix		Wastewater						
SAL Sample Number		1402721-04						
Date/Time Collected		03/14/14 10:00						
Collected by		Sean Schmidt						
Date/Time Received		03/14/14 12:03						
Sulfide	mg/L	1.8	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	350	SM 2320B	8.0	2.0		03/25/14 15:34	1
Total Kjeldahl Nitrogen	mg/L	1.8	EPA 351.2	1.0	0.25	03/15/14 23:01	03/18/14 15:47	5
Total Organic Carbon	mg/L	14	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	18	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	18	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	2.5	EPA 300.0	0.08	0.02		03/15/14 02:55	1
Microbiology								
Total Coliform	CFU/100 ml	10	SM 9222B	1	1	03/14/14 12:55	03/15/14 11:40	1
E. Coli	MPN/100 mL	8.5	SM 9223B	2.0	2.0	03/14/14 12:57	03/15/14 11:30	1
Fecal Coliforms	CFU/100 ml	10	SM 9222D	1	1	03/14/14 12:56	03/15/14 11:50	1
Sample Description		BHS2-ST2						
Matrix		Wastewater						
SAL Sample Number		1402721-05						
Date/Time Collected		03/14/14 09:42						
Collected by		Sean Schmidt						
Date/Time Received		03/14/14 12:03						
Client Provided Field Data								
pH		7.09						
Temperature		20.0 °C						
Conductivity		1205 umhos						
Dissolved Oxygen		0.07 mg/L						
Inorganics								
Hydrogen Sulfide (Unionized)	mg/L	14	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.38	EPA 350.1	0.040	0.009		03/20/14 16:25	1
Carbonaceous BOD	mg/L	47	SM 5210B	2	2	03/14/14 14:15	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	66	EPA 410.4	25	10	03/20/14 11:30	03/20/14 15:49	1
Nitrate (as N)	mg/L	0.03 I	EPA 300.0	0.04	0.01		03/15/14 04:04	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/15/14 04:04	1
Orthophosphate as P	mg/L	1.9	EPA 300.0	0.040	0.010		03/15/14 04:04	1
Phosphorous - Total as P	mg/L	3.0	SM 4500P-E	0.20	0.050	03/15/14 23:01	03/18/14 15:48	5
Sulfate	mg/L	190	EPA 300.0	6.0	2.0		03/25/14 17:42	10
Sulfide	mg/L	31	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		03/25/14 15:43	1
Total Kjeldahl Nitrogen	mg/L	1.1	EPA 351.2	1.0	0.25	03/15/14 23:01	03/18/14 15:48	5
Total Organic Carbon	mg/L	15	SM 5310B	1.0	0.060		03/17/14 14:05	1

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**Tampa, FL 33619**

**March 28, 2014**  
**Work Order: 1402721**

## Laboratory Report

Project Name		B-HS2 SE#12						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		<b>BHS2-ST2</b>						
Matrix		<b>Wastewater</b>						
SAL Sample Number		<b>1402721-05</b>						
Date/Time Collected		<b>03/14/14 09:42</b>						
Collected by		<b>Sean Schmidt</b>						
Date/Time Received		<b>03/14/14 12:03</b>						
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.03 I	EPA 300.0	0.08	0.02		03/15/14 04:04	1
<b>Microbiology</b>								
Total Coliform	CFU/100 ml	100	SM 9222B	1	1	03/14/14 12:55	03/15/14 11:40	1
E. Coli	MPN/100 mL	72	SM 9223B	2.0	2.0	03/14/14 12:57	03/15/14 11:30	1
Fecal Coliforms	CFU/100 ml	80	SM 9222D	1	1	03/14/14 12:56	03/15/14 11:50	1
Sample Description		<b>BHS2-ST2-DUP</b>						
Matrix		<b>Wastewater</b>						
SAL Sample Number		<b>1402721-06</b>						
Date/Time Collected		<b>03/14/14 09:47</b>						
Collected by		<b>Sean Schmidt</b>						
Date/Time Received		<b>03/14/14 12:03</b>						
<b>Client Provided Field Data</b>								
pH		7.09						
Temperature		20.0 °C						
Conductivity		1205 umhos						
Dissolved Oxygen		0.07 mg/L						
<b>Inorganics</b>								
Hydrogen Sulfide (Unionized)	mg/L	14	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.38	EPA 350.1	0.040	0.009		03/20/14 16:28	1
Carbonaceous BOD	mg/L	42	SM 5210B	2	2	03/14/14 14:15	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	72	EPA 410.4	25	10	03/20/14 11:30	03/20/14 15:49	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/15/14 04:15	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/15/14 04:15	1
Orthophosphate as P	mg/L	1.7	EPA 300.0	0.040	0.010		03/15/14 04:15	1
Phosphorous - Total as P	mg/L	3.1	SM 4500P-E	0.20	0.050	03/15/14 23:01	03/18/14 15:49	5
Sulfate	mg/L	210	EPA 300.0	6.0	2.0		03/25/14 17:52	10
Sulfide	mg/L	31	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	350	SM 2320B	8.0	2.0		03/25/14 15:52	1
Total Kjeldahl Nitrogen	mg/L	1.1	EPA 351.2	1.0	0.25	03/15/14 23:01	03/18/14 15:49	5
Total Organic Carbon	mg/L	15	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	2	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	2	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/15/14 04:15	1
<b>Microbiology</b>								

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## Laboratory Report

Project Name		B-HS2 SE#12						
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description		BHS2-ST2-DUP						
Matrix		Wastewater						
SAL Sample Number		1402721-06						
Date/Time Collected		03/14/14 09:47						
Collected by		Sean Schmidt						
Date/Time Received		03/14/14 12:03						
Total Coliform	CFU/100 ml	128	SM 9222B	1	1	03/14/14 12:55	03/15/14 11:40	1
E. Coli	MPN/100 mL	52	SM 9223B	2.0	2.0	03/14/14 12:57	03/15/14 11:30	1
Fecal Coliforms	CFU/100 ml	60	SM 9222D	1	1	03/14/14 12:56	03/15/14 11:50	1
Sample Description		BHS2-EB						
Matrix		Reagent Water						
SAL Sample Number		1402721-07						
Date/Time Collected		03/14/14 09:15						
Collected by		Sean Schmidt						
Date/Time Received		03/14/14 12:03						
<b><u>Client Provided Field Data</u></b>								
pH		7.05						
Temperature		16.8 °C						
Conductivity		1.39 umhos						
Dissolved Oxygen		8.35 mg/L						
<b><u>Inorganics</u></b>								
Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	03/18/14 08:26	03/18/14 08:30	1
Ammonia as N	mg/L	0.009 U	EPA 350.1	0.040	0.009		03/20/14 15:13	1
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	03/14/14 14:15	03/19/14 10:03	1
Chemical Oxygen Demand	mg/L	10 U	EPA 410.4	25	10	03/20/14 11:30	03/20/14 15:49	1
Nitrate (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 15:29	1
Nitrite (as N)	mg/L	0.01 U	EPA 300.0	0.04	0.01		03/14/14 15:29	1
Orthophosphate as P	mg/L	0.010 U	EPA 300.0	0.040	0.010		03/14/14 15:29	1
Phosphorous - Total as P	mg/L	0.010 U	SM 4500P-E	0.040	0.010	03/15/14 23:01	03/18/14 15:50	1
Sulfate	mg/L	0.20 U	EPA 300.0	0.60	0.20		03/14/14 15:29	1
Sulfide	mg/L	0.10 U	SM 4500SF	0.40	0.10		03/18/14 08:30	1
Total Alkalinity	mg/L	2.0 U	SM 2320B	8.0	2.0		03/25/14 16:01	1
Total Kjeldahl Nitrogen	mg/L	0.05 U	EPA 351.2	0.20	0.05	03/15/14 23:01	03/18/14 15:50	1
Total Organic Carbon	mg/L	0.060 U	SM 5310B	1.0	0.060		03/17/14 14:05	1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	03/17/14 11:34	03/18/14 17:00	1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	03/17/14 11:34	03/18/14 17:00	1
Nitrate+Nitrite (N)	mg/L	0.02 U	EPA 300.0	0.08	0.02		03/14/14 15:29	1
<b><u>Microbiology</u></b>								
Total Coliform	CFU/100 ml	1 U	SM 9222B	1	1	03/14/14 12:55	03/15/14 11:40	1
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	03/14/14 12:57	03/15/14 11:30	1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	03/14/14 12:56	03/15/14 11:50	1

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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Tampa, FL 33619

March 28, 2014  
Work Order: 1402721

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41347 - Digestion for TP and TKN</b>										
<b>Blank (BC41347-BLK1)</b>					Prepared: 03/13/14 Analyzed: 03/18/14					
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
<b>LCS (BC41347-BS1)</b>					Prepared: 03/13/14 Analyzed: 03/18/14					
Phosphorous - Total as P	0.521	0.040	0.010	mg/L	0.50		104	90-110		
Total Kjeldahl Nitrogen	0.971	0.20	0.05	mg/L	1.0		97	90-110		
<b>Matrix Spike (BC41347-MS1)</b>					<b>Source: 1402686-07</b>		Prepared: 03/13/14 Analyzed: 03/18/14			
Phosphorous - Total as P	0.495	0.040	0.010	mg/L	0.50	ND	99	90-110		
Total Kjeldahl Nitrogen	1.01	0.20	0.05	mg/L	1.0	ND	101	90-110		
<b>Matrix Spike (BC41347-MS2)</b>					<b>Source: 1402721-07</b>		Prepared: 03/13/14 Analyzed: 03/18/14			
Phosphorous - Total as P	0.508	0.040	0.010	mg/L	0.50	ND	102	90-110		
Total Kjeldahl Nitrogen	1.05	0.20	0.05	mg/L	1.0	ND	105	90-110		
<b>Matrix Spike Dup (BC41347-MSD1)</b>					<b>Source: 1402686-07</b>		Prepared: 03/13/14 Analyzed: 03/18/14			
Total Kjeldahl Nitrogen	1.03	0.20	0.05	mg/L	1.0	ND	103	90-110	2	20
Phosphorous - Total as P	0.501	0.040	0.010	mg/L	0.50	ND	100	90-110	1	25
<b>Matrix Spike Dup (BC41347-MSD2)</b>					<b>Source: 1402721-07</b>		Prepared: 03/13/14 Analyzed: 03/18/14			
Total Kjeldahl Nitrogen	1.11	0.20	0.05	mg/L	1.0	ND	111	90-110	6	20
Phosphorous - Total as P	0.525	0.040	0.010	mg/L	0.50	ND	105	90-110	3	25
<b>Batch BC41402 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41402-BLK1)</b>					Prepared & Analyzed: 03/14/14					
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		

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**Inorganics - Quality Control**

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41402 - Ion Chromatography 300.0 Prep</b>										
<b>LCS (BC41402-BS1)</b>					Prepared & Analyzed: 03/14/14					
Sulfate	9.14	0.60	0.20	mg/L	9.0		102	85-115		
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		104	85-115		
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115		
Orthophosphate as P	0.881	0.040	0.010	mg/L	0.90		98	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS Dup (BC41402-BS1)</b>					Prepared & Analyzed: 03/14/14					
Nitrate (as N)	1.68	0.04	0.01	mg/L	1.7		99	85-115	0.06	200
Sulfate	9.05	0.60	0.20	mg/L	9.0		101	85-115	1	200
Orthophosphate as P	0.883	0.040	0.010	mg/L	0.90		98	85-115	0.2	200
Nitrite (as N)	1.45	0.04	0.01	mg/L	1.4		104	85-115	0.07	200
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
<b>Matrix Spike (BC41402-MS1)</b>					<b>Source: 1402575-10</b>		Prepared & Analyzed: 03/15/14			
Nitrite (as N)	148	4.0	1.0	mg/L	140	2.00	104	85-115		
Nitrate (as N)	175	4.0	1.0	mg/L	170	ND	103	85-115		
Orthophosphate as P	87.2	4.0	1.0	mg/L	90	ND	97	85-115		
Sulfate	934	60	20	mg/L	900	ND	104	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		

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**Inorganics - Quality Control**

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41402 - Ion Chromatography 300.0 Prep</b>										
<b>Matrix Spike (BC41402-MS2)</b>		<b>Source: 1402575-12</b>			<b>Prepared &amp; Analyzed: 03/15/14</b>					
Sulfate	945	60	20	mg/L	900	ND	105	85-115		
Orthophosphate as P	90.5	4.0	1.0	mg/L	90	ND	101	85-115		
Nitrite (as N)	151	4.0	1.0	mg/L	140	2.10	106	85-115		
Nitrate (as N)	179	4.0	1.0	mg/L	170	ND	105	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		

**Batch BC41417 - BOD**

<b>Blank (BC41417-BLK1)</b>					<b>Prepared: 03/14/14 Analyzed: 03/19/14</b>					
Carbonaceous BOD	2 U	2	2	mg/L						
<b>Blank (BC41417-BLK2)</b>					<b>Prepared: 03/14/14 Analyzed: 03/19/14</b>					
Carbonaceous BOD	2 U	2	2	mg/L						
<b>LCS (BC41417-BS1)</b>					<b>Prepared: 03/14/14 Analyzed: 03/19/14</b>					
Carbonaceous BOD	196	2	2	mg/L	200		98	85-115		
<b>LCS (BC41417-BS2)</b>					<b>Prepared: 03/14/14 Analyzed: 03/19/14</b>					
Carbonaceous BOD	184	2	2	mg/L	200		92	85-115		
<b>LCS Dup (BC41417-BSD1)</b>					<b>Prepared: 03/14/14 Analyzed: 03/19/14</b>					
Carbonaceous BOD	194	2	2	mg/L	200		97	85-115	1	200
<b>LCS Dup (BC41417-BSD2)</b>					<b>Prepared: 03/14/14 Analyzed: 03/19/14</b>					
Carbonaceous BOD	185	2	2	mg/L	200		93	85-115	0.8	200



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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41417 - BOD</b>										
<b>Duplicate (BC41417-DUP1)</b>		<b>Source: 1402709-01</b>			Prepared: 03/14/14 Analyzed: 03/19/14					
Carbonaceous BOD	210	2	2	mg/L		210			0.5	25
<b>Duplicate (BC41417-DUP2)</b>		<b>Source: 1402714-01</b>			Prepared: 03/14/14 Analyzed: 03/19/14					
Carbonaceous BOD	160	2	2	mg/L		170			0.6	25
<b>Batch BC41423 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC41423-BLK1)</b>		Prepared & Analyzed: 03/15/14								
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
Sulfate	0.20 U	0.60	0.20	mg/L						
Orthophosphate as P	0.010 U	0.040	0.010	mg/L						
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
<b>LCS (BC41423-BS1)</b>		Prepared & Analyzed: 03/15/14								
Nitrate (as N)	1.73	0.04	0.01	mg/L	1.7		102	85-115		
Nitrite (as N)	1.47	0.04	0.01	mg/L	1.4		105	85-115		
Orthophosphate as P	0.813	0.040	0.010	mg/L	0.90		90	85-115		
Sulfate	9.26	0.60	0.20	mg/L	9.0		103	85-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		
Surrogate: Dichloroacetate	1.13			mg/L	1.0		113	90-115		

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41423 - Ion Chromatography 300.0 Prep</b>										
<b>LCS Dup (BC41423-BSD1)</b>					Prepared & Analyzed: 03/15/14					
Orthophosphate as P	0.811	0.040	0.010	mg/L	0.90		90	85-115	0.2	200
Nitrite (as N)	1.46	0.04	0.01	mg/L	1.4		104	85-115	0.4	200
Nitrate (as N)	1.72	0.04	0.01	mg/L	1.7		101	85-115	1	200
Sulfate	9.21	0.60	0.20	mg/L	9.0		102	85-115	0.6	200
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
Surrogate: Dichloroacetate	1.11			mg/L	1.0		111	90-115		
<b>Matrix Spike (BC41423-MS1)</b>					<b>Source: 1402584-09</b>		Prepared & Analyzed: 03/15/14			
Sulfate	160	6.0	2.0	mg/L	90	61.4	109	85-115		
Nitrate (as N)	19.5	0.40	0.10	mg/L	17	0.840	110	85-115		
Nitrite (as N)	14.8	0.40	0.10	mg/L	14	ND	106	85-115		
Orthophosphate as P	9.38	0.40	0.10	mg/L	9.0	ND	104	85-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
Surrogate: Dichloroacetate	1.12			mg/L	1.0		112	90-115		
<b>Matrix Spike (BC41423-MS2)</b>					<b>Source: 1402538-06</b>		Prepared & Analyzed: 03/15/14			
Sulfate	26.5	0.60	0.20	mg/L	9.0	18.0	94	85-115		
Orthophosphate as P	0.822	0.040	0.010	mg/L	0.90	ND	91	85-115		
Nitrite (as N)	1.52	0.04	0.01	mg/L	1.4	ND	109	85-115		
Nitrate (as N)	1.60	0.04	0.01	mg/L	1.7	0.0600	91	85-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		
Surrogate: Dichloroacetate	1.15			mg/L	1.0		115	90-115		

# SOUTHERN ANALYTICAL LABORATORIES, INC.

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



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

March 28, 2014  
Work Order: 1402721

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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### Batch BC41712 - VSS Prep

Blank (BC41712-BLK1) Prepared: 03/17/14 Analyzed: 03/18/14

Volatile Suspended Solids	1 U	1		mg/L						
Total Suspended Solids	1 U	1	1	mg/L						

LCS (BC41712-BS1) Prepared: 03/17/14 Analyzed: 03/18/14

Total Suspended Solids	48.0	1	1	mg/L	50		96	85-115		
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Duplicate (BC41712-DUP1) Source: 1402569-02 Prepared: 03/17/14 Analyzed: 03/18/14

Total Suspended Solids	5,590	1	1	mg/L		5460			2	30
Volatile Suspended Solids	4,770	1		mg/L		4640			3	20

### Batch BC41718 - TOC prep

Blank (BC41718-BLK1) Prepared & Analyzed: 03/17/14

Total Organic Carbon	0.060 U	1.0	0.060	mg/L						
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LCS (BC41718-BS1) Prepared & Analyzed: 03/17/14

Total Organic Carbon	10.0	1.0	0.060	mg/L	10		100	90-110		
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Matrix Spike (BC41718-MS1) Source: 1402721-07 Prepared & Analyzed: 03/17/14

Total Organic Carbon	10.4	1.0	0.060	mg/L	10	ND	104	85-115		
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Matrix Spike Dup (BC41718-MSD1) Source: 1402721-07 Prepared & Analyzed: 03/17/14

Total Organic Carbon	10.5	1.0	0.060	mg/L	10	ND	105	85-115	0.6	10
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### Batch BC41808 - Ion Chromatography 300.0 Prep

Blank (BC41808-BLK1) Prepared & Analyzed: 03/18/14

Sulfate	0.20 U	0.60	0.20	mg/L						
Nitrate (as N)	0.01 U	0.04	0.01	mg/L						
Surrogate: Dichloroacetate	1.03			mg/L	1.0		103	90-115		
Surrogate: Dichloroacetate	1.03			mg/L	1.0		103	90-115		

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March 28, 2014  
Work Order: 1402721

## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41808 - Ion Chromatography 300.0 Prep</b>										
<b>LCS (BC41808-BS1)</b>					Prepared & Analyzed: 03/19/14					
Nitrate (as N)	1.62	0.04	0.01	mg/L	1.7		95	85-115		
Sulfate	8.59	0.60	0.20	mg/L	9.0		95	85-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	90-115		
<b>LCS Dup (BC41808-BS1)</b>					Prepared & Analyzed: 03/19/14					
Nitrate (as N)	1.64	0.04	0.01	mg/L	1.7		96	85-115	1	200
Sulfate	8.64	0.60	0.20	mg/L	9.0		96	85-115	0.6	200
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
<b>Matrix Spike (BC41808-MS1)</b>					<b>Source: 1402084-01</b>		Prepared & Analyzed: 03/18/14			
Nitrate (as N)	16.2	0.40	0.10	mg/L	17	0.0360	95	85-115		
Sulfate	98.4	6.0	2.0	mg/L	90	13.5	94	85-115		
Surrogate: Dichloroacetate	1.03			mg/L	1.0		103	90-115		
Surrogate: Dichloroacetate	1.03			mg/L	1.0		103	90-115		
<b>Matrix Spike (BC41808-MS2)</b>					<b>Source: 1402340-03</b>		Prepared & Analyzed: 03/18/14			
Nitrate (as N)	17.9	0.40	0.10	mg/L	17	1.69	95	85-115		
Sulfate	194	6.0	2.0	mg/L	90	99.8	104	85-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
<b>Batch BC41835 - Sulfide prep</b>										
<b>Blank (BC41835-BLK1)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	0.10 U	0.40	0.10	mg/L						

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41835 - Sulfide prep</b>										
<b>Blank (BC41835-BLK2)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	0.10 U	0.40	0.10	mg/L						
<b>LCS (BC41835-BS1)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	4.84	0.40	0.10	mg/L	5.0		97	85-115		
<b>LCS (BC41835-BS2)</b>					Prepared & Analyzed: 03/18/14					
Sulfide	4.64	0.40	0.10	mg/L	5.0		93	85-115		
<b>Matrix Spike (BC41835-MS1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
<b>Matrix Spike (BC41835-MS2)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.64	0.40	0.10	mg/L	5.0	ND	93	85-115		
<b>Matrix Spike Dup (BC41835-MSD1)</b>					<b>Source: 1402550-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
<b>Matrix Spike Dup (BC41835-MSD2)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/18/14			
Sulfide	4.84	0.40	0.10	mg/L	5.0	ND	97	85-115	4	14
<b>Batch BC41836 - COD prep</b>										
<b>Blank (BC41836-BLK1)</b>					Prepared & Analyzed: 03/20/14					
Chemical Oxygen Demand	10 U	25	10	mg/L						
<b>LCS (BC41836-BS1)</b>					Prepared & Analyzed: 03/20/14					
Chemical Oxygen Demand	47	25	10	mg/L	50		94	90-110		

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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41836 - COD prep</b>										
<b>Matrix Spike (BC41836-MS1)</b>		<b>Source: 1402813-02</b>			Prepared & Analyzed: 03/20/14					
Chemical Oxygen Demand	47	25	10	mg/L	50	ND	94	85-115		
<b>Matrix Spike Dup (BC41836-MSD1)</b>		<b>Source: 1402813-02</b>			Prepared & Analyzed: 03/20/14					
Chemical Oxygen Demand	49	25	10	mg/L	50	ND	98	85-115	4	32
<b>Batch BC41921 - Ammonia by SEAL</b>										
<b>Blank (BC41921-BLK1)</b>		Prepared & Analyzed: 03/20/14								
Ammonia as N	0.009 U	0.040	0.009	mg/L						
<b>LCS (BC41921-BS1)</b>		Prepared & Analyzed: 03/20/14								
Ammonia as N	0.46	0.040	0.009	mg/L	0.50		92	90-110		
<b>Matrix Spike (BC41921-MS1)</b>		<b>Source: 1402686-07</b>			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110		
<b>Matrix Spike (BC41921-MS2)</b>		<b>Source: 1402721-07</b>			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.49	0.040	0.009	mg/L	0.50	ND	98	90-110		
<b>Matrix Spike Dup (BC41921-MSD1)</b>		<b>Source: 1402686-07</b>			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	95	90-110	0.6	10
<b>Matrix Spike Dup (BC41921-MSD2)</b>		<b>Source: 1402721-07</b>			Prepared & Analyzed: 03/20/14					
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	97	90-110	2	10
<b>Batch BC42503 - Ion Chromatography 300.0 Prep</b>										
<b>Blank (BC42503-BLK1)</b>		Prepared & Analyzed: 03/25/14								
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	90-115		

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March 28, 2014  
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## Inorganics - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC42503 - Ion Chromatography 300.0 Prep</b>										
<b>LCS (BC42503-BS1)</b>					Prepared & Analyzed: 03/25/14					
Sulfate	8.80	0.60	0.20	mg/L	9.0		98	85-115		
Surrogate: Dichloroacetate	1.14			mg/L	1.0		114	90-115		
<b>LCS Dup (BC42503-BSD1)</b>					Prepared & Analyzed: 03/25/14					
Sulfate	8.78	0.60	0.20	mg/L	9.0		98	85-115	0.3	200
Surrogate: Dichloroacetate	1.06			mg/L	1.0		106	90-115		
<b>Matrix Spike (BC42503-MS1)</b>					<b>Source: 1402721-04</b>		Prepared & Analyzed: 03/25/14			
Sulfate	238	6.0	2.0	mg/L	90	154	94	85-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	90-115		
<b>Matrix Spike (BC42503-MS2)</b>					<b>Source: 1403001-08</b>		Prepared & Analyzed: 03/25/14			
Sulfate	29.0	0.60	0.20	mg/L	9.0	20.1	99	85-115		
Surrogate: Dichloroacetate	0.978			mg/L	1.0		98	90-115		
<b>Batch BC42512 - alkalinity</b>										
<b>Blank (BC42512-BLK1)</b>					Prepared & Analyzed: 03/25/14					
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
<b>LCS (BC42512-BS1)</b>					Prepared & Analyzed: 03/25/14					
Total Alkalinity	120	8.0	2.0	mg/L	120		97	90-110		
<b>Matrix Spike (BC42512-MS1)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/25/14			
Total Alkalinity	120	8.0	2.0	mg/L	120	ND	98	80-120		
<b>Matrix Spike Dup (BC42512-MSD1)</b>					<b>Source: 1402721-07</b>		Prepared & Analyzed: 03/25/14			
Total Alkalinity	130	8.0	2.0	mg/L	120	ND	101	80-120	3	26

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## Microbiology - Quality Control

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch BC41420 - TC-MF</b>										
<b>Blank (BC41420-BLK1)</b>					Prepared: 03/14/14 Analyzed: 03/15/14					
Total Coliform	1 U	1	1	CFU/100 ml						
<b>Duplicate (BC41420-DUP1)</b>					<b>Source: 1402721-07</b> Prepared: 03/14/14 Analyzed: 03/15/14					
Total Coliform	1 U	1	1	CFU/100 ml		ND				200
<b>Batch BC41421 - FC-MF</b>										
<b>Blank (BC41421-BLK1)</b>					Prepared: 03/14/14 Analyzed: 03/15/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml						
<b>Duplicate (BC41421-DUP1)</b>					<b>Source: 1402713-02</b> Prepared: 03/14/14 Analyzed: 03/15/14					
Fecal Coliforms	1 U	1	1	CFU/100 ml		ND				200



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**\* Qualifiers, Notes and Definitions**

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

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

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

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

Z Too many colonies were present for accurate counting.


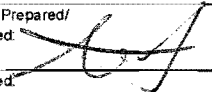

Questions regarding this report should be directed to :

Kathryn Nordmark

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

Kathryn@southernanalyticalabs.com



Client Name <b>Hazan and Sawyer</b>										Contact / Phone: <b>Josefin Hirst 813-630-4498</b>												
Project Name / Location <b>BHS2 SE#12</b>																						
Samplers: (Signature) 																						
Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water										PARAMETER / CONTAINER DESCRIPTION												
SAL Use Only	Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT	TLP, Cool Total Alkalinity, TSS, VSS, CBOD, NOx, OP, SO <sub>4</sub>	125mLP, H <sub>2</sub> SO <sub>4</sub> COD, TKN, NH <sub>3</sub> , TP	500mLP, NaOH, Zn Acetate H <sub>2</sub> S	40mLaV, HCl TOC	125mLP, Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> FC-MF, FC-QT, TC-MF (Non-potable)			<b>DO</b>	pH	Temperature	Conductivity			
	01	BHS2-STE	3/19/14	1040	WW		X	4	1	1	1	2				0.02	7.15	21.2	1430			
	02	BHS2-RECIRC		1025	WW		X	4	1	1	1	2				0.04	7.27	20.8	1402			
	03	BHS2-ST1		1015	WW		X	4	1	1	1	2				3.32	7.16	21.5	1198			
	04	BHS2-LIGNO-0		1000	WW		X		1	1	1	2	6			0.60	7.02	22.2	1112			
	05	BHS2-ST2		0942	WW		X		1	1	1	2	6			0.07	7.09	20.0	1205			
	06	BHS2-ST2-DUP		0947	WW		X		1	1	1	2	6			1	1	1	1			
	07	BHS2-EB		0915	R		X		1	1	1	2	6			8.35	7.05	16.8	1.39			
Containers Prepared/Relinquished: 		Date/Time: 1203 3/14/14	Received: 		Date/Time: 1203 3/14/14		Seal intact? Y <input checked="" type="radio"/> N <input checked="" type="radio"/>		Samples intact upon arrival? <input checked="" type="radio"/> Y N <input checked="" type="radio"/> N/A		Received on ice? Temp _____ <input checked="" type="radio"/> Y N <input checked="" type="radio"/> N/A		Proper preservatives indicated? <input checked="" type="radio"/> Y N <input checked="" type="radio"/> N/A		Rec'd w/in holding time? <input checked="" type="radio"/> Y N <input checked="" type="radio"/> N/A		Volatiles rec'd w/out headspace? Y <input checked="" type="radio"/> N <input checked="" type="radio"/> N/A		Proper containers used? <input checked="" type="radio"/> Y N <input checked="" type="radio"/> N/A		Instructions / Remarks	
		Date/Time:	Received:		Date/Time:																	
		Date/Time:	Received:		Date/Time:																	
		Date/Time:	Received:		Date/Time:																	
		Date/Time:	Received:		Date/Time:																	



## Appendix B: Operation & Maintenance Log

**Table B.1**  
**Operation and Maintenance Log**

Date	Description
7/31/12	Existing system evaluation performed. Septic tank was pumped out.
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
12/21/2012	Very high level in pump tank.
	Pulled float tree up (reset floats), and pump immediately came on.
12/22/2012	Very high level in pump tank. Audio alarm came on and was reset.
1/3/2013	Water level below top float in pump tank
	Re-positioned floats and zip-tied wires to tree.
1/10/2013	Very high level in pump tank.
	Pulled float tree up (reset floats), and pump immediately came on.
1/11/2013	Water level below top float in pump tank
1/15/2013	Low level in pump tank
1/16/2013	Floats not registering in panel
	Pulled float tree up (reset floats)
1/17/2013	Moved bottom float down
	Re-wrapped wires and checked lights in panel, floats registered.
2/5/2013	Sample Event No. 2
2/27/2013	Site visit. Cleaned out leaves from DBOX.
4/16/2013	Sample Event No. 3
5/29/2013	Site visit.

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**Table B.1 (continued)**  
**Operation and Maintenance Log**

Date	Description
6/4/2013	Sample Event No. 4
7/8/2013	System check
8/7/2013	Sample Event No. 5
	Revised recirculation mode of operation to Stage 1 biofilter spray nozzles
	Cleaned STE effluent screen
9/3/2013	System check
	Recirculation ratio still at 3:1
9/6/2013	System check
	Recirculation ratio still at 3:1
9/24/2013	System check
	Recirculation ratio still at 3:1
10/7/2013	Sample Event No. 6
	Recirculation ratio still at 3:1
10/24/2013	System check
11/27/2013	System check
	Recirculation ratio still at 3:1
12/3/2013	System check
12/5/2013	Sample Event No. 7
12/30/2013	System check
2/13/2014	System check
3/10/2014	Sample Event No. 8
3/11/2014	Sample Event No. 9
3/12/2014	Sample Event No. 10
3/13/2014	Sample Event No. 11
3/14/2014	Sample Event No. 12
4/30/2014	Met with homeowner regarding system acceptance
	Cleaned STE screen
	Reset recirculation mode of operation to recirc tank

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## Appendix C: Vericomm PLC Data

System Status			3/14/2014	3/13/2014	3/12/2014	3/11/2014	3/10/2014	2/13/2014	1/9/2014
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
1	Alarm Status	Automatic	OK	OK	OK	OK	OK	OK	OK
2	Alert Status	Automatic	OK	OK	OK	OK	OK	OK	OK
3	System Mode	Automatic	Normal	Normal	Normal	Normal	Normal	Normal	Normal
5	Timer Mode	Automatic	Normal	Normal	Normal	Off	Off	Normal	Override
6	Active Off Time	Automatic	58.8 Minutes	58.8 Minutes	58.8 Minutes	58.8 Minutes	58.8 Minutes	58.8 Minutes	15.0 Minutes
7	Active On Time	Automatic	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.2 Minutes	2.0 Minutes
9	Pump Mode	Automatic	OffCycl	OffCycl	OffCycl	Off	Off	OffCycl	OffCycl
10	Pump Status	Automatic	Off	Off	Off	Off	Off	Off	Off
12	Pump Cycles Today	Automatic	6.0 Cycles	6.0 Cycles	4.0 Cycles	6.0 Cycles	4.0 Cycles	5.0 Cycles	12.0 Cycles
13	Override Cycles Today	Automatic	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles	0.0 Cycles	5.0 Cycles
14	Pump Run Time Today	Automatic	6.3 Minutes	6.2 Minutes	3.8 Minutes	6.1 Minutes	3.5 Minutes	5.5 Minutes	16.0 Minutes
Settings									
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
17	Off Cycle Time	Constant/Setpoint	58.8 Minutes	58.8 Minutes	58.8 Minutes	58.8 Minutes	58.8 Minutes	58.8 Minutes	58.8 Minutes
18	On Cycle Time	Constant/Setpoint	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.2 Minutes	1.2 Minutes
19	Override Off Cycle Time	Constant/Setpoint	15.0 Minutes	15.0 Minutes	15.0 Minutes	15.0 Minutes	15.0 Minutes	15.0 Minutes	15.0 Minutes
20	Override On Cycle Time	Constant/Setpoint	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes
21	Minimum Override Cycles	Automatic	3.0 Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles	3.0 Cycles
23	Override Cycle Limit per Day	Automatic	10.0 Cycles	10.0 Cycles	10.0 Cycles	10.0 Cycles	10.0 Cycles	10.0 Cycles	10.0 Cycles
24	Time Limit per Day	Constant/Setpoint	40.0 Minutes	40.0 Minutes	40.0 Minutes	40.0 Minutes	40.0 Minutes	40.0 Minutes	40.0 Minutes
25	High Level Pump Test	Automatic	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes	2.0 Minutes
28	Alarm Update Interval	Automatic	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes	120.0 Minutes	240.0 Minutes
29	Page Delay	Automatic	960.0 Minutes	960.0 Minutes	960.0 Minutes	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	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	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	120.0 Minutes	120.0 Minutes	120.0 Minutes
Troubleshooting									
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
33	Top Float Status	Automatic	OK	OK	OK	OK	OK	OK	OK
34	Middle Float Status	Automatic	OK	OK	OK	OK	OK	OK	OK
35	Bottom Float Status	Automatic	OK	OK	OK	OK	OK	OK	OK
37	Contactor Status	Automatic	OK	OK	OK	OK	OK	OK	OK
38	Pump Status	Automatic	OK	OK	OK	OK	OK	OK	OK
40	Filter Status	Automatic	OK	OK	OK	OK	OK	OK	OK
41	Tank Status	Automatic	OK	OK	OK	OK	OK	OK	OK
43	Power Status	Automatic	OK	OK	OK	OK	OK	OK	OK
Flow Data									
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
49	Pump Run Time Today	Automatic	6.3 Minutes	6.2 Minutes	3.8 Minutes	6.1 Minutes	3.5 Minutes	5.5 Minutes	16.0 Minutes
50	Override Cycles Today	Automatic	0	0	0	0	0	0	5
51	Pump Cycles Today	Automatic	6.0 Cycles	6.0 Cycles	4.0 Cycles	6.0 Cycles	4.0 Cycles	5.0 Cycles	12.0 Cycles
52	Average Run Time per Cycle Today	Automatic	1.1 Minutes	1.0 Minutes	1.0 Minutes	1.0 Minutes	0.9 Minutes	1.1 Minutes	1.3 Minutes
54	Brownouts Today	Automatic	0	0	0	0	0	0	0

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			3/14/2014	3/13/2014	3/12/2014	3/11/2014	3/10/2014	2/13/2014	1/9/2014
<b>30-Day History Data</b>									
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
65	30 Day Average Run Time per Day	Automatic	15.4 Minutes	15.2 Minutes	15.4 Minutes	15.9 Minutes	17.2 Minutes	18.3 Minutes	22.9 Minutes
66	30 Day Average Override Cycles per Day	Automatic	0.1 Cycles	0.1 Cycles	0.1 Cycles	0.3 Cycles	0.7 Cycles	1.0 Cycles	2.1 Cycles
67	30 Day Average Cycles per Day	Automatic	14.5 Cycles	14.3 Cycles	14.5 Cycles	14.8 Cycles	15.5 Cycles	16.2 Cycles	18.9 Cycles
68	30 Day Average Run Time per Cycle	Automatic	1.1 Minutes	1.1 Minutes	1.1 Minutes	1.1 Minutes	1.1 Minutes	1.1 Minutes	1.2 Minutes
71	30 Day Total Pump Run Time	Automatic	463.3 Minutes	456.3 Minutes	462.0 Minutes	475.7 Minutes	515.6 Minutes	547.7 Minutes	685.8 Minutes
72	30 Day Total Override Cycles	Automatic	4.0 Cycles	4.0 Cycles	4.0 Cycles	8.0 Cycles	21.0 Cycles	31.0 Cycles	64.0 Cycles
73	30 Day Total Cycles	Automatic	435.0 Cycles	430.0 Cycles	434.0 Cycles	443.0 Cycles	466.0 Cycles	485.0 Cycles	567.0 Cycles
76	30 Day Total Brownouts	Automatic	0	0	0	0	0	0	0
<b>Totalized Pump Data</b>									
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
82	Pump Total Run Time	Automatic	204.3 Hours	204.0 Hours	203.7 Hours	203.6 Hours	203.4 Hours	196.9 Hours	185.6 Hours
83	Pump Total Cycles	Automatic	10582.0 Cycles	10566.0 Cycles	10549.0 Cycles	10539.0 Cycles	10527.0 Cycles	10162.0 Cycles	9573.0 Cycles
<b>Miscellaneous</b>									
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
145	Pump On Auto	Automatic	Off	Off	Off	Off	Off	Off	Off
147	Pump Test Today	Automatic	Off	Off	Off	Off	Off	Off	On
148	Pump Check Enable	Automatic	Off	Off	Off	Off	Off	Off	Off
149	Total Override Cycles	Automatic	0	0	0	0	0	0	1
150	High Level Condition	Automatic	Off	Off	Off	Off	Off	Off	Off
151	Leak Check Enable	Automatic	On	On	On	Off	Off	On	On
152	Brownout State	Automatic	Off	Off	Off	Off	Off	Off	Off
153	Test Mode	Automatic	Off	Off	Off	Off	Off	Off	Off
<b>Alarm Points</b>									
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
161	General Alarm	Automatic	Off	Off	Off	Off	Off	Off	Off
162	New Alarm	Automatic	Off	Off	Off	Off	Off	Off	Off
163	Update Central Enable	Automatic	On	On	On	On	On	On	On
167	Page Alarm Start	Automatic	Off	Off	Off	Off	Off	Off	Off
168	Pager Signal	Override Off	Off	Off	Off	Off	Off	Off	Off
169	Local Alarm Start	Automatic	Off	Off	Off	Off	Off	Off	Off
170	Local Alarm Silence	Automatic	Off	Off	Off	Off	Off	Off	Off
<b>Inputs &amp; Outputs</b>									
Point	Description	Status	Value	Value	Value	Value	Value	Value	Value
177	High Level/Override Timer Float Input	Automatic	Off	Off	Off	Off	Off	Off	Off
178	Timer Float Input	Automatic	On	On	On	Off	Off	On	On
179	Redundant Off Float & Low Level Alarm Input	Automatic	On	On	On	On	On	On	On
181	Push To Silence Input	Automatic	Off	Off	Off	Off	Off	Off	Off
182	Auxiliary Contact Input	Automatic	Off	Off	Off	Off	Off	Off	Off
186	Pump Output	Automatic	Off	Off	Off	Off	Off	Off	Off
188	Alarm Light Output	Automatic	Off	Off	Off	Off	Off	Off	Off
189	Audible Alarm Output	Automatic	Off	Off	Off	Off	Off	Off	Off