

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task C.25

C-HS1 Monitoring Data Summary Report No. 1

**Progress Report** 

June 2011



HAZEN AND SAWYER Environmental Engineers & Scientists In association with



OTIS ENVIRONMENTAL CONSULTANTS, LLC

## Florida Onsite Sewage Nitrogen Reduction Strategies Study

## TASK C.25 PROGRESS REPORT

## C-HS1 Monitoring Data Summary Report No. 1

## Prepared for:

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**FDOH Contract CORCL** 

June 2011

Prepared by:



In Association With:





## C-HS1 Monitoring Data Summary Report No. 1

### 1.0 Background

Task C of the Florida Onsite Sewage Nitrogen Reduction Strategies Study includes monitoring at field sites in Florida to evaluate nitrogen reduction in soil and groundwater, to assess groundwater impacts from various onsite wastewater systems, and to provide data for parameter estimation, verification, and validation of models developed in Task D. The Task C.5 QAPP documents the objectives, monitoring framework, sample frequency and duration, and analytical methods to be used at the field sites. The Task C.23 Instrumentation of C-HS1 mound system and plume progress report documents the test area design, number and location of monitoring points, and preliminary field parameters from monitoring points for this Wakulla County, Florida field site, and preliminary sample collection and analyses.

### 2.0 Purpose

This data documents data that was collected in the first C-HS1 mound monitoring and sampling event which was conducted May 19, 2011 and May 20, 2011. The corresponding sample event report was submitted as C-HS1 Sample Event Report No. 1, June 2011, as a deliverable under Task C.24. The monitoring event consisted of measurement of household water meters, groundwater elevation measured within the standpipe piezometers, measurement of field parameters, and collection of effluent and groundwater samples and their analyses in a NELAC certified laboratory.

### 3.0 Materials and Methods

#### 3.1 Project Site

The C-HS1 field site is located in Wakulla County, FL in a neighborhood near the Wakulla River. The drainfield mound at the site contains two drainfields. One drainfield serves the residence onsite and the second drainfield is part of the septic system for the house across the street which is located adjacent to the Wakulla River. The septic system for the residence onsite consists of a standard baffled septic tank located in the mound and has a gravity fed plastic tubing industries (PTI) multi-pipe bed drainfield. The septic system for the house across the dirt road has a standard baffled tank and a pump tank used to pump the effluent under the road to a separate PTI bed drainfield. Except for the drainfield mound, the house, and a small garden, the site is wooded and heavily vege-tated.

### **3.2 Operational Monitoring**

The water meters for both houses that have drainfields in the mound at the C-HS1 field site were read and recorded. The homeowners at the site residence do have a garden with irrigation, thus the actual wastewater flow can only be estimated. Although the neighboring residence does not have a garden, there is outside water use for other activities such as vehicle washing and landscape plant watering. A weather station (Wakulla Springs, Shadeville) is located approximately 3 miles from the site. Data from this weather station is available at the following website: <a href="http://www.wunderground.com">http://www.wunderground.com</a>.

### 3.3 Monitoring and Sampling Locations and Identification

A schematic of the site monitoring network is shown in Figure 1. Three types of monitoring points were installed: drive point samplers, standpipe piezometers, and soil lysimeters (refer to the Task C QAPP and Task C.23 C-HS1 Progress Report for additional detail). Each groundwater monitoring location has been assigned a unique identification indicating the type of monitoring point (DP = drive point, PZ = standpipe piezometer, LY = soil lysimeter). Drive point samplers consist of a stainless steel drive tip and attached 1-inch long screen connected to flexible tubing that extends to the ground surface. Standpipe piezometers consist of a 5 foot, <sup>3</sup>/<sub>4</sub> inch diameter PVC screen with a PVC riser extending to the surface. The two soil lysimeters have a 9 inch ceramic cup attached to 2 inch PVC pipe with a cap fitted with two valves. A total of 23 specific monitoring locations were sampled during this C-HS1 sampling event. For reference, a complete listing of the C-HS1 sample locations is presented in Appendix A.

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#### **3.4 Groundwater Elevation Measurements**

Groundwater level measurements are used to determine hydraulic gradients, directions of flow, rates of flow, locations of groundwater recharge and discharge, the amount of water in storage, the change in storage over time, and aquifer hydraulic characteristics. Groundwater levels were measured using a flat tape water level meter graduated in feet (measurement accuracy is 0.01 ft). The groundwater level within all 15 standpipe piezo-meters was measured consecutively on May 19, 2011 for this sampling event. Measuring all the standpipe piezometers over a short period of time (approximately 45 minutes) provides a snapshot of the groundwater prior to any sampling. Groundwater levels were measured again prior to purging the piezometer for sampling.

#### 3.5 Water Quality Sample Collection and Analyses

Groundwater and septic tank effluent (STE) were collected May 19-20, 2011 for water quality analysis. A sample was collected from the septic tank outlet filter to represent the effluent delivered to the drainfield. A peristaltic pump was used to collect STE directly into the analysis-specific containers supplied by the analytical laboratory. Groundwater samples were obtained using a peristaltic pump, which was either attached directly to the drive point tubing or to dedicated standpipe piezometer tubing. Samples were collected into the analysis-specific containers after sufficient purging (the sample was clear and pH and conductivity readings had stabilized) had occurred. A 50 KPa vacuum was placed on the soil lysimeters the day before sampling. The first 200+ mL of sample was used to rinse the lysimeter and sample tubes before taking the sample. Field parameters were then recorded.

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

In addition, the field sample duplicates were collected immediately subsequent to the regular samples. The field duplicate samples taken include:

- PZ-01
- PZ-07
- DP-03

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Field parameters (pH, specific conductance, temperature (Temp), and dissolved oxygen (DO)) were measured using portable electronic probes with probe tips placed in an overflowing plastic beaker as groundwater was being pumped. All samples were analyzed by the laboratory for: total alkalinity, total Kjeldahl nitrogen (TKN-N), ammonia nitrogen (NH<sub>3</sub>-N), nitrate/nitrite nitrogen (NO<sub>X</sub>-N), chemical oxygen demand (COD), and total phosphorus (TP). Additionally, the STE sample was analyzed for carbonaceous biological oxygen demand (CBOD<sub>5</sub>), total suspended solids (TSS), and total solids % by weight (TS), but not COD. All analyses were performed by an independent and fully certified analytical laboratory (Southern Analytical Laboratory). Table 1 lists the analytical parameters, analytical methods, and detection limits for these analyses.

Analytical Parameter	Method of Analysis	Laboratory Detection Limit (mg/L)
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/Nitrite Nitrogen (NO <sub>X</sub> -N)	EPA 300.0	0.02 mg/L
Total Phosphorus (TP)	SM 4500P-E	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

 Table 1

 Analytical Parameters, Method of Analysis, and Detection Limits

### 3.6 Data Management

To allow for a better visualization of the data collected at the site the mapping program **Surfer** was utilized. **Surfer** is a grid-based mapping program that interpolates irregularly spaced XYZ data into a regularly spaced grid. Although there are several methods used in Surfer to fill in areas where data is missing, the Kriging method was used as the output gave the most informative graphs.

### 4.0 Results

### 4.1 Operational Data and Site Conditions

Table 2 summarizes the water meter readings and average daily water use for the residence at site C-HS1 and the second residence which has a drainfield in the mound at site C-HS1.

	Table 2												
Water Meter Readings and Water Usage for C-HS1													
Residence Date and Time Read Meter Reading Gallons/day													
C-HS1 Residence	4/27/2011 16:30	692569.7											
	5/20/2011 16:15	695923.1	145.9										
Neighboring Residence	4/27/2011 15:55	663669.6											
	5/20/2011 16:15	666348.5	116.4										

Appendix B provides monthly recorded meteorological data. Table 3 provides the recorded meteorological data daily averages leading up to and during the sample event. Lower than normal rainfall has been reported in the Florida panhandle during the winter and spring months. Rainfall was generally approximately one inch below the long term average across the panhandle in March, three inches below average for most areas in April, and approximately three inches below average in May.

Meteo	orological L	Jata Daily	Averages	Measured May 1	5, 2011 – Ma	y 20, 2011
Date	T	emperatur (°F)	e	Humidity (%)	Wind (mph)	Rain Total (in)
	High	Avg	Low	Avg	Avg	Sum
5/15/11	76	67	58	63	8	0
5/16/11	76	63	50	61	9	0
5/17/11	77	64	50	57	8	0
5/18/11	82	63	43	55	4	0
5/19/11	89	69	48	54	2	0
5/20/11	95	74	52	53	3	0

Table 3

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#### 4.2 **Groundwater Levels**

Groundwater level monitoring has been conducted a total of four times (September 2010, November 2010, April 2011 and May 2011) of the seven months since the first piezometers were installed in September 2010. Water levels were measured at all standpipe piezometers on May 19, 2011 for this sampling event as summarized in Table 4. Figure 2 illustrates the surficial groundwater contours as measured within the standpipe piezometers on May 19, 2011. The groundwater elevations have been found to fluctuate due to periods of dry weather and/or heavy precipitation; however, the general southeast flow-path does not change.

Measure	d May 19, 2011
Identification	Water Table Elevation (ft) May 19, 2011
PZ-01	91.26
PZ-02	91.46
PZ-03	91.39
PZ-04	91.64
PZ-05	91.09
PZ-06	91.08
PZ-07	91.42
PZ-08	91.43
PZ-09	91.47
PZ-10	91.41
PZ-11	91.33
PZ-12	91.18
PZ-13	91.30
PZ-14	91.76
PZ-15	91.43

	Tabl	e 4	
Standpipe	Piezometer	Groundwa	ater Levels
	Measured	May 19, 20	011





#### 4.3 Water Quality Analyses

#### 4.3.1 Field Parameters

Field parameters (temperature, pH, dissolved oxygen (DO), and specific conductivity) were measured at all the sampling locations during the May sampling event and are provided in Appendix C. Variations in measured values were expected as the chemical composition of the groundwater varied due to the discharge of STE. The temperature was found to range from 18.6 to 22.6 °C but the inter-quartile range (IQR) was between 18.8 and 19.3, pH varied from 5.8 to 7.3 with an IQR from 6.6 to 7.1, DO varied from 0.4 to 6.9 mg/L with an IQR of 0.5 to 1.5, and finally the conductivity varied from 75 to 1,433  $\mu$ S with an IQR of 578 to 851 (Table 5). The small range for some of these field parameters may suggest little variation in the plume groundwater.

	Field Parameters	
Field Parameters	Range	IQR
Temperature (°C)	18.6 - 24.2	18.8 – 19.3
рН	5.8 - 7.3	6.6 - 7.1
DO (mg/L)	0.4 - 6.9	0.5 – 1.5
Specific conductance (µS)	75 - 1,433	578 - 851

	Tab	le	5	
hlai	Pa	rar	no	tor

#### 4.3.2 Correlations

Correlations between various field parameters and nitrogen concentration were conducted. Such correlations can provide insight into expected nitrogen removal or can be used to approximate difficult to obtain parameter values. However, no significant correlations were observed including the relationship between specific conductance and the concentration of NOX (Figure 3).



Figure 3 Correlation Between the Specific Conductance (uS) and the Concentrations of Nitrate/Nitrite (mg-N/L)

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#### 4.3.3 Analytical Parameters

In addition to measuring field parameters, all samples were analyzed for total alkalinity (as CaCO<sub>3</sub>), chemical oxygen demand (COD), total Kjeldahl nitrogen (TKN-N), ammonia nitrogen (NH3-N), nitrate/nitrite nitrogen (NOX-N), and total phosphorus (TP). By analyzing for the different nitrogen species, a clearer picture will be gained on the transformation of nitrogen within the plume. The complete water quality analytical results for Sample Event No. 1 are listed in Table 1 of Appendix C. The summary of the water quality is presented in Table 1 of Appendix D. The laboratory report containing the raw analytical data is included in Appendix E.

#### 4.3.4 Nitrate/Nitrite Concentrations with Depth

Based on this first sampling event, the general trend of the nitrogen plume at the site can be somewhat determined. Although **Surfer** is an excellent tool for mapping the information from the site, it cannot project a 3-dimensional view of concentrations with depth. The 8 drive points and 15 piezometers installed at different locations and depths below the ground surface were mapped in **Surfer**. The concentrations of NOX and specific conductance at all locations that groundwater sample was obtained are illustrated in Figures 4 and 5 respectively. The maps show contours of the concentrations as estimated using the Kriging method in Surfer. As is evident, an overall trend is visible. The highest concentration of NOX (Figure 4) and specific conductance (Figure 5) is close to the center of the mound with a maximum concentration in PZ-07. Surrounding the mound on all sides, the NOX concentration is very low. The slightly elevated NOX concentration seen at the eastern edge of the map (at PZ-06) appears to be unrelated to the mound. One suggestion is the presence of a pet at the residence which is fenced in the general area that the piezometer is located. The specific conductance concentrations show some movement similar to the groundwater contours (Figure 2).

Karst is a term applied to areas where extensive dissolution of rock (in this area limestone) which has led to the development of subterranean channels through which groundwater flows in conduits (enclosed or semi-enclosed channels). These conduits can vary in size from slightly enlarged cracks to tunnels many feet in diameter and many feet in length. Two notable features due to fracture controlled flow of karst hydrology are: the often unknown flow paths and the wide variability of flow rates. The NOX map indicates that the nitrogen plume flow path may be dropping vertically in a downward direction at this site. Although the May sampling event did provide some insight into the current nitrogen plume, the fracture/karst flow makes the plume identification very difficult.

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Figure 4 NOX Concentrations (mg-N/L) May 19-20, 2011

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Figure 5 Specific Conductance Concentrations (µS) May 19-20, 2011

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### 5.0 C-HS1 Data Summary Report No. 1: Summary and Recommendations

### 5.1 Summary

The results of this first sampling event served to identify the general trend of the NOX plume and provide the basis upon which to make adjustments and modifications to future monitoring locations. Results of Sample Event No. 1 indicate that:

- Although the groundwater fluctuates, the direction of flow does not appear to change.
- There are small variations in field parameters over the site with no clear correlations between field parameters and NOX concentrations identified.
- The nitrogen plume appears to be flowing in a vertically downward direction and possibly extend towards the southeast similar to the groundwater contours with elevated concentrations in the mound.

### 5.2 Recommendation

The following recommendation is based on the existing available information in context of the overriding goal to develop a field-monitoring framework at home sites and a simple groundwater model (Task D). As discussed in the instrumentation report (Task C.23 report), the variability of the underlying limestone rock and clay layers made installation of monitoring points very difficult. The results from this sample event indicate that further monitoring of the sample points will not assist in developing the simple groundwater model as the plume flow path appears to be in a vertical downward direction. Additional analyses of field parameters and sampling of all locations will not provide the information needed to determine the necessary parameters for model development nor determination of nitrogen fate and transport. Therefore, the recommendation is to abandon this site.

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# **Appendix A: C-HS1 Sample Identification**

		Table A.1 C-HS1 Sample Iden	tification	
	Sample ID	Type of Monitoring Point	Surface Elevation (ft)	Bottom Elevation (ft)
1	STE	Waste Water	NA	NA
2	DP-01	1" Drive Point	96.30	87.05
3	DP-02	1" Drive Point	95.61	86.71
4	DP-03	1" Drive Point	96.33	86.49
5	DP-04	1" Drive Point	96.32	85.71
6	DP-05	1" Drive Point	96.25	86.70
7	DP-06	1" Drive Point	96.05	87.35
8	DP-07	1" Drive Point	96.24	90.14
9	DP-08	1" Drive Point	97.41	89.89
10	PZ-01	3/4" Standpipe Piezometer	95.73	85.11
11	PZ-02	3/4" Standpipe Piezometer	96.17	86.99
12	PZ-03	3/4" Standpipe Piezometer	96.54	88.66
13	PZ-04	3/4" Standpipe Piezometer	95.77	85.76
14	PZ-05	3/4" Standpipe Piezometer	96.06	87.99
15	PZ-06	3/4" Standpipe Piezometer	95.57	90.26
16	PZ-07	3/4" Standpipe Piezometer	99.84	87.22
17	PZ-08	3/4" Standpipe Piezometer	95.91	89.69
18	PZ-09	3/4" Standpipe Piezometer	96.33	86.73
19	PZ-10	3/4" Standpipe Piezometer	95.97	88.80
20	PZ-11	3/4" Standpipe Piezometer	97.17	85.27
21	PZ-12	3/4" Standpipe Piezometer	96.36	87.93
22	PZ-13	3/4" Standpipe Piezometer	97.15	89.44
23	PZ-14	3/4" Standpipe Piezometer	97.31	89.84
24	PZ-15	3/4" Standpipe Piezometer	99.79	86.73
25	LY-01	Soil Lysimeter	99.84	≈93.84
26	LY-02	Soil Lysimeter	99.79	≈93.79

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## **Appendix B: Weather Station Data**

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	Temp	Temp	Temp	Humidity	Humidity	Humidity	Wind	Wind	Wind	Rain	Rain
Period	high	avg	low	high	avg	low	high	avg	low	max	total
	(°F)	(°F)	(°F)	(%)	(%)	(%)	(mph)	(mph)	(mph)	(in)	(in)
Jan-10	59	47	34	89	64	39	23	17	7	4.66	8.09
Feb-10	59	47	34	90	66	42	23	18	6	2.13	4.97
Mar-10	69	56	43	92	65	38	24	18	6	2.62	5.11
Apr-10	82	68	53	95	64	33	22	16	5	1.54	3.58
May-10	89	78	66	93	70	45	21	16	5	1.18	2.95
Jun-10	95	84	73	93	69	44	22	16	4	1.90	7.99
Jul-10	94	85	75	93	72	50	26	19	5	1.81	7.83
Aug-10	92	84	76	94	76	56	25	19	4	2.31	9.97
Sep-10	93	81	69	92	66	39	19	14	4	0.71	2.02
Oct-10	84	69	53	92	64	35	20	15	4	0.43	0.78
Nov-10	74	59	44	94	67	40	19	14	5	2.88	3.90
Dec-10	59	45	30	89	63	36	21	16	6	0.37	1.48
Jan-11	59	47	34	94	68	42	21	16	5	1.43	4.43
Feb-11	69	56	42	95	70	43	21	16	5	0.96	2.61
Mar-11	78	64	49	94	67	39	24	18	6	1.56	3.14
Apr-11	85	70	54	94	66	37	23	17	5	1.11	2.11

# Table B.1Monthly Recorded Meteorological Data

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# **Appendix C: Water Quality Analytical Results**

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## Table C.1 Water Quality Analytical Results (May 19-20, 2011)

Sample ID	Sample Date	Sample Time	Sample Type	Temp (°C)	рН	Specific Conductance (µS)	DO (mg/L)	Total Alkalinity (mg/L)	TSS (mg/L)	CBOD₅ (mg/L)	COD	TN (mg-N/L)	TKN (mg-N/L)	Organic N (mg-N/L)	NH3-N (mg-N/L)	NOx (mg-N/L)	TIN (mg-N/L)	TP (mg-P/L)	TS % by Wt.
STE Sample																			
C-HS1-STE	05/19/11	12:45	G	22.3	7.20	1367	1.36	610	89	92		110.16	110	17.00	93	0.16	93.16	30	0.07
Drive Points																			
C-HS1-DP01	05/20/11	10:36	G	18.6	6.60	845	0.84	390			55	0.82	0.81	0.58	0.23	0.01	0.24	0.055	
C-HS1-DP02	05/20/11	10:22	G	18.7	6.60	770	0.56	370			26	0.87	0.86	0.68	0.18	0.01	0.19	0.042	
C-HS1-DP03	05/20/11	12:38	G	18.6	6.60	868	0.44	420			22	0.58	0.57	0.43	0.14	0.01	0.15	0.15	
C-HS1-DP03-D	05/20/11	12:40	G	18.6	6.60	868	0.44	430			18	0.60	0.59	0.47	0.12	0.01	0.13	0.17	
C-HS1-DP04	05/19/11	17:30	G	18.8	7.10	570	0.38	280			65	0.82	0.77	0.66	0.11	0.05	0.16	0.16	
C-HS1-DP05	05/19/11	18:26	G	20.6	7.10	830	1.50	360			22	0.84	0.81	0.75	0.06	0.03	0.09	0.022	
C-HS1-DP06	05/19/11	16:54	G	19.2	7.00	926	0.49	370			69	2.21	2.2	2.07	0.13	0.01	0.14	0.22	
C-HS1-DP07	05/20/11	12:55	G	18.9	6.60	813	0.46	360			18	0.63	0.62	0.53	0.094	0.01	0.10	0.058	
Piezometers																			
C-HS1-PZ01	05/20/11	10:11	G	18.9	5.83	75	0.71	33			32	1.64	1.5	1.38	0.12	0.14	0.26	0.17	
C-HS1-PZ01-D	05/20/11	10:09	G	18.9	5.83	75	0.71	33			51	1.54	1.4	1.28	0.12	0.14	0.26	0.15	
C-HS1-PZ02	05/19/11	15:39	G	19.2	7.10	516	3.02	240			10	0.45	0.44	0.36	0.076	0.01	0.09	0.15	
C-HS1-PZ03	05/19/11	15:06	G	19.0	7.10	500	1.95	270			10	0.81	0.8	0.59	0.21	0.01	0.22	0.081	
C-HS1-PZ04	05/19/11	16:11	G	19.2	7.20	484	1.45	290			10	0.86	0.85	0.74	0.11	0.01	0.12	0.084	
C-HS1-PZ05	05/20/11	11:00	G	18.8	6.60	752	2.58	380			24	1.01	1	1.00	0.005	0.01	0.02	0.071	
C-HS1-PZ06	05/19/11	14:37	G	21.3	7.29	580	6.86	300			10	10.13	0.43	0.42	0.01	9.7	9.71	0.026	
C-HS1-PZ07	05/20/11	15:26	G	19.6	6.50	999	1.04	320			10	36.60	2.6	2.60	0.005	34	34.01	0.2	
C-HS1-PZ07-D	05/20/11	15:30	G	19.6	6.50	999	1.04	320			10	36.60	2.6	2.60	0.005	34	34.01	0.21	
C-HS1-PZ09	05/19/11	17:58	G	19.1	7.10	665	0.56	300			10	1.41	1.4	1.15	0.25	0.01	0.26	0.031	
C-HS1-PZ10	05/19/11	16:39	G	19.5	7.10	674	0.58	320			10	1.87	1	0.98	0.02	0.87	0.89	0.010	
C-HS1-PZ11	05/20/11	11:38	G	18.8	6.69	913	0.43	380			10	3.90	2.8	2.21	0.59	1.1	1.69	0.042	
C-HS1-PZ12	05/20/11	12:18	G	19.0	6.60	933	0.78	380			10	6.90	2.4	2.28	0.12	4.5	4.62	0.15	
C-HS1-PZ13	05/20/11	13:29	G	18.9	6.12	692	1.49	130			63	3.30	3.2	2.99	0.21	0.1	0.31	0.6	
C-HS1-PZ15	05/20/11	15:40	G	22.6	6.51	842	1.48	390			24	1.28	0.78	0.65	0.13	0.5	0.63	0.56	
Lysimeters																			
C-HS1-LY01	05/20/11	14:40	G	21.6	6.42	788	4.57	140			26	7.67	0.47	0.40	0.067	7.2	7.27	1.6	
C-HS1-LY02	05/20/11	14:18	G	24.2	6.34	1433	1.95	270			22	4.31	0.71	0.71	0.005	3.6	3.61	31	
Notes:																			

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. Held beyond hold time Sample had bubbles while pumping

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY C-HS1 MONITORING DATA SUMMARY REPORT NO. 1

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



# **Appendix D: Summary of Water Quality Data**

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY C-HS1 MONITORING DATA SUMMARY REPORT NO. 1

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

#### Table D.1 Summary of Water Quality Data

Sample ID	Statistical Parameter	Temp (°C)	рН	Specific Conductance (µS)	DO (mg/L)	Total Alkalinity (mg/L)	TSS (mg/L)	CBOD₅ (mg/L)	COD	TN (mg-N/L)	TKN (mg-N/L)	Organic N (mg- N/L)	NH3-N (mg-N/L)	NOx (mg-N/L)	TIN (mg-N/L)	TP (mg-P/L)	TS % by Wt.
STE Sample	•	•								•							
	n	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1
	MEAN	22.30	7.20	1367.00	1.36	610.00	89.00	92.00		110.16	110.00	17.00	93.00	0.16	93.16	30.00	0.07
C-HS1-STE	STD. DEV.																
	MIN	22.30	7.20	1367.00	1.36	610.00	89.00	92.00		110.16	110.00	17.00	93.00	0.16	93.16	30.00	0.07
	MAX	22.30	7.20	1367.00	1.36	610.00	89.00	92.00		110.16	110.00	17.00	93.00	0.16	93.16	30.00	0.07
Drive Points																	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	18.60	6.60	845.00	0.84	390.00			55.00	0.82	0.81	0.58	0.23	0.01	0.24	0.06	
C-HS1-DP01	STD. DEV.																
	MIN	18.60	6.60	845.00	0.84	390.00			55.00	0.82	0.81	0.58	0.23	0.01	0.24	0.06	
	MAX	18.60	6.60	845.00	0.84	390.00			55.00	0.82	0.81	0.58	0.23	0.01	0.24	0.06	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	ļ
	MEAN	18.70	6.60	770.00	0.56	370.00			26.00	0.87	0.86	0.68	0.18	0.01	0.19	0.04	ļ
C-HS1-DP02	STD. DEV.																ļ
	MIN	18.70	6.60	770.00	0.56	370.00			26.00	0.87	0.86	0.68	0.18	0.01	0.19	0.04	l
	MAX	18.70	6.60	770.00	0.56	370.00			26.00	0.87	0.86	0.68	0.18	0.01	0.19	0.04	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	ļ
C 1154 DD00	MEAN	18.60	6.60	868.00	0.44	420.00			22.00	0.58	0.57	0.43	0.14	0.01	0.15	0.15	
C-HS1-DP03	STD. DEV.	40.00	6.60	0.00	0.44	420.00			22.00	0.50	0.57	0.42	0.44	0.04	0.45	0.45	ļ
	IVIIN	18.60	6.60	868.00	0.44	420.00			22.00	0.58	0.57	0.43	0.14	0.01	0.15	0.15	
	IVIAX	18.60	6.60	868.00	0.44	420.00			22.00	0.58	0.57	0.43	0.14	0.01	0.15	0.15	
		10.00	7 10	T	1	1 280.00			1	1	0.77	1	0.11	1	0.16	0.16	
		18.80	7.10	570.00	0.38	280.00			05.00	0.82	0.77	0.00	0.11	0.05	0.10	0.10	
C HSI DI 04	STD. DEV.	18.80	7 10	570.00	0.38	280.00			65.00	0.82	0.77	0.66	0.11	0.05	0.16	0.16	
	ΜΔΧ	18.80	7.10	570.00	0.38	280.00			65.00	0.82	0.77	0.00	0.11	0.05	0.10	0.10	
	n	10.00	1	1	1	1			1	1	1	1	1	1	1	1	
	ΜΕΔΝ	20.60	7 10	830.00	1 50	360.00			22.00	0.84	0.81	0.75	0.06	0.03	0.09	0.02	
C-HS1-DP05	STD. DEV.	20.00	7110	000.00	1.00	500.00			22.00	0.01	0.01	0.75	0.00	0.00	0.05	0.02	
	MIN	20.60	7.10	830.00	1.50	360.00			22.00	0.84	0.81	0.75	0.06	0.03	0.09	0.02	
	MAX	20.60	7.10	830.00	1.50	360.00			22.00	0.84	0.81	0.75	0.06	0.03	0.09	0.02	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	19.20	7.00	926.00	0.49	370.00			69.00	2.21	2.20	2.07	0.13	0.01	0.14	0.22	
C-HS1-DP06	STD. DEV.																
	MIN	19.20	7.00	926.00	0.49	370.00			69.00	2.21	2.20	2.07	0.13	0.01	0.14	0.22	
	MAX	19.20	7.00	926.00	0.49	370.00			69.00	2.21	2.20	2.07	0.13	0.01	0.14	0.22	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	18.90	6.60	813.00	0.46	360.00			18.00	0.63	0.62	0.53	0.09	0.01	0.10	0.06	
C-HS1-DP07	STD. DEV.																
	MIN	18.90	6.60	813.00	0.46	360.00			18.00	0.63	0.62	0.53	0.09	0.01	0.10	0.06	
	MAX	18.90	6.60	813.00	0.46	360.00			18.00	0.63	0.62	0.53	0.09	0.01	0.10	0.06	

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY C-HS1 MONITORING DATA SUMMARY REPORT NO. 1

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

#### Table D.1 (con't) Summary of Water Quality Data

Sample ID	Statistical	Temp	рН	Specific Conductance	DO (mg/l)	Total Alkalinity	TSS (mg/l)	CBOD₅	COD	TN (ma N/l)	TKN	Organic N (mg-	NH3-N	NOx	TIN (ma N/L)	TP (ma D(L)	TS %
	Farameter	(0)		(μS)	(IIIg/L)	(mg/L)	(IIIg/L)	(mg/L)		(IIIg-IN/L)	(IIIg-IN/L)	N/L)	(IIIg-IN/L)	(IIIg-IN/L)	(IIIg-IN/L)	(111g-F/L)	by Wt.
Piezometers					0		0						-				
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	18.90	5.83	75.00	0.71	33.00			32.00	1.64	1.50	1.38	0.12	0.14	0.26	0.17	
C-HS1-PZ01	STD. DEV.																
	MIN	18.90	5.83	75.00	0.71	33.00			32.00	1.64	1.50	1.38	0.12	0.14	0.26	0.17	
	MAX	18.90	5.83	75.00	0.71	33.00			32.00	1.64	1.50	1.38	0.12	0.14	0.26	0.17	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	19.20	7.10	516.00	3.02	240.00			10.00	0.45	0.44	0.36	0.08	0.01	0.09	0.15	
C-HS1-PZ02	STD. DEV.																
	MIN	19.20	7.10	516.00	3.02	240.00			10.00	0.45	0.44	0.36	0.08	0.01	0.09	0.15	
	MAX	19.20	7.10	516.00	3.02	240.00			10.00	0.45	0.44	0.36	0.08	0.01	0.09	0.15	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	19.00	7.10	500.00	1.95	270.00			10.00	0.81	0.80	0.59	0.21	0.01	0.22	0.08	
C-HS1-PZ03	STD. DEV.																
	MIN	19.00	7.10	500.00	1.95	270.00			10.00	0.81	0.80	0.59	0.21	0.01	0.22	0.08	
	MAX	19.00	7.10	500.00	1.95	270.00			10.00	0.81	0.80	0.59	0.21	0.01	0.22	0.08	_
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	19.20	7.20	484.00	1.45	290.00			10.00	0.86	0.85	0.74	0.11	0.01	0.12	0.08	
C-HS1-PZ04	STD. DEV.																
	MIN	19.20	7.20	484.00	1.45	290.00			10.00	0.86	0.85	0.74	0.11	0.01	0.12	0.08	
	MAX	19.20	7.20	484.00	1.45	290.00			10.00	0.86	0.85	0.74	0.11	0.01	0.12	0.08	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	18.80	6.60	752.00	2.58	380.00			24.00	1.01	1.00	1.00	0.01	0.01	0.02	0.07	
C-HS1-PZ05	STD. DEV.																
	MIN	18.80	6.60	752.00	2.58	380.00			24.00	1.01	1.00	1.00	0.01	0.01	0.02	0.07	
	MAX	18.80	6.60	752.00	2.58	380.00			24.00	1.01	1.00	1.00	0.01	0.01	0.02	0.07	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	21.30	7.29	580.00	6.86	300.00			10.00	10.13	0.43	0.42	0.01	9.70	9.71	0.03	
C-HS1-PZ06	STD. DEV.																
	MIN	21.30	7.29	580.00	6.86	300.00			10.00	10.13	0.43	0.42	0.01	9.70	9.71	0.03	
	MAX	21.30	7.29	580.00	6.86	300.00			10.00	10.13	0.43	0.42	0.01	9.70	9.71	0.03	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	19.60	6.50	999.00	1.04	320.00			10.00	36.60	2.60	2.60	0.01	34.00	34.01	0.20	
C-HS1-PZ07	STD. DEV.																
	MIN	19.60	6.50	999.00	1.04	320.00			10.00	36.60	2.60	2.60	0.01	34.00	34.01	0.20	
	MAX	19.60	6.50	999.00	1.04	320.00			10.00	36.60	2.60	2.60	0.01	34.00	34.01	0.20	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	19.10	7.10	665.00	0.56	300.00			10.00	1.41	1.40	1.15	0.25	0.01	0.26	0.03	
C-HS1-PZ09	STD. DEV.																
	MIN	19.10	7.10	665.00	0.56	300.00			10.00	1.41	1.40	1.15	0.25	0.01	0.26	0.03	
	MAX	19.10	7.10	665.00	0.56	300.00			10.00	1.41	1.40	1.15	0.25	0.01	0.26	0.03	

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY C-HS1 MONITORING DATA SUMMARY REPORT NO. 1

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Table D.1 (con't)
Summary of Water Quality Data

Sample ID	Statistical Parameter	Temp (°C)	рН	Specific Conductance (µS)	DO (mg/L)	Total Alkalinity (mg/L)	TSS (mg/L)	CBOD₅ (mg/L)	COD	TN (mg-N/L)	TKN (mg-N/L)	Organic N (mg- N/L)	NH3-N (mg-N/L)	NOx (mg-N/L)	TIN (mg-N/L)	TP (mg-P/L)	TS % by Wt.
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	19.50	7.10	674.00	0.58	320.00			10.00	1.87	1.00	0.98	0.02	0.87	0.89	0.01	
C-HS1-PZ10	STD. DEV.																
	MIN	19.50	7.10	674.00	0.58	320.00			10.00	1.87	1.00	0.98	0.02	0.87	0.89	0.01	
	MAX	19.50	7.10	674.00	0.58	320.00			10.00	1.87	1.00	0.98	0.02	0.87	0.89	0.01	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	18.80	6.69	913.00	0.43	380.00			10.00	3.90	2.80	2.21	0.59	1.10	1.69	0.04	
C-HS1-PZ11	STD. DEV.																
	MIN	18.80	6.69	913.00	0.43	380.00			10.00	3.90	2.80	2.21	0.59	1.10	1.69	0.04	
	MAX	18.80	6.69	913.00	0.43	380.00			10.00	3.90	2.80	2.21	0.59	1.10	1.69	0.04	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	19.00	6.60	933.00	0.78	380.00			10.00	6.90	2.40	2.28	0.12	4.50	4.62	0.15	
C-HS1-PZ12	STD. DEV.																
	MIN	19.00	6.60	933.00	0.78	380.00			10.00	6.90	2.40	2.28	0.12	4.50	4.62	0.15	
	MAX	19.00	6.60	933.00	0.78	380.00			10.00	6.90	2.40	2.28	0.12	4.50	4.62	0.15	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	18.90	6.12	692.00	1.49	130.00			63.00	3.30	3.20	2.99	0.21	0.10	0.31	0.60	
C-HS1-PZ13	STD. DEV.																
	MIN	18.90	6.12	692.00	1.49	130.00			63.00	3.30	3.20	2.99	0.21	0.10	0.31	0.60	
	MAX	18.90	6.12	692.00	1.49	130.00			63.00	3.30	3.20	2.99	0.21	0.10	0.31	0.60	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	22.60	6.51	842.00	1.48	390.00			24.00	1.28	0.78	0.65	0.13	0.50	0.63	0.56	
C-HS1-PZ-15	STD. DEV.																
	MIN	22.60	6.51	842.00	1.48	390.00			24.00	1.28	0.78	0.65	0.13	0.50	0.63	0.56	
	MAX	22.60	6.51	842.00	1.48	390.00			24.00	1.28	0.78	0.65	0.13	0.50	0.63	0.56	
Lysimeters																	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	21.60	6.42	788.00	4.57	140.00			26.00	7.67	0.47	0.40	0.07	7.20	7.27	1.60	
C-HS1-LY01	STD. DEV.																
	MIN	21.60	6.42	788.00	4.57	140.00			26.00	7.67	0.47	0.40	0.07	7.20	7.27	1.60	
	MAX	21.60	6.42	788.00	4.57	140.00			26.00	7.67	0.47	0.40	0.07	7.20	7.27	1.60	
	n	1	1	1	1	1			1	1	1	1	1	1	1	1	
	MEAN	24.20	6.34	1433.00	1.95	270.00			22.00	4.31	0.71	0.71	0.01	3.60	3.61	31.00	I
C-HS1-LY02	STD. DEV.									L							I
	MIN	24.20	6.34	1433.00	1.95	270.00			22.00	4.31	0.71	0.71	0.01	3.60	3.61	31.00	I
Nataa	MAX	24.20	6.34	1433.00	1.95	270.00			22.00	4.31	0.71	0.71	0.01	3.60	3.61	31.00	1

Notes: 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. Held beyond hold time Sample had bubbles while pumping

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY C-HS1 MONITORING DATA SUMMARY REPORT NO. 1

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# **Appendix E: Laboratory Report**

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY C-HS1 MONITORING DATA SUMMARY REPORT NO. 1

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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

June 3, 2011 Work Order: 1104283

Laboratory Report

Project Name	Project Name Wakulla County-C-HS1 SE#1									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-STE Wastewater 1104283-01 05/19/11 12:45 Client 05/23/11 11:10								
Inorganics										
Ammonia as N	mg/L	93	EPA 350.1	0.010	0.005		05/27/11 09:30	SMD		
Carbonaceous BOD	mg/L	92 Q	SM 5210B	2	2	05/23/11 15:39	05/28/11 10:39	KTC		
Phosphorous - Total as P	mg/L	30	SM 4500P-E	0.040	0.010	05/27/11 14:05	05/31/11 15:55	SMD		
Total Alkalinity	mg/L	610	SM 2320B	8.0	2.0		05/31/11 15:24	MMF		
Total Kjeldahl Nitrogen	mg/L	110	EPA 351.2	0.20	0.05	05/26/11 17:09	05/31/11 14:32	SMD		
Total Solids	% by wt	0.07 Q	EPA 160.3	0.01	0.01	05/26/11 17:00	05/27/11 16:07	JAG		
Total Suspended Solids	mg/L	89	SM 2540D	1	1	05/25/11 10:33	05/26/11 09:15	JAG		
Nitrate+Nitrite (N)	mg/L	0.16	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ01 Groundwater 1104283-02 05/20/11 10:11 Client 05/23/11 12:05								
Inorganics										
Ammonia as N	mg/L	0.12	EPA 350.1	0.010	0.005		05/27/11 09:30	SMD		
Chemical Oxygen Demand	mg/L	32	EPA 410.4	25	10		05/25/11 10:43	MMF		
Phosphorous - Total as P	mg/L	0.17	SM 4500P-E	0.040	0.010	05/27/11 14:05	05/31/11 15:55	SMD		
Total Alkalinity	mg/L	33	SM 2320B	8.0	2.0		05/31/11 15:24	MMF		
Total Kjeldahl Nitrogen	mg/L	1.5	EPA 351.2	0.20	0.05	05/26/11 17:09	05/31/11 14:32	SMD		
Nitrate+Nitrite (N)	mg/L	0.14	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ01-D Groundwater 1104283-03 05/20/11 10:09 Client 05/23/11 12:05								
Inorganics										
Ammonia as N	mg/L	0.12	EPA 350.1	0.010	0.005		05/27/11 09:30	SMD		
Chemical Oxygen Demand	mg/L	51	EPA 410.4	25	10		05/25/11 10:43	MMF		
Phosphorous - Total as P	mg/L	0.15	SM 4500P-E	0.040	0.010	05/27/11 14:05	05/31/11 15:55	SMD		
Total Alkalinity	mg/L	33	SM 2320B	8.0	2.0		05/31/11 15:24	MMF		
Total Kjeldahl Nitrogen	mg/L	1.4	EPA 351.2	0.20	0.05	05/26/11 17:09	05/31/11 14:32	SMD		
Nitrate+Nitrite (N)	mg/L	0.14	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD		

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

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



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

June 3, 2011 Work Order: 1104283

Project Name		Wakulla County-C-HS1 SE#1									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ02 Groundwater 1104283-04 05/19/11 15:39 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen	mg/L mg/L mg/L mg/L mg/L	0.076 10 U 0.15 240 0.44	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2	0.010 25 0.040 8.0 0.20	0.005 10 0.010 2.0 0.05	05/27/11 14:05 05/26/11 17:12	05/27/11 09:30 05/25/11 10:43 05/31/11 15:55 05/31/11 15:24 06/01/11 14:04	SMD MMF SMD MMF SMD			
Nitrate+Nitrite (N)	mg/L	0.01 U	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ03 Groundwater 1104283-05 05/19/11 15:06 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L mg/L mg/L mg/L	0.21 10 U 0.081 270 0.80 0.01 U	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2 EPA 353.2	0.010 25 0.040 8.0 0.20 0.04	0.005 10 0.010 2.0 0.05 0.01	05/27/11 14:05 05/26/11 17:12	05/27/11 09:30 05/25/11 10:43 05/31/11 15:55 05/31/11 15:24 06/01/11 14:04 05/31/11 09:10	SMD MMF SMD MMF SMD SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ04 Groundwater 1104283-06 05/19/11 16:11 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P	mg/L mg/L mg/L	0.11 10 U 0.084	EPA 350.1 EPA 410.4 SM 4500P-E	0.010 25 0.040	0.005 10 0.010	05/27/11 14:05	05/27/11 09:30 05/25/11 10:43 05/31/11 15:55	SMD MMF SMD			
i otal Alkalinity Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L mg/L	290 0.85 0.01 U	SM 2320B EPA 351.2 EPA 353.2	8.0 0.20 0.04	2.0 0.05 0.01	05/26/11 17:12	05/31/11 15:24 06/01/11 14:04 05/31/11 09:10	MMF SMD SMD			

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

June 3, 2011 Work Order: 1104283

Project Name		Wakulla County-C-HS1 SE#1									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ05 Groundwater 1104283-07 05/20/11 11:00 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen Nitrato+Nitrito (N)	mg/L mg/L mg/L mg/L mg/L	0.005 U 24 I 0.071 380 1.0	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2 EPA 353.2	0.010 25 0.040 8.0 0.20	0.005 10 0.010 2.0 0.05 0.01	05/27/11 14:05 05/26/11 17:12	06/02/11 13:37 05/25/11 10:43 05/31/11 15:55 05/31/11 15:24 06/01/11 14:04	SMD MMF SMD MMF SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ06 Groundwater 1104283-08 05/19/11 14:37 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L mg/L mg/L mg/L	0.010 10 U 0.026 I 300 0.43 9.7	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2 EPA 353.2	0.010 25 0.040 8.0 0.20 0.04	0.005 10 0.010 2.0 0.05 0.01	05/27/11 14:05 05/26/11 17:12	06/02/11 13:37 05/25/11 10:43 05/31/11 15:55 05/31/11 15:24 06/01/11 14:04 05/31/11 09:10	SMD MMF SMD MMF SMD SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ07 Groundwater 1104283-09 05/20/11 15:26 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P	mg/L mg/L mg/L	0.005 U 10 U 0.20	EPA 350.1 EPA 410.4 SM 4500P-E	0.010 25 0.040	0.005 10 0.010	05/27/11 14:05	06/02/11 13:37 05/25/11 10:43 05/31/11 15:55	SMD MMF SMD			
Total Alkalinity Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L mg/L	320 2.6 34	SM 2320B EPA 351.2 EPA 353.2	8.0 0.20 0.04	2.0 0.05 0.01	05/26/11 17:12	05/31/11 15:24 06/01/11 14:04 05/31/11 09:10	MMF SMD SMD			

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

June 3, 2011 Work Order: 1104283

Project Name		Wakulla County-C-HS1 SE#1									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ07-D Groundwater 1104283-10 05/20/11 15:30 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity	mg/L mg/L mg/L mg/L	0.005 U 10 U 0.21 320	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B	0.010 25 0.040 8.0	0.005 10 0.010 2.0	05/27/11 14:05	06/02/11 13:37 05/25/11 10:43 05/31/11 15:55 05/31/11 15:24	SMD MMF SMD MMF			
Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L	2.6 34	EPA 351.2 EPA 353.2	0.20 0.04	0.05 0.01	05/26/11 17:12	06/01/11 14:04 05/31/11 09:10	SMD SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ09 Groundwater 1104283-12 05/19/11 17:58 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L mg/L mg/L mg/L	0.25 10 U 0.031 I 300 1.4 0.01 U	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2 EPA 353.2	0.010 25 0.040 8.0 0.20 0.04	0.005 10 0.010 2.0 0.05 0.01	05/27/11 14:05 05/26/11 17:12	06/02/11 13:37 05/25/11 10:43 05/31/11 15:55 05/31/11 15:24 06/01/11 14:04 05/31/11 09:10	SMD MMF SMD MMF SMD SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ10 Groundwater 1104283-13 05/19/11 16:39 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P	mg/L mg/L mg/L	0.020 10 U 0.010 U	EPA 350.1 EPA 410.4 SM 4500P-E	0.010 25 0.040	0.005 10 0.010	05/27/11 14:05	06/02/11 13:37 05/25/11 10:43 05/31/11 15:55	SMD MMF SMD			
Total Alkalinity Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L mg/L	320 1.0 0.87	SM 2320B EPA 351.2 EPA 353.2	8.0 0.20 0.04	2.0 0.05 0.01	05/26/11 17:12	05/31/11 15:24 06/01/11 14:04 05/31/11 09:10	MMF SMD SMD			

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

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Project Name		Wakulla County-C-HS1 SE#1									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ11 Groundwater 1104283-14 05/20/11 11:38 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen	mg/L mg/L mg/L mg/L mg/L	0.59 10 U 0.042 380 2.8	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2 EPA 252 2	0.010 25 0.040 8.0 0.20	0.005 10 0.010 2.0 0.05	05/27/11 14:05 05/26/11 17:12	06/02/11 13:37 05/25/11 10:43 05/31/11 15:55 05/31/11 15:24 06/01/11 14:04	SMD MMF SMD MMF SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ12 Groundwater 1104283-15 05/20/11 12:18 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L mg/L mg/L mg/L	0.12 10 U 0.15 380 2.4 4.5	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2 EPA 353.2	0.010 25 0.040 8.0 0.20 0.04	0.005 10 0.010 2.0 0.05 0.01	05/27/11 14:05 05/26/11 17:12	06/02/11 13:37 05/25/11 10:43 05/31/11 15:55 05/31/11 15:24 06/01/11 14:04 05/31/11 09:10	SMD MMF SMD MMF SMD SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-PZ13 Groundwater 1104283-16 05/20/11 13:29 Client 05/23/11 12:05									
Inorganics											
Ammonia as N Chemical Oxygen Demand	mg/L mg/L	0.21 63	EPA 350.1 EPA 410.4	0.010 25	0.005 10	05/31/11 10:30	06/02/11 13:37 05/31/11 16:40	SMD MMF			
Phosphorous - Total as P Total Alkalinity	mg/L ma/L	0.60	SM 4500P-E SM 2320B	0.040 8.0	0.010 2.0	05/27/11 14:05	05/31/11 15:55 05/31/11 15:24	SMD MMF			
Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L	3.2 0.10	EPA 351.2 EPA 353.2	0.20 0.04	0.05 0.01	05/26/11 17:12	06/01/11 14:04 05/31/11 09:10	SMD SMD			

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Project Name		Wakulla County-C-HS1 SE#1								
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-DP01 Groundwater 1104283-18 05/20/11 10:36 Client 05/23/11 12:05								
Inorganics										
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen	mg/L mg/L mg/L mg/L mg/L	0.23 55 0.055 390 0.81	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2	0.010 25 0.040 8.0 0.20	0.005 10 0.010 2.0 0.05	05/31/11 10:30 05/27/11 14:05 05/26/11 17:12	06/02/11 13:37 05/31/11 16:40 05/31/11 15:55 05/31/11 15:24 06/01/11 14:04	SMD MMF SMD MMF SMD		
Nitrate+Nitrite (N)	mg/L	0.01 U	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-DP02 Groundwater 1104283-19 05/20/11 10:22 Client 05/23/11 12:05								
Inorganics										
Ammonia as N Chemical Oxygen Demand Phosphorous - Total as P Total Alkalinity Total Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L mg/L mg/L mg/L	0.18 26 0.042 370 0.86 0.01 U	EPA 350.1 EPA 410.4 SM 4500P-E SM 2320B EPA 351.2 EPA 353.2	0.010 25 0.040 8.0 0.20 0.04	0.005 10 0.010 2.0 0.05 0.01	05/31/11 10:30 05/27/11 14:07 05/26/11 17:12	06/02/11 13:37 05/31/11 16:40 05/31/11 17:08 05/31/11 15:24 06/01/11 14:04 05/31/11 09:10	SMD MMF SMD MMF SMD SMD		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-DP03 Groundwater 1104283-20 05/20/11 12:38 Client 05/23/11 12:05								
Inorganics										
Ammonia as N	mg/L	0.14	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD		
Chemical Oxygen Demand	mg/L	22	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF		
Phosphorous - Total as P	mg/L	0.15	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD		
	mg/L	420	SM 2320B	8.0	2.0	0=10011 + 1= 1=	05/31/11 15:24	MMF		
I otal Kjeldahl Nitrogen Nitrate+Nitrite (N)	mg/L mg/L	0.57 0.01 U	EPA 351.2 EPA 353.2	0.20 0.04	0.05 0.01	05/26/11 17:12	06/01/11 14:04 05/31/11 09:10	SMD		

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

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Project Name		Wakulla County-C-HS1 SE#1									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-DP03-D Groundwater 1104283-21 05/20/11 12:40 Client 05/23/11 12:05									
Inorganics											
Ammonia as N	mg/L	0.12	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD			
Chemical Oxygen Demand	mg/L	18 I	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF			
Phosphorous - Total as P	mg/L	0.17	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD			
Total Alkalinity	mg/L	430	SM 2320B	8.0	2.0		05/31/11 15:24	MMF			
Total Kjeldahl Nitrogen	mg/L	0.59	EPA 351.2	0.20	0.05	05/26/11 17:12	06/01/11 14:04	SMD			
Nitrate+Nitrite (N)	mg/L	0.01 U	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-DP04 Groundwater 1104283-22 05/19/11 17:30 Client 05/23/11 12:05									
Inorganics											
Ammonia as N	mg/L	0.11	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD			
Chemical Oxygen Demand	mg/L	65	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF			
Phosphorous - Total as P	mg/L	0.16	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD			
Total Alkalinity	mg/L	280	SM 2320B	8.0	2.0		05/31/11 15:24	MMF			
Total Kjeldahl Nitrogen	mg/L	0.77	EPA 351.2	0.20	0.05	05/26/11 17:12	06/01/11 14:04	SMD			
Nitrate+Nitrite (N)	mg/L	0.05	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-DP05 Groundwater 1104283-23 05/19/11 18:26 Client 05/23/11 12:05									
Inorganics											
Ammonia as N	mg/L	0.060	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD			
Chemical Oxygen Demand	mg/L	22 I	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF			
Phosphorous - Total as P	mg/L	0.022 I	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD			
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		05/31/11 15:24	MMF			
Total Kjeldahl Nitrogen	mg/L	0.81	EPA 351.2	0.20	0.05	05/26/11 17:12	06/01/11 14:04	SMD			
Nitrate+Nitrite (N)	mg/L	0.03	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD			

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June 3, 2011 Work Order: 1104283

Project Name		Wakulla County-C-HS1 SE#1									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-DP06 Groundwater 1104283-24 05/19/11 16:54 Client 05/23/11 12:05									
Inorganics											
Ammonia as N	mg/L	0.13	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD			
Chemical Oxygen Demand	mg/L	69	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF			
Phosphorous - Total as P	mg/L	0.22	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD			
Total Alkalinity	mg/L	370	SM 2320B	8.0	2.0		05/31/11 15:24	MMF			
Total Kjeldahl Nitrogen	mg/L	2.2	EPA 351.2	0.20	0.05	05/26/11 17:12	06/01/11 14:04	SMD			
Nitrate+Nitrite (N)	mg/L	0.01 U	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-DP07 Groundwater 1104283-25 05/20/11 12:55 Client 05/23/11 12:05									
Inorganics											
Ammonia as N	mg/L	0.094	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD			
Chemical Oxygen Demand	mg/L	18 I	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF			
Phosphorous - Total as P	mg/L	0.058	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD			
Total Alkalinity	mg/L	360	SM 2320B	8.0	2.0		05/31/11 15:24	MMF			
Total Kjeldahl Nitrogen	mg/L	0.62	EPA 351.2	0.20	0.05	05/26/11 17:12	06/01/11 14:04	SMD			
Nitrate+Nitrite (N)	mg/L	0.01 U	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD			
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		C-HS1-LY01 Groundwater 1104283-27 05/20/11 14:40 Client 05/23/11 12:05									
Inorganics											
Ammonia as N	mg/L	0.067	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD			
Chemical Oxygen Demand	mg/L	26	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF			
Phosphorous - Total as P	mg/L	1.6	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD			
Total Alkalinity	mg/L	140	SM 2320B	8.0	2.0		05/31/11 15:24	MMF			
Total Kjeldahl Nitrogen	mg/L	0.47	EPA 351.2	0.20	0.05	06/02/11 10:32	06/02/11 14:37	SMD			
Nitrate+Nitrite (N)	mg/L	7.2	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD			

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Project Name Wakulla County-C-HS1 SE#1										
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Ву		
Sample Description		C-HS1-LY02								
Matrix		Groundwater								
SAL Sample Number		1104283-28								
Date/Time Collected		05/20/11 14:18								
Collected by		Client								
Date/Time Received		05/23/11 12:05								
Inorganics										
Ammonia as N	mg/L	0.005 U	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD		
Chemical Oxygen Demand	mg/L	22	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF		
Phosphorous - Total as P	mg/L	31	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD		
Total Alkalinity	mg/L	270	SM 2320B	8.0	2.0		05/31/11 15:24	MMF		
Total Kjeldahl Nitrogen	mg/L	0.71	EPA 351.2	0.20	0.05	06/02/11 10:32	06/02/11 14:37	SMD		
Nitrate+Nitrite (N)	mg/L	3.6	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD		
Sample Description		PZ-15								
Matrix		Groundwater								
SAL Sample Number		1104283-29								
Date/Time Collected		05/20/11 15:40								
Collected by		Client								
Date/Time Received		05/23/11 12:05								
Inorganics										
Ammonia as N	mg/L	0.13	EPA 350.1	0.010	0.005		06/02/11 13:37	SMD		
Chemical Oxygen Demand	mg/L	24 I	EPA 410.4	25	10	05/31/11 10:30	05/31/11 16:40	MMF		
Phosphorous - Total as P	mg/L	0.56	SM 4500P-E	0.040	0.010	05/27/11 14:07	05/31/11 17:08	SMD		
Total Alkalinity	mg/L	390	SM 2320B	8.0	2.0		05/31/11 15:24	MMF		
Total Kjeldahl Nitrogen	mg/L	0.78	EPA 351.2	0.20	0.05	06/02/11 10:32	06/02/11 14:37	SMD		
Nitrate+Nitrite (N)	mg/L	0.50	EPA 353.2	0.04	0.01		05/31/11 09:10	SMD		

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Work Order: 1104283

June 3, 2011

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Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BE12349 - BOD										
Blank (BE12349-BLK1)					Prepared:	05/23/11 A	nalyzed: 05	/28/11		
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BE12349-BS1)					Prepared:	05/23/11 A	nalyzed: 05	/28/11		
Carbonaceous BOD	225	2	2	mg/L	200		112	85-115		
LCS Dup (BE12349-BSD1)					Prepared:	05/23/11 A	nalyzed: 05	/28/11		
Carbonaceous BOD	226	2	2	mg/L	200		113	85-115	0.4	10
Duplicate (BE12349-DUP1)		Source: 1	104453-01		Prepared:	05/23/11 A	nalyzed: 05	/28/11		
Carbonaceous BOD	110	2	2	mg/L		120			10	25
Batch BE12505 - TSS prep										
Blank (BE12505-BLK1)					Prepared:	05/25/11 A	nalyzed: 05	/26/11		
Total Suspended Solids	1 U	1	1	mg/L						
LCS (BE12505-BS1)					Prepared:	05/25/11 A	nalyzed: 05	/26/11		
Total Suspended Solids	50.0	1	1	mg/L	50		100	85-115		
Duplicate (BE12505-DUP1)		Source: 1	104258-03		Prepared:	05/25/11 A	nalyzed: 05	/26/11		
Total Suspended Solids	1.00	1	1	mg/L		1.00			0	30
Duplicate (BE12505-DUP2)		Source: 1	104453-05		Prepared:	05/25/11 A	nalyzed: 05	/26/11		
Total Suspended Solids	3.00	1	1	mg/L		3.00			0	30
Batch BE12624 - COD prep										
Blank (BE12624-BLK1)					Prepared 8	Analyzed:	05/25/11			
Chemical Oxygen Demand	10 U	25	10	mg/L						

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Work Order: 1104283

June 3, 2011

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

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BE12624 - COD prep										
LCS (BE12624-BS1)					Prepared 8	Analyzed:	05/25/11			
Chemical Oxygen Demand	47	25	10	mg/L	50		94	90-110		
Matrix Spike (BE12624-MS1)		Source: 1	104283-15		Prepared &	Analyzed:	05/25/11			
Chemical Oxygen Demand	51	25	10	mg/L	50	ND	102	85-115		
Matrix Spike Dup (BE12624-MSD1	1)	Source: 1	104283-15		Prepared &	Analyzed:	05/25/11			
Chemical Oxygen Demand	53	25	10	mg/L	50	ND	106	85-115	4	32
Batch BE12625 - Ammonia by	SEAL									
Blank (BE12625-BLK1)					Prepared &	Analyzed:	05/27/11			
Ammonia as N	0.005 U	0.010	0.005	mg/L						
Blank (BE12625-BLK2)					Prepared &	Analyzed:	05/27/11			
Ammonia as N	0.005 U	0.010	0.005	mg/L						
LCS (BE12625-BS1)					Prepared &	Analyzed:	05/27/11			
Ammonia as N	0.48	0.010	0.005	mg/L	0.50		97	90-110		
LCS (BE12625-BS2)					Prepared &	Analyzed:	05/27/11			
Ammonia as N	0.47	0.010	0.005	mg/L	0.50		93	90-110		
Matrix Spike (BE12625-MS1)	Source: 1	104232-36		Prepared &	Analyzed:	05/27/11				
Ammonia as N	0.46	0.010	0.005	mg/L	0.50	0.005	90	90-110		
Matrix Spike (BE12625-MS2)		Source: 1	104261-01		Prepared &	Analyzed:	05/27/11			
Ammonia as N	0.48 J5	0.010	0.005	mg/L	0.50	0.080	80	90-110		

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Work Order: 1104283

June 3, 2011

#### Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BE12625 - Ammonia by	SEAL									
Matrix Spike Dup (BE12625-MSD1	)	Source: 1	104232-36	i	Prepared 8	Analyzed:	05/27/11			
Ammonia as N	0.46	0.010	0.005	mg/L	0.50	0.005	92	90-110	2	10
Matrix Spike Dup (BE12625-MSD2	)	Source: 1	104261-01		Prepared &	Analyzed:	05/27/11			
Ammonia as N	0.50 J5	0.010	0.005	mg/L	0.50	0.080	83	90-110	3	10
Batch BE12626 - Digestion for	TKN by EPA	351.2								
Blank (BE12626-BLK1)					Prepared:	05/26/11 Ar	nalyzed: 05	/31/11		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BE12626-BS1)					Prepared:	05/26/11 Ar	nalyzed: 05	/31/11		
Total Kjeldahl Nitrogen	2.59	0.20	0.05	mg/L	2.5		103	90-110		
Matrix Spike (BE12626-MS1)		Source: 1	104232-35		Prepared:	05/26/11 Ar	nalyzed: 05	/31/11		
Total Kjeldahl Nitrogen	3.40 J5	0.20	0.05	mg/L	2.5	ND	136	80-120		
Matrix Spike Dup (BE12626-MSD1	)	Source: 1	104232-35		Prepared:	05/26/11 Ar	nalyzed: 05	/31/11		
Total Kjeldahl Nitrogen	3.45 J5	0.20	0.05	mg/L	2.5	ND	138	80-120	2	20
Batch BE12627 - Digestion for	TKN by EPA	351.2								
Blank (BE12627-BLK1)					Prepared:	05/26/11 Ar	nalyzed: 06	/01/11		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BE12627-BS1)					Prepared:	05/26/11 Ar	nalyzed: 06	/01/11		
Total Kjeldahl Nitrogen	2.68	0.20	0.05	mg/L	2.5		107	90-110		

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

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BE12627 - Digestion fe	or TKN by EPA	351.2								
Matrix Spike (BE12627-MS1)		Source: 1	104283-04		Prepared:	05/26/11 Ar	nalyzed: 06	/01/11		
Total Kjeldahl Nitrogen	2.94	0.20	0.05	mg/L	2.5	0.438	100	80-120		
Matrix Spike Dup (BE12627-MSI	01)	Source: 1	104283-04		Prepared:	05/26/11 Aı	nalyzed: 06	/01/11		
Total Kjeldahl Nitrogen	3.35	0.20	0.05	mg/L	2.5	0.438	116	80-120	13	20
Batch BE12715 - Digestion fe	or TP by EPA 3	65.2/SM450	0PE							
Blank (BE12715-BLK1)					Prepared:	05/27/11 Ar	nalyzed: 05	/31/11		
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BE12715-BS1)					Prepared:	05/27/11 Ai	nalyzed: 05	/31/11		
Phosphorous - Total as P	0.550	0.040	0.010	mg/L	0.50		110	90-110		
Matrix Spike (BE12715-MS1)		Source: 1	104426-07		Prepared:	05/27/11 Ai	nalyzed: 05	/31/11		
Phosphorous - Total as P	0.667	0.040	0.010	mg/L	0.50	0.171	99	75-125		
Matrix Spike Dup (BE12715-MSI	01)	Source: 1	104426-07		Prepared:	05/27/11 Ar	nalyzed: 05	/31/11		
Phosphorous - Total as P	0.735	0.040	0.010	mg/L	0.50	0.171	113	75-125	10	25
Batch BE12716 - Digestion fe	or TP by EPA 3	65.2/SM450	0PE							
Blank (BE12716-BLK1)					Prepared:	05/27/11 Ai	nalyzed: 05	/31/11		
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L						
LCS (BE12716-BS1)				Prepared:	05/27/11 Ai	nalyzed: 05	/31/11			
Phosphorous - Total as P	0.532	0.040	0.010	mg/L	0.50		106	90-110		

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

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BE12716 - Digestion fo	or TP by EPA 3	65.2/SM450	0PE							
Matrix Spike (BE12716-MS1)		Source: 1	104283-19		Prepared:	05/27/11 Ai	nalyzed: 05	/31/11		
Phosphorous - Total as P	0.654	0.040	0.010	mg/L	0.50	0.0425	122	75-125		
Matrix Spike Dup (BE12716-MSD	1)	Source: 1	104283-19		Prepared:	05/27/11 Ar	nalyzed: 05	/31/11		
Phosphorous - Total as P	0.699	0.040	0.010	mg/L	0.50	0.0425	131	75-125	7	25
Batch BE12717 - Nitrate 353.2	2 by seal									
Blank (BE12717-BLK1)					Prepared &	Analyzed:	05/31/11			
Nitrate+Nitrite (N)	0.01 U	0.04	0.01	mg/L						
Blank (BE12717-BLK2)				Prepared &	Analyzed:	05/31/11				
Nitrate+Nitrite (N)	0.01 U	0.04	0.01	mg/L						
LCS (BE12717-BS1)					Prepared &	Analyzed:	05/31/11			
Nitrate+Nitrite (N)	0.750	0.04	0.01	mg/L	0.80		94	90-110		
LCS (BE12717-BS2)					Prepared &	Analyzed:	05/31/11			
Nitrate+Nitrite (N)	0.799	0.04	0.01	mg/L	0.80		100	90-110		
Matrix Spike (BE12717-MS1)		Source: 1	104246-02		Prepared &	Analyzed:	05/31/11			
Nitrate+Nitrite (N)	1.46	0.04	0.01	mg/L	1.0	0.574	89	77-119		
Matrix Spike (BE12717-MS2) Source: 1104476-06					Prepared &	Analyzed:	05/31/11			
Nitrate+Nitrite (N)	1.05	0.04	0.01	mg/L	1.0	0.0151	103	77-119		
Matrix Spike Dup (BE12717-MSD	Source: 1	104246-02		Prepared &	Analyzed:	05/31/11				
Nitrate+Nitrite (N)	1.40	0.04	0.01	mg/L	1.0	0.574	83	77-119	4	20

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#### Hazen and Sawyer 10002 Princess Palm Ave, Suite 200

Tampa, FL 33619

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BE12717 - Nitrate 353.	2 by seal									
Matrix Spike Dup (BE12717-MSI	02)	Source: 1	104476-06		Prepared &	Analyzed:	05/31/11			
Nitrate+Nitrite (N)	1.12	0.04	0.01	mg/L	1.0	0.0151	110	77-119	7	20
Batch BE12725 - TS prep										
Blank (BE12725-BLK1)					Prepared:	05/26/11 Ai	nalyzed: 05	/27/11		
Total Solids	0.01 U	0.01	0.01	% by wt						
Duplicate (BE12725-DUP1)		Source: 1	104283-01		Prepared:	05/26/11 Ai	nalyzed: 05	/27/11		
Total Solids	0.0700	0.01	0.01	% by wt		0.0700			0	10
Batch BE13126 - alkalinity										
Blank (BE13126-BLK1)					Prepared 8	Analyzed:	05/31/11			
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
Blank (BE13126-BLK2)					Prepared &	Analyzed:	05/31/11			
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BE13126-BS1)					Prepared &	Analyzed:	05/31/11			
Total Alkalinity	130	8.0	2.0	mg/L	120		107	90-110		
LCS (BE13126-BS2)					Prepared &	Analyzed:				
Total Alkalinity	130	8.0	2.0	mg/L	120		107	90-110		
Matrix Spike (BE13126-MS1)	Source: 1	104283-19		Prepared &	Analyzed:	05/31/11				
Total Alkalinity	490	8.0	2.0	mg/L	120	370	98	80-120		

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

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BE13126 - alkalinity										
Matrix Spike (BE13126-MS2)		Source: 1	104618-02		Prepared 8	Analyzed:	05/31/11			
Total Alkalinity	320	8.0	2.0	mg/L	120	190	107	80-120		
Matrix Spike Dup (BE13126-MSD1)		Source: 1	104283-19		Prepared &	Analyzed:	05/31/11			
Total Alkalinity	480	8.0	2.0	mg/L	120	370	89	80-120	2	26
Matrix Spike Dup (BE13126-MSD2)		Source: 1	104618-02		Prepared &	Analyzed:	05/31/11			
Total Alkalinity	310	8.0	2.0	mg/L	120	190	98	80-120	4	26
Batch BE13131 - COD prep										
Blank (BE13131-BLK1)					Prepared 8	Analyzed:	05/31/11			
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BE13131-BS1)					Prepared &	Analyzed:	05/31/11			
Chemical Oxygen Demand	51	25	10	mg/L	50		102	90-110		
Matrix Spike (BE13131-MS1)		Source: 1	104283-16		Prepared &	Analyzed:	05/31/11			
Chemical Oxygen Demand	110	25	10	mg/L	50	63	88	85-115		
Matrix Spike Dup (BE13131-MSD1)		Source: 1	104283-16		Prepared &	Analyzed:	05/31/11			
Chemical Oxygen Demand	110	25	10	mg/L	50	63	92	85-115	2	32
Batch BF10122 - Ammonia by S	EAL									
Blank (BF10122-BLK1)					Prepared 8	Analyzed:	06/02/11			
Ammonia as N	0.005 U	0.010	0.005	mg/L						

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

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BF10122 - Ammonia by S	EAL									
Blank (BF10122-BLK2)					Prepared 8	Analyzed:	06/02/11			
Ammonia as N	0.005 U	0.010	0.005	mg/L						
LCS (BF10122-BS1)					Prepared &	Analyzed:	06/02/11			
Ammonia as N	0.52	0.010	0.005	mg/L	0.50		103	90-110		
LCS (BF10122-BS2)					Prepared &	Analyzed:	06/02/11			
Ammonia as N	0.50	0.010	0.005	mg/L	0.50		100	90-110		
Matrix Spike (BF10122-MS1)		Source: 1	104451-07		Prepared &	Analyzed:	06/02/11			
Ammonia as N	0.46	0.010	0.005	mg/L	0.50	0.031	85	90-110		
atrix Spike (BF10122-MS2)		Source: 1	104451-07		Prepared &	Analyzed:	06/02/11			
Ammonia as N	0.44 J5	0.010	0.005	mg/L	0.50	0.031	81	90-110		
Matrix Spike Dup (BF10122-MSD1)		Source: 1	104451-07		Prepared &	Analyzed:	06/02/11			
Ammonia as N	0.51	0.010	0.005	mg/L	0.50	0.031	96	90-110	11	10
Matrix Spike Dup (BF10122-MSD2)		Source: 1	104451-07		Prepared &	Analyzed:	06/02/11			
Ammonia as N	0.45 J5	0.010	0.005	mg/L	0.50	0.031	84	90-110	4	10
Batch BF10210 - Digestion for 1	KN by EPA	351.2								
Blank (BF10210-BLK1)				Prepared 8	Analyzed:	06/02/11				
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BF10210-BS1)					Prepared &	Analyzed:	06/02/11			
Total Kjeldahl Nitrogen	2.57	0.20	0.05	mg/L	2.5		103	90-110		

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

Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BF10210 - Digestion for	TKN by EPA	351.2								
Matrix Spike (BF10210-MS1)		Source: 1	104451-07		Prepared &	Analyzed:	06/02/11			
Total Kjeldahl Nitrogen	3.43	0.20	0.05	mg/L	2.5	0.862	103	80-120		
Matrix Spike Dup (BF10210-MSD1	)	Source: 1	104451-07	•	Prepared &	Analyzed:	06/02/11			
Total Kjeldahl Nitrogen	3.04	0.20	0.05	mg/L	2.5	0.862	87	80-120	12	20

A THE IN ACCORDANCE

Work Order: 1104283

June 3, 2011

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

#### \* Qualifiers, Notes and Definitions

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

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

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

Test results in this report meet all the requirements of the NELAC standards. Any applicable qualifiers are shown below. Questions regarding this report should be directed to Client Services at 813-855-1844.

Q Sample held beyond the accepted holding time.

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

Findail

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

SAL Project No. 1104283

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

Client	Name	and Sawver		· · · · · · · · · · · · · · · · · · ·						Contact / Josephin	Phone: Edeback-H	irst 813-6	30-4498	- <u></u>	- 1 <sub>9</sub> -2-2
Projec	ct Name / Location									jedeback(	Qhazanand	sawyer.co	m		
Samp	lers: (Signature) Waku	Ila County C-F	IS1 SE#1	1						L				<u> </u>	<u></u>
	· · · · · · · · · · · · · · · · · · ·							PAR	AMETER /	CONTAIN	ER DESCR	IPTION			
	Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water						0	SO4 Ox, TP	, CBOD	so₄ ox, TP, COD			•		iners (Total ation)
SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250ml P, Co Alkalinity	250 ml P, H <sub>2</sub> TKN, NH <sub>3</sub> , N	1LP, Cool Alk, TSS, TS	250 mi P, H <sub>2</sub> TKN, NH <sub>3</sub> , N	ka.				No. of Conta ner each loc
01	C-HS1-STE	5/19/11	12:45			x		1	1						
02	C-HS1-PZ01			GW		x	· 1			1					
03	C-HS1-PZ01-D		-	GW	•	x	1			1					
04	C-HS1-PZ02		1	GW		x	1			1					
05	С-НS1-РZ03		GW		x	1			1						
06	C-HS1-PZ03			GW		x	1			1					
07	C-HS1-PZ05			GW		x	1			1	· · ·				
08	C-HS1-PZ06		v	GW		x	1			1				_	
09	C-HS1-PZ07			GŴ		x	1			1.					
10	C-HS1-PZ07-D	,		GW		x	1			1					
11	C-HS1-PZ08	1		GW		x	1			1					
12	C-HS1-PZ09			GW		x	1			1				_	
Contain Relinqui	ers Prepared Shed: br			Date	/Time	:	Seal intac Samples	intact upon a	arrival?		Instructio	ons / Rema	arks		
	5-19-11	Fee	É		Jaie		•	Received	on ice? Ter	mpile(	Y)N NA				
Relinqui	shed: Date/Time:	Received:	am	zik	Date	$\frac{7}{2}$	1110	Proper pr Rec'd wit	eservatives hin holding ti	indicated?( me?  (					
Relinqui	shed: Date/Time:	Received:			Date	/Time	:	Volatiles Proper co	rec'd w/out l ontainers use	neadspace ad? 7	Y N 🖗	Ŀ			
Relinqui	shed: Date/Time:	Received:			Dete	Time				(	Y)N NA	11	04283		2

Custody.ds 11/19/01

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Chain of Custody

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

	Client	Name	Hazan	and Sawyer								Contact / Josephin	Phone: Edeback-H	lirst 813-6:	30-4498		
	Projec	t Name / Location	The	and ounjer								jedeback(	@hazanand	lsawyer.cor	<u>n</u>		
	Samp	lers: (Signature)	Wakuli	a County C-⊢	IS1 SE#1			Τ				I			<u> </u>		
		Matrix Codes: DW-Drinking Water WW-W SW-SurfaceWater SL-Sludg GW-Groundwater SA-Saline W R-Reagent Water	/astewater ge SO-Soil /ater O-Other					-		PAR, eL Q X	AMETER /	X, TP, COD		VIPTION	+	2/cm (	hers (Total tion)
	SAL Use Only Sample No.	Sample Descrip	ption	Date	Time	Matrix	Composite	Grab	250ml P, Coo Alkalinity	250 ml P, H <sub>2</sub> S TKN, NH <sub>3</sub> , NC	1LP, Cool Alk, TSS, TS,	250 ml P, H <sub>2</sub> S TKN, NH <sub>3</sub> , NC	Ten	Con	P H	D.C	No. of Contair per each loca
	01	C-HS1-STE		5/19/11	12:45	W.		x		1	1		22.3	1367	7.20	1.36	
	02	C-HS1-PZ01		5/20/11	10:11	GW		x	1			1	18.9	75	5.83	071	
	03	C-HS1-PZ01-D		5/20/11	10:09	GW		x	1			1	ļ		Ĺ		
	04	C-HS1-PZ02		5/14/11	15:39	GW		x	1			1	19.2	516	7.10	3.02	
	05	C-HS1-PZ03		5/19/11	15:06	GW		×	1			1	19.0	500	7.10	1.95	
4	06	C-HS1-PZ04	16:11	5/19/11	17:30	<b>16-11</b> GW		×	1		 	1	19.2	674	7.20	1.45	
	07	C-HS1-PZ05		Slzolu	11:00	GW		×			} 	1	18.8	752	660	2,58	
**	08	C-HS1-PZ06		5/19/11	14:37	GW		хļ	1			1	21.3	580	7.29	6.86	
	09	C-HS1-PZ07	· · · · · · · · · · · · · · · · · · ·	5/29/11	15:26	GW		хļ	1	 		1	19.6	999	6.50	1.04	
	10	C-HS1-PZ07-D	<u> </u>	5/20/11	15:30	GW		×Т	1			1					
	11	C-HS1-PZ08	5. 	5/19/11	X	GW		×	1			1	NO	1 >/	4M	PLE	
	12 Contains	C-HS1-PZ09	Date/Time: ICAA	5/19/11	17:58	GW		x	1			1	19.1	665	7.10	0.56	
	Relinqui	shed:	5-17-11	Received.			Dateri	me		Seal intac Samples	st? intact upon a	arrival?	Y N (NA) (7) N NA	Instructio	ns / Remai	rks	
	Relinqui	shed: ASA	Date/Time: (015) S-23-//	Received: KM	elme	ch	Date/T	"ime 2-	1205 VII	Received	on ice? Ter	mp (					
	Relinquis	shed:	Date/Time:	Received:			Date/T	ïme		Proper pr Rec'd wit	eservatives hin holding ti	indicated? ime?	() N NA () N NA				
	Relinquis	shed:	Date/Time:	Received:			Date/T	îme	2	Volatiles Proper co	rec'd w /out l	headspace ed?	Y N N	2			
	Relinquis	shed:	Date/Time:	Received:			Date/T	ïme	x:			(	Y/N NA	110	04283		

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

Client Name	and Source								Contact / I Josephin	Phone: Edeback-H	irst 813-63	30-4498		
Project Name / Location	and Sawyer								jedeback(	Dhazanand	sawyer.cor	<u>n</u>		
Wakul	la County C-F	IS1_SE#1												
							PARA	AMETER /	CONTAINE	ER DESCR	IPTION			
Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater 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	250ml P, Cool Alkalinity	250 ml P, H <sub>2</sub> SO4 TKN, NH <sub>3</sub> , NOX, TP	1LP, Cool Alk, TSS, TS, CBOD	250 ml P, H <sub>2</sub> SO4 TKN, NH <sub>3</sub> , NOX, TP, COD	Temp °C	cond us	0 H	D. J. my/2	No. of Containers (Total per each location)
13 C-HS1-PZ10	strala	16:39	GW		x	1			1	19.5	674	7.10	0.58	
14 C-HS1-PZ11	5/20/11	11:38	GW		x	1			1	18.8	913	6.69	0.43	
15 C-HS1-PZ12	5/20/11	12:18	GW		x	1			1	19.0	933	6.60	0.78	
16 C-HS1-PZ13	5/20/11	13:29	GW		x	1			1	18.9	692	6.12	1.49	
17 C-HS1-PZ14	5/19/11		GW	$\uparrow \uparrow$	x	1			1	NO	SI	AMB.	KE	
18 C-HS1-DP01	5/2/11	10:36	GW		x	1			1	17.6	845	6.60	0.84	
19 C-HS1-DP02	5/20/11	10:22	GW		x	1			1	18.7	770	6.60	0.56	
20 C-HS1-DP03	5/20/11	12:38	GW		x	1			1	18.6	868	6.60	0.44	
21 C-HS1-DP03-D	5/20/11	12:40	GW		x	1			1					
22 C-HS1-DP04	SIIgli	17:30	GW		x	1			1	18.8	570	7,10	0.38	
23 C-HS1-DP05	5/19/11	18:26	GW		x	1			1	20.6	830	7.10	1.50	
24 C-HS1-DP06	5/19/11	16:54	GW		x	1			1	19.2	926	7.00	0.49	
Containers Prepared/     Date/Time: 1,000       Relinquished:     5 - D - II       Relinquished:     Date/Time: 0,500       S - 2.3 - I /     S - 2.3 - I /       Relinquished:     Date/Time:       Relinquished:     Date/Time:       Relinquished:     Date/Time:	Received: Received: Received: Received: Paceived:	retme	uh	Date/	Time Time Time	1205 3/11	Seal intac Samples Received Proper pr Rec'd wit Volatiles r	t? intact upon a on ice? Ter eservatives hin holding ti rec'd w/out i ontainers use	arrival? ( mp ( indicated? ( ime? ( headspace ed?	Y N MA M N NA N NA N NA N NA Y N MA Y N MA	Instructio	ns / Remai	rks	
	CUCINEU.			Date/	1 #116				C	YN NA	11	04283		

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

	Client	Name	and Sawyer								Contact / I Josephin I	Phone: Edeback-Hi	rst 813-63	0-4498		
	Projec	t Name / Location	and outjoi	<u> </u>							jedeback@	Dhazanand	sawyer.con	<u>1</u>		
	Sampl	lers: (Signature) Wakul	la County C-F	HS1_SE#1			-1	·,	· <u> </u>		l					
			<del></del>	·	<u> </u>				PAR	AMETER /	CONTAINE	RDESCR				
		Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water						ō	SQ4 IOX, TP	s, ceod	so4 lox, TP, COD	3	Sml		7/6u	ainers (Total cation)
	SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	250ml P, Co Alkalinity	250 ml P, H, TKN, NH <sub>3</sub> , N	1LP, Cool Alk, TSS, TS	250 ml P, H, TKN, NH <sub>3</sub> , N	Tem	Conc	BH B	D.O.	No. of Contr per each lo
	25	C-HS1-DP07	5/20/11	12:55	GW		x	1			1	18.9	813	6.60	0.46	
	26	C-HS1-DP08	5/19/11	NS	GW		x	1			1	N	0 5	AM	PLE	
	27	C-HS1-LY01	5/20/11	14:40	GW		x	1			1	21.6	788	6.42	4.57	
	28	C-HS1-LY02	5/20/11	14:18	GW		x	1			1	24.2	1433	6.34	1.95	
Þ	29	spare 1 A ysed Spare 1, A	Of Spen	ez	GW		x	1			1					
S	,26	spare 2 192-15	5/20/11	15:40	GW		x	1			1	22.6	842	6.51	1.48	
14	31	spare 3			GW		x	1			1					
7	32	spare 4 Used 1 130+++18 for			GW		x	1			1					
	33	spare 5			GW		x	1		ļ	1					
		· · · · · · · · · · · · · · · · · · ·														
						$\downarrow$						 				
	Containe Relinquis	ers Prepared   Date/Time: /SOO shed: HT 5-D-1	Received:			Date/	Time	e:	Seal inta Samples	ct?	arrival?		Instructio	ns / Rema	rks	
	Relinquis	shed:	Received:	relm	ach	Date/	Time	: 1205 3/11	Received	d on ice? Tei	mp(					
	on reputs		. Coolved.			Date/		••	Rec'd wi	ithin holding t	ime? (					
	Relinquis	shed: Date/Time:	Received:		- <u>-</u>	Date/	Time	:	Volatiles	rec'd w/out i	headspace	Y N (N)A				
Ì	Relinquis	shed: Date/Time:	Received:			Date/	Time	:	rioperci		5ui (	Y) N NA	11	.04283		

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