Florida HEALTH

Florida Onsite Sewage Nitrogen Reduction Strategies Study

Task B.7 B-HS3 Field System Monitoring Report No. 7

Progress Report

November 2014



In association with:



Otis Environmental Consultants, LLC

Florida Onsite Sewage Nitrogen Reduction Strategies Study

TASK B.7 PROGRESS REPORT

B-HS3 Field System Monitoring Report No. 7

Prepared for:

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FDOH Contract CORCL

November 2014

Prepared by:



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B-HS3 Field System Monitoring Report No. 7

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 seventh sample event of a passive nitrogen reduction system at home site B-HS3 in Seminole County, Florida.

2.0 Purpose

Operation of the B-HS3 system was initiated on July 12, 2013. This monitoring report documents data collected from the seventh monitoring and sampling event conducted on October 23 and 24, 2014 (Day 468). The monitoring event consisted of collecting flow measurements from the household water use meter and the treatment system flow meters, recording electricity use, monitoring of field parameters, collection of water samples from ten points in the treatment system, and chemical analyses of water samples by a NELAC certified laboratory.

3.0 Materials and Methods

3.1 Project Site

The B-HS3 field site is located in Seminole County, FL. The nitrogen reducing onsite treatment system for the single family residence was installed in June 2013. Design and construction details were presented previously in the Task B.6 document. A system schematic identifying the system components and layout of the installation is shown in Figure 1. A flow schematic of the system is shown in the Figure 2. The B-HS3 system consists of a 1,500 gallon two chamber concrete primary treatment (septic) tank that replaced the former septic tank; a 600 gallon concrete septic tank effluent (STE) dose tank; a two zone drip system; and a 1,050 gallon concrete tank enclosing a Stage 2 saturated media biofilter. The two zone drip system consists of a Stage 1 lined drip zone

(Zone 1), that receives primary effluent and a drip zone that receives treated effluent from the Stage 2 biofilter (Zone 2).





3.2 Monitoring and Sample Locations and Identification

3.2.1 Treatment System Monitoring Points

This monitoring event included sample collection from ten points within the treatment system (Figure 3). In the treatment system, household wastewater enters the 1st chamber of the primary tank and exits the second chamber as septic tank effluent through an effluent screen into the STE dose tank. The first monitoring point, B-HS3-STE, is the effluent sampled approximately 1.5 feet below the surface of the second chamber of the primary tank (Figure 4) before the effluent filter, which is referred to as primary effluent or septic tank effluent (STE). Samples from monitoring point B-HS3-STE are of whole household wastewater after it has had some residence time in the primary tank and represent the influent to the remainder of the onsite nitrogen reduction system.

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Figure 4 Second Chamber of Primary Tank (B-HS3-STE Sample)

The STE dose tank effluent is pumped through the drip system hydraulic unit and discharged to the Stage 1 drip system (Zone 1). In the Stage 1 drip area, wastewater percolates downward through an 18-inch layer of unsaturated sand and a layer of lignocellulosic and sand media (9-inch maximum thickness) placed above a 30 mil PVC liner. The second and third sampling points are two suction lysimeters (BHS3-LY01 and BHS3-LY02) located at the interface of the overlying sand and underlying lignocellulosic/sand mixture. These sample locations ostensibly represent wastewater that has been nitrified by passage through the overlying sand layer (Figure 5).

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Figure 5 Stage 1 Suction Lysimeter (BHS3-LY01 and –LY02)

The Stage 1 drip system area was prepared by grading a V-shape so that effluent would collect on the liner and flow to the center where a perforated pipe within a gravel underdrain conveys the effluent to the Stage 2 denitrification tank through a pipe boot within the liner. The fourth sampling point (BHS3-LINER) is a sample port of the Stage 1 lined area effluent prior to the Stage 2 biofilter. At the BHS3-LINER sample point, wastewater should be denitrified by passage through the lignocellulosic media mixture.

The liner effluent is conveyed to a Stage 2 biofilter, a concrete 1,050 gallon tank, containing elemental sulfur reactive media for additional treatment (denitrification). Wastewater flow is in an upward direction. The fifth sampling point, B-HS3-ST2, is the Stage 2 biofilter effluent which is sampled approximately 6 inches below the water surface of the Stage 2 biofilter tank (Figure 6).

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Figure 6 Second Chamber of Stage 2 Biofilter (B-HS3-ST2 Sample)

The Stage 2 biofilter effluent is pumped through the drip system hydraulic unit and discharged through the treated effluent drip system emitters (Zone 2) to natural soil. Monitoring points 6 through 10 were placed below the Zone 2 drip emitters. Their locations are shown in Figure 3. Sampling points six and seven are suction lysimeters (BHS3-LY03 and BHS3-LY04) located in the treated effluent drip area with the top of the 9 inch ceramic cup located 24 inches below the drip emitters to represent treatment through 24-inches of unsaturated soil (Figure 7). Sampling points eight, nine and ten are also located within the treated effluent drip area; these are standpipe piezometers (BHS3-PZ07, BHS3-PZ08, and BHS3-PZ09) positioned so that the top of the 5-foot screen is 24-inches below the drip emitters (Figure 8).

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Figure 7 Treated Effluent Suction Lysimeter (B-HS3-LY03 and –LY04 sample)



Figure 8 Treated Effluent Area Standpipe Piezometers (B-HS3-PZ07, -PZ08 and –PZ09)

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3.2.2 Groundwater Monitoring Points

For this monitoring event, twenty of the sixty-seven downgradient groundwater monitoring points that were installed as part of the C-HS2 groundwater monitoring network were included. A sampling grid for groundwater screening was developed downgradient of the original OSTDS as depicted in Figure 9. A 10-foot by 40-foot grid was staked then locations surveyed (x, y, and z). Transect lines A through D were located perpendicular to the groundwater flow direction (southwest) and increase (higher letter identification) moving southward from the mound. Transect lines 0 through 15 were located parallel to the groundwater flow direction and increase moving from southeast to northwest. Groundwater monitoring points were installed in June and July 2011. One type of monitoring point was installed using either hand or drilling methods: standpipe piezometers. Standpipe piezometers consist of either ³/₄-inch or 2-inch diameter PVC with a 1-foot, 2-foot, or 4-foot screen (0.010-inch slots) and riser extending to the ground surface (refer to the Task C QAPP and Task C.23 C-HS2 Instrumentation Report for additional detail).

Each monitoring location was assigned a unique identification indicating grid location (self explanatory), and depth below ground surface (bottom of the drive point or well screen in feet). For example A09-7 is a standpipe piezometer sampler located on the grid at A09 at approximately 7-feet below ground surface.

Groundwater level measurements are used to determine hydraulic gradients and directions of flow. Groundwater levels were measured using a flat tape water level meter graduated in feet (measurement accuracy is 0.01 feet). The groundwater level within the standpipe piezometers sampled was measured for this sampling event. Figure 10 illustrates the surficial groundwater contours as measured within the standpipe piezometers.



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Figure 10 Groundwater Sampling Locations and Surficial Groundwater Contours October 23 and 24, 2014

3.3 Operational Monitoring

Start-up of the system occurred on July 12, 2013 (Experimental Day 0) and the system has operated almost continually since that date. Between September 10, 2013 and Sep-

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS3 FIELD SYSTEM MONITORING REPORT NO. 7 tember 17, 2013 the system was not operating because a replacement part for the hydraulic unit was required.

Regular maintenance includes checking and cleaning, as necessary, the primary tank effluent screen and the STE dose tank effluent screen installed within the outlet tees. During sample event site visits, this is done after sampling. The cleaning of the disc filters in the hydraulic unit is an automated process. A backflush of the filters occurs at the beginning of each dose cycle, and the backflush flow is directed to the primary tank.

3.4 Flow Monitoring

The seventh formal sampling event was conducted October 23, 2014 (Experimental Day 468). For the seventh formal sampling event, the water meter for the house and the treatment system flow meters were read and recorded on October 23, 2014. The household potable water use is recorded via a water meter (Meter 1) located in the front yard which includes indoor and outdoor water use. The household has a separate irrigation well which supplies the irrigation system; however the metered potable water use includes filling the pool, car washing, etc. The combined pump flow meter is located inside the hydraulic unit following the hydraulic unit filters prior to the split between the two zones, and records the cumulative pumped flow in gallons pumped from both the STE dose tank and Stage 2 biofilter tank (Meter 2). Therefore, the measurement of the combined flow meter includes both the STE flow from the household and the treated effluent flow from the Stage 2 biofilter. The Stage 2 treated effluent flow meter (Meter 3) is located following the split on the line from the pump to the treated effluent drip system and records the cumulative flow in gallons pumped from the Stage 2 biofilter tank. The control panel includes telemetry which logs alarms, cumulative pump cycles, and cumulative field flush cycles.

The daily wastewater volume supplied to the passive nitrogen removal system was the volume that was pumped to the lined Stage 1/2a biofilter (Drip Zone 1); it was estimated by calculating the difference between the volume readings of Meter 2 and Meter 3. This calculation does not account for water entering or leaving the Stage 1/2a biofilter (Drip Zone 1) through hydrologic processes such as precipitation, irrigation, and evapotranspiration.

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Flow calculations using the metered data: Combined pumped flow = Meter 2 Treated effluent flow (Zone 2) = Meter 3 Stage 1/2a biofilter wastewater flow (Zone 1) = Meter 2 – Meter 3 Additional Zone 1 inputs/outputs = Meter 3 - [Meter 2- Meter 3]

3.5 Energy, Chemical and/or Additives Consumption

Energy consumption was monitored using an electrical meter installed between the main power box for the house and the control panel. The electrical meter records the cumulative power usage of the system in kilowatt-hours. The power usage of the system is primarily due to the single pump, although a small amount of power is used by the control panel itself. There are no chemicals added to the system. However, the denitrification media (lignocellulosic and sulfur) are "reactive" media which will be consumed during operation. The Stage 1 lined area was initially filled with 9 inches of lignocellulosic and sand media mixture and the Stage 2 biofilter was initially filled with 12 inches of sulfur and oyster shell media mixture, which ostensibly will last for many years without replenishment or replacement.

3.6 Water Quality Sample Collection and Analyses

The seventh formal sample event was conducted on October 23, 2014 and included a full suite of influent, intermediate and effluent water quality samples from the system. Samples were collected at each of the thirty monitoring points described previously in Section 3.2 and illustrated in Figures 3 and 10: ten treatment system monitoring points and twenty groundwater sampling points. A peristaltic pump was used to collect the treatment system samples and route them directly into analysis-specific containers after sufficient flushing of the tubing had occurred. Field parameters were then recorded.

Groundwater samples were obtained using a peristaltic pump, which was attached directly to dedicated standpipe piezometer tubing. Samples were collected after sufficient purging (the sample was clear (turbidity reading below 20 NTU) and field read-ings had stabilized) had occurred.

In addition, an equipment blank (EB) sample was taken. The equipment blank was collected by pumping deionized water through the cleaned pump tubing. These samples were then analyzed for the same parameters as the monitoring samples. The analysis-specific containers were supplied by the analytical laboratory and contained appropriate preservatives. The analysis-specific containers were labeled, placed in coolers and transported on ice to the analytical laboratories. Each sample container was secured in packing material as appropriate to prevent damage and spills, and was recorded on chain-of-custody forms supplied by the laboratory. Chain of custody forms, provided in Appendix A, were used to document the transfer of samples from field personnel to the analytical laboratory.

Field parameters were measured using portable electronic probes and included temperature (Temp), dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, and specific conductance. The field parameters were measured by placing the analytical probes in a container overflowing with sample water. The influent, intermediate, and effluent samples were analyzed by the laboratory for: total alkalinity, chemical oxygen demand (COD), Carbonaceous Biological Oxygen Demand (CBOD₅), total Kjeldahl nitrogen (TKN-N), ammonia nitrogen (NH₃-N), nitrate nitrogen (NO₃-N), nitrite nitrogen (NO₂-N), total phosphorus (TP), orthophosphate (Ortho P), total suspended solids (TSS), volatile suspended solids (VSS), total organic carbon (TOC), chloride, fecal coliform (fecal), and E. coli. The influent and sulfur media samples included sulfate, sulfide, and hydrogen sulfide (unionized). All analyses were performed by an independent and fully NELAC certified analytical laboratory (Southern Analytical Laboratory). Table 1 lists the analytical parameters, analytical methods, and detection limits for these analyses.

Analytical Parameter	Method of Analysis	Method Detection Limit (mg/L)
Total Alkalinity as CaCO ₃	SM 2320B	2 mg/L
Chemical Oxygen Demand (COD)	EPA 410.4	10 mg/L
Total Kjeldahl Nitrogen (TKN-N)	EPA 351.2	0.05 mg/L
Ammonia Nitrogen (NH ₃ -N)	EPA 350.1	0.005 mg/L
Nitrate Nitrogen (NO ₃ -N)	EPA 300.0	0.01 mg/L
Nitrite Nitrogen (NO ₂ -N)	EPA 300.0	0.01 mg/L
Nitrate+Nitrite Nitrogen (NOX-N)	EPA 300.0	0.02 mg/L
Total Phosphorus (TP)	SM 4500P-E	0.01 mg/L
Orthophosphate as P (Ortho P)	EPA 300.0	0.01 mg/L
Carbonaceous Biological Oxygen Demand (CBOD ₅)	SM5210B	2 mg/L
Total 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
Chloride	EPA 300.0	0.50 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)	SM 9222D	2 ct/100mL
E.coli	SM 9223B	2 ct/100mL

 Table 1

 Analytical Parameters, Method of Analysis, and Detection Limits

4.0 Results and Discussion

4.1 Operational Monitoring

Table 2 provides a summary of the household water use since July 13, 2011. The treatment system flow meter readings for the B-HS3 field site are summarized in Table 3. The operation and maintenance log which includes actions taken since start-up is provided in Appendix B.

	Oun	initially of filoacons	
	Cumulative	Average Daily Household	
Date	Volume	Botwoon road	Comments
	(gallons)	ings	
		(dpd)	
7/13/2011 14:45	5302677.9	(9P ~/	Installed
7/20/2011 17:50	5304207.8	214.6	
7/26/2011 15:19	5305257.9	178.1	
10/27/2011 15:19	5327920.4	243.7	
11/30/2011 8:00	5355610.4	821.8	
3/13/2012 8:10	5378780.2	222.8	
7/10/2012 16:15	5453899.3	629.5	
10/18/2012 15:30	5470593.1	167.0	
3/7/2013 14:00	5488517.4	128.1	$\sim \prime \prime$
6/7/2013 14:00	5504725.9	176.2	
7/9/2013 12:50	5508873.0	129.8	
7/12/13			PNRS start-up
7/12/13 14:01	5509172.1	98.1	
7/17/13 13:55	5509884.1	142.5	
7/29/13 9:50	5510830.9	80.0	
8/6/13 10:40	5511588.8	94.3	
8/12/13 11:07	5512244.8	109.0	
8/15/13 8:48	5513128.8	304.5	Prelim Event No. 1
9/5/13 15:31	5514810.2	79.0	
9/10/13			Septic tank pumped
9/17/13			System running again
9/27/13 8:00	5517331.9	116.3	
9/30/13 8:00	5517622.5	96.9	Sample Event No. 1
10/11/13 8:30	5518421.6	72.5	
10/17/13 11:00	5519187.0	125.4	
11/15/2013 10:00	5524455.0	181.9	
11/27/2013 9:10	5525784.8	111.1	
12/2/2013 8:30	5527623.5	369.8	Several guests stayed in the home over the Thanksgiving holiday
12/4/2013 8:51	5527809.2	92.2	Sample Event No. 2
12/23/2013 11:45	5529755.3	101.8	
1/23/2014 11:00	5532487.5	88.2	
1/30/2014 9:00	5533156.8	96.8	
2/3/2014 8:00	5533482.0	82.2	Sample Event No. 3
2/4/2014 8:15	5533499 6	17.4	Sample Event No. 4

 Table 2

 Summary of Household Water Use

Summary of Household Water Use														
Date	Cumulative Volume (gallons)	Average Daily Household Flow, Q Between readings (gpd)	Comments											
2/5/2014 10:45	5533558.4	53.3	Sample Event No. 5											
2/6/2014 10:45	5533690.6	132.2	Sample Event No. 6											
2/7/2014 8:00	5533788.6	110.7	Sample Event No. 7											
2/12/14 10:00	5534282.7	97.2												
3/14/14 8:24	5537363.8	102.9												
4/3/14 8:45	5539932.0	128.3	Sample Event No. 8 (formal No. 4)											
4/29/14 10:10	5544794.2	186.6												
5/29/14 10:00	5549396.9	153.5	Sample Event No. 9 (formal No. 5)											
6/9/14 12:45	5550719.1	119.0												
7/29/14 9:30	5555927.1	104.4												
8/22/14 7:30	5557593.9	69.7	Sample Event No. 10 (formal No. 6)											
9/19/2014 12:48	5560271.5	94.9												
10/23/2014 15:45	5564131.1	113.1	Sample Event No. 11 (formal No. 7)											
Total average PNRS start-up to 10/23/14		117.4												

 Table 2

 Summary of Household Water Use

Date and Time Read	Meter 2 Combined Pumped Flow	Average Daily Combined Pumped Flow between readings	Calc Flow to Stage 1/2a [Meter 2 – Meter 3]	Average Daily Calculated Flow to Stage 1 between readings	Meter 3 Treated Effluent Flow	Aver- age Daily Treated Effluent Flow be- tween read- ings	Stage 1 Area Water Input or Output ¹
	Cum Vol. (gal)	Gal/ Day	Cum Vol. (gal)	Gal/ Day	Cum Vol. (gal)	Gal/ Day	Gal/ Day
7/12/13 14:01	206.9	Start-up	Start-up	Start-up	58.6	Start-up	Start-up
7/17/13 11:57	423.0	44.0	40.6		234.2	35.7	
7/29/13 9:52	3,345.1	245.3	765.3	60.8	2,431.6	184.5	123.6
8/6/13 9:45	6,541.1	399.7	1,045.1	35.0	5,347.8	364.8	329.8
8/12/13 11:07	8,953.1	398.2	2,360.0	217.1	6,444.9	181.1	-36.0
8/15/13 8:48	10,131.2	405.8	3,084.3	249.4	6,898.7	156.3	-93.1
9/5/13 15:31	18,696.5	402.5	7,734.4	218.5	10,813.8	184.0	-34.5
9/9/13 9:00	19,884.6	318.7	8,287.6	148.4	11,448.8	170.3	22.0
9/17/13 10:12	20,912.4	127.7	8,785.2	61.8	11,979.0	65.9	4.0
9/27/13 8:00	22,142.0	124.1	9,239.3	45.8	12,754.5	78.3	32.4
9/30/13 8:00	22,885.0	247.7	9,692.2	151.0	13,044.6	96.7	-54.2
10/11/13 8:30	26,428.9	321.6	11,417.0	156.5	14,863.7	165.1	8.5
10/17/13 11:00	28,781.4	385.4	12,823.8	230.5	15,809.4	154.9	-75.5
11/8/13 12:30	34,278.1	249.1	15,844.0	136.9	18,285.9	112.2	-24.6
11/27/13 9:10	39,031.1	252.0	18,656.6	149.1	20,226.3	102.9	-46.2
12/2/13 8:30	42,081.5	613.5	20,437.6	358.2	21,495.7	255.3	-102.9
12/4/13 8:51	42,599.8	257.3	20,729.5	144.9	21,722.1	112.4	-32.6
12/23/13 11:45	47,135.0	237.2	23,346.3	136.9	23,640.5	100.3	-44.3
1/23/14 11:00	54,702.9	244.4	27,486.2	133.7	27,068.4	110.7	-23.0
1/30/14 9:00	56,954.9	325.6	28,619.7	163.9	28,187.0	161.7	-2.2
2/3/14 8:00	58,390.4	362.7	29,205.1	147.9	29,037.1	214.8	66.9
2/4/14 8:15	58,688.7	295.2	29,298.1	92.0	29,242.4	203.2	111.1
2/5/14 10:45	58,870.7	164.8	29,393.9	86.7	29,328.6	78.1	-8.6
2/6/14 10:45	59,118.7	248.0	29,553.8	159.9	29,416.7	88.1	-71.9
2/7/14 8:00	59,354.0	265.8	29,704.7	170.4	29,501.1	95.4	-75.0

Table 3Summary of System Flow

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Date and Time Read	Meter 2 Combined Pumped Flow	Average Daily Combined Pumped Flow between readings	Calc Flow to Stage 1/2a [Meter 2 – Meter 3]	Average Daily Calculated Flow to Stage 1 between readings	Meter 3 Treated Effluent Flow	Average Daily Treated Effluent Flow between readings	Stage 1 Area Water Input or Output ¹
	Cum Vol. (gal)	Gal/ Day	Cum Vol. (gal)	Gal/ Day	Cum Vol. (gal)	Gal/ Day	Gal/ Day
2/12/14 10:00	61,023.9	328.5	30,135.7	84.8	30,739.9	243.7	158.9
3/14/14 8:24	67,901.2	229.8	34,391.1	142.2	33,361.9	87.6	-54.6
4/3/14 8:45	73,953.4	302.4	37,466.0	153.6	36,339.2	148.8	-4.9
4/29/14 10:10	81,273.0	280.9	41,710.4	162.9	39,414.4	118.0	-44.9
5/29/14 10:00	86,833.4	185.4	44,628.2	97.3	42,057.0	88.1	-9.2
6/9/14 12:45	90,633.4	341.9	46,511.8	169.5	43,973.4	172.4	3.0
7/11/14 14:45	98,858.8	256.4	50,797.4	133.6	47,913.2	122.8	-10.8
7/29/14 9:30	105,444.4	370.4	54,191.1	190.9	51,105.1	179.5	-11.3
8/22/14 7:30	110,175.4	197.8	56,565.4	99.3	53,461.8	98.5	-0.7
9/19/2014 12:48	118,258.6	286.4	60,754.3	148.4	57,356.1	138.0	-10.4
10/23/2014 15:45	130,079.5	346.4	65,886.9	150.4	64,044.4	196.0	45.6
Avg start-up to 10/23/14		277.5		140.8		136.7	-4.1

Table 3 (con't)

¹This value is the difference between the calculated flow to Stage 1/2a and metered Treated Effluent flow (Meter 3) from the Stage 2 biofilter. A positive value indicates an additional water input to the Stage 1 area (precipitation, irrigation, etc.) whereas a negative value indicates a water output (evapotranspiration, etc.). ²The additional volume in the Stage 1 flow as compared to the household water use meter is the volume returned to the septic tank during field flushing of the drip lines. The average household water use since the PNRS system start-up was 117.4 gallons per day with periods of higher and lower flows. Since the PNRS system start-up, the average combined pumped flow (flow to the Stage 1 drip system and treated effluent drip system) was 277.5 gallons per day, the average calculated Stage 1 drip system (STE) flow was 140.8 gallons per day and the average treated effluent drip system (Stage 2 biofilter effluent) flow was 136.7 gallons per day. The calculated Stage 1 drip system (STE) flow includes pumped water used for field flushing of the drip lines, which is returned to the septic tank after flushing. This is the reason that the calculated STE flow is considerably higher than the flow measured by the household potable water meter. Actual system treated flow is probably closer to the potable water meter flow value.

The difference between the flow to the Stage 1 drip system (STE) and the treated effluent drip system (Stage 2 biofilter effluent) are due to water inputs and outputs. Water inputs include precipitation, applied STE, and any lawn irrigation water collected in the Stage 1 lined area. Water outputs include evapotranspiration. The last column in Table 3 summarizes the difference in the Stage 1 and treated effluent flows for each time period. The positive values indicate higher treated effluent flow (water inputs) which are likely attributed to precipitation and irrigation water collected in the lined area. The negative values indicate higher Stage 1 flow (water outputs) which is likely attributed to evapotranspiration. Overall, there was a net loss of water equal to approximately 4.1 gallons per day.

A weather station (Lake Wayman Heights, Longwood, FL) is located approximately 5 miles from the site. Data from this weather station is available at the following website: http://www.wunderground.com. Recorded meteorological data is provided in Appendix C, Table C.1 from this weather station. Table 4 provides daily precipitation totals leading up to and during the sample event. There was approximately 0 inches of rain in the 5 days ending on October 24th.

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Table 4
Precipitation Data Daily Totals Measured October 1, 2014 through October 24, 2014
Sample Event No. 7

Date	Precipitation (inches)
10/1/2014	0.5
10/2/2014	0
10/3/2014	0.02
10/4/2014	0.01
10/5/2014	0
10/6/2014	0
10/7/2014	0
10/8/2014	0
10/9/2014	0
10/10/2014	0
10/11/2014	0
10/12/2014	0
10/13/2014	0
10/14/2014	0.35
10/15/2014	0.02
10/16/2014	0.01
10/17/2014	0
10/18/2014	0
10/19/2014	0
10/20/2014	0
10/21/2014	0
10/22/2014	0
10/23/2014	0
10/24/2014	0

4.2 Energy, Chemical and/or Additives Consumption

Energy consumption is monitored using an electrical meter installed between the main power box for the house and the control panel to record cumulative power usage of the pump in kilowatt-hours. The recorded electrical use for the system is summarized in Table 5. The total average electrical use through October 23, 2014 was 0.89 kWh per day. The average electrical use per 1,000 gallons treated was 6.376 kWh per 1,000 gallons, and this parameter varies based on the amount of additional pumped flow attributed to precipitation.

	Guinni			-						
		Average	Average	Average						
Date and	Electrical	Daily	Electrical Use	Electrical Use						
	Meter	Electrical Use	Per Treated	Per 1,000 Gallons						
Time Reau	Reading	between	Gallon	Treated						
	_	readings	between readings	between readings						
	Cumulative		(Id) (In (mol))	(kWh/						
	(kWh)	(KVVN/day)	(KVVII/gai)	1,000 gal)						
7/12/13 14:01	0.6	Start-up	Start-up	Start-up						
7/17/13 11:57	1.1	0.10	0.011	10.763						
7/29/13 9:52	8.9	0.65	0.036	36.456						
8/6/13 9:45	19.1	1.28	0.007	6.692						
8/12/13 11:07	27.9	1.45	0.006	6.351						
8/15/13 8:48	32.5	1.58	0.008	7.978						
9/5/13 15:31	69.6	1.74	0.023	22.959						
9/9/13 9:00	82.3	3.41	0.008	7.838						
9/17/13 10:12	86.2	0.48	0.006	5.725						
9/27/13 8:00	88.8	0.26	0.004	3.975						
9/30/13 8:00	90.6	0.60	0.005	4.580						
10/11/13 8:30	98.5	0.72	0.004	4.407						
10/17/13 11:00	104.7	1.02	0.005	5.430						
11/8/13 12:30	121.1	0.74	0.005	5.155						
11/27/13 9:10	135.6	0.77	0.005	5.334						
12/2/13 8:30	145.1	1.91	0.006	5.823						
12/4/13 8:51	146.8	0.84	0.000	0.000						
1/23/14 11:00	185.1	0.76	0.006	5.720						
1/30/14 9:00	192.3	1.04	0.006	6.352						
2/3/14 8:00	197.0	1.19	0.008	8.029						
2/4/14 8:15	198.0	0.99	0.011	10.753						
2/5/14 10:45	198.6	0.54	0.006	6.266						
2/6/14 10:45	199.3	0.73	0.005	4.556						
2/7/14 8:00	200.2	0.98	0.006	5.776						
2/12/14 10:00	205.7	1.08	0.013	12.760						
3/14/14 8:24	228.2	0.75	0.005	5.287						
4/3/14 8:45	248.3	1.00	0.007	6.537						
4/29/14 10:10	272.5	0.93	0.006	5.702						
5/29/14 10:00	290.2	0.59	0.006	6.066						
6/9/14 12:45	302.0	1.06	0.006	6.265						
7/11/14 14:45	327.3	0.79	0.006	5 903						
7/29/14 9:30	347.3	1 12	0.006	5 893						
8/22/14 7:30	361.4	0.59	0.006	5 939						
9/19/14 12:48	385.1	0.84	0.006	5 658						
10/23/14 15:45	420.7	1 04	0.007	6.936						
Total average	720.1	1.04	0.001	0.000						
start-up to 10/23/14		0.90	0.006	6.376						

 Table 5

 Summary of System Electrical Use

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4.3 Water Quality

Water quality analytical results, for Sample Event No. 7 are listed in Table 6 and graphically displayed in Figure 11. A summary of the water quality data collected to date for the test system is presented in Table 7. The laboratory report containing the raw analytical data is included in Appendix A. The following discussion summarizes the water quality analytical results for the Sample Event No. 7. The performance of the various system components was compared by considering the changes through treatment of nitrogen species (TKN, NH_3 -N, and NO_X -N), as well as supporting water quality parameters.

۹ 🛋	STE		GE 1 & LY02	STAGE 1 LINER	STAGE 2 SULFUR
CBOD ₅ mg/L	42	13	4	4	16
TKN mg N/L	62	2.3	4.5	1.9	1.5
$NH_3 mg N/L$	54	0.01	0.04	0.04	0.38
NO _x mg N/L	0.1	30.0	47.1	4.8	0.04
TN mg N/L	62.1	32.3	51.6	6.7	1.5
Sulfate mg/L	40	Not analyzed	61	44	120
Fecal Coliform (Ct/100mL)	35,000	Not analyzed	Not analyzed	1	Non- detect

Figure 11 Graphical Representation of Water Quality Results Sample Event No. 7, October 23, 2014

Septic Tank Effluent (STE) Quality: The water quality characteristics of STE collected in Sample Event 7 were within the typical range generally expected for domestic STE. The measured STE total nitrogen (TN) concentration was 62 mg/L, which is within the range that has been typically reported for Florida single family residence STE. The measured STE CBOD₅ was 42 mg/L which is in the low end of the typical range.

Stage 1 (Bottom of Sand Layer) Soil Suction Lysimeters (LY01 and LY02): The soil suction lysimeters effluent NH₃-N levels were 0.011 mg/L and 0.035 mg/L for LY01 and

LY02, respectively (Table 6). The NO_x-N was 30 mg/L and 47 mg/L for LY01 and LY02, respectively. There has been a considerable difference between these two sample points in terms of NO_x-N concentrations in several sample events, and the reasons for this are unclear. The Stage 1 biofilter showed nearly complete nitrification and some denitrification with an effluent concentration equal to or less than NH₃-N of 0.04 mg/L, NO_x-N of 47 mg/L and TKN of 4.5 mg/L.

Stage 1 Liner Effluent (Liner): The Stage 1 effluent NH_3 -N level was 0.04 mg/L with a DO level at 1.36 mg/L (Table 6). TSS and $CBOD_5$ were 1 and 4 mg/L, respectively. The Stage 1 effluent NO_x -N was 4.78 mg/L. These results indicate significant denitrification by passage through the lignocellulosic/sand layer in the Stage 1 lined area (between 84 and 90% reduction of NO_x -N). The combined Stage 1/liner area biofilter showed nearly complete ammonium removal and substantial removal of NO_x -N with an effluent NH_3 -N of 0.04 mg/L, NOx-N of 4.78 mg/L and TKN of 1.9 mg/L.

Stage 2 Biofilter Effluent (ST2): Effluent NO_x-N from the Stage 2 biofilter was 0.04 mg/L with a DO level at 0.1 mg/L and ORP at -247 mV. Final total nitrogen (TN) in the passive nitrogen removal system effluent was 1.54 mg/L. The Stage 2 biofilter effluent CBOD₅ concentration was 16 mg/L, TSS was below the method detection limit of 1 mg/L and sulfate was 120 mg/L.

Treated Effluent Soil Suction Lysimeters (LY03 and LY04): The treated effluent drip system monitoring devices LY03 and LY04 NO_x-N concentrations were 12 mg/L and 4.2 mg/L, respectively, which is considerably higher than the Stage 2 effluent concentration. It appears that there must be another source of nitrogen to the effluent irrigation area, and it is suspected that fertilizer from the new sod installed in the area is still contributing to this result. The NO_x-N concentrations did appear to decrease with time following sod installation and in the winter months with less rainfall; however in March and June the NO_x-N concentrations increased possibly from sod fertilizer runoff in the rainy season (Figure 12).



Table 6 Sample Event 6 Water Quality Results

Sample ID	Sample Date/Time	Temp (°C)	рН	Specific Conduct ance (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH3-N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NOx (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Chloride (mg/L)	Sulfate (mg/L)	Hydrogen Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)
BHS3-STE	10/23/2014 11:50	24.34	7.55	1127	0.09	-255.8	450	32	29	42	120	62.11	62	8.00	54	0.02	0.09	0.11	54.11	6	5.8	87	40	0.01	11	35000	240000
BHS3-LY01	10/23/2014 11:00	25.30	6.48	693	3.68	301.9	55	1	1	13	22	32.31	2.3	2.29	0.011	30	0.01	30.01	30.02	0.58	0.52	37					
BHS3-LY02	10/23/2014 11:10	25.70	6.27	784	1.53	279.2	74	1	1	4	27	51.56	4.5	4.47	0.035	47	0.06	47.06	47.10	1.3	1.2	44	61				
BHS3-LINER	10/23/2014 10:40	24.67	6.53	755	1.36	7.4	270	1	1	4	18	6.68	1.9	1.86	0.04	4.7	0.08	4.78	4.82	0.27	0.22	32	44			1	. 2
BHS3-ST2	10/23/2014 10:34	24.60	6.65	856	0.10	-247.2	260	1	1	16	45	1.54	1.5	1.12	0.38	0.02	0.02	0.04	0.42	0.61	0.51	39	120	0.01	13	1	. 2
BHS3-ST2-DUP	10/23/2014 10:38	24.60	6.65	856	0.10	-247.2	270	1	1	12	39	1.44	1.4	0.74	0.66	0.02	0.02	0.04	0.70	0.61	0.49	39	120	0.01	13	1	. 2
BHS3-LY03	10/23/2014 11:35	24.60	6.59	632	5.39	248.7	220	1	1	2	23	14.51	2.5	2.49	0.009	12	0.01	12.01	12.02	0.21	0.13	16	100	0.01	0.1		
BHS3-LY04	10/23/2014 11:22	24.10	6.54	619	5.38	265.5	160	1	1	2	16	5.31	. 1.1	1.06	0.038	4.2	0.01	4.21	4.25	0.15	0.059	18	93				
BHS3-PZ07	10/23/2014 12:10	23.90	6.46	516	4.42	189.6	160	1	1	2	35	2.95	1.2	1.01	0.19	1.6	0.15	1.75	1.94	0.22	0.14	15	66	0.3	0.4	1	. 2
BHS3-PZ08	10/23/2014 12:25	23.69	6.47	492	5.67	66.0	130	4	3	2	27	7.34	1.5	0.00	1.5	5.8	0.04	5.84	7.34	0.54	0.48	7.7	44	0.01	0.1	1	. 2
BHS3-PZ09	10/23/2014 11:30	26.60	6.27	272	5.50	256.4	120	6	5	2	45	1.86	1	0.99	0.009	0.84	0.02	0.86	0.87	1.8	1.9	3.6	4.5	0.39	0.6	1	. 2
PZ-A7-6	10/23/2014 13:44	24.06	6.35	546	3.06	-40.3						0.95	0.92	0.80	0.12	0.02	0.01	0.03	0.15			19	62				
PZ-A7-8	10/23/2014 14:05	24.65	6.00	519	2.91	-19.8						5.86	1.5	1.37	0.13	4.3	0.06	4.36	4.49			19	50				
PZ-A7-11	10/24/2014 9:30	24.50	5.39	289	4.78	-10.1						1.54	1.5	0.30	1.2	0.03	0.01	0.04	1.24			18	65				
PZ-B6-6	10/23/2014 14:08	25.40	6.63	700	5.37	183.8						0.83	0.8	0.75	0.055	0.02	0.01	0.03	0.09			28	58				
PZ-B6-8	10/24/2014 8:54	22.60	5.18	217	4.32	-43.8	0					1.43	1.4	0.66	0.74	0.02	0.01	0.03	0.77			19	27				
PZ-B8-5	10/23/2014 14:25	25.23	5.98	516	3.51	-41.1	65				1	1.93	1.9	1.26	0.64	0.02	0.01	0.03	0.67			30	64				
PZ-B8-5-DUP	10/23/2014 14:30	25.23	5.98	516	3.51	-41.1						1.93	1.9	1.26	0.64	0.02	0.01	0.03	0.67			33	60				
PZ-B8-7	10/23/2014 14:50	25.06	6.14	369	6.19	43.7	~					2.98	1.5	0.77	0.73	1.4	0.08	1.48	2.21			28	24				
PZ-B8-10	10/23/2014 15:20	24.90	5.04	148	8.09	-28.4						0.66	0.62	0.22	0.4	0.03	0.01	0.04	0.44			44	0.55				
PZ-B10-5	10/24/2014 8:10	24.10	6.51	411	1.14	-47.1						4.97	4.9	1.70	3.2	0.02	0.05	0.07	3.27			12	6.7				
PZ-B10-7	10/24/2014 8:20	24.20	6.31	368	1.18	-118.6						5.13	5.1	0.40	4.7	0.02	0.01	0.03	4.73			21	14				
PZ-B15-5	10/24/2014 8:40	24.20	5.65	245	1.28	-44.9	2					1.57	1.5	1.19	0.31	0.06	0.01	0.07	0.38			28	17				
PZ-B15-7	10/24/2014 8:55	24.50	5.09	156	1.80	-97.0	<i>y</i>					0.78	0.75	0.28	0.47	0.02	0.01	0.03	0.50			45	0.68				
PZ-C4-5	10/24/2014 9:24	23.47	5.18	815	3.14	-41.5	<i>y</i>					2.05	2	0.80	1.2	0.04	0.01	0.05	1.25			120	120				
PZ-C06-5	10/24/2014 8:00	21.78	5.86	624	3.79	187.2	2 2				()	2.53	2.5	1.20	1.3	0.02	0.01	0.03	1.33		1	44	84				
PZ-C06-7	10/22/2014 8:14	22.33	5.74	281	2.83	19.0						1.23	1.2	1.08	0.12	0.02	0.01	0.03	0.15			41	7.1				
PZ-C06-10	10/23/2014 8:36	22.12	4.69	161	3.23	-61.7			1			0.67	0.63	0.24	0.39	0.03	0.01	0.04	0.43			44	0.58				
PZ-C10-6	10/22/2014 14:58	26.00	5.97	245	3.78	83.9						2.98	2.9	2.47	0.43	0.06	0.02	0.08	0.51			9.3	13				
PZ-D4-5	10/24/2014 9:58	24.69	5.92	338	4.53	-22.9						2.49	1.9	1.74	0.16	0.55	0.04	0.59	0.75			22	36				
PZ-D4-7	10/28/2014 10:05	24.93	5.70	279	4.88	-2.2						1.33	1.3	0.96	0.34	0.02	0.01	0.03	0.37			43	11				
PZ-D4-10	10/27/2014 10:16	25.00	5.41	181	4.24	-81.0						0.94	0.9	0.53	0.37	0.03	0.01	0.04	0.41			43	1.5				
EB	10/58/2014 12:40	23.50	5.66	5	8.31		2	1	1	2	10	0.08	0.05	0.04	0.009	0.02	0.01	0.03	0.04	0.01	0.014	1	0.2	0.01	0.1	1	. 2
Notes:	RO																										

¹Total Nitrogen (TN \overline{E} s a calculated value equal to the sum of TKN and NO_{X.}

²Organic Nitrogen () is a calculated value equal to the difference of TKN and NH_{3.}

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

Gray-shaded data poles 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.

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		Summary of Water Quality Data																									
Sample ID	Statistic	Temp (°C)	рН	Specific Conducta nce (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD ₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH3-N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NOx (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Chloride	Sulfate (mg/L)	Hydroge n Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)
	n	17	17	17	17	12	16	13	11	13	12	2 17	17	17	17	15	14	17	17	13	13	15	14	12	12	13	
	MEAN	23.91	7.27	1092.24	0.31	-292.53	414.38	25.15	21.27	79.92	181.67	60.44	60.29	10.88	49.41	0.08	0.08	0.15	49.56	5.66	4.10	54.20	20.67	3.52	8.45	61,753	28,671
STE	STD. DEV.	3.89		139.54	0.45	30.62	39.66	14.33	12.60	46.94	74.69	19.50	19.36	11.41	15.17	0.21	0.25	0.43	15.26	1.78	1.51	12.70	13.15	2.79	3.25	j	
	MIN	18.50	6.88	868.00	0.00	-341.70	330.00	12.00	9.00	42.00	120.00	30.05	30.00	0.00	27.00	0.01	0.01	0.02	27.05	3.50	2.20	39.00	0.82	0.01	1.00	20,000	10,000
	MAX	29.60	7.82	1322.00	1.20	-253.90	490.00	61.00	55.00	210.00	400.00	110.06	110.00	45.00	85.00	0.82	0.94	1.80	85.06	9.00	7.50	87.00	40.00	8.90	12.00	420,000	240,000
	n	11	11	11	10	10	4	5	5	5	10) 11	11	11	11	11	11	11	11	10	10	10	10	0	0	0 0	(
Stage 1	MEAN	23.23	6.80	544.91	6.00	128.84	91.00	1.60	1.40	6.60	39.80	19.10	1.74	1.68	0.06	17.34	0.02	17.36	17.42	0.21	0.12	38.10	37.90				
LY01	STD. DEV.	4.27		118.22	2.86	98.37	31.84	0.89	0.55	6.31	50.48	3 10.25	0.51	0.50	0.08	10.11	0.04	10.09	10.11	0.21	0.21	11.92	12.09				
	MIN	15.80	6.33	330.00	0.54	-75.00	55.00	1.00	1.00	2.00	10.00	2.50	0.99	0.93	0.01	1.30	0.01	1.30	1.38	0.05	0.01	15.00	21.00				
	MAX	30.90	7.24	711.00	9.92	301.90	130.00	3.00	2.00	14.00	180.00	34.30	2.70	2.66	0.30	33.00	0.13	33.00	33.01	0.60	0.52	61.00	54.00				
	n	12	12	12	12	12	5	8	8	8	11	L 12	12	12	12	12	12	12	12	11	11	11	11	0	0	1	1
Stage 1	MEAN	23.12	6.56	758.25	4.34	111.63	134.80	2.13	1.63	6.25	23.64	1 29.25	2.13	1.94	0.19	26.99	0.08	27.12	27.31	2.04	1.56	42.27	42.09			1,000	2
LY02	STD. DEV.	4.32		94.12	2.91	82.82	45.88	1.55	1.41	7.30	12.31	l 11.73	1.05	1.20	0.45	11.61	0.15	11.70	11.78	1.00	0.95	7.70	10.60				
	MIN	14.60	6.18	559.00	0.73	-25.30	74.00	1.00	1.00	2.00	10.00	9.90	1.00	0.10	0.01	7.10	0.01	7.10	7.12	0.18	0.01	23.00	26.00			1,000	2
	MAX	30.20	6.99	871.00	10.23	279.20	180.00	5.00	5.00	23.00	49.00	51.56	4.50	4.47	1.60	47.00	0.47	47.06	47.10	3.20	2.80	52.00	61.00			1,000	2
	n	12	12	12	12	12	. 11	11	11	11	11	l 12	12	12	12	12	12	12	12	11	11	11	10	5	5	5 11	10
	MEAN	23.28	6.71	723.92	2.72	-9.01	269.09	17.55	8.55	4.00	27.00	7.24	1.89	1.76	0.14	5.32	0.02	5.34	5.48	0.49	0.03	35.09	27.22	0.42	0.66	5 40	3
Stage 1 Liner	STD. DEV.	4.42		102.55	2.53	93.92	42.06	35.84	12.34	3.79	14.11	L 4.35	0.53	0.49	0.16	4.25	0.02	4.24	4.27	0.87	0.06	7.78	13.77	0.42	0.60)	
	MIN	18.10	6.39	552.00	0.31	-199.70	210.00	1.00	1.00	2.00	10.00	0.99	0.93	0.89	0.04	0.01	0.01	0.02	0.07	0.01	0.01	15.00	5.50	0.01	0.10) 1	2
	MAX	31.80	7.15	925.00	9.09	124.50	360.00	125.00	45.00	14.00	60.00	16.01	2.80	2.62	0.63	14.00	0.08	14.01	14.07	2.90	0.22	43.00	47.00	1.10	1.60	6,800	310
	n	12	12	12	12	12	11	11	11	11	11	L 12	12	12	12	12	12	12	12	11	11	11	12	. 12	12	11	10
	MEAN	22.72	6.82	842.92	0.26	-215.06	274.55	4.64	3.36	14.27	34.18	3 1.94	1.28	0.96	0.32	0.37	0.28	0.66	0.97	0.17	0.07	35.73	102.50	2.67	5.31	. 5	2
Stage 2	STD. DEV.	4.05		82.46	0.27	86.34	27.34	3.20	2.06	22.68	13.08	3 1.79	0.38	0.35	0.23	0.93	0.67	1.58	1.54	0.21	0.16	8.09	40.71	3.50	5.30)	
	MIN	18.70	6.53	653.00	0.01	-299.90	240.00	1.00	1.00	2.00	10.00	0.84	0.82	0.44	0.02	0.01	0.01	0.02	0.04	0.01	0.01	15.00	27.00	0.01	0.10	0 1	2
	MAX	29.70	7.15	942.00	0.91	38.20	310.00	12.00	6.00	81.00	50.00	7.10	1.80	1.58	0.87	3.20	2.10	5.30	5.52	0.61	0.51	45.00	150.00	12.00	16.00	300	10
	n	8	8	8	8	8	4	5	5	5	7	7 8	8	8	8	8	8	8	8	7	7	7	8	4	4	1	1
Treated	MEAN	24.76	6.45	718.59	5.03	142.14	182.40	2.40	2.40	24.80	44.29	14.44	2.35	2.29	0.06	12.09	0.02	12.09	12.15	0.16	0.06	26.71	88.63	0.24	0.33	1	2
Effluent LY03	STD. DEV.	2.33		274.69	1.99	47.30	116.06	1.52	1.52	47.70	48.40	0 4.96	0.62	0.64	0.08	4.59	0.01	4.58	4.61	0.05	0.06	9.96	26.37	0.29	0.29	9	
	MIN	21.81	6.27	75.70	2.05	103.30	9.60	1.00	1.00	2.00	10.00	8.61	1.80	1.74	0.01	6.10	0.01	6.11	6.12	0.09	0.01	13.00	50.00	0.01	0.10	0 1	2
	MAX	29.00	6.64	934.00	9.09	248.70	250.00	4.00	4.00	110.00	150.00	21.60	3.60	3.57	0.25	18.00	0.05	18.00	18.04	0.21	0.13	38.00	120.00	0.60	0.71	. 1	2
	n	8	8	8	8	8	6	5	5	6	7	7 8	8	8	8	8	8	8	8	7	7	7	8	3	3	1	1
Treated	MEAN	25.21	6.46	769.75	4.44	125.23	220.00	1.20	1.20	3.67	27.86	5 7.10	1.67	1.63	0.04	5.42	0.01	5.43	5.47	0.10	0.02	25.29	87.75	0.28	0.37	1 1	2
Effluent LY04	STD. DEV.	2.34	0.15	72.96	2.56	61.28	38.99	0.45	0.45	2.88	13.70	6.12	1.06	1.04	0.04	5.08	0.00	5.08	5.10	0.08	0.02	14.55	30.70	0.24	0.25	j	
	MIN	22.10	6.21	619.00	1.41	66.20	160.00	1.00	1.00	2.00	16.00	1.79	0.80	0.79	0.01	0.99	0.01	0.99	1.00	0.01	0.01	0.05	40.00	0.01	0.10	0 1	2
	MAX	29.40	6.62	821.00	9.98	265.50	270.00	2.00	2.00	9.00	56.00	21.00	4.00	3.91	0.10	17.00	0.01	17.00	17.09	0.25	0.06	42.00	130.00	0.48	0.60	1	2
	n	6	6	6	6	6	4	4	4	5	5	6	6	6	6	6	6	6	6	5	5	5	5	4	4	3	3
Groundwater	MEAN	26.12	6.41	732.50	3.55	33.83	225.00	6.25	4.25	3.00	30.00	6.72	1.97	1.79	0.18	4.72	0.03	4.75	4.93	0.19	0.08	22.40	70.80	0.28	0.36	1	2
PZ07	STD. DEV.	4.96	0.19	118.78	1.87	158.95	60.28	4.99	2.75	1.41	12.21	L 4.09	1.12	0.89	0.28	3.27	0.06	3.24	3.33	0.12	0.07	10.06	31.12	0.10	0.10)	
	MIN	21.31	6.18	516.00	0.59	-248.70	160.00	1.00	1.00	2.00	10.00	2.65	0.84	0.83	0.01	1.60	0.01	1.75	1.82	0.04	0.01	15.00	35.00	0.13	0.21	. 1	2
1	MAX	34.70	6.74	833.00	5.44	189.60	290.00	11.00	7.00	5.00	43.00	12.30	4.00	3.26	0.74	10.00	0.15	10.00	10.08	0.37	0.17	40.00	120.00	0.35	0.41	1	2

Table 7 Summary of Water Quality Data

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS3 FIELD SYSTEM MONITORING REPORT NO. 7

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Table 7 (continued)Summary of Water Quality Data

Sample ID	Statistic	Temp (°C)	рН	Specific Conducta nce (uS/cm)	DO (mg/L)	ORP (mV)	Total Alkalinity (mg/L)	TSS (mg/L)	VSS (mg/L)	CBOD₅ (mg/L)	COD (mg/L)	TN (mg/L N) ¹	TKN (mg/L N)	Organic N (mg/L N) ²	NH3-N (mg/L N)	NO ₃ -N (mg/L N)	NO ₂ -N (mg/L N)	NOx (mg/L N)	TIN (mg/L N) ³	TP (mg/L)	Ortho P (mg/L P)	Chloride	Sulfate (mg/L)	Hydroge n Sulfide (mg/L)	Sulfide (mg/L)	Fecal (Ct/100 mL)	E-coli (Ct/100 mL)
	n	6	6	6	6	6	4	4	4	5	5	6	6	6	6	6	i e	6 6	6	5	5	5	5	5	5	4	4
Groundwator	MEAN	24.51	6.21	655.50	3.50	76.50	167.50	14.75	7.25	4.80	31.40	8.29	1.58	1.31	0.27	6.70	0.02	6.71	6.98	0.41	0.23	20.54	70.00	0.10	0.18	2	2
P708	STD. DEV.	3.78		172.76	1.48	69.92	26.30	12.58	5.74	4.09	16.20	7.21	. 0.75	0.99	0.60	6.56	0.01	6.56	6.54	0.10	0.18	12.07	37.10	0.14	0.13		
F 200	MIN	20.04	5.67	492.00	2.12	-21.90	130.00	4.00	2.00	2.00	10.00	2.54	0.84	0.00	0.01	1.70	0.01	1.70	1.71	0.29	0.05	7.70	35.00	0.01	0.10	1	. 2
	MAX	29.70	6.47	962.00	5.67	186.00	190.00	28.00	14.00	11.00	50.00	21.50	2.50	2.48	1.50	19.00	0.04	19.00	19.02	0.54	0.48	40.00	130.00	0.32	0.41	10	2
	n	4	4	4	4	4	2	2	2	2	3	4	4	4	4	4	. 4	4 4	4	3	3	3	3	3	3	2	2
Groundwater	MEAN	25.98	5.59	558.25	3.22	98.90	115.00	42.50	17.50	2.00	126.67	14.13	2.30	2.25	0.05	11.83	0.01	11.83	11.87	2.23	1.66	26.33	75.67	0.57	0.61	1	2
P700	STD. DEV.	3.27		48.92	1.83	95.96				0.00	150.19	2.68	0.63	0.60	0.03	2.10	0.00	2.09	2.12	1.97	1.60	12.74	37.90	0.19	0.20		
1205	MIN	21.30	5.09	525.00	0.62	38.30	110.00	11.00	11.00	2.00	35.00	11.11	1.80	1.76	0.01	9.30	0.01	9.31	9.32	1.00	0.73	18.00	35.00	0.37	0.41	1	. 2
	MAX	28.90	5.94	629.00	4.81	241.70	120.00	74.00	24.00	2.00	300.00	17.10	3.10	3.03	0.07	14.00	0.01	14.00	14.07	4.50	3.50	41.00	110.00	0.75	0.81	1	. 2
	n	11	11	11	11	7	9	0	0	0	3	11	. 11	11	. 11	8	7	11	. 11	2	1	9	8	0	0	1	. 1
Groundwater	MEAN	23.51	6.06	499.36	2.20	39.99	114.67	7			186.67	4.27	1.80	1.64	0.16	0.41	0.02	2.47	2.63	0.62	1.00	22.19	50.53			1	. 2
P7A7-6	STD. DEV.	3.23		176.81	1.96	106.70	49.59				15.28	6.04	1.12	1.08	0.11	0.61	0.02	5.24	5.27	0.51		10.66	36.04				
1247-0	MIN	18.50	5.80	242.00	0.09	-51.40	58.00)			170.00	0.58	0.56	0.44	0.02	0.01	0.01	0.02	0.04	0.26	1.00	5.70	0.20			1	. 2
	MAX	28.00	6.35	701.00	5.50	249.90	190.00)			200.00	20.60	3.60	3.30	0.35	1.70	0.06	5 17.00	17.30	0.98	1.00	42.00	110.00			1	. 2
	n	12	12	12	12	7	10	0 0	0	0	4	12	12	12	. 12	10	10) 12	. 12	2	2	10	9	0	0	1	. 1
Groundwater	MEAN	23.71	5.99	556.00	0.81	-19.90	108.30)			90.50	13.19	3.03	2.23	0.81	6.67	0.04	10.16	10.97	5.00	3.00	23.59	48.78			1	. 2
	STD. DEV.	2.23		153.43	0.84	103.38	102.79				57.88	12.36	1.54	1.29	1.24	8.44	0.04	12.02	12.12	0.42	1.41	11.48	21.42				
FZA7=0	MIN	20.00	5.60	186.00	0.11	-200.20	2.00)			36.00	1.24	0.89	0.58	0.01	0.34	0.01	0.35	0.66	4.70	2.00	3.90	14.00			1	. 2
	MAX	26.90	6.38	784.00	2.91	115.30	270.00)			150.00	39.20	5.80	4.87	4.10	23.00	0.12	37.00	37.01	5.30	4.00	40.00	84.00			1	. 2
	n	12	12	12	12	7	10	0 0	0	0	5	12	12	12	. 12	11	10) 12	. 12	2	. 3	10	11	0	0	1	. 1
Croundwater	MEAN	23.84	5.82	464.75	0.95	71.13	81.10)			86.20	12.00	2.71	2.56	0.15	6.40	0.05	9.29	9.44	0.75	0.70	23.30	42.64			1	. 2
	STD. DEV.	2.71		83.69	0.98	88.71	46.30)			51.74	13.96	1.09	1.18	0.17	9.41	0.06	5 13.14	13.07	0.92	0.26	6.85	22.77				
P200-5	MIN	19.79	5.50	296.00	0.10	-41.10	21.00)			0.00	1.02	1.00	0.72	0.03	0.01	0.01	0.02	0.10	0.10	0.49	13.00	0.00			1	. 2
	MAX	29.00	6.16	586.00	3.51	213.30	180.00)			130.00	39.70	4.70	4.67	0.64	28.00	0.18	35.00	35.03	1.40	0.99	34.00	76.00			1	. 2
	n	12	12	12	11	7	9	0	0	0	4	12	12	12	12	8	5	3 12	. 12	2	0	10	7	0	0	1	. 1
Croundwater	MEAN	23.76	5.88	349.92	1.03	104.07	51.89				55.25	5.79	1.60	1.46	0.15	2.34	0.06	6 4.19	4.34	0.50		28.99	16.14			1	. 2
Groundwater	STD. DEV.	2.24		87.33	1.75	68.30	25.17	,			23.82	6.38	0.57	0.60	0.21	5.54	0.10	5.92	5.93	0.38		11.60	10.68				
PZB8-7	MIN	20.84	5.46	249.00	0.10	32.10	2.00)			36.00	0.77	0.75	0.60	0.01	0.01	0.01	0.02	0.10	0.23		6.90	4.00			1	. 2
	MAX	27.80	6.14	518.00	6.19	207.00	93.00)			90.00	18.00	2.50	2.36	0.73	16.00	0.30	16.00	16.02	0.77		44.00	30.00			1	. 2
	n	12	12	12	12	7	10	0 0	0	0	4	12	. 12	12	. 12	9	8	3 12	. 12	2	1	10	8	0	0	1	. 1
Constant	MEAN	24.33	5.92	372.31	1.18	25.10	119.20)			97.75	5.46	3.53	2.87	0.66	1.13	0.03	1.93	2.59	0.10	0.01	16.83	13.80			1	. 2
Groundwater	STD. DEV.	2.89		151.65	1.25	108.67	97.54	ŀ			17.75	2.55	0.73	0.79	0.46	1.15	0.04	2.64	2.64	0.02		8.62	7.26				
PZC10-6	MIN	19.19	5.10	200.70	0.10	-70.70	15.00)			77.00	2.98	2.70	1.50	0.11	0.01	0.01	0.02	0.21	0.08	0.01	8.00	4.00			1	2
	MAX	29.00	6.30	689.00	3.78	230.00	270.00)			120.00	11.90	5.00	4.75	1.40	2.80	0.12	9.20	9.51	0.11	0.01	32.00	23.00			1	2

Notes:

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

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

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

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

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

FLARIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-BS3 FIELD SYSTEM MONITORING REPORT NO. 7

PAGE 1-30 HAZEN AND SAWYER, P.C. **Groundwater Monitoring Standpipe Piezometers**: As discussed in Section 3.2.2, twenty downgradient groundwater monitoring points installed as part of the C-HS2 groundwater monitoring network were sampled during this event. Figure 13 depicts a site plan of maximum TN concentrations at all locations where groundwater samples were obtained during the four sample events (July 2011 through July 2012) conducted as part of the C-HS2 monitoring events (taken prior to PNRS installation). In addition, illustrated in Figure 13 are two transect cross sections A-A' and B-B'. For comparison, Figure 14 depicts the maximum TN concentration at all locations where groundwater samples were obtained during this sample event (October 23 and 24, 2014) along with similar transect cross sections A-A' and B-B'. Figure 15 is a time series plot of total nitrogen concentrations during the Task C monitoring. A significant decrease in total nitrogen concentration in the groundwater plume downgradient of the PNRS system has occurred since PNRS system installation.





B-HS3 FIELD SYSTEM MONITORING REPORT NO. 7

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TN Time Series for Various Groundwater Wells

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FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS3 FIELD SYSTEM MONITORING REPORT NO. 7
5.0 B-HS3 Sample Event No. 7: Summary and Recommendations

5.1 Summary

The results of the seventh sampling event indicate that the system is operating well and no adjustments are recommended at this time. The Sample Event No. 7 results indicate that:

- Septic tank effluent (STE) quality is characteristic of typical household STE quality. The total nitrogen concentration of 62 mg/L is within the range of values typically reported for Florida single family residence STE. However, the CBOD₅ concentration of 42 mg/L is in the low end of the typical range of values.
- The combined Stage 1 and lined drip system with lignocellulosic media was effective in converting ammonium to oxidized nitrogen; effluent contained 1.9 mg/L TKN, of which 0.04 mg/L was ammonia. The lower layer of lignocellulosic produced a reducing environment and effluent NO_x-N was 4.8 mg/L.
- The Stage 2 biofilter effluent NO_x-N was 0.04 mg/L.
- The total nitrogen concentration in the final effluent from the total treatment system was approximately 1.5 mg/L, an approximately 98% reduction from STE.

5.2 Recommendations

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

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Appendix A: Laboratory Report

FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY B-HS3 FIELD SYSTEM MONITORING REPORT NO. 7

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

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STED IN ACCORDANCE

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

November 18, 2014 Work Order: 1410752 Revised Report

Laboratory Report

Project Name BHS3 SE#11									
Parameters	Units	Results *		Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-STE Wastewater 1410752-01 10/23/14 11:50 Josefin Hirst 10/23/14 14:58							
Inorganics									
Hydrogen Sulfide (Unionized)	mg/L	0.01	U	SM 4550SF	0.04	0.01	10/28/14 15:46	10/28/14 15:4	48 1
Ammonia as N	mg/L	54		EPA 350.1	0.040	0.009		10/24/14 15:2	29 1
Carbonaceous BOD	mg/L	42		SM 5210B	2	2	10/24/14 11:12	10/29/14 13:4	49 1
Chemical Oxygen Demand	mg/L	120		EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:3	30 1
Chloride	mg/L	87		SM 4500CI-E	50	10		10/27/14 13:	53 10
Nitrate+Nitrite (N)	mg/L	0.01	U	EPA 353.2	0.04	0.01		10/24/14 12:	55 1
Nitrite (as N)	mg/L	0.09		SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11:0	06 1
Orthophosphate as P	mg/L	5.8		SM 4500P-E	0.20	0.060		10/24/14 10:5	58 5
Phosphorous - Total as P	mg/L	6.0		SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15:2	20 1
Sulfate	mg/L	40		EPA 300.0	0.60	0.20		10/31/14 23:	11 1
Sulfide	mg/L	11		SM 4500SF	0.40	0.10		10/28/14 16:2	22 1
Total Alkalinity	mg/L	450		SM 2320B	8.0	2.0		10/27/14 13:	56 1
Total Kjeldahl Nitrogen	mg/L	62		EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:2	20 1
Total Suspended Solids	mg/L	32		SM 2540D	1	1	10/28/14 08:20	10/29/14 16:	14 1
Volatile Suspended Solids	mg/L	29		EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:	14 1
Nitrate (as N)	mg/L	0.02	U	EPA 353.2	0.08	0.02		10/24/14 12:5	55 1
Microbiology	-								
E. Coli	MPN/100 ml	240 000	7	SM 9223B	20	2.0	10/23/14 16·03	10/24/14 10:3	35 1
Fecal Coliforms	CFU/100 ml	35,000	_	SM 9222D	1	1	10/23/14 15:54	10/24/14 14:2	22 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by		BHS3-LY01 Wastewater 1410752-02 10/23/14 11:00 Josefin Hirst							
Date/Time Received		10/23/14 14:58							
Inorganics									
Ammonia as N	mg/L	0.011	I	EPA 350.1	0.040	0.009		10/24/14 16:5	52 1
Carbonaceous BOD	mg/L	13		SM 5210B	2	2	10/24/14 11:12	10/29/14 13:4	49 1
Chemical Oxygen Demand	mg/L	22	I	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:3	30 1
Chloride	mg/L	37		SM 4500CI-E	5.0	1.0		10/24/14 13:	51 1
Nitrate+Nitrite (N)	mg/L	30		EPA 353.2	0.96	0.24		10/24/14 14:	18 24
Nitrite (as N)	mg/L	0.01	U	SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11:0)7 1
Orthophosphate as P	mg/L	0.52		SM 4500P-E	0.040	0.012		10/24/14 10:2	27 1
Phosphorous - Total as P	mg/L	0.58		SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15:2	20 1

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SADIED IN ACCORDANCE

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November 18, 2014 Work Order: 1410752 Revised Report

Project Name BHS3 SE#11								
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed D	ilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by		BHS3-LY01 Wastewater 1410752-02 10/23/14 11:00 Josefin Hirst						
Date/ Time Received		10/23/14 14:58						
Total Alkalinity	mg/L	55	SM 2320B	8.0	2.0		10/27/14 14:01	1 1
Total Kjeldahl Nitrogen	mg/L	2.3	EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:20) 1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	10/28/14 08:20	10/29/14 16:14	41
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:14	41
Nitrate (as N)	mg/L	30	EPA 353.2	1.0	0.25		10/24/14 14:18	3 24
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-LY02 Wastewater 1410752-03 10/23/14 11:10 Josefin Hirst 10/23/14 14:58						
Inorganics								
Ammonia as N	ma/l	0.035 1	EPA 350.1	0.040	0 009		10/24/14 15:33	3 1
Carbonaceous BOD	ma/L	4	SM 5210B	2	2	10/24/14 11:12	10/29/14 13:49	9 1
Chemical Oxygen Demand	ma/L	27	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:30) 1
Chloride	mg/L	44	SM 4500CI-E	5.0	1.0		10/24/14 13:52	2 1
Nitrate+Nitrite (N)	mg/L	47	EPA 353.2	0.96	0.24		10/24/14 14:19	24
Nitrite (as N)	mg/L	0.06	SM 4500NO2 B	0.04	0.01	10/24/14 10:50	10/24/14 11:09	9 1
Orthophosphate as P	ma/L	1.2	SM 4500P-E	0.040	0.012		10/24/14 10:28	3 1
Phosphorous - Total as P	mg/l	13	SM 4500P-E	0.040	0.010	10/24/14 08·35	10/24/14 15:20) 1
Sulfate	mg/L	61	EPA 300.0	0.60	0.20		10/31/14 23:22	2 1
Total Alkalinity	ma/L	74	SM 2320B	8.0	2.0		10/27/14 14:07	7 1
Total Kieldahl Nitrogen	mg/L	4.5	EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:20) 1
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	10/28/14 08:20	10/29/14 16:14	4 1
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:14	4 1
Nitrate (as N)	mg/L	47	EPA 353.2	1.0	0.25		10/24/14 14:19	9 24
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-LINER Wastewater 1410752-04 10/23/14 10:40 Josefin Hirst 10/23/14 14:58						
Inorganics Ammonia as N	mg/L	0.040	EPA 350.1	0.040	0.009		10/24/14 15:34	4 1

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

STED IN ACCORDANCE

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

November 18, 2014 Work Order: 1410752 Revised Report

Laboratory Report

Parameters Units Results * Method PQL MDL Propared Analyzed Dilution Sample Description BH53-LINER Matrix Westeweiter Vasteweiter SAL Sample Description BH53-LINER Westeweiter SAL Sample Description BH53-LINER Westeweiter SAL Sample Description SAL Sample Description	Project Name	Project Name BHS3 SE#11									
BHS3-LINER Matrix BHS3-LINER Wasteweirer SAL Sample Description BHS3-LINER Wasteweirer 10/23/14 10-04 010/23/14 10-04 010/23/14 10-04 010/23/14 10-04 010/23/14 10-04 010/23/14 10-04 010/23/14 10-04 010/23/14 10-04 010/23/14 10-04 010/21/14 11:25 Subsective 10/23/14 10-04 25 Subsective 10/23/14 11:21 Display 10/23/14 11:21 <	Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution		
Carbonaceous BOD mg/L 4 SM 5210B 2 2 10/24/14 11:12 10/29/14 13:49 1 Chemical Oxygen Demand mg/L 18 I EPA 410.4 25 10 10/30/14 12:16 10/30/14 13:45 1 Chloride mg/L 3.2 SM 4500CHE 5.0 1.0 10/24/14 13:45 1 Nitrite (Nitrite (Nitrite (N) mg/L 0.7 EPA 353.2 0.20 0.05 10/24/14 10:50 10/24/14 13:41 5 Orthophosphate as P mg/L 0.22 SM 4500P-E 0.040 0.011 10/24/14 10:50 10/24/14 10:29 1 Phosphorous - Total as P mg/L 0.27 SM 4500P-E 0.040 0.010 10/24/14 10:20 10/24/14 15:20 1 Sulfate mg/L 1.270 SM 3208 8.0 2.0 10/31/14 23:43 1 Total Kjeldah Nitrogen mg/L 1.9 EPA 330.2 0.04 10/24/14 08:20 10/24/14 15:24 Total Kjeldah Nitrogen mg/L 1.4 10/28/14 15:41 1	Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-LINER Wastewater 1410752-04 10/23/14 10:40 Josefin Hirst 10/23/14 14:58								
Chemical Oxygen Demand mg/L 18 I EPA 410.4 25 10 10/30/14 12:16 10/30/14 12:36 1 Chioride mg/L 32 SM 4500C1E 5.0 10 10/24/14 13:12 1 Nitrite+Nitrite (N) mg/L 0.08 SM 0.04 0.01 10/24/14 10:50 10/24/14 10:29 1 Orthophosphate as P mg/L 0.22 SM 4500P-E 0.040 0.01 10/24/14 08:35 10/24/14 10:29 1 Phosphorous - Total as P mg/L 0.27 SM 4500P-E 0.040 0.01 10/24/14 08:35 10/24/14 16:20 1 Sulfate mg/L 1.9 EPA 351.2 0.20 0.05 10/24/14 08:35 10/24/14 16:14 1 Total Kjeldahi Nitrogen mg/L 1.0 EA 53.2 0.24 1 10/24/14 08:20 10/24/14 16:14 1 Total Kjeldahi Nitrogen mg/L 4.7 EPA 353.2 0.24 0.06 10/24/14 16:14 1 Nitrate Nitrite (s N) mg/L 2.0 <td< td=""><td>Carbonaceous BOD</td><td>mg/L</td><td>4</td><td>SM 5210B</td><td>2</td><td>2</td><td>10/24/14 11:12</td><td>10/29/14 13:4</td><td>91</td></td<>	Carbonaceous BOD	mg/L	4	SM 5210B	2	2	10/24/14 11:12	10/29/14 13:4	91		
Chloride mg/L 32 SM 4500CLE 5.0 1.0 10/24/14 13:52 1 Nitrate-Nitrife (N) mg/L 4.7 EPA 353.2 0.20 0.05 10/24/14 13:41 5 Nitrite (as N) mg/L 0.08 SM 0.04 0.01 10/24/14 10:50 10/24/14 10:29 1 Orthophosphate as P mg/L 0.22 SM 4500P-E 0.040 0.012 10/24/14 10:29 1 Sulfate mg/L 0.27 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 1.9 EPA 351.2 0.20 10/31/14 23:34 1 Total Kjeldahi Nitrogen mg/L 1 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 16:14 1 Total Kjeldahi Nitrogen mg/L 1.9 EPA 351.2 0.20 0.05 10/24/14 08:35 10/24/14 16:14 1 Volatile Suspended Solids mg/L 1 Z 0.02 10/23/14 16:34 1 20/2	Chemical Oxygen Demand	ma/L	18 I	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:3	0 1		
Nitrate +Nitrite (N) mg/L 4.7 EPA 353.2 0.20 0.05 10/24/14 13:41 5 Nitrite (as N) mg/L 0.08 SM 0.04 0.01 10/24/14 13:41 5 Orthophosphate as P mg/L 0.22 SM 4500P-E 0.040 0.012 10/24/14 10:25 1 Sulfate mg/L 0.27 SM 4500P-E 0.040 0.010 10/24/14 10:35 10/24/14 10:35 10/24/14 10:35 1 Sulfate mg/L 4.4 EPA 300.0 0.60 0.20 10/31/14 23:34 1 Total Kjeldahi Nitrogen mg/L 1 SM 4500P 1 1 10/24/14 08:35 10/24/14 18:35 10/24/14 08:35 10/24/14 18:35 10/24/14 08:35 10/24/14 18:35 10/24/14 08:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 10/24/14 18:35 1 10/24/14 18:35 10/24/14 18:35 1	Chloride	ma/L	32	SM 4500CI-E	5.0	1.0		10/24/14 13:5	2 1		
Nitrite (as N) mg/L 0.08 SM 0.04 0.01 10/24/14 11:50 10/24/14 11:10 1 Orthophosphate as P mg/L 0.22 SM 4500P-E 0.040 0.010 10/24/14 10:29 1 Phosphorous - Total as P mg/L 0.27 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 244 EPA 300.0 0.60 0.20 10/31/14 23:34 1 Total Akalinity mg/L 270 SM 4500P-E 0.040 0.05 10/24/14 08:35 10/24/14 16:20 1 Total Suspended Solids mg/L 1 SM 2540D 1 1 10/28/14 08:20 10/28/14 15:41 1 Volatile Suspended Solids mg/L 4.7 EPA 353.2 0.24 0.06 10/24/14 10:35 1 Volatile Suspended Solids mg/L 4.7 EPA 353.2 0.24 0.06 10/24/14 10:35 1 Volatile Suspended Solids mg/L 0.20 VI SM 9223B	Nitrate+Nitrite (N)	mg/L	4.7	EPA 353.2	0.20	0.05		10/24/14 13:4	1 5		
Orthophosphate as P mg/L 0.22 SM 4500P-E 0.040 0.012 10/24/14 10:29 1 Phosphorous - Total as P mg/L 0.27 SM 4500P-E 0.040 0.010 10/24/14 10:23 1 Total Alkalinity mg/L 444 EPA 3300 0.66 0.20 10/31/14 23:34 1 Total Alkalinity mg/L 1.9 EPA 351.2 0.20 10/24/14 08:35 10/24/14 15:20 1 Total Suppended Solids mg/L 1 SM 25400 1 1 10/28/14 08:20 10/24/14 16:14 1 Volatile Suspended Solids mg/L 1 U EPA 160.4 1 1 10/28/14 08:20 10/24/14 16:35 1 Volatile Suspended Solids mg/L 4.7 EPA 353.2 0.24 0.06 10/23/14 16:35 1 Sitrobiology E Col SM 9223B 2.0 1 1 10/23/14 16:35 1 Fecal Coliforms CFU/100 ml 1 SM 9223B 2.0 10/23/14 16:46	Nitrite (as N)	mg/L	0.08	SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11:10	0 1		
Phosphorous - Total as P mg/L 0.27 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 44 EPA 300.0 0.060 0.20 10/31/14 23:34 1 Total Aklaihity mg/L 1.9 SM 3230B 8.0 2.0 10/21/14 14:16 1 Total Kjeldahi Nitrogen mg/L 1.9 EPA 351.2 0.20 0.05 10/24/14 08:20 10/24/14 15:20 1 Volatile Suspended Solids mg/L 1.0 SM 2540D 1 1 10/28/14 08:20 10/24/14 13:41 5 Microbiology E Coli MPN/100 mL 2.0 U SM 9223B 2.0 2.0 10/23/14 16:03 10/24/14 13:41 5 Microbiology E Coli MPN/100 mL 2.0 U SM 9223B 2.0 2.0 10/23/14 16:03 10/24/14 13:41 5 Sample Description BHS3-ST2 Matrix Wastewater SAL Sample Number 10/23/14 10:34 1 Collected by	Orthophosphate as P	mg/L	0.22	SM 4500P-E	0.040	0.012		10/24/14 10:2	91		
Sulfate mg/L 44 EPA 300.0 0.60 0.20 10/31/14 23:34 1 Total Aklalinity mg/L 270 SM 2320B 8.0 2.0 10/27/14 14:16 1 Total Aklainity mg/L 1.9 EPA 351.2 0.20 0.05 10/24/14 08:35 10/24/14 15:20 1 Total Suspended Solids mg/L 1 SM 2540D 1 1 10/28/14 08:20 10/29/14 16:14 1 Volatie Suspended Solids mg/L 4.7 EPA 353.2 0.24 0.06 10/23/14 16:33 10/24/14 13:41 5 Microbiology E Coll MPN/100 mL 2.0 U SM 9223B 2.0 2.0 10/23/14 16:33 10/24/14 10:35 1 Fecal Coliforms CFU/100 ml 1 SM 9223B 2.0 10/23/14 15:44 10/23/14 14:23 1 Date/Time Collected 10/23/14 14:53 1 10/23/14 14:53 1 1 Date/Time Received 10/23/14 14:58 10/28/14 15:48 1 1 10/28/14 1	Phosphorous - Total as P	mg/L	0.27	SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15:2	0 1		
Total Alkalinity mg/L 270 SM 2320B 8.0 2.0 10/27/14 14:16 1 Total Kjeldahi Nitrogen mg/L 1.9 EPA 351.2 0.20 0.05 10/24/14 08:20 10/24/14 15:20 1 Total Suspended Solids mg/L 1 Microbiology 10/28/14 08:20 10/28/14 16:14 1 Nitrate (as N) mg/L 4.7 EPA 353.2 0.24 0.06 10/24/14 10:35 1 Fecal Coliforms MPN/100 mL 2.0 U SM 9223B 2.0 2.0 10/23/14 16:03 10/24/14 10:35 1 Fecal Coliforms CFU/100 ml 1 SM 9223D 1 1 10/23/14 16:03 10/24/14 10:35 1 Sample Description BHS3-ST2 Matrix Wastewater SALSample Number 10/23/14 10:34 1 10/28/14 15:46 10/28/14 15:48 1 Collected by Josefin Hirst Date/Time Collected 10/23/14 10:34 1 1 Carbonaceous BOD mg/L 0.61 SM 4500FE 0.04 0.01 <td>Sulfate</td> <td>mg/L</td> <td>44</td> <td>EPA 300.0</td> <td>0.60</td> <td>0.20</td> <td></td> <td>10/31/14 23:34</td> <td>4 1</td>	Sulfate	mg/L	44	EPA 300.0	0.60	0.20		10/31/14 23:34	4 1		
Total Kjeldahi Nitrogen mg/L 1.9 EPA 351.2 0.20 0.05 10/24/14 08:35 10/24/14 15:20 1 Total Suspended Solids mg/L 1 SM 2540D 1 1 10/28/14 08:20 10/29/14 16:14 1 Volatile Suspended Solids mg/L 1 U EPA 153.2 0.24 0.06 10/24/14 16:14 1 Volatile Suspended Solids mg/L 4.7 EPA 353.2 0.24 0.06 10/24/14 10:35 1 Microbiology E Coli MPN/100 mL 2.0 U SM 9223B 2.0 2.0 10/23/14 16:33 10/24/14 10:35 1 Fecal Coliforms CFU/100 ml 1 SM 9222D 1 1 10/23/14 16:34 10/24/14 14:22 1 Sample Description BHS3-ST2 Wastewater SAL Sample Number 1410752-05 Date/Time Received 10/23/14 16:34 1 Collected by Josefin Hirst Date/Time Received 10/24/14 15:46 1 Ammonia as N mg/L 0.38	Total Alkalinity	mg/L	270	SM 2320B	8.0	2.0		10/27/14 14:1	6 1		
Total Suspended Solids mg/L 1 SM 2540D 1 1 10/28/14 08:20 10/29/14 16:14 1 Volatile Suspended Solids mg/L 1 U EPA 160.4 1 1 10/28/14 08:20 10/29/14 16:14 1 Nitrate (as N) mg/L 4.7 EPA 353.2 0.24 0.06 10/23/14 16:33 10/24/14 13:41 5 Microbiology E Coli MPN/100 mL 2.0 V SM 9223B 2.0 2.0 10/23/14 16:33 10/24/14 10:35 1 Fecal Coliforms CFU/100 ml 1 SM 9222D 1 1 10/23/14 15:54 10/24/14 14:22 1 Sample Description BHS3-ST2 Matrix Wastewater SAL Sample Number 1410752-05 10/23/14 10:34 1 10/23/14 10:34 1 Date/Time Received J0/23/14 10:34 10/23/14 10:34 1 10/24/14 15:36 1 Carbonaceous BOD mg/L 0.01 SM 4500FE 0.04 0.01 10/24/14 15:36 1 <	Total Kjeldahl Nitrogen	mg/L	1.9	EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:2	0 1		
Volatile Suspended Solids mg/L 1 U EPA 160.4 1 1 10/28/14 08:20 10/29/14 16:14 1 Nitrate (as N) mg/L 4.7 EPA 353.2 0.24 0.06 10/24/14 13:41 5 Microbiology E. Coli MPN/100 mL 2.0 U SM 92238 2.0 2.0 10/23/14 16:03 10/24/14 10:35 1 Fecal Coliforms CFU/100 ml 1 SM 9222D 1 1 10/23/14 15:54 10/24/14 14:22 1 Sample Description BHS3-ST2 Matrix Wastewater SAL Sample Number 10/23/14 10:34 10/23/14 10:34 1 Collected by Josefin Hirst Josefin Hirst Date/Time Received 10/23/14 15:46 10/28/14 15:46 1 Armonia as N mg/L 0.01 SM 4550SF 0.04 0.01 10/28/14 15:46 1 Choraceous BOD mg/L 16 SM 52108 2 2 10/24/14 13:36 1 Choride mg/L 0.38 EPA 410.4 25	Total Suspended Solids	mg/L	1	SM 2540D	1	1	10/28/14 08:20	10/29/14 16:1	4 1		
Nitrate (as N) mg/L 4.7 EPA 353.2 0.24 0.06 10/24/14 13:41 5 Microbiology E. Coli MPN/100 mL 2.0 U SM 9223B 2.0 2.0 10/23/14 16:03 10/24/14 10:35 1 Fecal Coliforms CFU/100 ml 1 SM 9223B 2.0 2.0 10/23/14 15:04 10/24/14 10:35 1 Sample Description BHS3-ST2 Wastewater SAL Sample Number 1410752-05 Sample Collected 10/23/14 10:34 Collected 10/23/14 15:46 10/28/14 15:48 1 Collected by Josefin Hirst Date/Time Received 0.01 SM 4550SF 0.04 0.01 10/28/14 15:46 10/28/14 15:48 1 Ammonia as N mg/L 0.01 SM 4550SF 0.04 0.01 10/28/14 15:48 1 Carbonaceous BOD mg/L 0.38 EPA 410.4 2 10 10/28/14 15:43 1 Mitrate+Nitrite (N) mg/L 0.02 I EPA 410.4 25 10 10/24/14 11:12 10/28/14 14:3:31	Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:1	4 1		
Microbiology Procession Procesion Procession Proces	Nitrate (as N)	mg/L	4.7	EPA 353.2	0.24	0.06		10/24/14 13:4	15		
Intervention MPN/100 mL 2.0 U SM 9223B 2.0 2.0 10/23/14 16:03 10/24/14 10:35 1 Fecal Coliforms CFU/100 ml 1 SM 9222D 1 1 10/23/14 15:54 10/24/14 10:35 1 Sample Description BHS3-ST2 Wastewater SAL Sample Number 1410752-05 Intervention	Microbiology	5									
Endot Init in the formation in the formatine in the formation in the formation in the formation	E Coli	MPN/100 ml	2011	SM 9223B	20	20	10/23/14 16:03	10/24/14 10:3	5 1		
BHS3-ST2 Matrix Wastewater SAL Sample Number 1410752-05 Date/Time Collected 10/23/14 10:34 Collected by Josefin Hirst Date/Time Received 10/23/14 14:58 Inorganics Marking Marking Hydrogen Sulfide (Unionized) mg/L 0.01 U SM 4550SF 0.04 0.01 10/28/14 15:46 10/28/14 15:46 1 Ammonia as N mg/L 0.38 EPA 350.1 0.040 0.009 10/24/14 11:12 10/29/14 13:49 1 Chemical Oxygen Demand mg/L 16 SM 5210B 2 2 10/30/14 12:16 10/30/14 14:30 1 Chioride mg/L 39 SM 4500CI-E 5.0 1.0 10/24/14 13:53 1 Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 12:59 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.012 10/24/14 10:30 1 Phosphorous - Total as P mg/L 0.51 SM 4500P-E 0.040 0.011 10/24/14 10:30 1	Eecal Coliforms	CELI/100 mL	1	SM 9222D	1	1	10/23/14 15:54	10/24/14 14.2	2 1		
Sample Description Matrix BHS3-ST2 Wastewater SAL Sample Number 1410752-05 Date/Time Collected 10/23/14 10:34 Collected by Josefin Hirst Date/Time Received 10/23/14 14:58 Inorganics Hydrogen Sulfide (Unionized) mg/L 0.01 SM 4550SF 0.04 0.01 10/28/14 15:46 10/28/14 15:48 1 Ammonia as N mg/L 0.38 EPA 350.1 0.040 0.009 10/24/14 15:36 1 Carbonaceous BOD mg/L 16 SM 5210B 2 2 10/24/14 11:12 10/29/14 13:49 1 Chloride mg/L 39 SM 4500CF-E 5.0 1.0 10/24/14 13:53 1 Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 11:50 10/24/14 11:51 1 Nitrite (as N) mg/L 0.02 I SM 0.04 0.01 10/24/14 11:51 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 <		010/100111	· · ·	0		1	10/20/14 10:04	10/24/14 14.2	<u> </u>		
Inorganics Hydrogen Sulfide (Unionized) mg/L 0.01 U SM 4550SF 0.04 0.01 10/28/14 15:46 10/28/14 15:48 1 Ammonia as N mg/L 0.38 EPA 350.1 0.040 0.009 10/24/14 15:36 1 Carbonaceous BOD mg/L 16 SM 5210B 2 2 10/24/14 11:12 10/29/14 13:49 1 Chemical Oxygen Demand mg/L 45 EPA 410.4 25 10 10/30/14 12:16 10/30/14 14:30 1 Chloride mg/L 39 SM 4500CI-E 5.0 1.0 10/24/14 13:53 1 Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 12:59 1 Nitrite (as N) mg/L 0.02 I SM 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120	Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-ST2 Wastewater 1410752-05 10/23/14 10:34 Josefin Hirst 10/23/14 14:58								
Hydrogen Sulfide (Unionized) mg/L 0.01 U SM 4550SF 0.04 0.01 10/28/14 15:46 10/28/14 15:46 1 Ammonia as N mg/L 0.38 EPA 350.1 0.040 0.009 10/24/14 15:36 1 Carbonaceous BOD mg/L 16 SM 5210B 2 2 10/24/14 11:12 10/29/14 13:49 1 Chemical Oxygen Demand mg/L 45 EPA 410.4 25 10 10/30/14 12:16 10/30/14 14:30 1 Chloride mg/L 39 SM 4500CI-E 5.0 1.0 10/24/14 13:53 1 Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Nitrite (as N) mg/L 0.02 I SM 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.012 10/24/14 10:30 1 Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1	Inorganics										
Ammonia as N mg/L 0.38 EPA 350.1 0.040 0.009 10/24/14 15:36 1 Carbonaceous BOD mg/L 16 SM 5210B 2 2 10/24/14 11:12 10/29/14 13:49 1 Chemical Oxygen Demand mg/L 45 EPA 410.4 25 10 10/30/14 12:16 10/30/14 14:30 1 Chloride mg/L 39 SM 4500Cl-E 5.0 1.0 10/24/14 13:53 1 Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Nitrite (as N) mg/L 0.02 I SM 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.012 10/24/14 10:30 1 Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfide mg/L 13	Hydrogen Sulfide (Unionized)	mg/L	0.01 U	SM 4550SF	0.04	0.01	10/28/14 15:46	10/28/14 15:4	81		
Carbonaceous BOD mg/L 16 SM 5210B 2 2 10/24/14 11:12 10/29/14 13:49 1 Chemical Oxygen Demand mg/L 45 EPA 410.4 25 10 10/30/14 12:16 10/30/14 14:30 1 Chloride mg/L 39 SM 4500CI-E 5.0 1.0 10/24/14 13:53 1 Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 12:59 1 Nitrite (as N) mg/L 0.02 I SM 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.012 10/24/14 10:30 1 Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfide mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:221	Ammonia as N	mg/L	0.38	EPA 350.1	0.040	0.009		10/24/14 15:3	61		
Chemical Oxygen Demand mg/L 45 EPA 410.4 25 10 10/30/14 12:16 10/30/14 14:30 1 Chloride mg/L 39 SM 4500CI-E 5.0 1.0 10/24/14 13:53 1 Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 12:59 1 Nitrite (as N) mg/L 0.02 I SM 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfide mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:22 1 Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25	Carbonaceous BOD	mg/L	16	SM 5210B	2	2	10/24/14 11:12	10/29/14 13:4	91		
Chloride mg/L 39 SM 4500CI-E 5.0 1.0 10/24/14 13:53 1 Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 12:59 1 Nitrite (as N) mg/L 0.02 I SM 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfide mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:22 1 Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25 1	Chemical Oxygen Demand	mg/L	45	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:3	0 1		
Nitrate+Nitrite (N) mg/L 0.02 I EPA 353.2 0.04 0.01 10/24/14 12:59 1 Nitrite (as N) mg/L 0.02 I SM 4500NO2-B 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfide mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:22 1 Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25 1	Chloride	mg/L	39	SM 4500CI-E	5.0	1.0		10/24/14 13:5	31		
Nitrite (as N) mg/L 0.02 I SM 4500NO2-B 0.04 0.01 10/24/14 10:50 10/24/14 11:10 1 Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.012 10/24/14 10:30 1 Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfate mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:22 1 Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25 1	Nitrate+Nitrite (N)	mg/L	0.02 I	EPA 353.2	0.04	0.01		10/24/14 12:5	91		
Orthophosphate as P mg/L 0.51 SM 4500P-E 0.040 0.012 10/24/14 10:30 1 Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfide mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:22 1 Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25 1	Nitrite (as N)	mg/L	0.02 I	SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11:10	0 1		
Phosphorous - Total as P mg/L 0.61 SM 4500P-E 0.040 0.010 10/24/14 08:35 10/24/14 15:20 1 Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfate mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:22 1 Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25 1	Orthophosphate as P	mg/L	0.51	SM 4500P-E	0.040	0.012		10/24/14 10:3	0 1		
Sulfate mg/L 120 EPA 300.0 6.0 2.0 11/05/14 15:35 10 Sulfide mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:22 1 Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25 1	Phosphorous - Total as P	mg/L	0.61	SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15:2	0 1		
Sulfide mg/L 13 SM 4500SF 0.40 0.10 10/28/14 16:22 1 Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25 1	Sulfate	mg/L	120	EPA 300.0	6.0	2.0		11/05/14 15:3	5 10		
Total Alkalinity mg/L 260 SM 2320B 8.0 2.0 10/27/14 14:25 1	Sulfide	mg/L	13	SM 4500SF	0.40	0.10		10/28/14 16:2	2 1		
	Total Alkalinity	mg/L	260	SM 2320B	8.0	2.0		10/27/14 14:2	51		

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Sone Car

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November 18, 2014 Work Order: 1410752 Revised Report

Project Name	BHS3 SE#11								
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Di	lution	
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-ST2 Wastewater 1410752-05 10/23/14 10:34 Josefin Hirst 10/23/14 14:58							
Total Kjeldahl Nitrogen	mg/L	1.5	EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:20) 1	
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	10/28/14 08:20	10/29/14 16:14	. 1	
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:14	. 1	
Nitrate (as N)	mg/L	0.02 U	EPA 353.2	0.08	0.02		10/24/14 12:59) 1	
Microbiology	-								
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	10/23/14 16:03	10/24/14 10:35	i 1	
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	10/23/14 15:54	10/24/14 14:22	2 1	
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-S12-DUP Wastewater 1410752-06 10/23/14 10:38 Josefin Hirst 10/23/14 14:58							
Inorganics									
Hydrogen Sulfide (Unionized)	ma/l	0.01 U	SM 4550SF	0.04	0.01	10/28/14 15:46	10/28/14 15:48	3 1	
Ammonia as N	ma/l	0.66	EPA 350.1	0.040	0.009		10/24/14 15:38	3 1	
Carbonaceous BOD	ma/L	12	SM 5210B	2	2	10/24/14 11:12	10/29/14 13:49) 1	
Chemical Oxygen Demand	mg/L	39	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:30) 1	
Chloride	mg/L	39	SM 4500CI-E	5.0	1.0		10/24/14 13:54	. 1	
Nitrate+Nitrite (N)	mg/L	0.01 U	EPA 353.2	0.04	0.01		10/24/14 13:00) 1	
Nitrite (as N)	mg/L	0.02 I	SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11:11	1	
Orthophosphate as P	mg/L	0.49	SM 4500P-E	0.040	0.012		10/24/14 10:32	: 1	
Phosphorous - Total as P	mg/L	0.61	SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15:20	/ 1	
Sulfate	mg/L	120	EPA 300.0	6.0	2.0		11/05/14 15:46	10	
Sulfide	mg/L	13	SM 4500SF	0.40	0.10		10/28/14 16:22	. 1	
Total Alkalinity	mg/L	270	SM 2320B	8.0	2.0		10/27/14 14:34	· 1	
Total Kjeldahl Nitrogen	mg/L	1.4	EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:20	/ 1	
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	10/28/14 08:20	10/29/14 16:14	· 1	
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:14	. 1	
Nitrate (as N)	mg/L	0.02 U	EPA 353.2	80.0	0.02		10/24/14 13:00	/ 1	
<u>Microbiology</u>									
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	10/23/14 16:03	10/24/14 10:35	1	
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	10/23/14 15:54	10/24/14 14:22	. 1	

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Sone Car

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November 18, 2014 Work Order: 1410752 Revised Report

Project Name BHS3 SE#11									
Parameters	Units	Results *		Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-LY03 Wastewater 1410752-07 10/23/14 11:35 Josefin Hirst 10/23/14 14:58							
Inorganics									
Hydrogen Sulfide (Unionized)	mg/L	0.01	U	SM 4550SF	0.04	0.01	10/28/14 15:46	10/28/14 15:4	18 1
Ammonia as N	mg/L	0.009	U	EPA 350.1	0.040	0.009		10/24/14 15:4	13 1
Carbonaceous BOD	mg/L	2	U	SM 5210B	2	2	10/24/14 11:12	10/29/14 13:4	19 1
Chemical Oxygen Demand	mg/L	23	I	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:3	30 1
Chloride	mg/L	16		SM 4500CI-E	5.0	1.0		10/24/14 13:5	54 1
Nitrate+Nitrite (N)	mg/L	12		EPA 353.2	0.96	0.24		10/28/14 12:4	13 24
Nitrite (as N)	mg/L	0.01	U	SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11:1	1 1
Orthophosphate as P	mg/L	0.13		SM 4500P-E	0.040	0.012		10/24/14 10:3	33 1
Phosphorous - Total as P	mg/L	0.21		SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15:2	20 1
Sulfate	mg/L	100	L	EPA 300.0	0.60	0.20		11/01/14 01:3	88 1
Sulfide	mg/L	0.10	U	SM 4500SF	0.40	0.10		10/28/14 16:2	22 1
Total Alkalinity	mg/L	220		SM 2320B	8.0	2.0		10/27/14 14:4	10
Total Kjeldahl Nitrogen	mg/L	2.5		EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:2	20 1
Total Suspended Solids	mg/L	1	U	SM 2540D	1	1	10/28/14 08:20	10/29/14 16:1	14 1
Volatile Suspended Solids	mg/L	1	U	EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:1	14 1
Nitrate (as N)	mg/L	12		EPA 353.2	1.0	0.25		10/28/14 12:4	43 24
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-LY04 Wastewater 1410752-08 10/23/14 11:22 Josefin Hirst 10/23/14 14:58							
Inorganics									
Ammonia as N	mg/L	0.038	I	EPA 350.1	0.040	0.009		10/24/14 15:4	45 1
Carbonaceous BOD	mg/L	2	U	SM 5210B	2	2	10/24/14 11:12	10/29/14 13:4	19 1
Chemical Oxygen Demand	mg/L	16	I	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:3	30 1
Chloride	mg/L	18		SM 4500CI-E	5.0	1.0		10/24/14 13:5	55 1
Nitrate+Nitrite (N)	mg/L	4.2		EPA 353.2	0.20	0.05		10/28/14 12:2	<u>28</u> 5
Nitrite (as N)	mg/L	0.01	U	SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11:1	2 1
Orthophosphate as P	mg/L	0.059		SM 4500P-E	0.040	0.012		10/24/14 10:3	34 1
Phosphorous - Total as P	mg/L	0.15		SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15:2	20 1
Sulfate	mg/L	93		EPA 300.0	6.0	2.0		11/05/14 15:5	57 10
Total Alkalinity	mg/L	160		SM 2320B	8.0	2.0		10/27/14 14:4	46 1
Total Kjeldahl Nitrogen	mg/L	1.1		EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:2	20 1

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Project Name	Project Name BHS3 SE#11									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-LY04 Wastewater 1410752-08 10/23/14 11:22 Josefin Hirst 10/23/14 14:58								
Total Suspended Solids	mg/L	1 U	SM 2540D	1	1	10/28/14 08:20	10/29/14 16:1	4 1		
Volatile Suspended Solids	ma/L	1 U	EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:1	4 1		
Nitrate (as N)	mg/L	4.2	EPA 353.2	0.24	0.06		10/28/14 12:2	8 5		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-PZ07 Wastewater 1410752-09 10/23/14 12:10 Josefin Hirst 10/23/14 14:58								
Inorganics										
Hydrogen Sulfide (Unionized)	mg/L	0.30	SM 4550SF	0.04	0.01	10/28/14 15:46	10/28/14 15:4	8 1		
Ammonia as N	mg/L	0.19	EPA 350.1	0.040	0.009		10/24/14 15:4	6 1		
Carbonaceous BOD	mg/L	2 U	SM 5210B	2	2	10/24/14 11:12	10/29/14 13:4	9 1		
Chemical Oxygen Demand	mg/L	35	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14:3	0 1		
Chloride	mg/L	15	SM 4500CI-E	5.0	1.0		10/24/14 13:5	6 1		
Nitrate+Nitrite (N)	mg/L	1.8	EPA 353.2	0.04	0.01		10/28/14 11:1	71		
Nitrite (as N)	mg/L	0.15	SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11:1:	2 1		
Orthophosphate as P	mg/L	0.14	SM 4500P-E	0.040	0.012		10/24/14 10:3	5 1		
Phosphorous - Total as P	mg/L	0.22	SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15:2	20 1		
Sulfate	mg/L	66	EPA 300.0	0.60	0.20		11/01/14 02:0	0 1		
Sulfide	mg/L	0.40	SM 4500SF	0.40	0.10		10/28/14 16:2	2 1		
Total Alkalinity	mg/L	160	SM 2320B	8.0	2.0		10/27/14 14:5	i9 1		
Total Kjeldahl Nitrogen	mg/L	1.2	EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15:2	20 1		
Total Suspended Solids	mg/L	1	SM 2540D	1	1	10/28/14 08:20	10/29/14 16:1	4 1		
Volatile Suspended Solids	mg/L	1 U	EPA 160.4	1	1	10/28/14 08:20	10/29/14 16:1	4 1		
Nitrate (as N)	mg/L	1.6	EPA 353.2	0.08	0.02		10/28/14 11:1	7 1		
Microbiology										
E. Coli	MPN/100 mL	2.0 U	SM 9223B	2.0	2.0	10/23/14 16:03	10/24/14 10:3	5 1		
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	10/23/14 15:54	10/24/14 14:2	2 1		

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Project Name BHS3 SE#11								
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed Di	lution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-PZ08 Wastewater 1410752-10 10/23/14 12:25 Josefin Hirst 10/23/14 14:58						
Inorganics Hydrogen Sulfide (Unionized) Ammonia as N Carbonaceous BOD Chemical Oxygen Demand Chloride Nitrate+Nitrite (N) Nitrite (as N) Orthophosphate as P Phosphorous - Total as P Sulfate Sulfide	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	0.01 U 1.5 2 U 27 7.7 5.8 0.04 0.48 0.54 44	SM 4550SF EPA 350.1 SM 5210B EPA 410.4 SM 4500CI-E EPA 353.2 SM 4500NO2-B SM 4500P-E SM 4500P-E EPA 300.0 SM 4500SE	0.04 0.040 2 25 5.0 0.20 0.04 0.040 0.040 0.60 0.40	0.01 0.009 2 10 1.0 0.05 0.01 0.012 0.010 0.20 0.10	10/28/14 15:46 10/24/14 11:12 10/30/14 12:16 10/24/14 10:50 10/24/14 08:35	10/28/14 15:48 10/24/14 15:48 10/29/14 13:49 10/30/14 14:30 10/24/14 13:57 10/28/14 12:29 10/24/14 11:13 10/24/14 10:36 10/24/14 15:20 11/01/14 02:11 10/28/14 16:22	1 1 1 5 1 1 1 1
Total Alkalinity Total Kjeldahl Nitrogen Total Suspended Solids Volatile Suspended Solids Nitrate (as N) <u>Microbiology</u> E. Coli Fecal Coliforms	mg/L mg/L mg/L mg/L mg/L MPN/100 mL CFU/100 ml	130 1.5 4 3 5.8 2.0 U 1 U	SM 43003F SM 2320B EPA 351.2 SM 2540D EPA 160.4 EPA 353.2 SM 9222B SM 9222D	0.40 8.0 0.20 1 1 0.24 2.0 1	0.10 2.0 0.05 1 1 0.06 2.0 1	10/24/14 08:35 10/28/14 08:20 10/28/14 08:20 10/23/14 16:03 10/23/14 15:54	10/28/14 10:22 10/27/14 15:05 10/24/14 15:20 10/29/14 16:14 10/29/14 16:14 10/28/14 12:29 10/24/14 10:35 10/24/14 14:22	1 1 1 1 5 1 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-PZ09 Wastewater 1410752-11 10/23/14 11:30 Josefin Hirst 10/23/14 14:58						
Inorganics Hydrogen Sulfide (Unionized) Ammonia as N Carbonaceous BOD Chemical Oxygen Demand Chloride Nitrate+Nitrite (N) Nitrite (as N) Orthophosphate as P	mg/L mg/L mg/L mg/L mg/L mg/L mg/L	0.39 0.009 U 2 U 45 3.6 I 0.87 0.02 I 1.9	SM 4550SF EPA 350.1 SM 5210B EPA 410.4 SM 4500CI-E EPA 353.2 SM 4500NO2-B SM 4500P-E	0.04 0.040 2 25 5.0 0.04 0.04 0.040	0.01 0.009 2 10 1.0 0.01 0.01 0.012	10/28/14 15:46 10/24/14 11:12 10/30/14 12:16 10/24/14 10:50	10/28/14 15:48 10/24/14 15:50 10/29/14 13:49 10/30/14 14:30 10/24/14 13:57 10/28/14 11:22 10/24/14 11:14 10/24/14 10:39	1 1 1 1 1 1 1

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Laboratory Report

Project Name		BHS	3 SE#11					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		BHS3-PZ09 Wastewater 1410752-11 10/23/14 11:30 Josefin Hirst 10/23/14 14:58						
Phosphorous - Total as P Sulfate Sulfide Total Alkalinity Total Kjeldahl Nitrogen Total Suspended Solids Volatile Suspended Solids Nitrate (as N) <u>Microbiology</u> E. Coli	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	1.8 4.5 0.60 120 1.0 6 5 0.84 2.0 U	SM 4500P-E EPA 300.0 SM 4500SF SM 2320B EPA 351.2 SM 2540D EPA 160.4 EPA 353.2 SM 9223B	0.040 0.60 0.40 8.0 0.20 1 1 0.08 2.0	0.010 0.20 0.10 2.0 0.05 1 1 0.02 2.0	10/24/14 08:35 10/24/14 08:35 10/28/14 08:20 10/28/14 08:20 10/23/14 16:03	10/24/14 15:2 11/01/14 02:2 10/28/14 16:2 10/27/14 15:1 10/24/14 15:2 10/29/14 16:1 10/29/14 16:1 10/28/14 11:2 10/24/14 10:3	10 1 12 1 12 1 12 1 10 1 14 1 12 1 15 1
Fecal Coliforms	CFU/100 ml	1 U	SM 9222D	1	1	10/23/14 15:54	10/24/14 14:2	2 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-A7-6 Wastewater 1410752-12 10/23/14 13:44 Josefin Hirst 10/24/14 15:50						
Inorganics Ammonia as N Chloride Nitrate+Nitrite (N) Nitrite (as N)	mg/L mg/L mg/L mg/L	0.12 19 0.02 I 0.01 U	EPA 350.1 SM 4500CI-E EPA 353.2 SM	0.040 5.0 0.04 0.04	0.009 1.0 0.01 0.01	10/27/14 18:36	10/27/14 20:0 10/27/14 13:5 10/28/14 11:2 10/24/14 17:2	17 1 14 1 14 1 16 1
Sulfate Total Kjeldahl Nitrogen Nitrate (as N)	mg/L mg/L mg/L	62 0.92 0.02 I	EPA 300.0 EPA 351.2 EPA 353.2	0.60 0.20 0.08	0.20 0.05 0.02	10/28/14 08:59	11/01/14 02:3 10/29/14 14:3 10/28/14 11:2	4 1 4 1 4 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-A7-8 Wastewater 1410752-13 10/23/14 14:05 Josefin Hirst 10/24/14 15:50						
<u>Inorganics</u> Ammonia as N Chloride	mg/L mg/L	0.13 19	EPA 350.1 SM 4500CI-E	0.040 5.0	0.009 1.0	10/27/14 18:36	10/27/14 20:0 10/27/14 11:1	71 41

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Project Name	Project Name BHS3 SE#11									
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed [Dilution		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-A7-8 Wastewater 1410752-13 10/23/14 14:05 Josefin Hirst 10/24/14 15:50								
Nitrate+Nitrite (N)	mg/L	4.4	EPA 353.2	0.20	0.05		10/28/14 12:3	30 5		
Nitrite (as N)	mg/L	0.06	SM 4500NO2-B	0.04	0.01		10/24/14 17:2	27 1		
Sulfate	mg/L	50	EPA 300.0	0.60	0.20		11/01/14 02:4	5 1		
Total Kjeldahl Nitrogen	mg/L	1.5	EPA 351.2	0.20	0.05	10/28/14 08:59	10/29/14 14:3	34 1		
Nitrate (as N)	mg/L	4.3	EPA 353.2	0.24	0.06		10/28/14 12:3	30 5		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B15-7 Wastewater 1410752-14 10/24/14 08:55 Josefin Hirst 10/24/14 15:50								
Inorganics										
Ammonia as N	mg/L	0.47	EPA 350.1	0.040	0.009	10/27/14 18:36	10/27/14 20:0)7 1		
Chloride	mg/L	45	SM 4500CI-E	5.0	1.0		10/27/14 11:1	5 1		
Nitrate+Nitrite (N)	mg/L	0.02 I	EPA 353.2	0.04	0.01		10/28/14 11:2	28 1		
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:2	28 1		
Sulfate	mg/L	0.68	EPA 300.0	0.60	0.20		11/01/14 02:5	6 1		
Total Kjeldahl Nitrogen	mg/L	0.75	EPA 351.2	0.20	0.05	10/28/14 08:59	10/29/14 14:3	34 1		
Nitrate (as N)	mg/L	0.02 l	EPA 353.2	0.08	0.02		10/28/14 11:2	8 1		
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B6-6 Wastewater 1410752-15 10/23/14 14:08 Josefin Hirst 10/24/14 15:50								
Inorganics										
Ammonia as N	mg/L	0.055	EPA 350.1	0.040	0.009	10/27/14 18:36	10/27/14 20:0)7 1		
Chloride	mg/L	28	SM 4500CI-E	5.0	1.0		10/27/14 11:1	61		
Nitrate+Nitrite (N)	mg/L	0.02 I	EPA 353.2	0.04	0.01		10/28/14 11:3	60 1		
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:3	32 1		
Sulfate	mg/L	58	EPA 300.0	0.60	0.20		11/01/14 03:0	8 1		
Total Kjeldahl Nitrogen	mg/L	0.80	EPA 351.2	0.20	0.05	10/28/14 08:59	10/29/14 14:3	34 1		
Nitrate (as N)	mg/L	0.02 I	EPA 353.2	0.08	0.02		10/28/14 11:3	60 1		

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Project Name BHS3 SE#11								
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B8-5 Wastewater 1410752-16 10/23/14 14:25 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	0.64	EPA 350.1	0.040	0.009	10/27/14 18:36	10/27/14 20:0)7 1
Chloride	mg/L	30	SM 4500CI-E	5.0	1.0		10/27/14 11:1	17
Nitrate+Nitrite (N)	mg/L	0.02 I	EPA 353.2	0.04	0.01		10/28/14 11:3	32 1
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:3	33 1
Sulfate	mg/L	64	EPA 300.0	0.60	0.20		11/01/14 03:5	52 1
Total Kjeldahl Nitrogen	mg/L	1.9	EPA 351.2	0.20	0.05	10/28/14 08:59	10/29/14 14:3	34 1
Nitrate (as N)	mg/L	0.02 I	EPA 353.2	0.08	0.02		10/28/14 11:3	32 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B8-5-DUP Wastewater 1410752-17 10/23/14 14:30 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia og N	ma/l	0.64	EPA 350 1	0.040	0.000	10/27/14 19:26	10/27/14 20:0	1 דר
	mg/L	0.04	SM 4500CLE	5.0	1.0	10/21/14 10:50	10/27/14 20.0	1 1
Nitroto+Nitrito (NI)	mg/L	0.02.1	EPA 353 2	0.04	0.01		10/20/14 11.1	10 I D/ 1
Nitrite (as N)	mg/L	0.02 1	SM	0.04	0.01		10/20/14 11.3	22 1
Nulle (ds N)	ilig/L	0.01 0	4500NO2-B	0.04	0.01		10/24/14 17.0	55 1
Sulfate	mg/L	60	EPA 300.0	0.60	0.20		11/01/14 04:1	15 1
Total Kjeldahl Nitrogen	mg/L	1.9	EPA 351.2	0.20	0.05	10/28/14 08:59	10/29/14 14:3	34 1
Nitrate (as N)	mg/L	0.02 I	EPA 353.2	0.08	0.02		10/28/14 11:3	34 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B8-7 Wastewater 1410752-18 10/23/14 14:50 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	ma/l	0.73 .15	EPA 350.1	0 040	0 009		10/29/14 12:3	30 1
Chloride	ma/l	28	SM 4500CI-E	5.0	1.0		10/27/14 11.1	8 1
Nitrate+Nitrite (N)	ma/l	1.5	EPA 353.2	0.04	0.01		10/28/14 11.4	11 1
Nitrite (as N)	mg/L	0.08	SM 4500NO2-B	0.04	0.01		10/24/14 17:3	34 1

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Project Name		BHS	3 SE#11					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B8-7 Wastewater 1410752-18 10/23/14 14:50 Josefin Hirst 10/24/14 15:50						
Sulfate	mg/L	24	EPA 300.0	0.60	0.20		11/01/14 04:20	61
Total Kjeldahl Nitrogen	mg/L	1.5	EPA 351.2	0.20	0.05	10/28/14 08:59	10/29/14 14:3	4 1
Nitrate (as N)	mg/L	1.4	EPA 353.2	0.08	0.02		10/28/14 11:4	1 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B8-10 Wastewater 1410752-19 10/23/14 15:20 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	0.40	EPA 350.1	0.040	0.009		10/29/14 12:3	2 1
Chloride	mg/L	44	SM 4500CI-E	5.0	1.0		10/27/14 11:20	0 1
Nitrate+Nitrite (N)	mg/L	0.03 I	EPA 353.2	0.04	0.01		10/28/14 11:43	31
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:3	4 1
Sulfate	mg/L	0.55 I	EPA 300.0	0.60	0.20		11/01/14 04:3	71
Total Kjeldahl Nitrogen	mg/L	0.62	EPA 351.2	0.20	0.05	10/28/14 08:59	10/29/14 14:3	4 1
Nitrate (as N)	mg/L	0.03 I	EPA 353.2	0.08	0.02		10/28/14 11:43	3 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B10-5 Wastewater 1410752-20 10/24/14 08:10 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	3.2	EPA 350.1	0.40	0.095		10/29/14 13:4	8 10
Chloride	mg/L	12	SM 4500CI-E	5.0	1.0		10/27/14 11:2	1 1
Nitrate+Nitrite (N)	mg/L	0.07	EPA 353.2	0.04	0.01		10/28/14 11:4	51
Nitrite (as N)	mg/L	0.05	SM 4500NO2-B	0.04	0.01		10/24/14 17:3	5 1
Sulfate	mg/L	6.7	EPA 300.0	0.60	0.20		11/01/14 04:49	91
Total Kjeldahl Nitrogen	mg/L	4.9	EPA 351.2	0.20	0.05	10/28/14 08:59	10/29/14 14:3	4 1
Nitrate (as N)	mg/L	0.02 U	EPA 353.2	0.08	0.02		10/28/14 11:4	51

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Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B10-7 Wastewater 1410752-21 10/24/14 08:20 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	4.7	EPA 350.1	0.40	0.095		10/29/14 13:5	50 10
Chloride	mg/L	21	SM 4500CI-E	5.0	1.0		10/27/14 11:2	21 1
Nitrate+Nitrite (N)	mg/L	0.01 I	EPA 353.2	0.04	0.01		10/28/14 11:4	7 1
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:3	35 1
Sulfate	mg/L	14	EPA 300.0	0.60	0.20		11/01/14 05:0	0 1
Total Kjeldahl Nitrogen	mg/L	5.1	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	28 1
Nitrate (as N)	mg/L	0.02 U	EPA 353.2	0.08	0.02		10/28/14 11:4	7 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-B15-5 Wastewater 1410752-22 10/24/14 08:40 Josefin Hirst 10/24/14 15:50						
In concertant								
Inorganics	ma/l	0.21	EDA 350 1	0.040	0 000		10/20/14 12:4	1 1
Chlorido	mg/L	0.31	SM 4500CLE	0.040 5 0	1.0		10/29/14 12.4	14 I
Nitroto I Nitrito (N)	mg/L	20	EDA 353 2	0.04	0.01		10/27/14 11.2	2 I
Nitrite (as N)	mg/L	0.08	SM	0.04	0.01		10/27/14 15.5	26 1
Nulle (ds N)	iiig/L	0.011	4500NO2-B	0.04	0.01		10/24/14 17.0	
Sulfate	mg/L	17	EPA 300.0	0.60	0.20		11/01/14 05:1	1 1
Total Kjeldahl Nitrogen	mg/L	1.5	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	28 1
Nitrate (as N)	mg/L	0.06 I	EPA 353.2	0.08	0.02		10/27/14 15:5	59 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-C06-5 Wastewater 1410752-23 10/24/14 08:00 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	ma/l	13	EPA 350.1	0 040	0 000		10/29/14 12:4	15 1
Chloride	mg/L	44	SM 4500CI-F	50	1 0		10/27/14 11.2	1 20
Nitrate+Nitrite (N)	mg/L	0 02 1	EPA 353 2	0.04	0.01		10/27/14 16:0	
Nitrite (as N)	ma/l	0.01 U	SM	0.04	0.01		10/24/14 17:3	38 1
	ing/L	0.01 0	4500NO2-B	0.04	0.01			

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Project Name		BHS	3 SE#11					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-C06-5 Wastewater 1410752-23 10/24/14 08:00 Josefin Hirst 10/24/14 15:50						
Sulfate	mg/L	84	EPA 300.0	0.60	0.20		11/01/14 05:2	2 1
Total Kjeldahl Nitrogen	mg/L	2.5	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	8 1
Nitrate (as N)	mg/L	0.02 I	EPA 353.2	0.08	0.02		10/27/14 16:0	5 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-C06-10 Wastewater 1410752-24 10/23/14 08:36 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	0.39	EPA 350.1	0.040	0.009		10/29/14 12:4	7 1
Chloride	mg/L	44	SM 4500CI-E	5.0	1.0		10/27/14 11:2	3 1
Nitrate+Nitrite (N)	mg/L	0.03 I	EPA 353.2	0.04	0.01		10/27/14 16:0	7 1
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:3	9 1
Sulfate	mg/L	0.58 I	EPA 300.0	0.60	0.20		11/01/14 05:3	4 1
Total Kjeldahl Nitrogen	mg/L	0.63	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	8 1
Nitrate (as N)	mg/L	0.03 I	EPA 353.2	0.08	0.02		10/27/14 16:0	7 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-C06-7 Wastewater 1410752-25 10/24/14 08:14 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	0.12	EPA 350.1	0.040	0.009		10/29/14 12:4	9 1
Chloride	mg/L	41	SM 4500CI-E	5.0	1.0		10/27/14 11:2	31
Nitrate+Nitrite (N)	mg/L	0.02 I	EPA 353.2	0.04	0.01		10/27/14 16:0	9 1
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:3	9 1
Sulfate	mg/L	7.1	EPA 300.0	0.60	0.20		11/01/14 05:4	51
Total Kjeldahl Nitrogen	mg/L	1.2	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	8 1
Nitrate (as N)	mg/L	0.02 I	EPA 353.2	0.08	0.02		10/27/14 16:0	9 1

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Project Name			BHS	53 SE#11						
Parameters	Units	Results	k	Method	PQL	MDL	Prepared	Analyzed	Dilut	tion
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-C10-6 Wastewater 1410752-26 10/23/14 14:58 Josefin Hirst 10/24/14 15:50	;)							
Inorganics										
Ammonia as N	mg/L	0.43		EPA 350.1	0.040	0.009		10/29/14 12	:50	1
Chloride	mg/L	9.3		SM 4500CI-E	5.0	1.0		10/27/14 11	:24	1
Nitrate+Nitrite (N)	mg/L	0.08		EPA 353.2	0.04	0.01		10/27/14 16	:11	1
Nitrite (as N)	mg/L	0.02	I	SM 4500NO2-B	0.04	0.01		10/24/14 17	:40	1
Sulfate	mg/L	13		EPA 300.0	0.60	0.20		11/05/14 16	:09	1
Total Kjeldahl Nitrogen	mg/L	2.9		EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14	:28	1
Nitrate (as N)	mg/L	0.06	I	EPA 353.2	0.08	0.02		10/27/14 16	:11	1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		EB Reagent Wate 1410752-27 10/23/14 12:40 Josefin Hirst 10/23/14 14:58	r) }							
Inorganics										
Hydrogen Sulfide (Unionized)	mg/L	0.01	U	SM 4550SF	0.04	0.01	10/28/14 15:46	10/28/14 15	:48	1
Ammonia as N	mg/L	0.009	U	EPA 350.1	0.040	0.009		10/24/14 15	:51	1
Carbonaceous BOD	mg/L	2	U	SM 5210B	2	2	10/24/14 11:12	10/29/14 13	:49	1
Chemical Oxygen Demand	mg/L	10	U	EPA 410.4	25	10	10/30/14 12:16	10/30/14 14	:30	1
Chloride	mg/L	1.0	U	SM 4500CI-E	5.0	1.0		10/24/14 13	:58	1
Nitrate+Nitrite (N)	mg/L	0.01	I	EPA 353.2	0.04	0.01		10/27/14 16	:14	1
Nitrite (as N)	mg/L	0.01	U	SM 4500NO2-B	0.04	0.01	10/24/14 10:50	10/24/14 11	:15	1
Orthophosphate as P	mg/L	0.014	I	SM 4500P-E	0.040	0.012		10/24/14 10	:40	1
Phosphorous - Total as P	mg/L	0.010	U	SM 4500P-E	0.040	0.010	10/24/14 08:35	10/24/14 15	:20	1
Sulfate	mg/L	0.20	U	EPA 300.0	0.60	0.20		11/05/14 16	:20	1
Sulfide	ma/L	0.10	U	SM 4500SF	0.40	0.10		10/28/14 16	:22	1
Total Alkalinity	mg/L	2.0	U	SM 2320B	8.0	2.0		10/27/14 15	:14	1
Total Kieldahl Nitrogen	mg/L	0.05	U	EPA 351.2	0.20	0.05	10/24/14 08:35	10/24/14 15	:20	1
Total Suspended Solids	mg/L	1	Ū	SM 2540D	1	1	10/24/14 09:13	10/27/14 15	:54	1
Volatile Suspended Solids	mg/l	1	Ū	EPA 160.4	1	1	10/24/14 09.13	10/27/14 16	·27	1
Nitrate (as N)	mg/L	0.02	U	EPA 353.2	0.08	0.02		10/27/14 16	:14	1
Microbiology		0.02	-							
F. Coli	MPN/100 ml	20	U	SM 9223B	20	20	10/23/14 16:03	10/24/14 10	·35	1
Fecal Coliforms	CFU/100 ml		U	SM 9222D	1	1	10/23/14 15:54	10/24/14 14	:22	1

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Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-D4-7 Wastewater 1410752-28 10/24/14 10:05 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	0.34	EPA 350.1	0.040	0.009		10/29/14 12:5	52 1
Chloride	mg/L	43	SM 4500CI-E	5.0	1.0		10/27/14 11:2	24 1
Nitrate+Nitrite (N)	mg/L	0.02 I	EPA 353.2	0.04	0.01		10/27/14 16:1	16 1
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:4	40 1
Sulfate	mg/L	11	EPA 300.0	0.60	0.20		11/05/14 16:3	31 1
Total Kjeldahl Nitrogen	mg/L	1.3	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	28 1
Nitrate (as N)	mg/L	0.02 I	EPA 353.2	0.08	0.02		10/27/14 16:1	16 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-D6-8 Wastewater 1410752-29 10/24/14 08:54 Josefin Hirst 10/24/14 15:50						
In concertant								
Inorganics	m g /l	0.74	EDA 350 1	0.040	0 000		10/20/14 12:5	= 1
Chlorido	mg/L	0.74	SM 4500CLE	0.040 5 0	1.0		10/29/14 12:	05 1
Nitroto I Nitrito (N)	mg/L	19	EDA 353 2	0.04	0.01		10/27/14 11.2	10 1
Nitrite (as N)	mg/L	0.02 1	SM	0.04	0.01		10/24/14 10.	10 I 11 1
	ing/L	0.01 0	4500NO2-B	0.01	0.01		10,2	
Sulfate	mg/L	27	EPA 300.0	0.60	0.20		11/05/14 17:0)5 1
Total Kjeldahl Nitrogen	mg/L	1.4	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	28 1
Nitrate (as N)	mg/L	0.02 I	EPA 353.2	0.08	0.02		10/27/14 16:1	18 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-D4-10 Wastewater 1410752-30 10/24/14 10:16 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	ma/l	0.37	EPA 350.1	0 040	0 000		10/29/14 12.4	56 1
Chloride	ma/l	43	SM 4500CI-F	50	1 0		10/27/14 11:2	26 1
Nitrate+Nitrite (N)	ma/l	0.03.1	EPA 353.2	0.04	0.01		10/27/14 16:2	20 1
Nitrite (as N)	ma/l	0.00 1	SM	0.04	0.01		10/24/14 17:2	41 1
		0.01 0	4500NO2-B	0.07	0.01			

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November 18, 2014 Work Order: 1410752 Revised Report

Project Name		BHS	3 SE#11					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-D4-10 Wastewater 1410752-30 10/24/14 10:16 Josefin Hirst 10/24/14 15:50						
Sulfate	mg/L	1.5	EPA 300.0	0.60	0.20		11/05/14 18:4	7 1
Total Kjeldahl Nitrogen	mg/L	0.90	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	8 1
Nitrate (as N)	mg/L	0.03 I	EPA 353.2	0.08	0.02		10/27/14 16:2	.0 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-A7-11 Wastewater 1410752-31 10/24/14 09:30 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	1.2	EPA 350.1	0.040	0.009		10/29/14 13:0	1 1
Chloride	mg/L	18	SM 4500CI-E	5.0	1.0		10/27/14 11:2	7 1
Nitrate+Nitrite (N)	mg/L	0.03 I	EPA 353.2	0.04	0.01		10/27/14 16:2	2 1
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:4	2 1
Sulfate	mg/L	65	EPA 300.0	0.60	0.20		11/05/14 18:5	8 1
Total Kjeldahl Nitrogen	mg/L	1.5	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	8 1
Nitrate (as N)	mg/L	0.03 I	EPA 353.2	0.08	0.02		10/27/14 16:2	2 1
Sample Description Matrix SAL Sample Number Date/Time Collected Collected by Date/Time Received		PZ-C4-5 Wastewater 1410752-32 10/24/14 09:24 Josefin Hirst 10/24/14 15:50						
Inorganics								
Ammonia as N	mg/L	1.2	EPA 350.1	0.040	0.009		10/29/14 13:0	2 1
Chloride	mg/L	120	SM 4500CI-E	50	10		10/27/14 11:3	9 10
Nitrate+Nitrite (N)	mg/L	0.04	EPA 353.2	0.04	0.01		10/27/14 16:2	4 1
Nitrite (as N)	mg/L	0.01 U	SM 4500NO2-B	0.04	0.01		10/24/14 17:4	3 1
Sulfate	mg/L	120	EPA 300.0	6.0	2.0		11/06/14 19:0	5 10
Total Kjeldahl Nitrogen	mg/L	2.0	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14:2	8 1
Nitrate (as N)	mg/L	0.04 I	EPA 353.2	0.08	0.02		10/27/14 16:2	4 1

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November 18, 2014 Work Order: 1410752 Revised Report

Project Name		BHS	63 SE#11					
Parameters	Units	Results *	Method	PQL	MDL	Prepared	Analyzed	Dilution
Oserarda Deservicións		D7 D4 C						
Sample Description		PZ-D4-5						
Matrix		wastewater						
SAL Sample Number		1410752-33						
Collected by		losofin Hirst						
Date/Time Received		10/24/14 15:50						
		10/24/14 13:30						
Inorganics								
Ammonia as N	mg/L	0.16	EPA 350.1	0.040	0.009		10/29/14 13	:04 1
Chloride	mg/L	22	SM 4500CI-E	5.0	1.0		10/27/14 11	:28 1
Nitrate+Nitrite (N)	mg/L	0.59	EPA 353.2	0.04	0.01		10/27/14 16	:31 1
Nitrite (as N)	mg/L	0.04	SM	0.04	0.01		10/24/14 17	:44 1
	-		4500NO2-B					
Sulfate	mg/L	36	EPA 300.0	0.60	0.20		11/05/14 19	:20 1
Total Kjeldahl Nitrogen	mg/L	1.9	EPA 351.2	0.20	0.05	10/27/14 08:52	10/29/14 14	:28 1
Nitrate (as N)	mg/L	0.55	EPA 353.2	0.08	0.02		10/27/14 16	:31 1

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					Spike	Source		%REC		RPD	
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit	
Batch BJ42402 - Ortho phosp	horus SM4500	P-E by seal									
Blank (BJ42402-BLK1)					Prepared &	Analyzed:	10/24/14 10):03			
Orthophosphate as P	0.0163 I,V	0.040	0.012	mg/L							
LCS (BJ42402-BS1)					Prepared &	Analyzed:	10/24/14 10):04			
Orthophosphate as P	0.805	0.040	0.012	mg/L	0.80		101	90-110			
LCS (BJ42402-BS2)					Prepared &	Analyzed:	10/24/14 10):06			
Orthophosphate as P	0.819	0.040	0.012	mg/L	0.80		102	90-110			
LCS (BJ42402-BS3)					Prepared &	Analyzed:	10/24/14 10):07			
Orthophosphate as P	0.779	0.040	0.012	mg/L	0.80		97	90-110			
LCS (BJ42402-BS4)					Prepared &	Analyzed:	10/24/14 10):08			
Orthophosphate as P	0.825	0.040	0.012	mg/L	0.80		103	90-110			
LCS (BJ42402-BS5)					Prepared &	Analyzed:	10/24/14 10):09			
Orthophosphate as P	0.783	0.040	0.012	mg/L	0.80		98	90-110			
Matrix Spike (BJ42402-MS1)		Source: 1	410752-27		Prepared &	Analyzed:	10/24/14 10):11			
Orthophosphate as P	1.04	0.040	0.012	mg/L	1.0	0.0141	103	90-110			
Matrix Spike (BJ42402-MS2)		Source: 1	410747-10		Prepared &	Analyzed:	10/24/14 10):13			
Orthophosphate as P	1.04	0.040	0.012	mg/L	1.0	0.0137	103	90-110			
Matrix Spike Dup (BJ42402-MSD1)	Source: 1	410752-27		Prepared &	Analyzed:	10/24/14 10):12			
Orthophosphate as P	0.981	0.040	0.012	mg/L	1.0	0.0141	97	90-110	6	20	
Matrix Spike Dup (BJ42402-MSD2	2)	Source: 1	410747- <u>1</u> 0		Prepared &	Analyzed:	10/24/14 10):14			
Orthophosphate as P	1.02	0.040	0.012	mg/L	1.0	0.0137	100	90-110	3	20	

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					Spike	Source		%REC		RPD	
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit	
Batch BJ42403 - Digestion for	TP and TKN										
Blank (BJ42403-BLK1)					Prepared 8	Analyzed:	10/24/14 15	5:20			
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L							
Phosphorous - Total as P	0.010 U	0.040	0.010	mg/L							
LCS (BJ42403-BS1)					Prepared 8	Analyzed:	10/24/14 15	5:20			
Total Kjeldahl Nitrogen	0.992	0.20	0.05	mg/L	1.0		99	90-110			
Phosphorous - Total as P	1.03	0.040	0.010	mg/L	1.0		103	90-110			
Matrix Spike (BJ42403-MS1)		Source: 1	410747-10		Prepared 8	Analyzed:	10/24/14 15	5:20			
Phosphorous - Total as P	1.08	0.040	0.010	mg/L	1.0	ND	108	90-110			
Total Kjeldahl Nitrogen	1.05	0.20	0.05	mg/L	1.0	ND	105	90-110			
Matrix Spike (BJ42403-MS2)		Source: 1	410752-27		Prepared 8	Analyzed:	10/24/14 15	5:20			
Total Kjeldahl Nitrogen	1.05	0.20	0.05	mg/L	1.0	ND	105	90-110			
Phosphorous - Total as P	1.09	0.040	0.010	mg/L	1.0	ND	109	90-110			
Matrix Spike Dup (BJ42403-MSD1)		Source: 1	410747-10		Prepared 8	Analyzed:	10/24/14 15	5:20			
Total Kjeldahl Nitrogen	1.09	0.20	0.05	mg/L	1.0	ND	109	90-110	4	20	
Phosphorous - Total as P	1 00	0 040	0.010	ma/l	10	ND	109	90-110	1	25	
	1.05	0.040	0.010	mg/L	1.0	ND	100				
Matrix Spike Dup (BJ42403-MSD2)	1.03	Source: 1	410752-27	iiig/L	Prepared 8	Analyzed:	10/24/14 15	5:20	·		
Matrix Spike Dup (BJ42403-MSD2) Total Kjeldahl Nitrogen	1.05	Source: 1 0.20	410752-27 0.05	mg/L	Prepared 8	Analyzed:	10/24/14 15 105	5:20 90-110	0.5	20	
Matrix Spike Dup (BJ42403-MSD2) Total Kjeldahl Nitrogen Phosphorous - Total as P	1.05	Source: 1 0.20 0.040	410752-27 0.05 0.010	mg/L mg/L	1.0 Prepared 8 1.0 1.0	Analyzed: ND ND ND	10/24/14 15 105 108	5:20 90-110 90-110	0.5 0.8	20 25	
Matrix Spike Dup (BJ42403-MSD2) Total Kjeldahl Nitrogen Phosphorous - Total as P Batch BJ42405 - Nitrite SM 450	1.05 1.05 1.08 0NO2-B by se	5.040 Source: 1 0.20 0.040	410752-27 0.05 0.010	mg/L mg/L	Prepared 8 1.0 1.0	Analyzed: ND ND	10/24/14 15 105 108	90-110 90-110 90-110	0.5 0.8	20 25	
Matrix Spike Dup (BJ42403-MSD2) Total Kjeldahl Nitrogen Phosphorous - Total as P Batch BJ42405 - Nitrite SM 450 Blank (BJ42405-BLK1)	1.05 1.08 0NO2-B by se	Source: 1 0.20 0.040	410752-27 0.05 0.010	mg/L mg/L	Prepared 8 1.0 1.0 Prepared 8	Analyzed:	10/24/14 15 105 108 10/24/14 10	90-110 90-110 90-110	0.5 0.8	20 25	



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Inorganics - Quality Control	
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Analyte	Result	PQL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch BJ42405 - Nitrite SM 450	0NO2-B by se	al								
Blank (BJ42405-BLK2)					Prepared &	Analyzed:	10/24/14 16	6:09		
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
LCS (BJ42405-BS1)					Prepared &	Analyzed:	10/24/14 10):55		
Nitrite (as N)	0.0774	0.04	0.01	mg/L	0.080		97	90-110		
LCS (BJ42405-BS2)					Prepared &	Analyzed:	10/24/14 16	6:39		
Nitrite (as N)	0.0974	0.04	0.01	mg/L	0.10		97	90-110		
Matrix Spike (BJ42405-MS1)		Source: 1	410747-01		Prepared &	Analyzed:	10/24/14 10	:56		
Nitrite (as N)	0.161 J2	0.04	0.01	mg/L	0.10	0.0990	62	77-119		
Matrix Spike (BJ42405-MS2)		Source: 1	410752-07		Prepared &	& Analyzed:	10/24/14 11	:01		
Nitrite (as N)	0.0905	0.04	0.01	mg/L	0.10	ND	90	77-119		
Matrix Spike (BJ42405-MS3)		Source: 1	410752-10		Prepared &	Analyzed:	10/24/14 11	:08		
Nitrite (as N)	0.112	0.04	0.01	mg/L	0.10	0.0356	77	77-119		
Matrix Spike Dup (BJ42405-MSD1)		Source: 1	410747-01		Prepared &	& Analyzed:	10/24/14 10):56		
Nitrite (as N)	0.162 J2	0.04	0.01	mg/L	0.10	0.0990	63	77-119	0.5	20
Matrix Spike Dup (BJ42405-MSD2)		Source: 1	410752-07		Prepared &	Analyzed:	10/24/14 11	:02		
Nitrite (as N)	0.0926	0.04	0.01	mg/L	0.10	ND	93	77-119	2	20
Matrix Spike Dup (BJ42405-MSD3)		Source: 1	410752-10		Prepared &	& Analyzed:	10/24/14 11	:09		
Nitrite (as N)	0.117	0.04	0.01	mg/L	0.10	0.0356	82	77-119	4	20
Batch BJ42411 - VSS Prep										
Blank (BJ42411-BLK1)					Prepared:	10/24/14 An	alyzed: 10/2	27/14 15:54		
Volatile Suspended Solids	1 U	1		mg/L						
Total Suspended Solids	1 U	1	1	mg/L						



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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42411 - VSS Prep										
LCS (BJ42411-BS1)					Prepared:	10/24/14 An	alyzed: 10/2	27/14 15:54		
Total Suspended Solids	49.0	1	1	mg/L	50		98	85-115		
Duplicate (BJ42411-DUP1)		Source: 1	410747-01		Prepared:	10/24/14 An	alyzed: 10/2	27/14 15:54		
Total Suspended Solids	41.0	1	1	mg/L		45.0			9	30
Volatile Suspended Solids	30.0 J3	1		mg/L		44.0			38	20
Batch BJ42416 - Nitrate 353.2 b	y seal									
Blank (BJ42416-BLK1)					Prepared 8	Analyzed:	10/24/14 12	2:08		
Nitrate+Nitrite (N)	0.01 U	0.04	0.01	mg/L						
LCS (BJ42416-BS1)					Prepared 8	Analyzed:	10/24/14 12	2:10		
Nitrate+Nitrite (N)	0.797	0.04	0.01	mg/L	0.80		100	90-110		
Matrix Spike (BJ42416-MS1)		Source: 1	410747-03		Prepared 8	Analyzed:	10/24/14 15	5:17		
Nitrate+Nitrite (N)	49.2 L2	4.8	1.2	mg/L	1.0	55.0	NR	90-110		
Matrix Spike (BJ42416-MS2)		Source: 1	410747-06		Prepared 8	Analyzed:	10/24/14 14	1:11		
Nitrate+Nitrite (N)	12.6 L2	0.96	0.24	mg/L	1.0	12.8	NR	90-110		
Matrix Spike Dup (BJ42416-MSD1)		Source: 1	410747-03		Prepared 8	Analyzed:	10/24/14 15	5:18		
Nitrate+Nitrite (N)	50.5 L2	4.8	1.2	mg/L	1.0	55.0	NR	90-110	3	20
Matrix Spike Dup (BJ42416-MSD2)		Source: 1	410747-06		Prepared 8	Analyzed:	10/24/14 14	1:12		
Nitrate+Nitrite (N)	12.4 L2	0.96	0.24	mg/L	1.0	12.8	NR	90-110	1	20

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42419 - Chloride by Se	al									
Blank (BJ42419-BLK1)					Prepared 8	Analyzed:	10/24/14 13	3:44		
Chloride	1.0 U	5.0	1.0	mg/L						
LCS (BJ42419-BS1)					Prepared &	Analyzed:	10/24/14 13	3:45		
Chloride	39	5.0	1.0	mg/L	40		98	90-110		
LCS (BJ42419-BS2)					Prepared &	Analyzed:	10/24/14 13	3:46		
Chloride	42	5.0	1.0	mg/L	40		105	90-110		
LCS (BJ42419-BS3)					Prepared &	Analyzed:	10/24/14 13	3:46		
Chloride	38	5.0	1.0	mg/L	40		95	90-110		
LCS (BJ42419-BS4)					Prepared &	Analyzed:	10/24/14 13	3:47		
Chloride	42	5.0	1.0	mg/L	40		104	90-110		
LCS (BJ42419-BS5)					Prepared &	Analyzed:	10/24/14 13	3:48		
Chloride	38	5.0	1.0	mg/L	40		96	90-110		
Matrix Spike (BJ42419-MS1)		Source: 1	410752-27		Prepared &	Analyzed:	10/24/14 13	3:49		
Chloride	2.3 I	5.0	1.0	mg/L	2.0	ND	115	80-120		
Matrix Spike Dup (BJ42419-MSD1)		Source: 1	410752-27		Prepared &	Analyzed:	10/24/14 13	3:50		
Chloride	1.8 I,J3	5.0	1.0	mg/L	2.0	ND	88	80-120	26	20
Batch BJ42421 - BOD										
Blank (BJ42421-BLK1)					Prepared:	10/24/14 An	alyzed: 10/2	29/14 13:49		
Carbonaceous BOD	2 U	2	2	mg/L						



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November 18, 2014

Revised Report

Work Order: 1410752

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42421 - BOD										
Blank (BJ42421-BLK2)					Prepared:	10/24/14 An	alyzed: 10/	29/14 13:49		
Carbonaceous BOD	2 U	2	2	mg/L						
LCS (BJ42421-BS1)					Prepared:	10/24/14 An	alyzed: 10/	29/14 13:49		
Carbonaceous BOD	201	2	2	mg/L	200		101	85-115		
LCS (BJ42421-BS2)					Prepared:	10/24/14 An	alyzed: 10/	29/14 13:49		
Carbonaceous BOD	217	2	2	mg/L	200		109	85-115		
LCS Dup (BJ42421-BSD1)					Prepared:	10/24/14 An	alyzed: 10/	29/14 13:49		
Carbonaceous BOD	195	2	2	mg/L	200		97	85-115	3	200
LCS Dup (BJ42421-BSD2)					Prepared:	10/24/14 An	alyzed: 10/	29/14 13:49		
Carbonaceous BOD	206	2	2	mg/L	200		103	85-115	5	200
Duplicate (BJ42421-DUP1)		Source: 1	410747-01		Prepared:	10/24/14 An	alyzed: 10/	29/14 13:49		
Carbonaceous BOD	92	2	2	mg/L		110			15	25
Duplicate (BJ42421-DUP2)		Source: 1	411489-01		Prepared:	10/24/14 An	alyzed: 10/	29/14 13:49		
Carbonaceous BOD	200	2	2	mg/L		200			0	25
Batch BJ42422 - Ammonia b	y SEAL									
Blank (BJ42422-BLK1)					Prepared &	& Analyzed:	10/24/14 1	5:05		
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BJ42422-BS1)					Prepared &	& Analyzed:	10/24/14 1	5:07		
Ammonia as N	0.48	0.040	0.009	mg/L	0.50		95	90-110		

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42422 - Ammonia by	SEAL									
Matrix Spike (BJ42422-MS1)		Source: 1	410747-01		Prepared 8	Analyzed:	10/24/14 16	6:17		
Ammonia as N	2.7 L2	0.40	0.095	mg/L	0.50	66	NR	90-110		
Matrix Spike (BJ42422-MS2)		Source: 1	410752-08		Prepared &	Analyzed:	10/24/14 15	5:22		
Ammonia as N	0.49	0.040	0.009	mg/L	0.50	0.038	91	90-110		
Matrix Spike Dup (BJ42422-MSD1)		Source: 1	410747-01		Prepared &	Analyzed:	10/24/14 16	6:19		
Ammonia as N	2.8 L2	0.40	0.095	mg/L	0.50	66	NR	90-110	3	10
Matrix Spike Dup (BJ42422-MSD2)		Source: 1	410752-08		Prepared &	Analyzed:	10/24/14 15	5:24		
Ammonia as N	0.52	0.040	0.009	mg/L	0.50	0.038	96	90-110	4	10
Batch BJ42439 - alkalinity										
Blank (BJ42439-BLK1)					Prepared 8	Analyzed:	10/27/14 11	:24		
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
Blank (BJ42439-BLK2)					Prepared &	Analyzed:	10/27/14 11	:27		
Total Alkalinity	2.0 U	8.0	2.0	mg/L						
LCS (BJ42439-BS1)					Prepared &	Analyzed:	10/27/14 11	:36		
Total Alkalinity	130	8.0	2.0	mg/L	120		107	90-110		
LCS (BJ42439-BS2)					Prepared &	Analyzed:	10/27/14 11	:42		
Total Alkalinity	140	8.0	2.0	mg/L	120		109	90-110		
Matrix Spike (BJ42439-MS1)		Source: 1	410747-10		Prepared &	Analyzed:	10/27/14 12	2:52		
Total Alkalinity	130	8.0	2.0	mg/L	120	2.9	103	80-120		

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42439 - alkalinity										
Matrix Spike (BJ42439-MS2)		Source: 1	410752-27		Prepared 8	& Analyzed:	10/27/14 1	5:20		
Total Alkalinity	140	8.0	2.0	mg/L	120	ND	110	80-120		
Matrix Spike Dup (BJ42439-MSD1)		Source: 1	410747-10		Prepared &	Analyzed:	10/27/14 12	2:57		
Total Alkalinity	140	8.0	2.0	mg/L	120	2.9	106	80-120	3	26
Matrix Spike Dup (BJ42439-MSD2)		Source: 1	410752-27		Prepared &	Analyzed:	10/27/14 15	5:26		
Total Alkalinity	140	8.0	2.0	mg/L	120	ND	110	80-120	0.5	26
Batch BJ42445 - Nitrite SM 450	0NO2-B by s	eal								
Blank (BJ42445-BLK1)					Prepared &	& Analyzed:	10/24/14 17	7:23		
Nitrite (as N)	0.01 U	0.04	0.01	mg/L						
LCS (BJ42445-BS1)					Prepared &	Analyzed:	10/24/14 17	7:24		
Nitrite (as N)	0.0774	0.04	0.01	mg/L	0.080		97	90-110		
Matrix Spike (BJ42445-MS1)		Source: 1	410752-12		Prepared &	Analyzed:	10/24/14 17	7:25		
Nitrite (as N)	0.102	0.04	0.01	mg/L	0.10	ND	102	77-119		
Matrix Spike (BJ42445-MS2)		Source: 1	410752-17		Prepared &	Analyzed:	10/24/14 17	7:31		
Nitrite (as N)	0.103	0.04	0.01	mg/L	0.10	ND	103	77-119		
Matrix Spike Dup (BJ42445-MSD1)		Source: 1	410752-12		Prepared &	Analyzed:	10/24/14 17	7:25		
Nitrite (as N)	0.0925	0.04	0.01	mg/L	0.10	ND	92	77-119	9	20
Matrix Spike Dup (BJ42445-MSD2)		Source: 1	410752-17		Prepared &	Analyzed:	10/24/14 17	7:31		
Nitrite (as N)	0.101	0.04	0.01	mg/L	0.10	ND	101	77-119	3	20

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42705 - Digestion f	or TP and TKN									
Blank (BJ42705-BLK1)					Prepared:	10/27/14 An	alyzed: 10/2	29/14 14:28		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BJ42705-BS1)					Prepared:	10/27/14 An	alyzed: 10/2	29/14 14:28		
Total Kjeldahl Nitrogen	1.07	0.20	0.05	mg/L	1.0		107	90-110		
Matrix Spike (BJ42705-MS1)		Source: 1	411550-02		Prepared:	10/27/14 An	alyzed: 10/2	29/14 14:28		
Total Kjeldahl Nitrogen	1.71	0.20	0.05	mg/L	1.0	0.757	96	90-110		
Matrix Spike (BJ42705-MS2)		Source: 1	411537-07		Prepared:	10/27/14 An	alyzed: 10/2	29/14 14:28		
Total Kjeldahl Nitrogen	1.75	0.20	0.05	mg/L	1.0	0.685	107	90-110		
Matrix Spike Dup (BJ42705-MS	ix Spike Dup (BJ42705-MSD1) Sourc					10/27/14 An	alyzed: 10/2	29/14 14:28		
Total Kjeldahl Nitrogen	1.71	0.20	0.05	mg/L	1.0	0.757	95	90-110	0.1	20
Matrix Spike Dup (BJ42705-MS	D2)	Source: 1	411537-07		Prepared:	10/27/14 An	alyzed: 10/2	29/14 14:28		
Total Kjeldahl Nitrogen	1.72	0.20	0.05	mg/L	1.0	0.685	103	90-110	2	20
Batch BJ42708 - Digestion f	or TP and TKN									
Blank (BJ42708-BLK1)					Prepared:	10/28/14 An	alyzed: 10/2	29/14 14:34		
Total Kjeldahl Nitrogen	0.05 U	0.20	0.05	mg/L						
LCS (BJ42708-BS1)					Prepared:	10/28/14 An	alyzed: 10/2	29/14 14:34		
Total Kjeldahl Nitrogen	1.00	0.20	0.05	mg/L	1.0		100	90-110		
Matrix Spike (BJ42708-MS1)		Source: 1	410752-12		Prepared:	10/28/14 An	alyzed: 10/2	29/14 14:34		
Total Kjeldahl Nitrogen	1.91	0.20	0.05	mg/L	1.0	0.919	99	90-110		



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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42708 - Digestion for	TP and TKN									
Matrix Snike (B 142708-MS2)		Source: 1	411576-07		Prepared:	10/28/14 An	alvzed: 10/	29/14 14:34		
Total Kieldahl Nitrogen	1 74	0.20	0.05	ma/l	1.0	0.697	104	90-110		
Matrix Spike Dup (BJ42708-MSD1)		Source: 1	410752-12		Prepared:	10/28/14 An	alyzed: 10/	29/14 14:34		
Total Kjeldahl Nitrogen	1.98	0.20	0.05	mg/L	1.0	0.919	106	90-110	4	20
Matrix Spike Dup (BJ42708-MSD2)		Source: 1	411576-07		Prepared:	10/28/14 An	alyzed: 10/	29/14 14:34		
Total Kjeldahl Nitrogen	1.68	0.20	0.05	mg/L	1.0	0.697	98	90-110	3	20
Batch BJ42712 - Chloride by S	eal									
Blank (BJ42712-BLK1)					Prepared &	Analyzed:	10/27/14 11	1:09		
Chloride	1.0 U	5.0	1.0	mg/L						
LCS (BJ42712-BS1)					Prepared 8	Analyzed:	10/27/14 11	1:10		
Chloride	39	5.0	1.0	mg/L	40		98	90-110		
Matrix Spike (BJ42712-MS1)		Source: 1	410752-13		Prepared &	& Analyzed:	10/27/14 12	2:16		
Chloride	80 J2	50	10	mg/L	40	19	151	80-120		
Matrix Spike (BJ42712-MS2)		Source: 1	410752-14		Prepared &	& Analyzed:	10/27/14 12	2:17		
Chloride	87	50	10	mg/L	40	45	107	80-120		
Matrix Spike Dup (BJ42712-MSD1)		Source: 1	410752-13		Prepared &	Analyzed:	10/27/14 12	2:17		
Chloride	99 J2	50	10	mg/L	40	19	198	80-120	21	20
Matrix Spike Dup (BJ42712-MSD2)		Source: 1	410752-14		Prepared &	Analyzed:	10/27/14 12	2:18		
Chloride	120	50	10	mg/L	40	45	176	80-120	27	20

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42724 - Chloride by S	Seal									
Blank (BJ42724-BLK1)					Prepared 8	Analyzed:	10/31/14 16	6:39		
Chloride	1.0 U	5.0	1.0	mg/L						
LCS (BJ42724-BS1)					Prepared &	Analyzed:	10/27/14 13	3:52		
Chloride	41	5.0	1.0	mg/L	40		102	90-110		
Matrix Spike (BJ42724-MS1)		Source: 1	410752-12		Prepared &	Analyzed:	10/27/14 14	1:06		
Chloride	51	50	10	mg/L	40	19	80	80-120		
Matrix Spike Dup (BJ42724-MSD1)	Source: 1	410752-12		Prepared &	Analyzed:	10/27/14 14	4:07		
Chloride	57	50	10	mg/L	40	19	95	80-120	11	20
Batch BJ42735 - Nitrate 353.2	by seal									
Blank (BJ42735-BLK1)					Prepared 8	Analyzed:	10/27/14 15	5:46		
Nitrate+Nitrite (N)	0.0100 l	0.04	0.01	mg/L						
LCS (BJ42735-BS1)					Prepared &	Analyzed:	10/27/14 15	5:48		
Nitrate+Nitrite (N)	0.752	0.04	0.01	mg/L	0.80		94	90-110		
Matrix Spike (BJ42735-MS1)		Source: 1	411550-02		Prepared &	Analyzed:	10/27/14 15	5:50		
Nitrate+Nitrite (N)	1.23	0.04	0.01	mg/L	1.0	0.335	90	90-110		
Matrix Spike (BJ42735-MS2)		Source: 1	410752-27		Prepared &	Analyzed:	10/27/14 15	5:54		
Nitrate+Nitrite (N)	0.951	0.04	0.01	mg/L	1.0	0.0140	94	90-110		
Matrix Spike Dup (BJ42735-MSD1)	Source: 1	411550-02		Prepared &	Analyzed:	10/27/14 15	5:52		
Nitrate+Nitrite (N)	1.22	0.04	0.01	mg/L	1.0	0.335	88	90-110	1	20

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					Spike	Source		%REC		RPD	
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit	
Batch BJ42735 - Nitrate 353.	2 by seal										
Matrix Spike Dup (BJ42735-MSE	02)	Source: 1	410752-27		Prepared &	Analyzed:	10/27/14 15	5:56			
Nitrate+Nitrite (N)	0.990	0.04	0.01	mg/L	1.0	0.0140	98	90-110	4	20	
Batch BJ42747 - Ammonia b	y SEAL										
Blank (BJ42747-BLK1)					Prepared &	Analyzed:	10/27/14 20):07			
Ammonia as N	0.013 I	0.040	0.009	mg/L							
LCS (BJ42747-BS1)					Prepared &	Analyzed:	10/27/14 20):07			
Ammonia as N	0.46	0.040	0.009	mg/L	0.50		92	90-110			
Matrix Spike (BJ42747-MS1)		Source: 1	411489-07		Prepared & Analyzed: 10/27/14 20:07						
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	96	90-110			
Matrix Spike (BJ42747-MS2)		Source: 1	411550-02		Prepared &	Analyzed:	10/27/14 20):07			
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	0.010	93	90-110			
Matrix Spike Dup (BJ42747-MSD	01)	Source: 1	411489-07		Prepared &	Analyzed:	10/27/14 20):07			
Ammonia as N	0.48	0.040	0.009	mg/L	0.50	ND	95	90-110	0.3	10	
Matrix Spike Dup (BJ42747-MSD	02)	Source: 1	411550-02		Prepared &	Analyzed:	10/27/14 20):07			
Ammonia as N	0.49	0.040	0.009	mg/L	0.50	0.010	96	90-110	3	10	
Batch BJ42802 - VSS Prep											
Blank (BJ42802-BLK1)					Prepared:	10/28/14 An	alyzed: 10/2	29/14 16:14			
Volatile Suspended Solids	1 U	1		mg/L							
Total Suspended Solids	1 U	1	1	mg/L							

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42802 - VSS Prep										
LCS (BJ42802-BS1)					Prepared:	10/28/14 An	alyzed: 10/	29/14 16:14		
Total Suspended Solids	49.5	1	1	mg/L	50		99	85-115		
Duplicate (BJ42802-DUP1)		Source: 1	410752-10		Prepared:	10/28/14 An	alyzed: 10/	29/14 16:14		
Volatile Suspended Solids	1 U	1		mg/L		3.25				20
Total Suspended Solids	3.75	1	1	mg/L		3.50			7	30
Batch BJ42804 - Nitrate 353.2	2 by seal									
Blank (BJ42804-BLK1)					Prepared 8	Analyzed:	10/28/14 10	0:56		
Nitrate+Nitrite (N)	0.01 U	0.04	0.01	mg/L						
Blank (BJ42804-BLK2)					Prepared 8	Analyzed:	10/28/14 12	2:06		
Nitrate+Nitrite (N)	0.0150 I	0.04	0.01	mg/L						
LCS (BJ42804-BS1)					Prepared 8	Analyzed:	10/28/14 10	0:58		
Nitrate+Nitrite (N)	0.829	0.04	0.01	mg/L	0.80		104	90-110		
LCS (BJ42804-BS2)					Prepared 8	Analyzed:	10/28/14 12	2:07		
Nitrate+Nitrite (N)	0.772	0.04	0.01	mg/L	0.80		96	90-110		
Matrix Spike (BJ42804-MS1)		Source: 1	411576-07		Prepared 8	Analyzed:	10/28/14 11	1:00		
Nitrate+Nitrite (N)	1.90 J2	0.04	0.01	mg/L	1.0	0.998	90	90-110		
Matrix Spike (BJ42804-MS2)		Source: 1	410752-15		Prepared 8	Analyzed:	10/28/14 11	1:05		
Nitrate+Nitrite (N)	0.996	0.04	0.01	mg/L	1.0	0.0150	98	90-110		
Matrix Spike (BJ42804-MS3)		Source: 1	410752-16		Prepared 8	Analyzed:	10/28/14 12	2:08		
Nitrate+Nitrite (N)	1.05	0.04	0.01	mg/L	1.0	0.0200	103	90-110		

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42804 - Nitrate 353.2 I	by seal									
Matrix Spike Dup (BJ42804-MSD1))	Source: 1	411576-07		Prepared 8	& Analyzed:	10/28/14 11	:02		
Nitrate+Nitrite (N)	1.80 J2	0.04	0.01	mg/L	1.0	0.998	80	90-110	5	20
Matrix Spike Dup (BJ42804-MSD2)	1	Source: 1	410752-15		Prepared &	Analyzed:	10/28/14 11	:07		
Nitrate+Nitrite (N)	1.01	0.04	0.01	mg/L	1.0	0.0150	99	90-110	1	20
Matrix Spike Dup (BJ42804-MSD3)	1	Source: 1	410752-16		Prepared &	Analyzed:	10/28/14 12	2:08		
Nitrate+Nitrite (N)	1.01	0.04	0.01	mg/L	1.0	0.0200	99	90-110	4	20
Batch BJ42822 - Ammonia by	SEAL									
Blank (BJ42822-BLK1)					Prepared &	& Analyzed:	10/29/14 12	2:23		
Ammonia as N	0.009 U	0.040	0.009	mg/L						
LCS (BJ42822-BS1)					Prepared &	Analyzed:	10/29/14 12	2:25		
Ammonia as N	0.55	0.040	0.009	mg/L	0.50		109	90-110		
Matrix Spike (BJ42822-MS1)		Source: 1	410752-18		Prepared &	Analyzed:	10/29/14 12	2:26		
Ammonia as N	1.1 J2	0.040	0.009	mg/L	0.50	0.73	71	90-110		
Matrix Spike (BJ42822-MS2)		Source: 1	410752-22		Prepared &	& Analyzed:	10/29/14 12	2:40		
Ammonia as N	0.81	0.040	0.009	mg/L	0.50	0.31	100	90-110		
Matrix Spike Dup (BJ42822-MSD1)	1	Source: 1	410752-18		Prepared &	Analyzed:	10/29/14 12	2:28		
Ammonia as N	1.2 J2	0.040	0.009	mg/L	0.50	0.73	85	90-110	7	10
Matrix Spike Dup (BJ42822-MSD2)		Source: 1	410752-22		Prepared &	Analyzed:	10/29/14 12	2:42		
Ammonia as N	0.83	0.040	0.009	mg/L	0.50	0.31	104	90-110	3	10

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					Spike	Source		%REC		RPD	
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit	
Batch BJ42825 - Sulfide prep											
Blank (BJ42825-BLK1)					Prepared 8	Analyzed:	10/28/14 16	6:22			
Sulfide	0.10 U	0.40	0.10	mg/L							
Blank (BJ42825-BLK2)					Prepared &	Analyzed:	10/28/14 16	6:22			
Sulfide	0.10 U	0.40	0.10	mg/L							
LCS (BJ42825-BS1)					Prepared &	Analyzed:	10/28/14 16	6:22			
Sulfide	5.21	0.40	0.10	mg/L	5.0		104	85-115			
LCS (BJ42825-BS2)					Prepared &	Analyzed:	10/28/14 16	3:22			
Sulfide	5.21	0.40	0.10	mg/L	5.0		104	85-115			
Matrix Spike (BJ42825-MS1)		Source: 1	410747-10		Prepared & Analyzed: 10/28/14 16:22						
Sulfide	5.21	0.40	0.10	mg/L	5.0	ND	104	85-115			
Matrix Spike (BJ42825-MS2)		Source: 1	410748-10		Prepared &	Analyzed:	10/28/14 16	3:22			
Sulfide	5.21	0.40	0.10	mg/L	5.0	ND	104	85-115			
Matrix Spike Dup (BJ42825-MSD1)		Source: 1	410747-10		Prepared &	Analyzed:	10/28/14 16	6:22			
Sulfide	5.01	0.40	0.10	mg/L	5.0	ND	100	85-115	4	14	
Matrix Spike Dup (BJ42825-MSD2)		Source: 1	410748-10		Prepared &	Analyzed:	10/28/14 16	3:22			
Sulfide	4.81	0.40	0.10	mg/L	5.0	ND	96	85-115	8	14	
Batch BJ43022 - COD prep											
Blank (BJ43022-BLK1)					Prepared &	Analyzed:	10/30/14 14	1:30			
Chemical Oxygen Demand	10 U	25	10	mg/L							

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Inorganics - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ43022 - COD prep										
Blank (BJ43022-BLK2)					Prepared 8	Analyzed:	10/30/14 14	4:30		
Chemical Oxygen Demand	10 U	25	10	mg/L						
LCS (BJ43022-BS1)					Prepared 8	Analyzed:	10/30/14 14	4:30		
Chemical Oxygen Demand	47	25	10	mg/L	50		94	90-110		
LCS (BJ43022-BS2)					Prepared 8	Analyzed:	10/30/14 14	4:30		
Chemical Oxygen Demand	45	25	10	mg/L	50		90	90-110		
Matrix Spike (BJ43022-MS1)		Source: 1	410747-10		Prepared 8	Analyzed:	10/30/14 14	4:30		
Chemical Oxygen Demand	50	25	10	mg/L	50	ND	100	85-115		
Matrix Spike (BJ43022-MS2)		Source: 1	410748-10		Prepared 8	Analyzed:	10/30/14 14	4:30		
Chemical Oxygen Demand	54	25	10	mg/L	50	ND	108	85-115		
Matrix Spike Dup (BJ43022-MSD1)		Source: 1	410747-10		Prepared 8	Analyzed:	10/30/14 14	4:30		
Chemical Oxygen Demand	52	25	10	mg/L	50	ND	104	85-115	4	32
Matrix Spike Dup (BJ43022-MSD2)		Source: 1	410748-10		Prepared 8	Analyzed:	10/30/14 14	4:30		
Chemical Oxygen Demand	50	25	10	mg/L	50	ND	100	85-115	8	32
Batch BJ43112 - Ion Chromatog	raphy 300.0	Prep								
Blank (BJ43112-BLK1)					Prepared 8	Analyzed:	10/31/14 17	7:12		
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	0.807			mg/L	1.0		81	78-120		
LCS (BJ43112-BS1)					Prepared 8	Analyzed:	10/31/14 17	7:23		
Sulfate	8.95	0.60	0.20	mg/L	9.0		99	85-115		

1.0

mg/L

108

78-120

Surrogate: Dichloroacetate

1.08

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					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ43112 - Ion Chroma	tography 300.0	Prep								
LCS Dup (BJ43112-BSD1)					Prepared 8	Analyzed:	10/31/14 17	':34		
Sulfate	9.01	0.60	0.20	mg/L	9.0		100	85-115	0.6	200
Surrogate: Dichloroacetate	1.05			mg/L	1.0		105	78-120		
Matrix Spike (BJ43112-MS1)		Source: 1	411704-01		Prepared 8	Analyzed:	10/31/14 19	9:38		
Sulfate	57.3	0.60	0.20	mg/L	9.0	47.1	114	85-115		
Surrogate: Dichloroacetate	0.809			mg/L	1.0		81	78-120		
Matrix Spike (BJ43112-MS2)		Source: 1	410752-05		Prepared 8	Analyzed:	10/31/14 23	3:56		
Sulfate	151 L1	0.60	0.20	mg/L	9.0	121	332	85-115		
Surrogate: Dichloroacetate	1.07			mg/L	1.0		107	78-120		
Batch BJ43115 - Ion Chroma	tography 300.0	Prep								
Blank (BJ43115-BLK1)					Prepared 8	Analyzed:	11/01/14 00	:52		
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	0.813			mg/L	1.0		81	78-120		
LCS (BJ43115-BS1)					Prepared 8	Analyzed:	11/01/14 01	:04		
Sulfate	8.86	0.60	0.20	mg/L	9.0		98	85-115		
Surrogate: Dichloroacetate	1.06			mg/L	1.0		106	78-120		
LCS Dup (BJ43115-BSD1)					Prepared 8	Analyzed:	11/01/14 01	:15		
Sulfate	8.79	0.60	0.20	mg/L	9.0		98	85-115	0.8	200
Surrogate: Dichloroacetate	1.09			mg/L	1.0		109	78-120		
Matrix Spike (BJ43115-MS1)		Source: 1	410752-15		Prepared 8	Analyzed:	11/01/14 03	:19		
Sulfate	67.9	0.60	0.20	mg/L	9.0	58.1	109	85-115		
Surrogate: Dichloroacetate	1.16			mg/L	1.0		116	78-120		
-				-						


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Inorganics - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ43115 - Ion Chromat	ography 300.0	Prep								
Matrix Spike (BJ43115-MS2)		Source: 1	410752-16		Prepared 8	Analyzed:	11/01/14 04	:04		
Sulfate	72.8	0.60	0.20	mg/L	9.0	63.9	98	85-115		
Surrogate: Dichloroacetate	0.967			mg/L	1.0		97	78-120		
Batch BK40504 - Ion Chroma	tography 300.0	Prep								
Blank (BK40504-BLK1)					Prepared &	Analyzed:	11/05/14 12	2:22		
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	0.870			mg/L	1.0		87	78-120		
LCS (BK40504-BS1)					Prepared &	Analyzed:	11/05/14 12	:33		
Sulfate	8.33	0.60	0.20	mg/L	9.0		93	85-115		
Surrogate: Dichloroacetate	1.00			mg/L	1.0		100	78-120		
LCS Dup (BK40504-BSD1)					Prepared &	Analyzed:	11/05/14 12	::45		
Sulfate	8.24	0.60	0.20	mg/L	9.0		92	85-115	1	200
Surrogate: Dichloroacetate	0.973			mg/L	1.0		97	78-120		
Matrix Spike (BK40504-MS1)		Source: 1	411836-03		Prepared &	& Analyzed:	11/05/14 15	5:01		
Sulfate	70.8	0.60	0.20	mg/L	9.0	62.6	91	85-115		
Surrogate: Dichloroacetate	0.794			mg/L	1.0		79	78-120		
Matrix Spike (BK40504-MS2)		Source: 1	410752-29		Prepared &	Analyzed:	11/05/14 17	':17		
Sulfate	35.9	0.60	0.20	mg/L	9.0	27.3	95	85-115		
Surrogate: Dichloroacetate	1.00			mg/L	1.0		100	78-120		
Batch BK40507 - Ion Chroma	tography 300.0	Prep								
Blank (BK40507-BLK1)					Prepared & Analyzed: 11/05/14 18:13					
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	0.856			mg/L	1.0		86	78-120		

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Inorganics - Quality Control

Analyte	Result		MDI	l Inite	Spike	Source	%REC	%REC	PPD	RPD Limit
Analyte	Result	I QL	MDE	Units	Level	Result	/orceo	Linito		
Batch BK40507 - Ion Chroma	atography 300.0) Prep								
LCS (BK40507-BS1)					Prepared 8	Analyzed:	11/05/14 18	3:24		
Sulfate	8.23	0.60	0.20	mg/L	9.0		91	85-115		
Surrogate: Dichloroacetate	1.03			mg/L	1.0		103	78-120		
LCS Dup (BK40507-BSD1)					Prepared 8	Analyzed:	11/05/14 18	3:35		
Sulfate	8.21	0.60	0.20	mg/L	9.0		91	85-115	0.3	200
Surrogate: Dichloroacetate	1.03			mg/L	1.0		103	78-120		
Matrix Spike (BK40507-MS1)		Source: 1	411727-05		Prepared 8	Analyzed:	11/05/14 20):39		
Sulfate	901	60	20	mg/L	900	138	85	85-115		
Surrogate: Dichloroacetate	1.04			mg/L	1.0		104	78-120		
Matrix Spike (BK40507-MS2)		Source: 1	411586-01		Prepared 8	Analyzed:	11/05/14 21	:57		
Sulfate	122	6.0	2.0	mg/L	90	44.8	86	85-115		
Surrogate: Dichloroacetate	0.811			mg/L	1.0		81	78-120		
Batch BK40627 - Ion Chroma	atography 300.0) Prep								
Blank (BK40627-BLK1)					Prepared 8	Analyzed:	11/06/14 17	' :46		
Sulfate	0.20 U	0.60	0.20	mg/L						
Surrogate: Dichloroacetate	0.820			mg/L	1.0		82	78-120		
LCS (BK40627-BS1)					Prepared 8	Analyzed:	11/06/14 17	:57		
Sulfate	8.56	0.60	0.20	mg/L	9.0		95	85-115		
Surrogate: Dichloroacetate	0.951			mg/L	1.0		95	78-120		
LCS Dup (BK40627-BSD1)					Prepared 8	Analyzed:	11/06/14 18	8:09		
Sulfate	8.66	0.60	0.20	mg/L	9.0		96	85-115	1	200
Surrogate: Dichloroacetate	0.979			mg/L	1.0		98	78-120		



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Inorganics - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BK40627 - Ion Chromat	ography 300.	0 Prep								
Matrix Spike (BK40627-MS1)		Source: 1	411837-05		Prepared &	& Analyzed:	11/06/14 20):12		
Sulfate	24.3	0.60	0.20	mg/L	9.0	15.3	100	85-115		
Surrogate: Dichloroacetate	1.08			mg/L	1.0		108	78-120		
Matrix Spike (BK40627-MS2)		Source: 1	411885-02		Prepared &	Analyzed:	11/06/14 22	2:38		
Sulfate	1,350	60	20	mg/L	900	517	93	85-115		
Surrogate: Dichloroacetate	0.950			mg/L	1.0		95	78-120		

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Microbiology - Quality Control

					Spike	Source		%REC		RPD
Analyte	Result	PQL	MDL	Units	Level	Result	%REC	Limits	RPD	Limit
Batch BJ42339 - FC-MF										
Blank (BJ42339-BLK1)					Prepared:	10/23/14 An	alyzed: 10/2	24/14 14:22		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl					
Duplicate (BJ42339-DUP1)		Source: 1	410752-2	27	Prepared:	10/23/14 An	alyzed: 10/2	24/14 14:22		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl	ND				200
Duplicate (BJ42339-DUP2)		Source: 1	410747-1	10	Prepared:	10/23/14 An	alyzed: 10/2	24/14 14:22		
Fecal Coliforms	1 U	1	1	CFU/100 r	nl	ND				200

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November 18, 2014

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* Qualifiers, Notes and Definitions

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

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

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

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

- Z Too many colonies were present for accurate counting.
- V Analyte was detected in both the sample and the associated method blank.
- L2 Analyte level in sample invalidated Matrix Spike.
- L1 Off-scale high. Result exceeded method capacity.
- 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.
- J3 Quality control value for precision was outside control limits.
- J2 Quality control value for accuracy was outside control limits.

Questions regarding this report should be directed to :

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

Nitrate aliquots for samples 12 thru 33 were received late in the day on Friday 10/24/2014. They were setup within acceptable holding time. Batch QC for these samples failed and the sample hold time had expired before the samples were rerun on 10/27/2014. LCB 10/27/2014

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Cli	ent	Name Hazan	and	Sawyer									Contact / Josefin H	Phone: lirst 813-6	630-4498				
Pro	ojec	t Name / Location					_												
Sa	mpl	ers: (Signature)	55#	<u>11</u>						T			L						
┣-		C Poros China	T	<u> </u>	r			1	r	<u> </u>		PARAMET	ER / CON	TAINER D T					<u> </u>
SA	4	Marrix Souss. DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water					đ		Иа ₂ S ₂ O ₃ С-QT	Cool linity, TSS, DD, NOX, CI,	H₂SO₄ V, NH₃, TP	NaOH & Zn	H ₂ SO4	Cool 04			ature	tivity	
Us On	se nly					×	posit		Г. Ы. 1. Ц. Ц.	S CBC	Ч, ТХ	le le	Γ. Έ.	C, S			pera	duct	
Sam	npie o.	Sample Description		Date	Time	Matri	Com	Grab	125m FC-M	500m Total VSS, OP, 5	125m COD	500m Aceta H ₂ S	125n TKN,	500rr NOX,		Hd	Tem	Co	8
0	1	BHS3-STE	10	23/14	11:50	ww		x	4	2	1	1			++	7.55	24.31	1/27	0.09
0	2	BHS3-LY01		<u>ر</u>	11:00	ww		x		2	1					6.48	25.3	693	3.68
0	3	BHS3-LY02			11:10	ww		x		2	1					6.27	25,7	784	1.53
0	4	BHS3-LINER			10.40	ww		x	4	2	1					6.53	24.67	755	1.36
0	5	BHS3-ST2		10:3	peres	ww		x	4	2	1	1				6.65	24.60	856	0,10
0	6	BHS3-ST2-DUP		10:32	TER	ww		X	4	2	1	1				6.65	24.60	856	0.10
0	7	BHS3-LY03			11:35	Ŵ		x		2	1	1				6.59	27.6	632	5.39
0	8	BHS3-LY04			11:22	ww		x		2	1	1				6.54	24.1	619	5,38
0	9	BHS3-PZ07			12:10	<u>ww</u>		x	4	2	1	1				6.76	23.9	516	4.72
1	0	BHS3-PZ08	\square		12:25	ww		x	4	2	1	1				6.47	23.69	492	5.67
1	1	BHS3-PZ09	V	<u> </u>	11:30	ww		x	4	2	1	1			M DIM	6.27	26.6	272	5.50
22	Ź	PZAZE 28 BHS3-EB			12:40	ww		x	ч	2)		x	1		5.66	23.5	5.47	831
Con Reli Reli	inqui inqui	shed: Date/Time: 1300	Rec	eived:	go bt	0	Da	te/Tim	100 101 101 101	200	Seal inta Samples	ict? s intact upon :	arrival?			Instructio	ns / Rema	arks	
C)¢	refor 6/13/14/300		M	10/2	3/14					Receive	d on ice? Te	mp						
Reli	ingu A	shed: Date/Time 355 D/M Date/Time 355 Date/Time	Ref		idme	nt	Da	te/Tim	" 14 23/14	58	Proper p Rec'd w	oreservatives Ithin holding (indicated?	BN NA DN NA					
1	/										Volatiles Proper c	s rec'd w/out	headspace ed?	Y N 🕖					
Reli	inqu	shed: Date/Time:	Rec	eived:			Da	te/Tim	ne:					() N N/A					
Chain Rev.D	n of C Dale 1	ustody.xis 1/19/01	1		- <u>-</u> ,						L			<u>.</u>		Chain of Cust	ody		
																	141	075	5
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Client	Name							<u>, </u>		Contact /	Phone:	30-4498					
Projec	t Name / Location	and Sawyer															
	BHS3	SE#11	,														
Samp	lers: (Signature) goodon Un								PARAMETI	ER / CONT	AINER DE	SCRIPTION					
	Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water					а ₂ S ₂ O ₃ -QТ	ool nity, TSS, D, NOx, Cl,	2SO₄ NH₃, TP	aOH & Zn	2SO4	00 04			ture	vity		
SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite Grab	125mLP, N FC-MF, FC	500mLP, C Total Alkali VSS, CBOI OP, SO4	125mLP, H COD, TKN,	500mLP, N Acetate H ₂ S	125mLP, H TKN, NH ₃	500mLP, C NOx, CI, SC		Нd	Temperat	Conducti	DO	
13	PZ-A7-8	10/23/14	14:05		x					1	1		6.00	24.65	519	2.91	
14	PE== 6 PE-BIS-7	0/24/14	8:55	ww	x					1	1		5.09	X1.5	156.3	į. 8	
15	PZ-B6-6	10/23/14	14:08	ww	x					1	1		6,63	25.7	700	5,17	
16	PZ-B8-5	10/23/14	14:25		x					1	1		5.98	25.23	516	3,51	
17	PZ-B8-5-DUP	10/23/14	14:30	ww	x					1	1		5.98	25,23	516	3.51	
18	PZ-B8-7	10/23/14	14:50	ww	x					1	11		6,14	25.06	369	6.19	
19	PZ-B8-10	10/23/14	15:20	~~~	x					1	1		5.04	24.90	148	8.09	
20	PZ-B10-5	10/24/14	8:10		x					1	1		6.51	24.1	Gabile	LIY_	41/
21	PZ-B10-7	10/24/14	8:20	ww	x	_				1	_1		6.31	24,2	368	1.18	
22	PZ-B15-5	10/19/14	8:40	ww	x					1	1		5.65	24.2	245	1.28	
23	PZ-C06-5	10/20/19	8:50	ww	x					1	1		5.86	21.8	629	3.79	
24	PZ-008-5 PZ-CO6-10	10/23/14	8:76		x					1	1_1		4.69	22.1	161	3.23	
Contair Relingu Rolingu	lers Prepared/ lished	Received:	go the	2 5 - 76 + 1X X 2 5 - 6 - 6 - 7 - 10 - 10 - 10 - 10 - 10 - 10 - 10				Seal inta Samples	ct? intact upon a	arrival?	0 N N/A 0 N N/A		Instructio	ons / Rema	rks		
Reling	ished Dater IIIe 12 PS	Baceived	ang	1 253°	Date/Tim	e.		Received	d on ice? Ter	np	6) N N/A						
	Eyhle 10-21550					°10-24)	0-279-17 Rec'd within holding time?										
Relinquished: Date/Time: Received: Received:					D&fe/Time: Volatiles rec'd w/out headspace Y N 10 Proper containers used? Date/Time: N N/A												i

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	Client	Name	and Sawyer								Contact / Josefin H	Phone: lirst 813-630-44	98				
F	Projec	t Name / Location	SE#11	<u>-</u>													
	Sampl	ers: (Signature)	JE#11													<u></u>	
	SAL Use Only Sample	Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water	Jate	ä	Aatrix	Composite Srab	25mLP, Na ₂ S ₂ O ₃ :c-MF, FC-QT	00mLP, Cool otal Alkalinity. TSS. /SS, CBOD, NOX, CI, 2P, SO4	25mLP, H ₂ SO₄ SOD, TKN, NH ₃ , TP	00mLP, NaOH & Zn Leetate	25mLP, H ₂ SO ₄ TKN, NH ₃	AINER DESCR		H	[emperature	Conductivity	0
ł	25	PZ-093-7 CO6 7-	10/.04/14	8:14	 		<u>~ u</u>	<u>., - > 0</u>				1		5.74	22.3	281	2,83
ŀ	26	PZ-C10-6	10/23/14	14:58		1 x					1			5.97	26.0	245	3.78
31		E P2- NY - 5	10/24/17	9:58	Cy cy	x	X	×	*	×	1	R I		5.92	24.7	338	4.53
	12	pz A7-6	10/23/14	13:44	GW	X						1		6.35	24.06	546	3.06
	28	Be 62- DY- 7	10/24/19	8036,10	as Coid	X					1	P		5.70	24.9	279	4.88
<u>v</u>	29	P2-D6-8	10/24/14	8:54	610	X					1			5.18	22.6	217	4,32
ne l	30	PZ-D4-10	10/24/14	10:16	60	X					1			5.41	25.D	181_	4,24
	3	PZ-A7-11	10/24/17	9:30	600	X					1	4		5.39	24.5	289	4.78
f 43	32	Pz. 14-5	10/27/19	9:24	60	X					1	1		518	23,5	815	3.14
		* for extra samples pleak	vun T	KN, NI	13, NO	x, ci	,soy										
	Contain Relinqui	ers Prepared/ ished JOH Ished. Date/Time Date/Time Date/Time	Received:	lou is		Date/Tim		.:00	Seal inta Samples	ct?	arrival?	O N N/A N N/A		Instructio	ons / Rem	arks	•
		sites Date/Time: 14 local 10-24150	Received:		2	Lc- Date/Tim	2-2-1	0	Received Proper p Rec'd wi	d on ice? Te reservatives ithin holding t	mp indicated? time?	0 N NA D N NA D N NA					
	Relin qu Relinqu	ished: Date/Time:	Received: Received:	/		Date/Tim Date/Tim	e:		Volatiles Proper c	rec'd w/out ontainers us	headspace ed?	Y N 194 ØN NA					

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Chain of Custody

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SAL Project No. 1410752



Appendix B: Operation & Maintenance Log

	Table B.1 Operation and Maintenance Log											
Date	Description											
7/25/2011	C-HS2 Groundwater Sample Event 1											
11/30/2011	C-HS2 Groundwater Sample Event 2											
3/13/2012	C-HS2 Groundwater Sample Event 3											
7/10/2012	C-HS2 Groundwater Sample Event 4											
6/14/2013	PNRS Pre-construction sample event											
6/17/2013	PNRS construction. Old septic tank removed, new septic tank installed											
	Stage 2 biofilter installed											
6/18/2013	PNRS construction - backfill to set tanks, anchor trench for liner area											
6/19/2013	PNRS construction - liner installed by Comanco											
	Ligno and sand 50/50 filled to toe of lined area, fill dirt to grade											
6/24/2013	New piezometers PZ-07, PZ-08, and PZ-09 installed and developed											
	4 Lysimeters installed											
6/26/2013	Both drip systems covered											
7/9/2013	Electrician installed panel for system											
7/11/2013	Electrician set up panel for hydraulic unit											
	Dose times and volumes set											
7/12/2013	System start-up											
	Installed priming tee on pump. Installed reclaimed water flowmeter											
7/17/2013	Site visit. System ok.											
7/22/2013	Repaired leaks in feed and return lines											
	Installed new fittings for air release valves											
7/29/2013	Site visit. System ok.											
7/31/2013	Sod installation											
8/15/2013	Preliminary SE#1											
9/5/2013	Site visit. System ok.											
9/8/2013	Homeowner reported alarm went off at 9 pm											
9/9/2013	System check - high water level in STE dose tank											
	Both hydraulic unit disc filters severely clogged - not able to dose											
9/10/2013	System check, still high alarm - high water level in STE dose tank											

Date	Description
9/10/2013	Not able to fix system - need replacement part for hydraulic unit
	Septic tank was pumped at 4 pm
9/11/2013	Homeowner reported no alarms
9/13/2013	Site visit. System ok.
9/17/2013	Installed replacement solenoid coil on backwash filter valve #2
	System operational again, septic tank very low volume still after pump-out
9/27/2013	SE#1 prep
	Applied vacuum to lysimeters
	Cleaned STE outlet filter screen
9/30/2013	Sample Event No. 1
10/11/2013	Site visit. System ok. Uploaded new program
10/17/2013	System check
	Bio valve ahead of pump had sand under the diaphragm in valve
11/8/2013	Site visit. System ok.
11/15/2013	Site visit. System ok.
11/27/2013	Site visit. System ok.
12/2/2013	Sample Event No. 2 preparation
12/4/2013	Sample Event No. 2
12/23/2013	Site visit. System ok.
1/23/2014	Site visit. System ok.
1/30/2014	Sample Event No. 3 preparation
2/3/2014	Sample Event No. 3
2/4/2014	Sample Event No. 4
2/5/2014	Sample Event No. 5
2/6/2014	Sample Event No. 6
2/7/2014	Sample Event No. 7
2/12/2014	Site visit. System ok.
3/14/2014	Site visit. System ok.
4/3/2014	Sample Event No. 8 (formal No. 4)
4/25/2014	Site visit. System ok.
4/29/2014	Site visit. System ok.
5/28/2014	Sample Event No. 9 (formal No. 5)
5/29/2014	Sample Event No. 9 (formal No. 5)
	Collected additives testing samples.
6/9/2014	Re-sampled BHS3-STE for toxicity testing.

Date	Description
7/11/2014	Site visit. Primary tank water level elevated.
	Cleaned STE screen; severely clogged.
	Pumped down STE dose tank to below high level float.
7/29/2014	Site visit. System ok.
8/21/2014	Sample Event No. 10 (formal No. 6)
8/22/2014	Sample Event No. 10 (formal No. 6)
9/19/2014	Site visit. System ok.
10/21/2014	Sample Event No. 11 (formal No. 7) preparation.
10/23/2014	Sample Event No. 11 (formal No. 7)
10/24/2014	Sample Event No. 11 (formal No. 7)



Appendix C: Weather Station Data

Table C.1 Weather Station Data

2014	Temp. (°F)			De	ew Point (°	F)	F	lumidity (%)	Sea L	evel Pressu	ire (in)	١	Wind (mph)		Precip (in)
August	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	gust	sum
8/23/2014	97	82	72	81	75	71	99	82	47	30.04	29.96	29.88	10	0	10	0.03
8/24/2014	98	83	74	80	77	73	98	83	52	29.92	29.86	29.8	19	1	19	0.02
8/25/2014	90	83	76	78	74	70	95	78	54	29.92	29.88	29.83	17	2	19	0.06
8/26/2014	90	81	73	77	73	69	98	80	55	29.99	29.94	29.89	15	2	19	0.04
8/27/2014	92	81	72	78	73	70	98	78	52	30.04	30	29.95	11	1	12	0.04
8/28/2014	94	81	69	77	72	68	99	78	46	30.05	30.01	29.97	12	1	12	0
8/29/2014	95	80	74	80	75	72	98	88	55	30.16	30.09	30.02	9	0	11	0.29
8/30/2014	94	82	72	78	75	70	99	81	47	30.18	30.12	30.06	10	1	10	0.01
8/31/2014	94	82	74	79	75	72	99	80	51	30.17	30.12	30.08	11	1	12	0
2014		Temp. (°F)		De	ew Point (°	F)	F	lumidity (%)	Sea L	evel Pressu	ire (in)	1	Wind (mph)		Precip (in)
September	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	gust	sum
9/1/2014	95	83	73	79	74	69	99	77	46	30.16	30.1	30.05	9	1	9	0
9/2/2014	94	84	74	78	74	72	98	74	50	30.14	30.08	30.01	10	1	13	0
9/3/2014	93	82	72	77	74	71	99	79	52	30.09	30.05	30	11	1	14	0
9/4/2014	91	78	72	77	74	72	98	88	56	30.14	30.1	30.06	9	0	13	0.03
9/5/2014	92	77	74	77	74	72	99	91	54	30.15	30.11	30.07	7	0	7	0.26
9/6/2014	93	78	72	79	74	71	99	90	53	30.11	30.05	29.99	10	0	12	0.04
9/7/2014	91	77	72	79	74	70	99	93	60	30.07	30.02	29.98	7	0	24	1.76
9/8/2014	92	78	71	78	74	71	99	89	54	30.1	30.06	30.01	9	0	15	2.23
9/9/2014	93	80	72	79	74	68	99	83	47	30.11	30.06	30	9	1	10	0.49
9/10/2014	90	82	73	80	75	72	99	81	59	30.08	30.03	29.99	13	1	14	0.01
9/11/2014	92	81	73	80	74	71	99	82	54	30.07	30.03	29.99	11	1	12	0
9/12/2014	90	80	74	80	76	73	98	88	67	30.04	30	29.96	14	1	14	0.05
9/13/2014	92	82	73	77	74	70	99	80	55	30.13	30.07	30.01	10	1	13	0
9/14/2014	91	82	74	76	73	70	98	78	52	30.18	30.13	30.08	9	1	12	0
9/15/2014	94	80	71	76	73	70	99	82	49	30.2	30.15	30.1	8	0	10	0
9/16/2014	92	80	74	76	74	69	98	83	48	30.16	30.08	29.99	7	0	8	0.02
9/17/2014	86	79	74	77	74	72	97	86	72	30	29.94	29.88	5	0	6	0
9/18/2014	93	79	71	77	74	70	99	86	50	29.98	29.93	29.88	6	0	8	0.22
9/19/2014	84	75	71	78	73	69	99	94	66	30.02	29.98	29.93	9	0	11	0.16
9/20/2014	86	75	71	76	72	70	99	91	67	30.02	29.95	29.89	6	0	9	0.47
9/21/2014	89	78	70	76	72	70	99	85	57	30.06	30.01	29.95	6	0	9	0
9/22/2014	88	75	71	78	73	70	99	94	70	30.07	30.03	29.99	7	0	10	0.89
9/23/2014	89	76	71	78	73	71	99	91	63	30.06	30.02	29.98	8	0	10	5.23
9/24/2014	82	75	70	76	72	69	99	92	79	30.15	30.09	30.03	12	1	12	0
9/25/2014	87	75	68	77	72	68	98	91	71	30.15	30.1	30.04	8	1	11	0.02
9/26/2014	90	76	71	79	74	70	99	93	67	30.07	30.03	29.99	14	0	16	1.57
9/27/2014	89	78	74	80	76	74	99	93	68	30.05	30.02	29.99	12	1	14	0.12
9/28/2014	90	80	74	80	76	74	99	91	67	30.05	29.99	29.94	10	1	11	0
9/29/2014	89	77	74	78	75	73	99	93	66	30.01	29.94	29.86	5	0	6	1.02
9/30/2014	88	76	72	78	74	72	99	95	69	29.89	29.85	29.82	4	0	6	2.77

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Table C.1 Weather Station Data (continued)

2014		Temp. (°F)		D	ew Point (°	F)	F	łumidity (%)	Sea L	evel Pressu	ıre (in)	١	Nind (mph)		Precip (in)
October	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	gust	sum
10/1/2014	83	76	73	78	75	73	99	96	82	30.02	29.95	29.88	5	0	7	0.5
10/2/2014	89	78	72	79	74	72	100	88	66	30.08	30.03	29.99	8	0	10	0
10/3/2014	92	80	71	79	75	70	99	86	57	30.07	30	29.93	6	0	6	0.02
10/4/2014	87	76	63	77	70	59	99	84	54	29.97	29.9	29.84	6	0	8	0.01
10/5/2014	80	67	56	59	54	46	95	65	40	30.09	30.02	29.96	8	0	9	0
10/6/2014	82	69	56	68	62	55	99	81	47	30.13	30.08	30.04	8	1	9	0
10/7/2014	86	75	66	72	69	65	99	83	59	30.14	30.1	30.06	8	0	9	0
10/8/2014	90	78	69	75	70	66	99	80	47	30.18	30.12	30.06	10	0	10	0
10/9/2014	88	76	67	75	70	67	99	84	57	30.15	30.1	30.06	11	1	11	0
10/10/2014	89	78	68	76	70	68	99	81	54	30.12	30.07	30.02	12	1	12	0
10/11/2014	90	76	67	77	70	66	99	84	56	30.09	30.05	30	9	1	13	0
10/12/2014	89	77	66	75	70	66	99	83	54	30.11	30.08	30.04	10	1	10	0
10/13/2014	89	78	67	75	70	67	99	80	49	30.14	30.08	30.03	13	1	13	0
10/14/2014	90	78	73	78	73	70	98	86	60	30.07	30	29.93	12	1	14	0.35
10/15/2014	83	74	62	74	69	60	99	85	63	30.01	29.97	29.92	7	0	7	0.02
10/16/2014	82	68	58	65	59	55	99	76	48	30.01	29.95	29.89	9	0	10	0.01
10/17/2014	83	67	55	63	58	54	98	77	41	30.04	30	29.95	6	0	6	0
10/18/2014	84	68	55	66	60	53	99	78	36	30.03	29.98	29.92	6	0	6	0
10/19/2014	84	70	59	69	64	58	99	82	53	30.08	30.03	29.98	11	1	11	0
10/20/2014	85	74	63	72	67	62	99	83	55	30.1	30.03	29.96	8	0	12	0
10/21/2014	87	74	67	74	70	66	99	87	54	30	29.96	29.92	3	0	4	0
10/22/2014	86	73	63	69	64	59	99	77	41	30.04	29.99	29.94	11	1	11	0
10/23/2014	81	69	58	62	59	55	95	72	45	30.05	30	29.95	12	1	12	0
10/24/2014	80	68	59	63	59	56	91	74	51	30.04	29.99	29.93	12	1	12	0

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