Biological Assessment of Spencer's Crossing WWTF Clay County NPDES # FL0173371 Sampled July 16, 2018

Division of Environmental Assessment and Restoration
Florida Department of Environmental Protection
January 2020

DEP Laboratory, Biology Program
2600 Blair Stone Road, MS 6515
Tallahassee, FL 32399-2400
www.floridadep.gov

Contents

Summary of Results 3
Facility Overview 3
Methods 3
Results 6
Literature Cited 10
Appendix A. Facility Summary 20
Appendix B. Explanations of Measurements 33
Appendix C. Chain of Custody 38
Appendix D. Physical/ Chemical and Habitat Assessment Field Sheets 44
Appendix E. Chemical Analysis of Effluent and Receiving Water 54

List of Tables

Table 1. Measured field parameters 11
Table 2. Analytical water chemistry, microbiological, and toxicological data 12
Table 3. Analytical metals data 14
Table 4. Algal Growth Potential (AGP) 14
Table 5. Periphyton sample – qualitative 15
Table 6. Macroinvertebrate Hester-Dendy samples – quantitative 17
Table 7. Macroinvertebrate dipnet samples – qualitative 18
Table 8. Detected Organic Constituents 19

List of Figures

Figure 1. Map of Facility and Sampling Locations 5

Summary of Results

During this sampling event, all parameters measured and analyzed, except effluent pH, met the applicable effluent permit limits and Class III Freshwater Water Quality Criteria (62-302.530, F.A.C.). Atrazine and atrazine desethyl were detected in the effluent grab sample at levels between the method detection level (MDL) and practical quantitation level (PQL). Despite nutrients detected in both the effluent grab sample and in the Test Site sample at levels higher than were detected in the Control Site sample, there was no detectable negative effects on the floral or faunal communities at the downstream receiving water site.

Facility Overview

The Spencer's Crossing Wastewater Treatment Facility is an advanced wastewater treatment system. Treated effluent is continuously discharged either to reuse or through outfall D-003 to an unnamed tributary of Little Black Creek, then to the lower St. Johns River (Figure 1). A Facility Summary, including a description of the facility, summary of permit limits, and any relevant Administrative Order (AO), Consent Order (CO), and Discharge Monitoring Report (DMR) information is provided in Appendix A. At the time of sampling for this event, the facility was operating under Consent Order (CO 17-1212) issued May 23, 2018 for nitrogen, phosphorus, and fecal exceedances. Interim limits for total nitrogen were 5.0 mg/L, annual average. This Consent Order was closed on July 31, 2019.

The unnamed tributary falls within the Peninsula Nutrient Watershed Region for Numeric Nutrient Criteria (NNC). For this region, the NNC thresholds, expressed as annual geometric means, are 0.12 mg/L total phosphorus and 1.54 mg/L total nitrogen. This FYI event only provides single sample results. It should be noted that waterbody impairment assessments are based on longer-term data, and individual exceedances of a criterion do not indicate use impairment. http://ca.dep.state.fl.us/mapdirect/?focus=nutrientcriteria

Methods

Effluent samples were taken for location D-003 as grab samples from monitoring site EFD-1 for the toxicity sample and EFA-2 for all other samples. Total phosphorus, total nitrogen, carbonaceous biological oxygen demand, and total suspended solids were collected as grab samples instead of the required 24-hour flow proportioned composite samples. Water and macroinvertebrate samples were collected and floral metrics were measured in order to make comparisons between the effluent, a Control Site (located beginning approximately 50 meters upstream of the point of discharge and ending 150 meters upstream of the point of discharge), and a Test Site (located approximately 50 meters downstream of the discharge and ending 150 meters downstream of the point of discharge). See Figure 1.

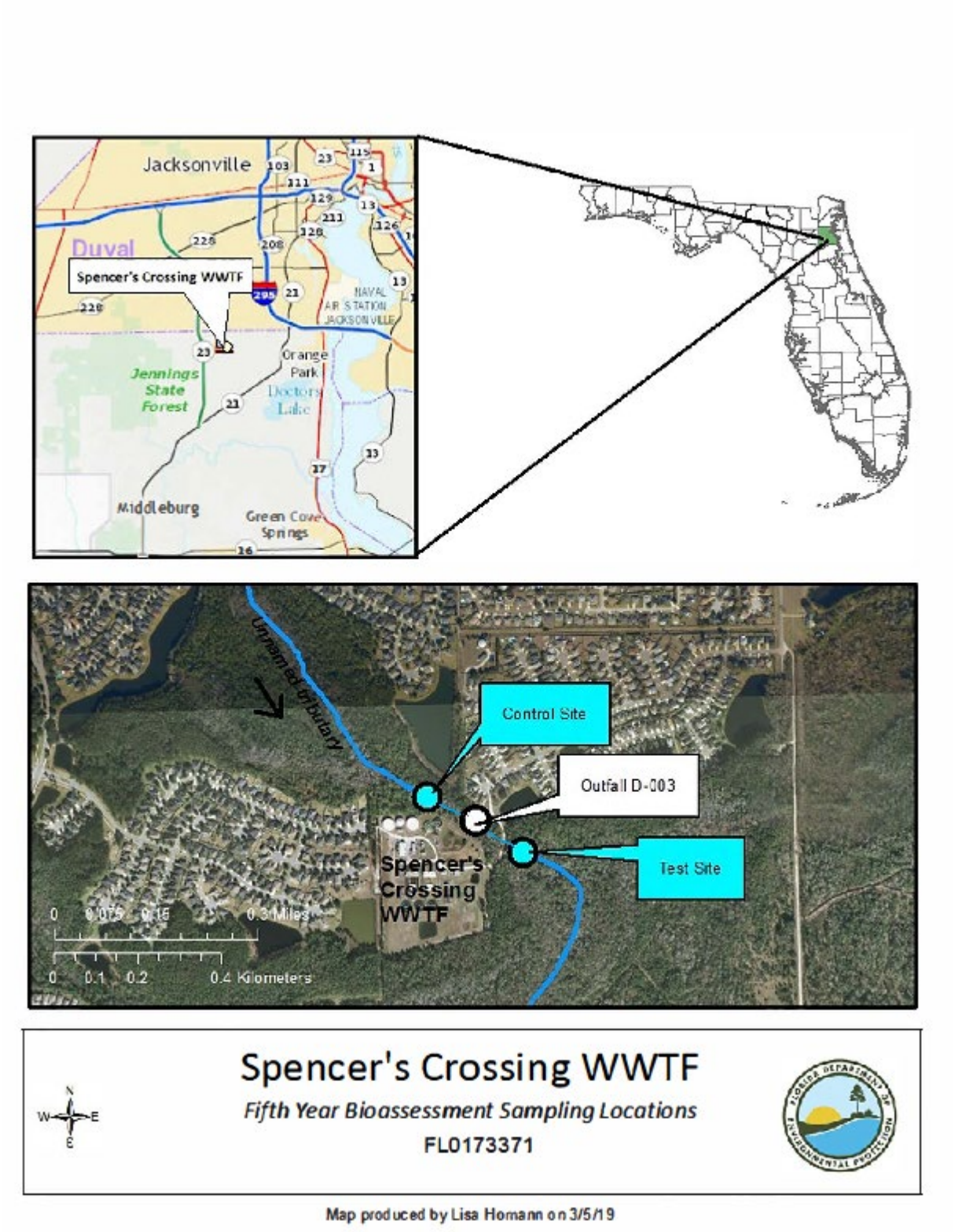
All field and laboratory methods followed DEP Standard Operating Procedures (see https://floridadep.gov/dear/quality-assurance/content/dep-sops and https://floridadep.gov/dear/florida-dep-laboratory/content/dep-laboratory-quality-assurance-

manual-and-sops for details) and met DEP quality assurance/quality control standards (see https://floridadep.gov/dear/quality-assurance). Explanations of specific methods and measurements can be found in Appendix B.

All references to 62-302.530, F.A.C. are to the surface water quality criteria table with an effective date of 02/17/2016 and a notice identification number of 17115667.

The following were involved in this investigation: Nick Williams and Hillary Saunders (Northeast District), Brian Davis and Pat O'Connor (DEP Northeast Regional Operation Center, Jacksonville), and DEP Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Nancy Ross and Adrienne Pennington).

Figure 1. Map of Facility and Sampling Locations



Results

Physical and Chemical Parameters / Site Characterization (See Table 1 and Appendices B, C, D, and E)

- Habitat Assessment scores were similar at the Test Site (118) and the Control Site (114), which places both sites in the suboptimal category. While both the Test and Control Sites had relatively low habitat diversity, the Test Site had more available substrate and higher water velocity than the Control Site. Both sites experienced some habitat smothering. The Test Site had more artificial channelization and less bank stability than the Control Site. The left bank of the Control Site lost points for riparian zone buffer width and vegetation quality.

- The pH of the effluent grab sample exceeded the Class III Freshwater Quality Criteria (62-302.530(52)(c) F.A.C.) and effluent permit limit.

- Effluent total residual chlorine data was supplied by the facility and was as not detected.

Analytical Water Chemistry (See Table 2 and Appendix E)

- Effluent total phosphorus and total nitrogen met permit limits but were collected as grab samples instead of the required 24-hour flow proportioned composite samples.

- Ortho-phosphate, total phosphorus, nitrate and nitrite, total Kjeldahl nitrogen, organic nitrogen, and total nitrogen were all detected in both the effluent grab sample and in the Test Site sample at levels higher than were detected in the Control Site sample. This indicates that nutrients present in the effluent are elevating the water chemistry downstream of the point of discharge relative to upstream.

- Chlorophyll a (corrected) was undetected in the effluent sample and was detected at a low level in both the Test and Control Site samples.

- Carbonaceous biochemical oxygen demand (CBOD) and total suspended solids (TSS) met the permit limits but were collected as grab samples instead of the required 24-hour flow proportioned composite samples.

Microbiology (See Table 2 and Appendix B and E)

- Fecal coliforms and *Escherichia coli* were undetected in the effluent sample. Fecal coliform met the effluent permit limit.

- *Escherichia coli* was detected in the Control and Test Site samples at levels which complied with Class III Freshwater Quality Criteria (62-302.530(6)(b), F.A.C.). Fecal coliforms were also detected in the Control and Test Site.

Toxicity Whole Effluent Test (See Table 2 and Appendix B and E)

- Tests were performed July 16 through July 20, 2018.

- For the 96-hour acute definitive test, the calculated LC50 for the water flea, *Ceriodaphnia dubia*, and the fish, *Cyprinella leedsi* was >100% effluent. The 96-hour acute definitive test complied with effluent permit limits. Although the permit table specifies 24-hour flow proportioned composite samples.be collected, the test permit instructions correctly identify grab sample collection.

- For more information or to obtain copies of the toxicity bench sheets, please contact the Biology Laboratory at 850-245-8177.

Metals (See Table 3 and Appendix E)

- Effluent metals were detected at levels that complied with Class III Freshwater Quality Criteria (62-302.530, F.A.C.). All metals in Test Site and Control Site grab samples were either undetected or detected at levels that complied with Class III Freshwater Quality Criteria (62-302.530, F. A. C.).

Algal Growth Potential (See Table 4 and Appendix B and E)

- The freshwater unicellular green alga, *Pseudokirchneriella subcapitata*, was used to determine the AGP values in the effluent, Test Site, and Control Site samples. The analytical chemistry suggests that the effluent and the Test Site are nitrogen-limited, and the Control Site is phosphorus limited (Miller et al. 1978).

- The effluent AGP result is greater than the AGP range (6.10 to 20.0 mg dry wt/L) suggested to be representative of high productivity for freshwater (Miller et al. 1978).

- Orthophosphate was not detected in the Control Site sample therefore, half the method detection level (MDL) for orthophosphate was used in the calculation of the inorganic nitrogen to phosphorus ratio and the predicted AGP (OP).

- Despite the effluent AGP being 124 A mg dry weight/L, the Test and Control Sites had comparatively low AGP values, 15.6 and 2.27 mg dry weight/L, respectively.

Flora (See Appendices B and D)

- Two temporally independent Linear Vegetation Survey (LVS) samplings showing a Coefficient of Conservatism score ≥ 2.5 and the frequency of occurrence of Florida Exotic Plant Pest Council (FLEPPC) exotic taxa ≤ 25% are needed to achieve NNC floral metrics. Sites with no observed macrophytes are considered to achieve the LVS component of the NNC. Two temporally independent Rapid Periphyton Survey (RPS) samplings with ≤ 25% rank 4 to 6 (algae > 6mm thick) coverage are needed to achieve NNC floral metrics. This FYI event only provides single sample results. It should be noted that waterbody impairment assessments are based on longer-term data, and individual exceedances of a criterion do not indicate use impairment.

- For the LVS, both Test and Control Sites lacked aquatic macrophytes.

- The RPS was performed at the Test and Control Sites. The canopy cover was reported as heavily shaded for both the Test Site and Control Site. Thick algal growth is not expected at heavily shaded sites. At both sites, none of the sampled points had algal length measurements greater than 1mm.

Periphyton (See Table 5 and Appendix E)

- Periphyton communities in both the Test and Control Site samples consisted mostly of diatoms. The diatom community in the Test Site sample was dominated by *Pinnularia* sp, while the diatom community in the Control Site sample was dominated by *Eunotia* sp.

Macroinvertebrates (See Tables 6 and 7 and Appendices B, D and E)

- Quantitative macroinvertebrate data were collected from floating racks, each with 4 Hester-Dendy samplers, at the Test and Control Sites. The Shannon-Weaver diversity scores were relatively low at both the Test and Control Sites (2.92 and 3.33, respectively). Though taxa richness was higher at the Test Site (30 taxa) compared to the Control Site (25 taxa), the Shannon-Weaver score at the Test Site was 13.39% lower than the Control Site because of the high dominance of the dipteran, *Rheotanytarsus pellucidus* (43.44%), at the Test Site.

- Qualitative macroinvertebrate data from dipnet samples indicated that the macroinvertebrate community at the Test Site was similar to the Control Site. The Test Site scored 58 A on the Stream Condition Index (SCI) and the Control Site scored 61 A, (see Appendix B for an explanation of SCI Categories). Both sites had similar taxonomic composition, with Coleoptera and Diptera composing nearly 50 percent of organisms collected at the Test Site and nearly 80 percent of the organisms collected at the Control Site. The numbers of Ephemeroptera, Trichoptera, sensitive, suspension feeder and clinger taxa were similar at each site. The percentage of suspension feeders was similar at both sites. The Control Site had a higher percentage of Tanytarsini individuals (which tend to decline with human disturbance). Long-lived taxa were not collected in the Test Site sample, and only two long-lived taxa were collected in the Control Site sample. Very tolerant individuals were not collected at either the Test or Control Sites (see Appendix B for an explanation of how these SCI metrics typically respond to human disturbance). Overall, there were no detectable negative effects on macroinvertebrates at the Test Site that were attributable to the effluent.

- For more information or to obtain a copy of the taxa lists, please contact the Biology Laboratory at 850-245-8177.

Organic Constituents (See Table 8 and Appendix E)

- Atrazine and atrazine desethyl were detected in the effluent grab sample between the MDL and PQL.

- Sucralose was detected in the effluent grab sample, Test Site sample, and Control Site sample, but was highest in the effluent sample. Although sucralose was detected in the Control Site sample, it was detected at a higher concentration in the Test Site sample, indicating the effluent is contributing to the Test Site.

Literature Cited

Fore, L.S., Frydenborg, R., Miller, D., Frick, T., Whiting, D., Espy, J., and Wolfe, L. 2007. Development and Testing of Biomonitoring Tools for Macroinvertebrates in Florida Streams (Stream Condition Index and Biorecon). Florida Department of Environmental Protection. 110 pp.

Karr, J.R. and Chu, E.W. 1998. Restoring life in running waters: Better biological monitoring. Island Press. Covelo, California. 200 p.

Magurran, A. E. 1988. Ecological diversity and its measurement. Princeton University Press, Princeton, New Jersey.

Miller, W. E., Maloney, T. E. and Greene, J. C. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA600/978-018. U. S. EPA, Cincinnati, Ohio. 126 p.

Plafkin, J. L., Barbour, M. T., Porter, K. D., Gross S. K., and Hughes, R. M. 1989. Rapid bioassessment protocols for use in streams and rivers: Benthic macroinvertebrates and fish. U. S. EPA, Office of Water Regulations and Standards, Washington D.C., EPA 440-4-89-001.

Stevenson, R. J. and Bahls, L. L. 1999. Periphyton protocols. Pp. 6.1-6.22 in: Rapid bioassessment protocols for use in wadeable streams and rivers. 2nd edition. By: M. T. Barbour, J. Gerritsen, B. D. Snyder and J. B. Stribling. EPA 841-B-99-002. U. S. Environmental Protection Agency, Office of Water, Washington, D. C.

Stevenson, R. J. and Smol, J. P. 2003. Use of algae in environmental assessments, pp. 775-803, in: Freshwater algae of North America, edited by J. D. Wehr and R. G. Sheath, Academic Press, San Diego. 918 pp.

USEPA. 2000. Nutrient Criteria Technical Guidance Manual – River and Streams. EPA-822-B-00-002.

Table 1. Measured field parameters

Effluent limits, Class III Freshwater Criteria, and field parameters for Spencer's Crossing WWTF

Parameter	Units	Class III Criteria	Effluent Permit Limits (EFA-2)	Effluent Grab (EFA-2)	Test Site	Control Site
Habitat Assessment	-	-	-	-	118	114
Sample Depth	m	-	-	1	0.1	0.05
Temperature	C°	-	Report (instream)	29.0	29.1	26.9
pH	SU	6.0 - 8.5	6.0 - 8.5	5.7 e	7.2	7.3
Specific Conductance	umhos/cm	≤ 1,275	-	510	280.6	233.7
Dissolved Oxygen	% saturation	≥ 34		89.6 c	80.3	82.1
Dissolved Oxygen	mg/L	-	≥ 5.0 (EFD-1)	6.88	6.17	6.54
Total Residual Chlorine (Disinfection)	mg/L	-	≥ 1.0	-	-	-
Total Residual Chlorine (De-chlorination)	mg/L	≤ 0.01	≤ 0.01 (EFD-1)	≤ 0.02U[1]	-	-
Flow	MGD	-	1.42[2] (EFD-2)	0.496[3]	-	-

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

e- Value exceeds the Class III Freshwater Quality Criteria or permit limits

c – Value is calculated

s - Single sample

U - Material analyzed for but not detected; value reported is the method detection limit

1 - A handheld meter was used with a minimum detection limit of 0.2 mg/L. The value was below the detection limit.

2 – Average annual daily maximum

3 – Actual annual average daily flow calculated by the facility (May 2017-April 2018)

Table 2. Analytical water chemistry, microbiological, and toxicological data

Effluent limits, Class III Freshwater Criteria, and analytical water chemistry, microbiological, and toxicological data

Analyte	Units	Class III Criteria	Effluent Permit Limits (EFA-2)	Effluent Grab (EFA-2)	Test Site	Control Site
Ortho-phosphate	mg P/L	-	-	0.66	0.078	0.004 U
Total Phosphorus	mg P/L	0.12 [4]	≤ 2.0 p	0.80	0.091	0.023
Total Ammonia	mg N/L	2.39 c (Test) 2.60 c (Cntrl)	2.98 c	0.038	0.025	0.024
Un-ionized Ammonia (calculated salinity)	mg N/L	-	-	< 0.02 c	< 0.02 c	< 0.02 c
Nitrate and Nitrite[5]	mg N/L	-	-	2.0	0.22	0.054
Total Kjeldahl Nitrogen	mg N/L	-		0.66	0.63	0.48
Organic Nitrogen	mg N/L	-	-	0.62 c	0.61 c	0.46 c
Total Nitrogen	mg N/L	1.54 [4]	≤ 6.0 p	2.7 c	0.85 c	0.53 c
Total Organic Carbon	mg C/L	-	-	5.4 A	5.3	5.2
Chlorophyll *a* - Corrected	µg/L	-	-	0.55 U	4.3	4.8
Phaeophytin	µg/L	-	-	0.40 U	0.85 I	1.3
CBOD, 5-day, N - inhibited	mg/L	-	≤ 10.0 p	2.0	1.6 I	1.5 I
Total Suspended Solids	mg/L	-	≤ 10 p	2 I	5 I	10
Turbidity[6]	NTU	< 29 t	-	0.60	3.2	5.1
Color (true)	PCU	-	-	4.4 I	22	28
Alkalinity	mg CaCO3/L	≥ 20	-	73A	56	53
Chloride	mg Cl/L	-	-	77	31	24 A
Fluoride	mg F/L	≤ 10.0	-	0.37	0.070 I	0.036 I
Sulfate	mg SO4/L	-	-	110	27	17 A
Fecal Coliforms [7]	cfu/100 mL	-	≤ 25 s	1 U	190 B	230 B
Escherichia coli	MPN/100 mL	≤ 410 s	-	1 U	57	120
Bioassay - Water flea *(Ceriodaphnia dubia)*	% effluent	-	≥ 100 (EFD-1)	≥ 100 (EFD-1)	-	-

Bioassay - Fish *(Cyprinella leedsi)*	% effluent	-	≥ 100 (EFD-1)	≥ 100 (EFD-1)	-	-

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
c - Value is calculated
p - Single 24 hour flow proportional sample
t - Shall not exceed 29 NTUs above background
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptance range
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
U - Material analyzed for but not detected; value reported is the method detection limit
4 – Peninsular Nutrient Watershed Region for Numeric Nutrient Criteria (NNC), 62-302.531(2)(c), F.A.C expressed as annual geometric means
5 - Nitrate and nitrite was detected in the field blank at 0.005 I mg/L
6 – Turbidity was detected in the field blank at 0.15 NTU.
7 - Class III Freshwater criteria is now for *E. coli*; however, fecal coliforms were also analyzed

Table 3. Analytical metals data

Effluent limits, Class III Freshwater Criteria, and analytical metals data

Analyte	Units	Effluent Class III Criteria	Effluent	Test Site Class III Criteria	Test Site	Control Site Class III Criteria	Control Site
Hardness	mg CaCO3/L	-	127 c	-	71.6 c	-	69.8 c
Aluminum	ug/L	-	60 U	-	100 I	-	150 I
Arsenic	ug/L	≤ 50	0.23	≤ 50	0.31	≤ 50	0.32
Cadmium	ug/L	≤ 0.323 b	0.020 U	≤ 0.211 b	0.020 U	≤ 0.207 b	0.020 U
Calcium	mg/L	-	30.3	-	22.7	-	23.8
Chromium, Total [8]	ug/L	≤ 105 b	0.40 U	≤ 65.5 b	0.40 U	≤ 64.2 b	0.40 U
Copper	ug/L	-	0.72 I	≤ 7.01 b	2.41	≤ 6.87 b	2.17
Iron	ug/L	≤ 1,000	130	≤ 1,000	150	≤ 1,000	200
Lead	ug/L	≤ 4.32 b	0.050 U	≤ 2.08 b	0.13 I	≤ 2.01 b	0.20
Magnesium	mg/L	-	12.5	-	3.62	-	2.53
Nickel	ug/L	≤ 63.9 b	2.60	≤ 39.3 b	0.50 I	≤ 38.5 b	0.24 I
Potassium	mg/L	-	12.2	-	3.9	-	2.7
Selenium	ug/L	≤ 5.0	0.20 U	≤ 5.0	0.20 U	≤ 5.0	0.20 U
Silver	ug/L	≤ 0.07	0.010 U	≤ 0.07	0.010 U	≤ 0.07	0.010 U
Sodium	mg/L	-	79.6	-	25.5	-	18.0
Zinc	ug/L	≤ 63.9 b	39	≤ 90.3 b	5.4 I	≤ 88.4 b	5.0 U

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
b - Value is calculated based on hardness, (62-302.530(3), F.A.C.)
c - Value is calculated
s - Single sample
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
U - Material analyzed for but not detected; value reported is the method detection limit
8 - Class III Freshwater Quality Criterion (62-302.530(19)(a), F.A.C.) is for chromium-III

Table 4. Algal Growth Potential (AGP)

Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus

Location	Test Species	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (OP) ± 20%	Predicted AGP (TN) ± 20%	Predicted AGP (TP) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	*Pseudokirchneriella subcapitata*	124 A	77.4 ± 15.5	283.8 ± 56.8	101.1 ± 20.2	344 ± 68.8	3.1	3.3
Test Site	*Pseudokirchneriella subcapitata*	15.6	9.3 ± 1.9	33.5 ± 6.7	32.3 ± 6.5	39.1 ± 7.8	3.1	9.3
Control Site	*Pseudokirchneriella subcapitata*	2.27	3 ± 0.6	0.86 ± 0.17 [9]	20.3 ± 4.1	9.9 ± 2	39[9]	23.2

A - Value reported is the mean of two or more determinations

9 - Orthophosphate was not detected in the Control Site sample therefore, half the method detection level (MDL) for orthophosphate was used in the calculation of the inorganic nitrogen to phosphorus ratio and the predicted AGP (OP).

Table 5. Periphyton samples—qualitative

	Test Site	Control Site
Wet Algae Analysis		
Number of Wet Taxa	28	22
Number of Wet Algal Units Identified	303	304
Percent Dominant Wet Taxon	17.3	39.1
Dominant Wet Taxon Name	*Staurastrum sp.* (Desmidiales)	*Staurastrum sp.* (Desmidiales)
% Blue-green	9.9	9.9
% Green	20.8	26.3
% Cryptophytes	1.0	1.0
% Pyrrophytes	1.0	1.0
% Diatoms	66.0	62.2
Diatom Analysis		
Number of Diatom Taxa	41	54
Number of Diatom Valves Identified	500	500
Percent Dominant Diatom Taxon	20	15.4
Dominant Diatom Taxon Name	*Pinnularia sp.* (Naviculales)	*Eunotia sp.* (Eunotiales)

Table 6. Macroinvertebrate Hester-Dendy samples – quantitative

	Test Site	Control Site
Summary Statistics		
Shannon-Weaver Diversity	2.92	3.33
Number of Taxa	30	25
Number of EPT Taxa	6	4
Percent Dominant Taxon	43.4	18.5
Dominant Taxon Name	*Rheotanytarsus pellucidus* (Diptera)	*Cheumatopsyche* sp. (Trichoptera)
Total Number of Individuals (counted)	1303	680
Total Number of Individuals (#/m^2)	3447	1800
Community Composition: Percent of total		
Acariformes	0.2	0.0
Amphipoda	0.1	0.0
Coleoptera	6.9	8.1
Decapoda	0.0	0.2
Diptera	90.4	61.8
Ephemeroptera	0.6	7.2
Gastropoda	0.0	0.7
Odonata	0.2	0.7
Oligochaeta	0.1	2.7
Plecoptera	0.0	0.0
Trichoptera	1.5	18.7
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	0.1	2.7
Predators	6.2	8.0
Scavengers	0.0	0.1
Scrapers	4.2	7.9
Shredders	14.2	9.6
Surface Deposit Feeders	28.9	29.2
Suspension Feeders	46.5	42.6

Table 7. Macroinvertebrate dipnet samples – qualitative

	Test Site		Control Site	
Stream Condition Index 2012	58		61	
Replicate	Rep 1	Rep 2	Rep 1	Rep 2
Stream Condition Index Metrics				
Number of Total Taxa	21	21	23	22
Number of Ephemeroptera Taxa	0	1	2	2
Number of Trichoptera Taxa	1	1	4	3
Number of Long-lived Taxa	2	3	0	0
Number of Sensitive Taxa	2	3	4	4
Percent of Dominant Taxon	28.1	41.9	26.2	27.3
Percent Suspension Feeders and Filterers	40.6	53.7	43	41.26
Percent of Tanytarsini Individuals	31.3	46.6	15.4	13.3
Percent of Very Tolerant Individuals	0	0	0.7	0
Total Number of Individuals	160	160	149	143
Community Composition: Percent of total				
Dominant Taxon Name	*Rheotanytarsus pellucidus* (Diptera)	*Rheotanytarsus pellucidus* (Diptera)	*Microcylloepus pusillus* (Coleoptera)	*Microcylloepus pusillus* (Coleoptera)
Bivalvia	0	0	0.7	0
Coleoptera	40.6	26.3	30.9	30.8
Diptera	48.7	60.6	27.5	32.2
Ephemeroptera	0	1.3	4	3.5
Gastropoda	0	0	1.3	0.7
Odonata	2.5	1.3	2	0.7
Oligochaeta	1.3	2.5	0.7	0.7
Plecoptera	0	0	0	0
Trichoptera	5	5.6	32.9	30.8
Other	1.9	2.4	0	0.7
Functional Feeding Groups: Percent of total				
Burrowing Deposit Feeders	1.25	2.5	0.7	0.7
Predators	7.2	5.9	2.7	2.8
Scrapers	20.3	13.1	19.1	17.9
Shredders	2.5	2.2	10.4	9.8
Surface Deposit Feeders	27.5	21.6	24.2	27.7
Suspension Feeders	40.6	53.8	43.0	41.3

Table 8. Detected Organic Constituents

Effluent limits, Class III Freshwater Criteria, and analytical organic and pesticide

Parameter	Units	Class III Criteria	Effluent Permit Limits	Effluent	Test Site	Control Site
Atrazine	ug/L	-	-	0.030 I	-	-
Atrazine Desethyl	ug/L	-	-	0.020 I	-	-
Sucralose	ug/L	-	-	46	8.4	2.5

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

Appendix A. Facility Summary

PART I: Information gathered prior to sampling event

Prepared By: Brittany Dion	**Contact Number:** (904) 256-1678
Facility Name (as it appears on permit): Spencer's Crossing WWTF	**Former Names:**
NPDES Permit Number: FL0173371	**Permit Expiration Date:** June 2, 2019
Physical Address: 4145 -1 Savannah Glen Drive, Orange Park, FL, 32073	
District: Northeast	**County:** Clay
Function of Facility: Clay County service area wastewater collection for residential and commercial customers.	
Facility Type: Domestic Wastewater	**Permitted Capacity (MGD):** 4.0 MGD annual average daily flow

Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): To D-003
May 2017- April 2018 (permit limit – Ann.Avg:1.42 MGD) = **0.496 MGD**
(permit limit – Ann.Tot (518.3 MG) = **31.73 MG**

If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):
May 2017- April 2018 (R-001)
(permit limit – Ann.Avg:4.0 MGD) = **1.75 MGD**
(permit limit – Ann.Avg:4.73 MGD) = **1.52 MGD**

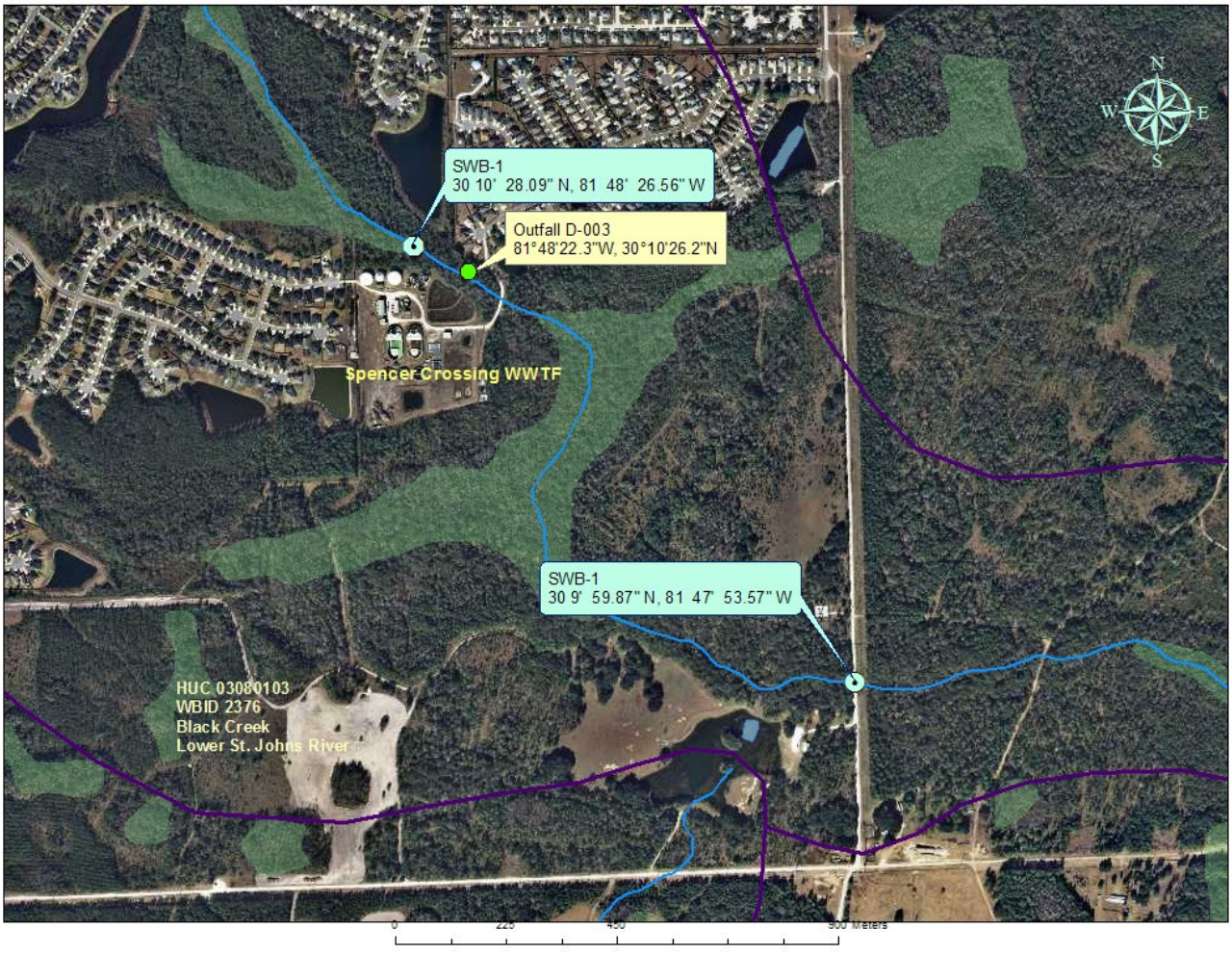
Description of type of Discharge:
☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent**
☐ **Other, please specify:**

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s):
D-003:
EFD-1 Effluent sample point immediately after dechlorination, before discharge to the unnamed tributary of Little Black Creek
EFD-2 Flow meter to measure flow discharged under the Apricot Act to unnamed tributary of Little Black Creek

R-001:
EFA-2 Effluent sample point immediately after disinfection and prior to dechlorination

Description of Permitted Outfall(s):
The discharge is limited to 1.42 MGD AADF (518.3 MG per year under APRICOT) **to an unnamed tributary (WBID 2376) to Little Black Creek (WBID 2368),** (Class III Fresh waters). Outfall D-003 point of discharge is located approximately at latitude 30° 10' 26.2" N, longitude 81° 48' 22.3" W.

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): The current advanced wastewater treatment system consists of influent fine screens followed by Carrousel biological treatment units, secondary clarifiers, traveling bridge sand filters, chlorine contact chambers, effluent pump station, reclaimed water storage tanks and BCR biosolids neutralizer system. Treated effluent is either sent to reuse or through outfall D-003 to Little Black Creek, then to the Lower St. Johns River.


SWB-1
30 10' 28.09" N, 81 48' 26.56" W
Outfall D-003
81°48'22.3"W, 30°10'26.2"N
Spencer Crossing WWTF
SWB-1
30 9' 59.87" N, 81 47' 53.57" W
HUC 03080103
WBID 2376
Black Creek
Lower St. Johns River
N
W
E
S
0
225
450
900 Meters

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under
(Leave cell blank if not applicable) -D-003

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site	Notes
Flow, Apricot Act Discharge	MGD	Max	1.42	Annual Average	Continuous *(During Discharge)*	Recording Flow Meter with Totalizer	EFD – 2	See I.A. 3
		Max	Report	Monthly Average				
Flow, Volume of Effluent Discharge under the APRICOT Act	MG	Max	518.3	Annual Total	Continuous *(During Discharge)*	Recording Flow Meter with Totalizer	EFD – 2	See I.A.4
			Report	Monthly Total				
			Report	Daily Total				
			Report	Single Sample				
BOD, Carbonaceous 5-day, 20°C	mg/L	Max	5.0	Annual Average	Weekly *(During Discharge)*	24-hour flow proportioned composite	EFA – 2	
			6.25	Monthly Average				
			7.5	Weekly Average				
			10.0	Single Sample				
Solids, Total Suspended	mg/L	Max	5.0	Annual Average	Weekly *(During Discharge)*	24-hour flow proportioned composite	EFA – 2	
			6.25	Monthly Average				
			7.5	Weekly Average				
			10.0	Single Sample				
pH	mg/L	Min	6.0	Single Sample	Continuous *(During Discharge)*	Meter	EFA – 2	See I.B.3
		Max	8.5	Single Sample				
Coliform, Fecal	#/100mL	Max	25	Single Sample	Daily (4 days/Wk)	Grab	EFA – 2	
Coliform, Fecal, % less than detection	Percent	Min	75	Monthly Average	Monthly	Calculated	CAL – 1	See I.A.6
Total Residual Chlorine (For Disinfection)	mg/L	Min	1.0	Single Sample	Continuous *(During Discharge)*	Meter	EFA – 2	See I.A.7
Total Residual Chlorine (For Dechlorination)	mg/L	Max	0.01	Single Sample	Daily *(During Discharge)*	Grab	EFD – 1	See I.A.9

			Effluent Limitations		Monitoring Requirements			
Parameter	**Units**	**Max/Min**	**Limit**	**Statistical Basis**	**Frequency of Analysis**	**Sample Type**	**Monitoring Site Number**	**Notes**
Dissolved Oxygen, (DO)	mg/L	Min	5.0	Single Sample	Daily *(During Discharge)*	Meter	EFD – 1	See I.A.8
Nitrogen, Total (as N)	mg/L	Max	3.0	Annual Average	Weekly *(During Discharge)*	24-hour flow proportioned composite	EFA – 2	
			3.75	Monthly Average				
			4.5	Weekly Average				
			6.0	Single Sample				
Total Nitrogen, Mass Loading	lb/yr	Max	Report	Annual Total Load	Monthly	Calculated	CAL – 1	See I.A.10
	lb/mth	Max	Report	Monthly Total Load				
TMDL - Total Nitrogen Incremental Mass Load	Lbs/yr	Max	**5,388**	Annual Total Load	Monthly	Calculated	CAL – 1	See I.A.10
Phosphorus, Total (as P)	mg/L	Max	1.0	Annual Average	Weekly *(During Discharge)*	24-hour flow proportioned composite	EFA – 2	See I.A.10
			1.25	Monthly Average				
			1.5	Weekly Average				
			2.0	Single Sample				
Acute Whole Effluent Toxicity, 96-hour LC50 (*Ceriodaphnia dubia*)	percent	Min	100	Single Sample	Semi-Annually; twice per year (During Discharge)	24-hour flow proportional composite	EFD-1	See I.A.14
Acute Whole Effluent Toxicity, 96-hour LC50 (*Cyprinella leedsi*)	percent	Min	100	Single Sample	Semi-Annually; twice per year (During Discharge)	24-hour flow proportional composite	EFD-1	See I.A.14

			Effluent Limitations		Monitoring Requirements			
Parameter	**Units**	**Max/Min**	**Limit**	**Statistical Basis**	**Frequency of Analysis**	**Sample Type**	**Monitoring Site Number**	**Notes**
BOD, Carbonaceous 5-day, 20ºC	**mg/L**	**Maximum**	**Report**	**Single Sample**	**Quarterly**	**Grab**	**SWB – 1 SWD – 1**	**See I.A.11**
Total Nitrogen (as N)	**mg/L**	**Maximum**	**Report** **Report**	**Single Sample** **Annual Geometric Mean**	**Quarterly**	**Grab**	**SWB – 1 SWD – 1**	**See I.A.11 & 12**
Nitrogen, Kjeldahl, Total as N	**mg/L**	**Maximum**	**Report**	**Single Sample**	**Quarterly**	**Grab**	**SWB – 1 SWD – 1**	**See I.A.11**
Nitrogen, Ammonia, Total (as N)	**mg/L**	**Maximum**	**Report**	**Single Sample**	**Quarterly**	**Grab**	**SWB – 1 SWD – 1**	**See I.A.11**
Nitrogen, Ammonia, Total Unionized (as N)	**mg/L**	**Maximum**	**Report**	**Single Sample**	**Quarterly**	**Grab**	**CAL – 2 CAL – 3**	**See I.A.11 & 13**
Phosphorus, Total (as P)	**mg/L**	**Maximum**	**Report** **Report**	**Single Sample** **Annual Geometric Mean**	**Quarterly**	**Grab**	**SWB – 1 SWD – 1**	**See I.A.11 & 12**
Oxygen, Dissolved (DO)	**mg/L**	**Maximum**	**Report**	**Single Sample**	**Quarterly**	**Grab**	**SWB – 1 SWD – 1**	**See I.A.11**
pH	**mg/L**	**Maximum**	**Report**	**Single Sample**	**Quarterly**	**Grab**	**SWB – 1 SWD – 1**	**See I.A.11**
Stage	**feet**	**Maximum**	**Report**	**Single Sample**	**Quarterly**	**Staff Gauge**	**SWB – 1 SWD – 1**	**See I.A.11**
Temperature, Water	**ºC**	**Maximum**	**Report**	**Single Sample**	**Quarterly**	**Meter**	**SWB – 1 SWD – 1**	**See I.A.11**

PART I: Continued	
Receiving Waters: Lower St. Johns River	**Classification (indicate whether fresh or marine):** Class III Fresh Waters

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):

a. Effluent Limitation
   (1) In any routine or additional follow-up test for acute whole effluent toxicity, the 96-hour LC50 shall not be less than 100% effluent. [Rules 62-302.200(1), 62-302.500(1)(a)4., 62-4.244(3)(a), and 62-4.241, F.A.C.]

b. Monitoring Frequency
   (1) Routine toxicity tests shall be conducted once every six months, the first starting within 6 months of the most recent test and lasting for the duration of this permit.

c. Sampling Requirements
   (1) All tests shall be conducted on a single grab sample of final effluent.

d. Test Requirements
   (1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 75%, 50%, 25%, and 12.5% effluent.
   (2) The permittee shall conduct 96-hour acute static renewal multi-concentration toxicity tests using the daphnid, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*, concurrently.
   (3) All test species, procedures and quality assurance criteria used shall be in accordance with Methods for Measuring Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 5th Edition, EPA-821-R-02-012. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct acute toxicity testing in accordance with the revised method.
   (4) The control water and dilution water shall be moderately hard water as described in EPA-821-R-02-012, Table 7.

e. Quality Assurance Requirements
   (1) A standard reference toxicant (SRT) quality assurance (QA) acute toxicity test shall be conducted with each species used in the required toxicity tests either concurrently or initiated no more than 30 days before the date of each routine or additional follow-up test conducted. Additionally, the SRT test must be conducted concurrently if the test organisms are obtained from outside the test laboratory unless the test organism supplier provides control chart data from at least the last five monthly acute toxicity tests using the same reference toxicant and test conditions. If the organism supplier provides the required SRT data, the organism supplier's SRT data and the test laboratory's monthly SRT-QA data shall be included in the reports for each companion routine or additional follow-up test required.
   (2) If the mortality in the control (0% effluent) exceeds 10% for either species in any test, the test for that species (including the control) shall be invalidated and the test repeated. The repeat test shall begin within 14 days after the last day of the invalid test.
   (3) If 100% mortality occurs in all effluent concentrations for either species prior to the end of any test and the control mortality is less than 10% at that time, the test (including the control) for that species shall be terminated with the conclusion that the test fails and constitutes non-compliance.
   (4) Routine and additional follow-up tests shall be evaluated for acceptability based on the concentration-response relationship, as required by EPA-821-R-02-012, Section 12.2.6.2., and included with the bioassay laboratory reports.

f. Reporting Requirements
   (1) **Results from all required routine and additional tests shall be reported as the calculated LC50 effluent concentration for that test species on the monthly Discharge Monitoring**

Report (DMR).

(2) **A bioassay laboratory report for the routine test shall be prepared according to EPA-821-R-02-012, Section 12, Report Preparation and Test Review, and mailed or e-mailed to the Department at the address below within 30 days after the last day of the test.**

(3) For additional follow-up tests, a single bioassay laboratory report shall be prepared according to EPA-821-R-02-012, Section 12, and mailed or e-mailed within 30 days after the last day of the second valid additional follow-up test.

(4) Data for invalid tests shall be included in the bioassay laboratory report for the repeat test.

(5) **The same bioassay data shall not be reported as the results of more than one test.**

(6) All bioassay laboratory reports shall be mailed or e-mailed to Jacksonville *only*:

Florida Department of Environmental Protection
Northeast District Office
8800 Baymeadows Way West, Suite 100
Jacksonville, Florida 32256

g. Test Failures

(1) A test fails when the test results do not meet the limits in 14.a.(1).

(2) Additional Follow-up Tests:

(a) If a routine test does not meet the acute toxicity limitation in 14.a.(1) above, the permittee shall notify the Department at the address above within 21 days after the last day of the failed routine test and conduct two additional follow-up tests on each species that failed the test in accordance with 14.d.

(b) The first test shall be initiated within 28 days after the last day of the failed routine test. The remaining additional follow-up tests shall be conducted weekly thereafter until a total of two valid additional follow-up tests are completed.

(c) The additional follow-up tests shall be conducted using a control and a minimum of five dilutions: 100%, 75%, 50%, 25%, and 12.5% effluent. The permittee may modify the dilution series in the additional follow-up tests to more accurately bracket the toxicity such that at least two dilutions above and two dilutions below the target concentration and a control are run. All test results shall be statistically analyzed according to the procedures in EPA-821-R-02-012.

(3) In the event of three valid test failures (whether routine or additional follow-up tests) within a 12-month period, the permittee shall notify the Department within 21 days after the last day of the third test failure.

(a) The permittee shall submit a plan for correction of the effluent toxicity within 60 days after the last day of the third test failure.

(b) The Department shall review and approve the plan before initiation.

(c) The plan shall be initiated within 30 days following the Department's written approval of the plan.

(d) Progress reports shall be submitted quarterly to the Department at the address above.

(e) During the implementation of the plan, the permittee shall conduct quarterly routine whole effluent toxicity tests in accordance with 14.d. Additional follow-up tests are not required while the plan is in progress. Following completion or termination of the plan, the frequency of monitoring for routine and additional follow-up tests shall return to the schedule established in 14.b.(1). If a routine test is invalid according to the acceptance criteria in EPA-821-R-02-012, a repeat test shall be initiated within 14 days after the last day of the invalid routine test.

(f) Upon completion of four consecutive quarterly valid routine tests that demonstrate compliance with the effluent limitation in 14.a.(1) above, the permittee may submit a written request to the Department to terminate the plan. The plan shall be terminated upon

written verification by the Department that the facility has passed at least four consecutive quarterly valid routine whole effluent toxicity tests.

(g) If a test within the sequence of the four is deemed invalid, but is replaced by a repeat valid test initiated within 14 days after the last day of the invalid test, the invalid test will not be counted against the requirement for four consecutive quarterly valid routine tests for the purpose of terminating the plan.

(4) The additional follow-up testing and the plan do not preclude the Department taking enforcement action for whole effluent toxicity failures.

[Rule 62-4.241, 62-620.620(3), F.A.C.*]*

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
CO 17-1212 issues May 23, 2018 for Nitrogen, Phosphorus, CBOD and Fecal exceedances

Interim Limits for Total Nitrogen expire February 28, 2019

Parameter	Units	Maximum	Basis for limit	Monitoring Frequency	Sample Type
Total Nitrogen	**mg/L**	**5.0**	**Annual Average**	**Monthly**	**24-hour flow proportioned composite**

Facility Mixing Zone Details (if applicable):
Not applicable.

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:

Date	Description	Result	Limit	Statistical Base
11/30/2017	Nitrogen, Total	4.6	3.0	AB - Annual Average
10/31/2017	Phosphorus, Total (as P)	1.8	1.5	WA - Weekly Average
10/31/2017	BOD, Carbonaceous 5 day, 20C	8.3	7.5	WA - Weekly Average
10/31/2017	Nitrogen, Total	5.2	3.0	AB - Annual Average
9/30/2017	Nitrogen, Total	4.9	3.0	AB - Annual Average
9/30/2017	Solids, Total Suspended	7.6	5.0	MB - Maximum
8/31/2017	Nitrogen, Total	5	3.0	AB - Annual Average
7/31/2017	Nitrogen, Total	4.9	3.0	AB - Annual Average
6/30/2017	Nitrogen, Total	4.8	3.0	AB - Annual Average
5/31/2017	Phosphorus, Total (as P)	1.7	1.5	WA - Weekly Average
5/31/2017	Nitrogen, Total	4.6	3.0	AB - Annual Average
4/30/2017	Nitrogen, Total	8.5	6.0	MB - Maximum
4/30/2017	Nitrogen, Total	4.4	3.0	AB - Annual Average
4/30/2017	Phosphorus, Total (as P)	2.7	2.0	MB - Maximum
4/30/2017	Phosphorus, Total (as P)	1.3	1.25	MK - Monthly Average
4/30/2017	Phosphorus, Total (as P)	2.7	1.5	WA - Weekly Average
4/30/2017	Nitrogen, Total	5.9	3.75	MK - Monthly Average
4/30/2017	Nitrogen, Total	8.5	4.5	WA - Weekly Average
4/30/2017	Nitrogen, Total	5.6	5.0	MK - Monthly Average
4/30/2017	Solids, Total Suspended	6.2	5.0	MB - Maximum

Describe previous FYI and WQBEL study:

• Toxicity Test Results

Bioassay samples were not collected during this sampling event.

• Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 12.9 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) determined that AGP values above 5.0 mg dry wt/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The ratio (7.9:1) of total nitrogen to total phosphorus suggests that the effluent was nitrogen limited. (Table 1; Miller et al. 1978).

• Chemistry Results

Adsorbable organic halides, chemical oxygen demand (COD), and settleable solids analyses were performed by Test America – Savannah.

The total ammonia concentration in the grab sample collected and preserved for chemical analysis was 0.035 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was <0.02 mg/L.

The effluent's dissolved oxygen (4.6 mg/L) was below the minimum limit for Class III Freshwater Quality Criterion (≥ 5.0 mg/L (62-302.530 (30), F.A.C.)) but did not exceed the facility's permitted limit. The effluent pH complied with Class III Freshwater Quality Criterion (62-302.530, F.A.C.) and/or the permitted limit (NPDES #FL0002763). Due to a field meter malfunction, the conductivity and salinity of the effluent (Table 2) is from analyses performed in the Central Laboratory. Iron, total Kjeldahl nitrogen, total nitrogen, total suspended solids, turbidity, color, chemical oxygen demand (COD), and hardness were detected in the effluent at levels that comply with Class III Freshwater Quality Criteria (62- 302.530, F.A.C.) and/or permitted limits (NPDES #FL0002763). The settleable solids result was below the detection limit for the analysis which was also the permitted limit. Arsenic, chromium-III, nickel, and zinc were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). The permit has a limit for biochemical oxygen demand (BOD) but the analysis run was carbonaceous biochemical oxygen demand (CBOD). Although adsorbable organic halides (AOX) were detected in the effluent, the limit was unable to be calculated as the flow for the day of sampling was not readily available.

In the trip blank, methylene chloride was detected between the laboratory method detection limit (MDL) and practical quantitation limit (PQL).

See Table 2 for results of analytes detected in the effluent, corresponding limits, and qualifiers. See Appendix B for a complete list of chemical analyses performed.

• Microbiology

Fecal coliform analyses were performed by Columbia Analytical Services - Jacksonville.

Fecal coliforms were detected in the effluent at levels which complied with Class III Freshwater Quality Criterion (62-302.530 (6), F.A.C.) and facility permit limits.

See Table 2 for results of analytes detected in the effluent, corresponding limits, and qualifiers. See Appendix B for a complete list of chemical analyses performed.

Conclusion

The effluent sample was collected from the EFF-1 NPDES sampling point for this facility on September 12, 2012. The effluent AGP result was greater than the "problem" threshold for fresh receiving waters suggesting that nutrient enrichment may be an issue. The effluent's dissolved oxygen concentration (4.6 mg/L) was below the minimum dissolved oxygen concentration criterion for Class III freshwater (≥ 5.0 mg/L (62-302.530 (30), F.A.C.)). Due to the absence of a concurrent background conductivity value and problems with the field meter

used to measure conductivity, it cannot be determined if the effluent's conductivity exceeded Class III freshwater criterion.
Describe previous or current Enforcement Actions (including WLs): Current enforcement actions taken May 2018 for total nitrogen, phosphorus and biosolids (Fecal) exceedances.
Describe any violations or problems noted in previous inspection: Last CEI was conducted on March 26th, 2016. The facility was determined to be in compliance. Only concern was that calibration verification were not being document for equipment used to measure pH, temperature, specific conductivity, and dissolved oxygen.
Discuss whether DMR trends within previous five years are improving or declining: Most parameters fluctuate up and down, but none appear to be rising or falling in a consistent manor. Exceedances have occurred most often with fecal coliform and pH, with others (turbidity, settleable solids, dissolved oxygen) having one or two hits in the last five years. More recently nitrogen and phosphorous has seen some exceedances within the past year, which is now under their CO 17-1212.
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse): N/A

PART II: Sampling Event Information	
Date(s) sample collected: 07/16/2018	**Sampler(s):** Nick Williams, Hillary Saunders
Temperature (Deg C): 21.7	**pH (SU): 7.21**
Dissolved Oxygen (mg/L): 3.76	**Conductivity (umhos/cm): 2323**
Total Residual Chlorine (mg/L): **Sample not taken.**	**Total Residual Chlorine - after Disinfection (mg/L):** **Sample not taken. Data provided by the facility.**
Method of Chlorination: **Sodium Hypochlorite**	**Method of De-chlorination:** **Sulfur Dioxide Gas**
Flow During Sample Collection for each outfall(MGD): **0.165 MGD EFD-2** **1.648 MGD EFA-2** **1.393 MGD CAL-6**	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day): **0.518 MGD EFD-2** **1.648 MGD EFA-2** **1.393 MGD CAL-6**	
Describe Discharge during Sampling Event: **☐ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent** **☐ Other, please specify: Facility discharges continuously to reuse: Discharge to surface waters is rainfall dependent.**	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here: NA	

Appendix B. Explanations of Measurements

Biological assessments are prepared by DEP staff to provide information for review of NPDES permit renewal applications. Biological assessments, in conjunction with other information concerning the subject facility and its receiving-water body, are used to determine appropriate permit conditions. References to Rule 62-302.530, F.A.C., are to the currently applicable surface water quality criteria table with an effective date of 02/17/2016 and a notice identification number of 17115667.

- **Chemical Analyses of the Effluent**

  The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following DEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

- **Toxicity Bioassays**

  Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62-302.500(1)a and/or facility permit limits. A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

- **Bacteriological Testing**

  High levels of fecal coliform bacteria may constitute an exceedance of 62-302.530(6) and/or facility permit limits. Fecal coliform results often are based on colony counts outside the acceptable range (B-qualifier). The dilutions performed on the sample did not yield results within the method acceptable range of 20- 60 colony forming units per plate. The B-qualifier does not affect data quality.

- **Habitat Assessment**

  Habitat assessment is used to evaluate the physical structure and extent of disturbance in a waterbody. Eight aspects are ranked, with 20 possible points for each aspect (QA Rule SOP FT 3100). The Habitat Assessment score includes types and amounts of benthic substrates, water velocity, amount of sand or silt accumulation, extent of artificial channelization, bank stability, and riparian zone width and vegetation type. All scores are summed to yield an overall Habitat Assessment score. Habitat Assessment score ranges from 11-160 and overall habitat quality is assigned to one of four categories: Optimal (120-160 points), Suboptimal (80-119 points), Marginal (40-79 points), and Poor (11-39 points).

- **Algal Growth Potential (AGP)**

  The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. AGP results within the range 6.10 to 20.0 mg dry wt/L are suggested to be representative of high productivity for freshwaters (Miller et al. 1978).

High AGP values may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), F.A.C.

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of ± 20%. When the ratio of nitrogen to phosphorus (N: P) is less than 10:1, nitrogen limitation of algal production is likely. When the N: P ratio is 20:1 or greater, phosphorus limitation is likely (USEPA 2000). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(61), F.A.C.

- **Algal Phytoplankton and Periphyton Assemblages**

  Qualitative periphyton are sampled by taking subsamples of algae from natural substrates throughout the sample reach. Phytoplankton were sampled from the water column using a 1 L grab sample. Periphyton were subsampled and identified to the lowest practical level, usually species. Wet taxa and diatoms are identified separately. In the wet taxa analysis, soft algae are identified to the lowest practical level, and diatoms are identified only to order level (diatom). In the diatom analysis, diatoms are identified to the lowest practical level.

  - Chlorophyll *a* Content: Chlorophyll *a* content is an estimate of algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may be constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a) F.A.C. and/or 62-302.530(47)(b) F.A.C.
  - Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples. Although algal density of a single site is highly variable and depends on several factors, comparison of algal density at a control site to algal density at a related test site gives a partial comparison of algal biomass at the two sites (Stevenson and Smol 2003).
  - Taxa richness: Taxa richness is the number of distinct algal taxa present in a sample. Extreme nutrient enrichment tends to reduce the number of different types of algae present in a sample because a few tolerant taxa tend to reproduce rapidly and constitute the majority of the cells present. However, moderate nutrient enrichment of nutrient poor waters may sometimes be correlated with increased algal taxa richness (Stevenson and Bahls 1999) as the algal community begins to respond to the increased input of nutrients.
  - Community Composition: Shifts in relative proportions of major groups of algae downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Stevenson and Bahls 1999) and may constitute exceedances of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) F.A.C.

- **Benthic Macroinvertebrate Assemblages**

Benthic macroinvertebrates were collected using two methods. Quantitative samples were collected from Hester-Dendy multi-plate samplers incubated for 28 days. Qualitative collections are made using 20 dipnet sweeps (QA Rule SOP FS7420). Benthic macroinvertebrates were sorted and identified to the lowest practical taxonomic level, usually species.

- Taxa richness: Taxa richness is the number of distinct macroinvertebrate taxa present in a sample. Stress, habitat destruction and pollution tend to reduce the number of different types of organisms present (Karr and Chu 1998). Decreases in taxa richness related to a facility's effluent may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., 62-302.530(47)(b), F.A.C. and/or 62-302.530(61), F.A.C.
- Percent Contribution of Dominant Taxon: Percent contribution of the dominant taxon is calculated by dividing the number of individuals in the most abundant taxa by the total number of individuals counted. Percent contribution of the dominant taxon tends to increase with increasing perturbation (Plafkin *et al*., 1989). Increases in the percent contribution of the dominant taxon related to a facility's effluent may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), F.A.C.
- Community Composition: Shifts in proportions of major groups of organisms downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Fore et. al. 2007, Karr and Chu 1998). Shifts in community composition related to a facility's effluent may constitute exceedances of 62-302.530(46) F.A.C., 62-302.530(47)(a), F.A.C., 62-302.530(47)(b), F.A.C. and/or 62-302.530(61), F.A.C.
- Functional Feeding Groups: Environmental degradation may differentially affect groups of invertebrates based on how the group feeds (e.g. predators, deposit feeders, etc.). In Florida, pollution may be responsible for reducing the numbers of filter feeders and shredders (Fore et. al. 2007). Changes in the proportions of functional feeding groups related to a facility's effluent may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., 62-302.530(47)(b), F.A.C. and/or 62-302.530(61), F.A.C..
- Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present in equitable abundance among taxa (Magurran 1988). A difference of 25% in Shannon-Weaver diversity between results from Hester-Dendy multiplate samplers incubated for 28 days at test and control sites constitute exceedances of 62-302.530(10), F.A.C.
- The Stream Condition Index (SCI): The SCI is a biological assessment tool that measures the degree to which flowing fresh waters support a healthy, well-balanced biological community, as indicated by aquatic, benthic macroinvertebrates. Macroinvertebrate taxonomic and abundance data are used to calculate ten biological metric scores, each of which has been shown to respond predictably to human disturbance (Fore et al. 2007; DEP SOP SCI 1000; DEP-SAS-001/11, incorporated into the Quality Assurance Rule by reference 62-160.210(2)(a), F.A.C.). The points

for each of the metric scores (0 to 10) are summed to yield a final SCI score (range 0-100). The ten metrics are percent contribution of Tanytarsini, number of sensitive taxa, percent contribution of very tolerant taxa, number of total taxa, number of Ephemeroptera taxa, number of Trichoptera taxa, percent contribution of the dominant taxon, the percent contribution of suspension and filter feeders, number of long-lived taxa, and number of clinger taxa. As human disturbance increases, it is expected that the number of total taxa, the number of Ephemeroptera taxa, Trichoptera taxa, sensitive taxa, clinger taxa, long-lived taxa, and the percent contribution of Tanytarsini and suspension and filter feeders will decrease while percent contribution of dominant taxon and percent contribution of very tolerant taxa will increase.

The SCI can be used to determine faunal health associated with Chapter 62-302.531, F.A.C. An average SCI score of 40 or higher from at least two temporally independent SCIs, performed at representative locations and times indicates a balanced faunal community. Neither of the two most recent SCI scores should be less than 35. Failure of the SCI indicates that the stream does not meet the Clean Water Act goal of biological integrity, as measured by community structure and function. A failing SCI could be due to water quality problems or other physical disturbance factors such as habitat disruption or hydrologic alterations. While the stressor may not be known, a failed SCI does indicate that fauna is not well-balanced. A failing SCI score, if it is shown to be related to a facility's effluent, may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., 62-302.530(47)(b), F.A.C., or of 62-302.530(61).

- **Rapid Periphyton Survey**

  Rapid Periphyton Survey (RPS) is a rapid method to quantify the extent and abundance of attached algae (periphyton) in a stream or river. A total of 99 points are assessed within a 100m area of sampling reach, 9 equidistant points along 11 cross-section transects spaced 10 m apart. If greater than 20% of sampled points have algal lengths greater than 6mm, a sample is collected and the autecological information associated with the dominant algae is evaluated (see DEP SOP FS 7230 Rapid Periphyton Survey). This method could be used to determine floral health associated with Chapter 62-302.531, F.A.C.

- **Linear Vegetation Survey**

  Linear Vegetation Survey (LVS) is a rapid screening tool for ecological condition, by determining how closely a site's flora resembles that of an undisturbed condition. When the total area of macrophytes equals or exceeds two square meters within the wetted area of the 100 m sampling reach, macrophyte taxonomic names are recorded (DEP SOP FS 7320 Stream and River Linear Vegetation Survey (LVS) Method). This method could be used to determine floral health associated with Chapter 62-302.531, F.A.C.

- **Definition of Qualifiers**

  A - Value reported is the mean of two or more determinations
  B - Results based on colony counts outside the acceptable range.
  I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Z - Colonies were too numerous to count (TNTC)

Appendix C. Chain of Custody

Request Number: RQ-2018-07-09-28

FYI5 Spencer's Crossing WWTF (FL0173371) Sampling Inspection

Customer: NE-DIST

Project ID: FYI5

Florida Department of Environmental Protection
Central Laboratory Submittal Form

last revised Jan 25, 2018

Requester: Adrienne E. Pennington

Field Report Prepared By: Nick Williams

Collected By: Nick Williams, Hillary Saunders

Sampling Agency: FDEP - NED

Location: Spencers Crossing FYI5 - Effluent

Field ID: 123456

WIN/ST:

Latitude: ☐ dd ☐ dms

Longitude: ☐ dd ☐ dms

☐ Comp ☑ Grab | Collection (comp begin or grab) Date 7/16/18 Time 11:32 | Eastern Central | Composite end Date Time | Bottle Group(s) (See pg 2): A

Matrix (type, e.g., Salt, Fresh, etc): Effluent | Diss. Oxygen: 6.88 ☑ mg/L ☐ % sat | Total Res. Chlorine (mg/L): <0.01

Temp (C): 29.0 | pH: 5.7 | Sample Depth: 1 ☐ ft ☑ m | Sp. Conductance (umho/cm): 510

Salinity (ppt): 0.25 | Comments:

Location: Spencers Crossing FYI5 - Field Blank

Field ID: 123456

WIN/ST:

Latitude: ☐ dd ☐ dms

Longitude: ☐ dd ☐ dms

☐ Comp ☑ Grab | Collection (comp begin or grab) Date 7/16/18 Time 10:02 | Eastern Central | Composite end Date Time | Bottle Group(s): D

Matrix (type, e.g., Salt, Fresh, etc): O.I. Water | Diss. Oxygen: N/A ☐ mg/L ☐ % sat | Total Res. Chlorine (mg/L): N/A

Temp (C): N/A | pH: N/A | Sample Depth: N/A ☐ ft ☐ m | Sp. Conductance (umho/cm): N/A

Salinity (ppt): N/A | Comments:

Location:

Field ID:

WIN/STORET #:

Latitude: ☐ dd ☐ dms | Longitude: ☐ dd ☐ dms

☐ Comp ☐ Grab | Collection (comp begin or grab) Date Time | Eastern Central | Composite end Date Time | Bottle Group(s):

Matrix (type, e.g., Salt, Fresh, etc): | Diss. Oxygen: ☐ mg/L ☐ % sat | Total Res. Chlorine (mg/L):

Temp (C): | pH: | Sample Depth: ☐ ft ☐ m | Sp. Conductance (umho/cm):

Salinity (ppt): | Comments:

Location:

Field ID:

WIN/STORET #:

Latitude: ☐ dd ☐ dms | Longitude: ☐ dd ☐ dms

☐ Comp ☐ Grab | Collection (comp begin or grab) Date Time | Eastern Central | Composite end Date Time | Bottle Group(s):

Matrix (type, e.g., Salt, Fresh, etc): | Diss. Oxygen: ☐ mg/L ☐ % sat | Total Res. Chlorine (mg/L):

Temp (C): | pH: | Sample Depth: ☐ ft ☐ m | Sp. Conductance (umho/cm):

Salinity (ppt): | Comments:

Relinquished By:	Date/Time	Shipping Method	Number of Coolers Shipped:	Received By:	Date/Time
Nick Williams	7/16/18 13:45	Fed Ex	4	Jessica Lickdyke	7.17.18/1125

7/17/18 10:25

Request Number: RQ-2018-07-09-28

FYI5 Spencer's Crossing WWTF (FL0173371) Sampling Inspection

Customer: NE-DIST

Project ID: FYI5

Florida Department of Environmental Protection
Central Laboratory Submittal Form

last revised Jan 25, 2018

Requester: Adrienne E. Pennington

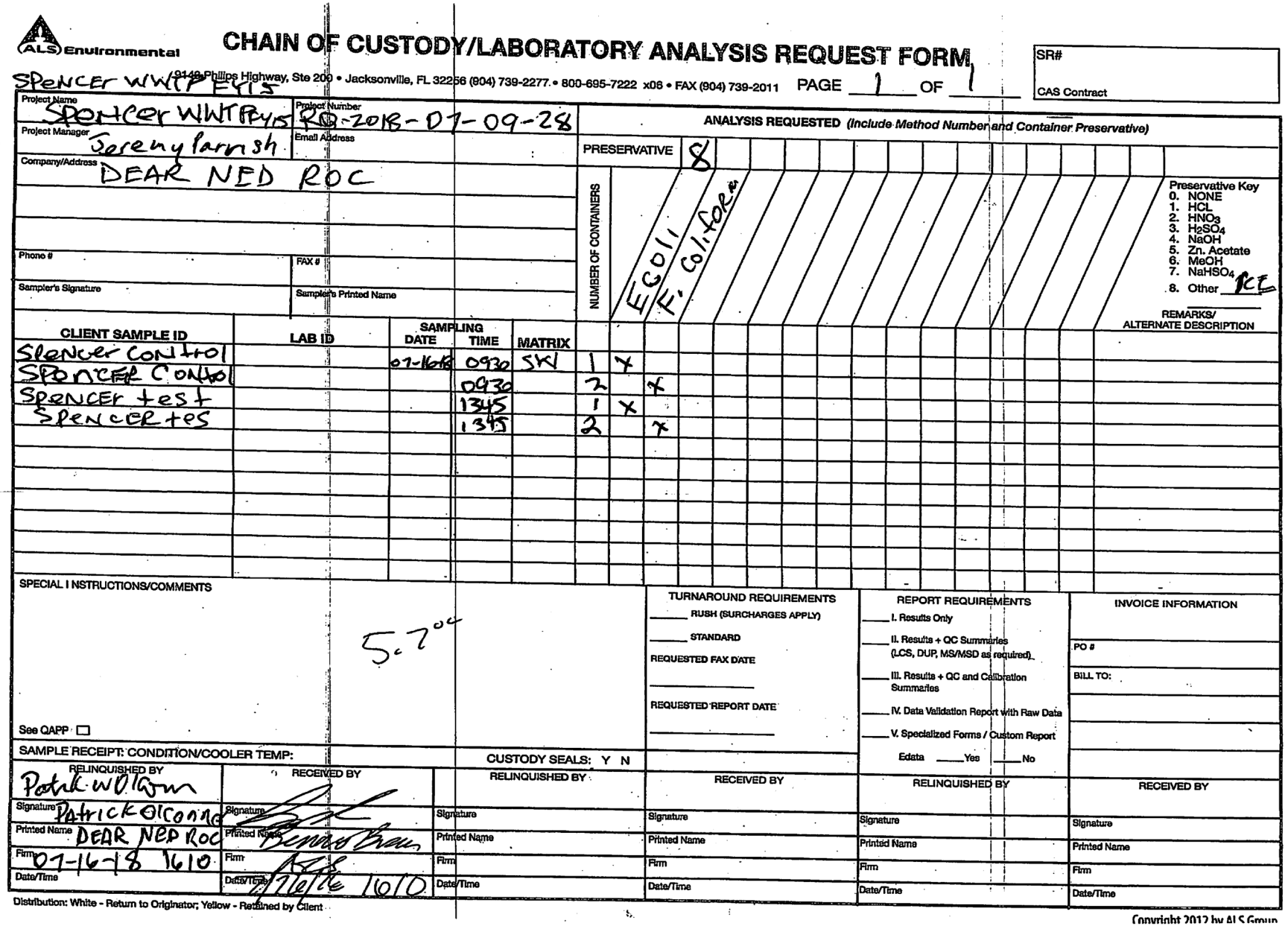
Field Report Prepared By: P. O'Connor

Collected By: B. DAVIS, P. O'Connor

Sampling Agency: DEAR NED ROC

Location: Spencer WWTP test site	☐ Comp ☒ Grab	Collection (comp begin or grab) Date 07-16-18 Time 1345	Eastern / Central	Composite end Date — Time —	Bottle Group(s) (See pg 2): B+C					
Field ID	Matrix (type, e.g., Salt, Fresh, etc): Surface Water Fresh	Diss. Oxygen: 6.17 ☒ mg/L ☐ % sat	Total Res. Chlorine (mg/L): —							
WIN/STORET #	Temp (C): 29.1	pH: 7.24	Sample Depth: 0.1 ☐ ft ☒ m	Sp. Conductance (umho/cm): 280.6						
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt): 0.13	Comments: SAL 0.13 DO% 80.3							
Location: Spencer WWTP control site	☐ Comp ☒ Grab	Collection (comp begin or grab) Date 07-16-18 Time 0930	Eastern / Central	Composite end Date — Time —	Bottle Group(s): B+C					
Field ID	Matrix (type, e.g., Salt, Fresh, etc): Surface Water Fresh	Diss. Oxygen: 6.54 ☒ mg/L ☐ % sat	Total Res. Chlorine (mg/L): —							
WIN/STORE	Temp (C): 26.9	pH: 7.3	Sample Depth: 0.05 ☐ ft ☒ m	Sp. Conductance (umho/cm): 233.7						
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt): 0.11	Comments: DO% 82.1							
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern / Central	Composite end Date Time	Bottle Group(s)					
Field ID	Matrix (type, e.g., Salt, Fresh, etc)	Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)							
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)						
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	~~Salinity~~ (ppt)	Comments							
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern / Central	Composite end Date Time	Bottle Group(s)					
Field ID	Matrix (type, e.g., Salt, Fresh, etc)	Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)							
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)						
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments							

Relinquished By:	Date/Time	Shipping Method	Number of Coolers Shipped:	Received By:	Date/Time
P. O'Connor	07-16-18 1630	Fed ex	3		7/17/18 10:25



ALS Environmental

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

9149 Philips Highway, Ste 200 • Jacksonville, FL 32256 (904) 739-2277 • 800-695-7222 x06 • FAX (904) 739-2011

SPENCER WWTP FY15

PAGE 1 OF 1

SR#

CAS Contract

Project Name: SPENCER WWTP FY15

Project Number: RQ-2018-01-09-28

Project Manager: Jeremy Parrish

Email Address:

Company/Address: DEAR NED ROC

Phone #:

FAX #:

Sampler's Signature:

Sampler's Printed Name:

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

PRESERVATIVE: 8

NUMBER OF CONTAINERS: EColi; F. Coliform

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other ICE

CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	EColi	F. Coliform	REMARKS/ ALTERNATE DESCRIPTION
SPENCER CONTROL		01-16-18	0930	SW	1	X		
SPENCER CONTROL			0930		2		X	
SPENCER TEST			1345		1	X		
SPENCER TEST			1345		2		X	

SPECIAL INSTRUCTIONS/COMMENTS

5.7°C

See QAPP ☐

SAMPLE RECEIPT: CONDITION/COOLER TEMP:

CUSTODY SEALS: Y N

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ STANDARD
REQUESTED FAX DATE
REQUESTED REPORT DATE

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
____ V. Specialized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO #
BILL TO:

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: Patrick O'Connor	Signature:	Signature:	Signature:	Signature:	Signature:
Printed Name: DEAR NED ROC	Printed Name: Bernard Brau	Printed Name:	Printed Name:	Printsd Name:	Printed Name:
Firm:	Firm: ALS	Firm:	Firm:	Firm:	Firm:
Date/Time: 01-16-18 1610	Date/Time: 1/16/18 1610	Date/Time:	Date/Time:	Date/Time:	Date/Time:

Distribution: White - Return to Originator; Yellow - Retained by Client

Copyright 2012 by ALS Group

ALS Environmental

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

9143 Philips Highway, Ste 200 • Jacksonville, FL 32256 (904) 739-2277 • 800-695-7222 x06 • FAX (904) 739-2011 PAGE _____ OF _____

SR#

CAS Contract

Project Name: Spencer's Crossing FYTS	Project Number: RQ-2018-07-09-28
Project Manager: Herndon Sims	Email Address: herndon.sims@dep.state.fl.us
Company/Address: FDEP 8800 Baymeadows Way W. Suit 100 Jacksonville, FL 32256	
Phone #: 904-256-1700	FAX #:
Sampler's Signature:	Sampler's Printed Name: Nick Williams

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE

NUMBER OF CONTAINERS

E. Coli

Fecal Col. Form

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

REMARKS/ ALTERNATE DESCRIPTION

CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	E. Coli	Fecal Col. Form	REMARKS/ ALTERNATE DESCRIPTION
NFD-ALS-ECQ		7/16/18	12:38	Effluent		1		
NFD-ALS-FC		7/16/18	12:38	Effluent			2	

SPECIAL I NSTRUCTIONS/COMMENTS

See QAPP ☐ 13.7°C - From Field

SAMPLE RECEIPT: CONDITION/COOLER TEMP: CUSTODY SEALS: Y N

TURNAROUND REQUIREMENTS
_____ RUSH (SURCHARGES APPLY)
_____ STANDARD
REQUESTED FAX DATE
_____
REQUESTED REPORT DATE
_____

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
____ V. Specialized Forms / Custom Report
Edata ____Yes ____No

INVOICE INFORMATION
PO #
BILL TO:

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Nick Williams	Printed Name: ISAYLA BLACKWELL	Printed Name	Printed Name	Printed Name	Printed Name
Firm: FDEP	Firm: ALS	Firm	Firm	Firm	Firm
Date/Time: 7/16/18 1800	Date/Time: 7.16.18 1300	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Return to Originator; Yellow - Retained by Client

Copyright 2012 by ALS Group

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
STRATEGIC MONITORING PROGRAM FIELD SHEET

January 2018

Data Qualified? Yes / No

WIN Station Name: Spencers Crossing FYIS Effluent **Date:** 07/16/2018 (mm/dd/yyyy)

WIN/ Field ID: BQ-2018-07-09-28 **WBID:** _____ **Latitude:** _____ (Decimal Degrees)

County: Clay **ORG ID:** 21FLA **Longitude:** _____ (Decimal Degrees)

Receiving Body of Water: Black Creek **RQ-2018-** 07-09-28

Sampling Team Members	WQ Measurements	Sample Collection	Documentation	Preservation	Preservation Check
Nicki Williams					
Hillary Saunders					

Sampling Equipment
☐ Sample Container ☐ Van Dorn ☐ Pole
☐ Carboy ☐ Syringe
☐ Dipper ☐ Other _____
Depth Measured with _____
Equipment ID _____

Collection Method
☐ Wading ☐ Canoe/Kayak
☐ From Shore ☐ Electric Motor
☐ Other _____ ☐ Gasoline Motor

Water Level: Dry/ Pooled/ Low / Normal / High / Flooded **Meter ID#** **Matrix:** Fresh / Marine / DI

Photos: Yes / No **Flow:** No Flow / Interstitial / Flowing / NA **Tide:** Rising/ Falling/ Slack/ NA **Tide Times:** High Low

Time Zone	Time	Total Depth (m)	Sample Depth (m)	Secchi Disk (m)	DO (mg/L)	DO (%SAT)	pH	Salinity (PPTh)	Sp COND (µmhos/cm)	Temp. (C°)
EST	12:20	2	1		6.88	89.7	5.7	0.25	510	29
CEN										

Biological Samples Collected: None HA SCI RPS Algae ID LVS LVI Other:

SBIO ID Numbers: SBIO-ID: HA-ID: RPS-ID: Macrophyte-ID: LIMS#:

Parameter Suite	Parameter Methods	Preservation	Lot#	Expiration	pH Check
Preserved Nutrients	☑ W-NH3 / W-NO2NO3 / W-TKN / W-TOC / W-S-A-TP	☑ Ice ☑ H_2SO_4	SA7341020	12-07-18	☑ <2
Metals	☑ W-ICPMS ☑ W-ICP	☑ Ice ☑ HNO_3	NA7261120	9-18-18	☑ <2
Filtered Nutrients	☑ W-PO4-F ☑ Field Filtered 0.45 µm Filter	☑ Ice			
Chlorophyll	☑ CHLSUITE-W	☑ Ice			
Physical/Aggregate (Fresh)	☑ Alkalinity / W-F / W-TSS / TURBIDITY / W-Cl-IC / W-COLOR / W-SO4-IC / W-TDS	☑ Ice			
Physical/Aggregate (Marine)	☐ Alkalinity / W-F / W-TSS / TURBIDITY	☐ Ice			
Macroinvertebrates	☐ MI-FW-QLDC	☐ Formalin			
Periphyton	☐ ALGAE-ID	☐ Ice			
Microbiology	☐ E Coli ☐ F Coli ☐ Enterococci	☐ Ice			
Molecular	☐ PCR-FILTER ☐ PCR-HF183 ☐ PCR-BacR ☐ PCR-GULL2 ☐ PCR-GFD	☐ Ice			
Tracers	☐ W-SUC-AA-R ☐ W-UHERB-AA ☐ W-AHERB-AA	☐ Ice			
Pesticides	☐ W-PSNP-TQ ☐ W-UHERB-AA ☐ W-AHERB-AA ☐ W-CARB-AA ☐ W-PCL-SQ-R ☐ W-PYR-AA-R ☐ W-GLYPH ☐ W-SUC-AA-R	☐ Ice ☐ Other			
	JBSY-AD-FCD/BSY-AD-FFS	√Ice			

Place Preservative Sticker(s) Here (If Available)

Notes:
√W-BNA
√W-1-4-DIOX
√W-NP-AA-SF
√W-E8321-DI/W-E8321-MS
√BOD-INHB
AA-AGP

√Ice
√NASUL, BIOSUF, √Ice
√Ice
√Ice
√Ice
√Ice

Place Label Here

Signature: NEALS-FC NEAEL-ACQ **Date:**

Enter Field Parameters, Verify Station ID In LIMS DMT: _____ (Initials/Date) QC Station ID, Field Parameters In LIMS DMT: _____ (Initials/Date)

Scan/Save Field Sheets _____ (Initials/Date) Migrate Data to WIN: _____ (Initials/Date) Verify Data In WIN: _____ (Initials/Date)

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
STRATEGIC MONITORING PROGRAM FIELD SHEET

January 2018

Data Qualified? Yes / No

WIN Station Name: Spencer's Crossing FYI5 Blanks **Date:** 7/16/2018 (mm/dd/yyyy)

WIN/ Field ID: RQ-2018-07-09-28 **WBID:** _____ **Latitude:** _____ (Decimal Degrees)

County: Clay **ORG ID:** 21FLA **Longitude:** _____ (Decimal Degrees)

Receiving Body of Water: N/A **RQ-2018-** 07-09-28

Sampling Team Members	WQ Measurements	Sample Collection	Documentation	Preservation	Preservation Check
Nick Williams					
Hillary Saunders					

Sampling Equipment
☐ Sample Container ☐ Van Dorn ☐ Pole
☐ Carboy ☐ Syringe
☐ Dipper ☐ Other _____
Depth Measured with _____
Equipment ID _____

Collection Method
☐ Wading ☐ Canoe/Kayak
☐ From Shore ☐ Electric Motor
☐ Other _____ ☐ Gasoline Motor

Water Level: Dry/ Pooled/ Low / Normal / High / Flooded **Meter ID#** **Matrix:** Fresh / Marine / DI

Photos: Yes / No **Flow:** No Flow / Interstitial / Flowing / NA **Tide:** Rising/ Falling/ Slack/ NA **Tide Times:** High Low

Time Zone	Time	Total Depth (m)	Sample Depth (m)	Secchi Disk (m)	DO (mg/L)	DO (%SAT)	pH	Salinity (PPTh)	Sp COND (µmhos/cm)	Temp. (C°)
EST										
CEN										

Biological Samples Collected: None HA SCI RPS Algae ID LVS LVI Other:

SBIO ID Numbers: SBIO-ID: HA-ID: RPS-ID: Macrophyte-ID: LIMS#:

Parameter Suite	Parameter Methods	Preservation	Lot#	Expiration	pH Check
Preserved Nutrients	☑ W-NH3 / W-NO2NO3 / W-TKN / W-TOC / W-S-A-TP	☑ Ice ☑ H_2SO_4	SA73410Z0	12/07/18	☑ <2
Metals	☑ W-ICPMS ☑ W-ICP	☑ Ice ☑ HNO_3	7261120	09-18-18	☑ <2
Filtered Nutrients	☑ W-PO4-F ☑ Field Filtered 0.45 µm Filter	☑ Ice			
Chlorophyll	☐ CHLSUITE-W	☐ Ice			
Physical/Aggregate (Fresh)	☑ Alkalinity / W-F / W-TSS / TURBIDITY / W-Cl-IC / W-COLOR / W-SO4-IC / W-TDS	☑ Ice			
Physical/Aggregate (Marine)	☐ Alkalinity / W-F / W-TSS / TURBIDITY	☐ Ice			
Macroinvertebrates	☐ MI-FW-QLDC	☐ Formalin			
Periphyton	☐ ALGAE-ID	☐ Ice			
Microbiology	☐ E Coli ☐ F Coli ☐ Enterococci	☐ Ice			
Molecular	☐ PCR-FILTER ☐ PCR-HF183 ☐ PCR-BacR ☐ PCR-GULL2 ☐ PCR-GFD	☐ Ice			
Tracers	☐ W-SUC-AA-R ☐ W-UHERB-AA ☐ W-AHERB-AA	☐ Ice			
Pesticides	☐ W-PSNP-TQ ☐ W-UHERB-AA ☐ W-AHERB-AA ☐ W-CARB-AA ☐ W-PCL-SQ-R ☐ W-PYR-AA-R ☐ W-GLYPH ☐ W-SUC-AA-R	☐ Ice ☐ Other			
	√W-1-4-DIOX	√$NAHSO_4$, NA_2SO_3 √Ice			

Place Preservative Sticker(s) Here (If Available)

Notes:
√W-BNA
√W-NP-AA-SF
√W-E8321-DI W-E8321-MS
~~W-E8321-DI FCB BSX AD FFS~~

√Ice
√Ice
√Ice
~~√Ice~~

Place Label Here

Signature: **Date:**

Enter Field Parameters, Verify Station ID In LIMS DMT: _____ (Initials/Date) QC Station ID, Field Parameters In LIMS DMT: _____ (Initials/Date)

Scan/Save Field Sheets _____ (Initials/Date) Migrate Data to WIN: _____ (Initials/Date) Verify Data In WIN: _____ (Initials/Date)

Appendix D. Physical/ Chemical and Habitat Assessment Field Sheets

DEP Form FD 9000-3 Physical/Chemical Characterization Field Sheet

SAMPLE ID _____ ORG ID _____ LATITUDE 30.1739
COUNTY CLAY STORET # 621211168 LONGITUDE 81.8064
DATE 07-16-18 TIME 0930 SAMPLING AGENCY DEAR NEW RCC
SITE NAME SPENCER WWTP Control Site
FIELD ID/NAME _____ RECEIVING BODY OF WATER L. Black Cr
Meter ID: DEP 154181

RIPARIAN ZONE / STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industry	Other (Specify)
90	5			5			

Landscape Development Intensity Index (LDI):

Local Watershed Erosion (select one): ☐ None ☐ Slight ☒ Moderate ☐ Heavy
Local Watershed NPS Pollution: ☐ No evidence ☒ Slight ☐ Moderate ☐ Heavy

Width of Riparian Vegetation (m) on Each Buffer Side
Left Bank: 12-16 Right Bank: >18

Hydrologic Modification Score (per FT 3101):

High Water Mark: 0.15 (m) + 0.2 (above present water level) = 0.35 (present depth) (above bed)

Artificially Impounded ☐ Yes ☒ No

Typical Width (m) Depth (m)/Velocity (m/sec) Transect
2.0 m wide
m/s m/s m/s
m deep 0.15 m deep m deep

Artificially Channelized: ☒ No ☐ Some recovery ☐ Mostly recovered, more sinuous ☐ Recent, severe

Canopy Cover % ☐ Open ☐ Lightly Shaded (11-45%) ☒ Heavily Shaded ☐ Moderate Shaded (46-80%)

SEDIMENT / SUBSTRATE

Sediment Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Sediment Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ Other (Specify):

Smothering of Substrates
Sand Smothering: None ☐ Slight ☒ Moderate ☐ Severe ☐
Silt Smothering: None ☐ Slight ☐ Moderate ☒ Severe ☐
Algae Smothering: None ☒ Slight ☐ Moderate ☐ Severe ☐

SUBSTRATE TYPE
Assessment Tool: ☒ SCI ☒ RPS ☒ LVS ☐ LCI ☐ BioRecon

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	5		
Undercut Banks / Roots	2.5		
Leaf Packs or Mat	–		
Aquatic Vegetation	–		
Rock or Shell Rubble..			
Sand.....			
Mud / Muck / Silt	90+		
Other			
Other			

WATER QUALITY

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	D.O. Sat (%)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top:	0.05							0.15
Mid:	0.95	26.9	7.3	6.54	82.1	233.7	0.11	TOTAL DEPTH
Bottom	No							0.1

System Type: Stream ☒ Lake ☐ Wetland ☐ Estuary ☐ Other(Specify) ☐

Water Odors Normal ☒ Petroleum ☐ Sewage ☐ Chemical ☐ Other ☐

Water Surface Oils Normal ☒ Sheen ☐ Globs ☐ Slick ☐ Other ☐

Water Sample Taken? ☒ Yes ☐ No
Sample Preserved? ☐ Yes ☐ No
Lot Number:_____ Exp:_____

Color Tannic ☐ Green (Algae) ☐ Clear ☒ Other (Specify) ☐

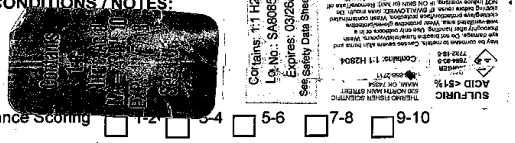
Algae Sample Taken? ☐ Yes ☒ No
Sample Preserved? ☐ Yes ☐ No
Lot Number:_____ Exp:_____

Clarity Clear ☒ Slightly Turbid ☐ Turbid ☐ Other ☐

ABUNDANCE

	Not Obs.	Rare	Common	Abundant
Periphyton:	☐	☒	☐	☐
Fish:	☐	☐	☒	☐
Aquatic Plants:	☒	☐	☐	☐
Iron/Sulfur Bacteria:	☐	☐	☒	☐

AMBIENT FIELD CONDITIONS / NOTES:



Hydrologic Disturbance Scoring ☐ 1-2 ☐ 3-4 ☐ 5-6 ☐ 7-8 ☐ 9-10

☒ The antecedent hydrologic conditions have been met to my best knowledge.

SAMPLING TEAM B. DAVIS, P. O'Connor SIGNATURE: _____

62-160.800, F.A.C. Revision Date: March 1, 2014

DEP Form FD 9000-5 Stream/River Habitat Assessment Field Sheet

SAMPLING AGENCY: NE ROC		STORET STATION NUMBER: 62NC1168	DATE (MM/DD/YY): 7/16/18	RECEIVING BODY OF WATER: Little Black Creek
REMARKS:	COUNTY: Clay	LOCATION: Spencer WWTP Control		FIELD ID/NAME:

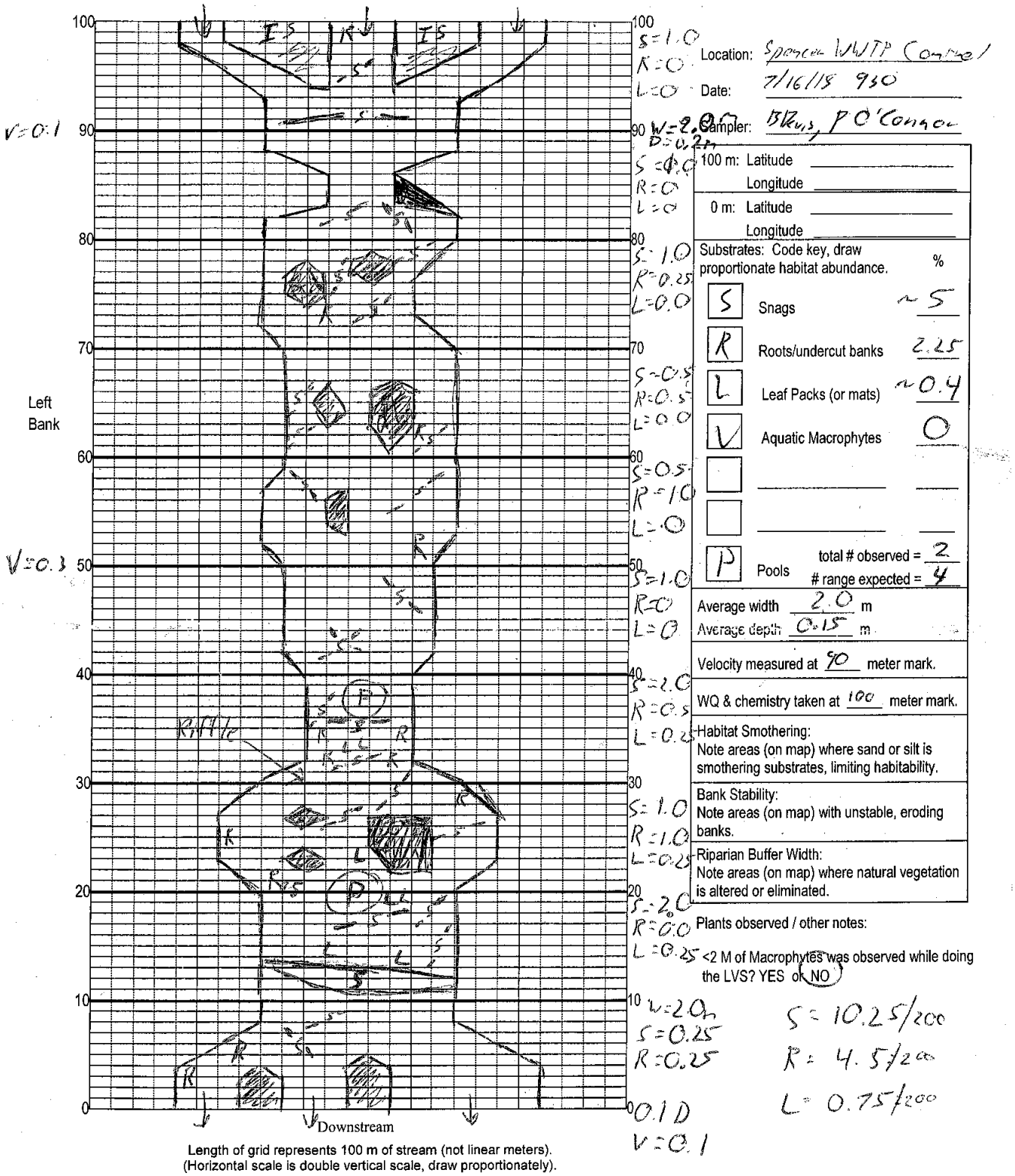
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 10	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed (10) 9 8 7 6	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 6	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 11	6% to 15% major productive habitat 10 9 8 7 (6)	Less than 5% major productive habitat 5 4 3 2 1
Water Velocity 13	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 15 14 (13) 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 7 Primary Score 36	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 14 13 12 11	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 (7) 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 20	Expected sinuosity given the stream width. No evidence of dredging or artificial straightening. No spoil banks. (20) 19 18 17 16	Good sinuosity within old channelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. 10 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 1
Bank Stability Right Bank 10 Left Bank 10	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. Bankfull is within or above the root zone with few raw eroded areas. (10) 9	Only meets 2 of the 3 requirements for optimal bank stability. 8 7 6	Only meets 1 of the 3 requirements for optimal bank stability. 5 4	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 8	Width of vegetation greater than 18 m (10) 9	Width of vegetation >12 to 18m (8) 7 6	Width of vegetation 6 to 12 m. human activities close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 10 Left Bank 9 Secondary Score 18	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). Minimal disturbance. (10) 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. 8 7 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 1

114 **TOTAL SCORE**

Date: 7/16/18	Analyst: [illegible]	Signature: [illegible]

62-160.800, F.A.C. Revision Date: March 1, 2014

DEP Form FD 9000-4 Stream/River Habitat Assessment Sketch Sheet



Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

Location: Spencer WWTP Control
Date: 7/16/18 930
Sampler: Ellis, PO'Connor

100 m: Latitude _____
Longitude _____
0 m: Latitude _____
Longitude _____

Substrates: Code key, draw proportionate habitat abundance.		%
S	Snags	~5
R	Roots/undercut banks	2.25
L	Leaf Packs (or mats)	~0.4
V	Aquatic Macrophytes	0
P	Pools	total # observed = 2 # range expected = 4

Average width 2.0 m
Average depth 0.15 m

Velocity measured at 90 meter mark.

WQ & chemistry taken at 100 meter mark.

Habitat Smothering:
Note areas (on map) where sand or silt is smothering substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed / other notes:
<2 M of Macrophytes was observed while doing the LVS? YES or (NO)

S = 10.25/200
R = 4.5/200
L = 0.75/200

62-160.800, F.A.C

Revision Date: March 1, 2014

DEP FORM FD 9000-32: LINEAR VEGETATION SURVEY FIELD SHEET

Waterbody: Spencer Control Site | Date: 07-16-18 | County: Clay | Storet Number: G2NE1168

Analyst: B Davis, P O'Connor | Signature:

Comments:

Instructions: Note taxa growing in the water with a checkmark if present, "D" if dominant, and "C" if codominant (dominance only if 1 m^2 of taxa present). Note in the boxes below if no dominant are selected, and note total macrophyte abundance rank for each section. Only the most common taxa are listed, so use blank spaces for additional taxa names.

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Alternanthera philoxeroides											
Bacopa caroliniana											
Bacopa monneri											
Bidens mitis											
Boehmeria cylindrica											
Centella asiatica											
Ceratophyllum demersum											
Chara											
Cicuta maculata											
Cladium jamaicense											
Colocasia esculenta											
Commelina diffusa											
Commelina virginica											
Crinum americanum											
Diodia virginiana											
Eichhornia crassipes											
Eleocharis (wispy viviparous)											
Hydrilla verticillata											
Hydrocotle											
Hygrophila polysperma											
Hymenocallis											
Lachnanthes caroliniana											
Landoltia punctata											
Lemna											
Limnophila sessiflora											
Ludwigia leptocarpa											
Ludwigia palustris											
Ludwigia peruviana											
Ludwigia repens											
Luziola fluitans											
If no Dominant or Co-Dominant were selected, indicate with "X"											
Indicate % cover macrophytes per section											
0-5% Macrophyte Coverage											
>5 and ≤10% Macrophyte Coverage											
>10 and ≤25% Macrophyte Coverage											
>25 and ≤50% Macrophyte Coverage											
> 50% Macrophyte Coverage											

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Micranthemum glomeratum											
Micranthemum umbrosum											
Myriophyllum aquaticum											
Najas guadelupensis											
Nuphar luteum											
Orontium aquaticum											
Panicum hemitomon											
Panicum repens											
Panicum rigidulum											
Pistia stratioides											
Polygonum glabra											
Polygonum hydropiperoides											
Polygonum punctatum											
Pontedaria cordata											
Potamogeton illinoensis											
Ruellia simplex											
Sacciolepis striata											
Sagittaria kurziana											
Sagittaria lancifolia											
Sagittaria latifolia											
Salvinia minima											
Samolus parviflora											
Saururus cernuus											
Sparganium americanum											
Typha											
Vallisneria americana											
Zizania aquatica											
NO Aquatic Plants											

62-160.800, F.A.C. page 1 of 2 Revision Date: March 1, 2014

DEP FORM FD 9000-25 Rapid Periphyton Survey Field Sheet

Site: SPENCER WWTP Control Site | County: CLAY | Date: 07-16-18 | Investigators: B. DAVIS, P. O'Connor

STORET Station Number: G2ME1168

Transect (m)	Point 1=right	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
0	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9			
10	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9			
20	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9			
30	1	N		
	2			
	3			
	4			
	5			92
	6			
	7			
	8			
	9			
40	1	N		
	2			
	3			
	4			
	5			90
	6			
	7			
	8			
	9			
50	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9			

Transect (m)	Point 1=right	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
60	1	N		
	2			
	3			
	4			
	5			92
	6			
	7			
	8			
	9			
70	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9			
80	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9			
90	1	N		
	2			
	3			
	4			
	5			40
	6			
	7			
	8			
	9			
100	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9			

Secchi depth	
Estimated?	

# points ranked 4-6	
total points assessed	
% points ranked 4-6	

Check accompanying data collected at same site/date.	
Algal mat sample	
Linear Veg Survey	
Habitat Assessment	
SCI/Biorecon	
Water sample	
RQ-	

Algal Thickness Rank	
N	rough, no algae, slimy, algae up to 1mm
3	>1mm - 6mm
4	>6mm - 20mm
5	>20mm - 10 cm
6	>10 cm

Record "N" and check "Estimated" for points deeper than the Secchi depth; algae are presumed absent. Check "Estimated" if thickness estimated for deep points which can be seen but not reached.

Record "X" for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. No estimated rank.

Record canopy cover as the number of small densiometer quadrants (out of 96) that HAVE canopy cover. Measure facing upstream at point 4, 5, or 6.

Collect algal mat sample following DEP SOP FS 7240 if the percentage of total sampled points with a thickness rank of 4, 5, or 6 is >20%.

62-160.800, F.A.C. Revision Date: March 1,2014

DEP Form FD 9000-3 Physical/Chemical Characterization Field Sheet

SAMPLE ID _____ ORG ID 21FLA LATITUDE 30.1758
COUNTY Clay STORET # 21FLNE1167 LONGITUDE 81.8091
DATE 07-16-18 TIME 1345 SAMPLING AGENCY DEAR NED ROC
SITE NAME SPENCER Test Site
FIELD ID/NAME _____ RECEIVING BODY OF WATER L Black Creek

RIPARIAN ZONE / STREAM FEATURES Meter ID: DEP# 154181

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industry	Other (Specify)
90	5	5					

Landscape Development Intensity Index (LDI):

Local Watershed Erosion (select one): ☐ None ☐ Slight ☐ Moderate ☐ Heavy
Local Watershed NPS Pollution: ☐ No evidence ☐ Slight ☐ Moderate ☐ Heavy

Width of Riparian Vegetation (m) on Each Buffer Side
Left Bank: >18 Right Bank: >18

Hydrologic Modification Score (per FT 3101):

High Water Mark: 0.2 (m) + 0.5 (above present water level) = 0.7 (present depth) (above bed)

Artificially Impounded ☐ Yes ☒ No

Typical Width (m) Depth (m)/Velocity (m/sec) Transect
1.5 m wide

m/s	0.3 m/s	m/s
m deep	m deep	m deep

Artificially Channelized: ☐ No ☒ Some recovery ☐ Mostly recovered, more sinuous ☐ Recent, severe

Canopy Cover % ☐ Open ☐ Lightly Shaded (11-45%) ☒ Heavily Shaded ☐ Moderate Shaded (46-80%)

SEDIMENT / SUBSTRATE

Sediment Oils: ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Sediment Odors: ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ Other (Specify):

Smothering of Substrates

Sand Smothering:	☐ None	☐ Slight	☐ Moderate	☒ Severe
Silt Smothering:	☐ None	☒ Slight	☐ Moderate	☐ Severe
Algae Smothering:	☒ None	☐ Slight	☐ Moderate	☐ Severe

SUBSTRATE TYPE
Assessment Tool: ☐ SCI ☐ RPS ☐ LVS ☐ LCI ☐ BioRecon

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	10		
Undercut Banks / Roots	4		
Leaf Packs or Mat			
Aquatic Vegetation			
Rock or Shell Rubble..			
Sand.....	80+		
Mud / Muck / Silt			
Other.....			
Other.....			

WATER QUALITY

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	D.O. Sat (%)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top:								0.25
Mid:	0.1	29.1	7.24	6.17	80.3	280.6	0.13	TOTAL DEPTH
Bottom								0.7

System Type: Stream ☒ Lake ☐ Wetland ☐ Estuary ☐ Other(Specify) ☐

Water Odors Normal ☐ Petroleum ☐ Sewage ☐ Chemical ☐ Other ☒ Cl^2

Water Surface Oils Normal ☒ Sheen ☐ Globs ☐ Slick ☐ Other ☐

Water Sample Taken? ☒ Yes ☐ No
Sample Preserved? ☐ Yes ☐ No
Lot Number: _____ Exp: _____

Color Tannic ☐ Green (Algae) ☐ Clear ☒ Other (Specify) ☐

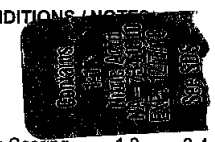
Algae Sample Taken? ☐ Yes ☒ No
Sample Preserved? ☐ Yes ☐ No
Lot Number: _____ Exp: _____

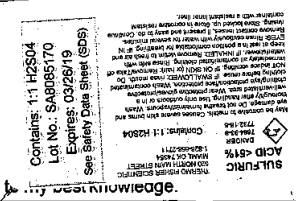
Clarity Clear ☒ Slightly Turbid ☐ Turbid ☐ Opaque ☐

ABUNDANCE

	Not Obs.	Rare	Common	Abundant
Periphyton:	☐	☒	☐	☐
Fish:	☐	☐	☒	☐
Aquatic Plants:	☒	☐	☐	☐
Iron/Sulfur Bacteria:	☐	☐	☒	☐

AMBIENT FIELD CONDITIONS / NOTES:
Chlorine odor observed.





Hydrologic Disturbance Scoring ☐ 1-2 ☐ 3-4 ☐ 5-6
☒ The antecedent hydrologic conditions have been met to ... best knowledge.

SAMPLING TEAM B. Davis, P. O'Connor SIGNATURE

62-160.800, F.A.C. Revision Date: March 1, 2014

DEP Form FD 9000-5 Stream/River Habitat Assessment Field Sheet

SAMPLING AGENCY: NE ROC		STORET STATION NUMBER: 62NE1167	DATE (MM/DD/YY): 07-16-18	RECEIVING BODY OF WATER: L. Black Creek
REMARKS:	COUNTY: Clay	LOCATION: Spencer Test Site		FIELD ID/NAME:

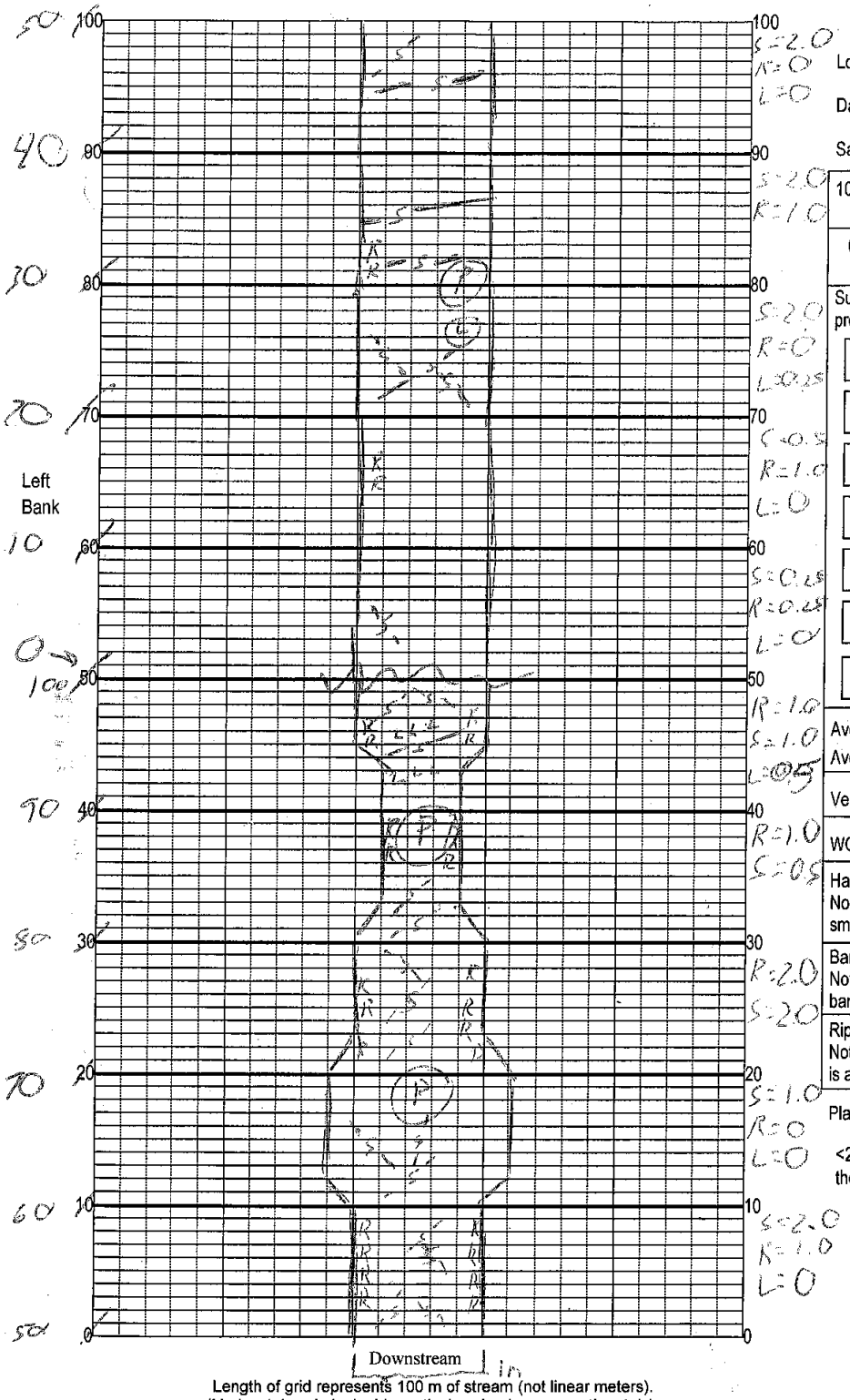
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 9	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 10	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 11	6% to 15% major productive habitat 10 9 8 7 6	Less than 5% major productive habitat 5 4 3 2 1
Water Velocity 16	Max. observed at typical transect: > 0.25 m/sec, But < 1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 10 Primary Score 17	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 14 13 12 11	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 15	Expected sinuosity given the stream width. No evidence of dredging or artificial straightening. No spoil banks. 20 19 18 17 16	Good sinuosity within old channelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. 10 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 1
Bank Stability Right Bank 8 Left Bank 8	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. Bankfull is within or above the root zone with few raw, eroded areas. 10 9	Only meets 2 of the 3 requirements for optimal bank stability. 8 7 6	Only meets 1 of the 3 requirements for optimal bank stability. 5 4	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 10	Width of vegetation greater than 18 m 10 9	Width of vegetation >12 to 18m 8 7 6	Width of vegetation 6 to 12 m. human activities close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 10 Left Bank 10 Secondary Score 71	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). Minimal disturbance. 10 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. 8 7 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 1

118 **TOTAL SCORE**

Date: 07-16-18	Analyst: B. DAVIS	Signature:

62-160.800, F.A.C. Revision Date: March 1, 2014

DEP Form FD 9000-4 Stream/River Habitat Assessment Sketch Sheet



Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

Location: SPENCER Test Site

Date: 07-16-18

Sampler: B. DAVIS

100 m: Latitude _____
Longitude _____

0 m: Latitude _____
Longitude _____

Substrates: Code key, draw proportionate habitat abundance. %

- Snags 10
- Roots/undercut banks ~5-5
- Leaf Packs (or mats) <0.1
- Aquatic Macrophytes _____
- _____ _____
- _____ _____
- Pools total # observed = _____ # range expected = _____

Average width _____ m
Average depth _____ m

Velocity measured at _____ meter mark.

WQ & chemistry taken at _____ meter mark.

Habitat Smothering:
Note areas (on map) where sand or silt is smothering substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed / other notes:

<2 M of Macrophytes was observed while doing the LVS? YES or NO

S = 15.25
R = 7.25
L = 0.25

62-160.800, F.A.C

Revision Date: March 1, 2014

DEP FORM FD 9000-32: LINEAR VEGETATION SURVEY FIELD SHEET

Waterbody: Spencer test Site | Date: 07-16-19 | County: Clay | Storet Number: G2NE1167

Analyst: B. Davis, P. O'Connor | Signature: Patrick O'Connor

Comments:

Instructions: Note taxa growing in the water with a checkmark if present, "D" if dominant, and "C" if codominant (dominance only if 1 m^2 of taxa present). Note in the boxes below if no dominant are selected, and note total macrophyte abundance rank for each section. Only the most common taxa are listed, so use blank spaces for additional taxa names.

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Alternanthera philoxeroides											
Bacopa caroliniana											
Bacopa monneri											
Bidens mitis											
Boehmeria cylindrica											
Centella asiatica											
Ceratophyllum demersum											
Chara											
Cicuta maculata											
Cladium jamaicense											
Colocasia esculenta											
Commelina diffusa											
Commelina virginica											
Crinum americanum											
Diodia virginiana											
Eichhornia crassipes											
Eleocharis (wispy viviparous)											
Hydrilla verticillata											
Hydrocotle											
Hygrophila polysperma											
Hymenocallis											
Lachnanthes caroliniana											
Landoltia punctata											
Lemna											
Limnophila sessiflora											
Ludwigia 'eptocarpa											
Ludwigia palustris											
Ludwigia peruviana											
Ludwigia repens											
Luziola fluitans											
If no Dominant or Co-Dominant were selected, indicate with "X"											
Indicate % cover macrophytes per section											
0-5% Macrophyte Coverage											
>5 and ≤10% Macrophyte Coverage											
>10 and ≤25% Macrophyte Coverage											
>25 and ≤50% Macrophyte Coverage											
> 50% Macrophyte Coverage											

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Micranthemum glomeratum											
Micranthemum umbrosum											
Myriophyllum aquaticum											
Najas guadelupensis											
Nuphar luteum											
Orontium aquaticum											
Panicum hemitomon											
Panicum repens											
Panicum rigidulum											
Pistia stratioides											
Polygonum glabra											
Polygonum hydropiperoides											
Polygonum punctatum											
Pontedaria cordata											
Potamogeton illinoensis											
Ruellia simplex											
Sacciolepis striata											
Sagittaria kurziana											
Sagittaria lancifolia											
Sagittaria latifolia											
Salvinia minima											
Samolus parviflora											
Saururus cernuus											
Sparganium americanum											
Typha											
Vallisneria americana											
Zizania aquatica											

NO Aquatic Plants

DEP FORM FD 9000-25 Rapid Periphyton Survey Field Sheet

Site: Spencer Test Site | County: Clay | Date: 07-16-18 | Investigators: B. Davis, P O'Connor

STORET Station Number: 62NE 1167

Transect (m)	Point 1=right	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
50	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		
0 / ~~60~~	1	N		
	2			
	3			
	4			
	5			76
	6			
	7			
	8			
	9	V		
60 / ~~10~~	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		
10 / ~~70~~	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		
10 / ~~20~~	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		
20 / ~~80~~	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		
80 / ~~30~~	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		
30 / ~~90~~	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		
90 / ~~40~~	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		
40 / ~~100~~	1	N/96		
	2			
	3			
	4			
	5			72
	6			
	7			
	8			
	9	V		
100 / ~~50~~	1	N		
	2			
	3			
	4			
	5			96
	6			
	7			
	8			
	9	V		

Secchi depth	
Estimated?	
# points ranked 4-6	
total points assessed	
% points ranked 4-6	

Check accompanying data collected at same site/date	
Algal mat sample	
Linear Veg Survey	
Habitat Assessment	
SCI/Biorecon	
Water sample	
RQ-	

Algal Thickness Rank	
N	rough, no algae, slimy, algae up to 1mm
3	>1mm - 6mm
4	>6mm - 20mm
5	>20mm - 10 cm
6	>10 cm

Record "N" and check "Estimated" for points deeper than the Secchi depth; algae are presumed absent. Check "Estimated" if thickness estimated for deep points which can be seen but not reached.

Record "X" for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. No estimated rank.

Record canopy cover as the number of small densiometer quadrants (out of 96) that HAVE canopy cover. Measure facing upstream at point 4, 5, or 6.

Collect algal mat sample following DEP SOP FS 7240 if the percentage of total sampled points with a thickness rank of 4, 5, or 6 is >20%.

62-160.800, F.A.C. Revision Date: March 1, 2014

Appendix E. Chemical Analysis of Effluent and Receiving Water

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 12:38	Effluent	Overflow	Fecal Coliforms-Membrane Filter	1 U	cfu/100 mL	1	1
7/16/2018 12:38	Effluent	Overflow	Escherichia Coli-Quanti-Tray	1 U	MPN/100 mL	1	1
7/16/2018 11:32	Effluent	AGP/LN	Algal Growth Potential	124 A	mg DryWt/L	0.3	0.9
7/16/2018 11:32	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55 U	ug/L	0.55	1.7
7/16/2018 11:32	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	0.40 U	ug/L	0.4	1.2
7/16/2018 11:32	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.40 U	ug/L	0.4	1.2
7/16/2018 11:32	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	2.0	mg/L	0.2	2
7/16/2018 11:32	Effluent	Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100 L	LC50		
7/16/2018 11:32	Effluent	Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	100 L	LC50		
7/16/2018 11:32	Effluent	Metals	Aluminum	60 U	ug/L	60	240
7/16/2018 11:32	Effluent	Metals	Magnesium	12.5	mg/L	0.04	0.16
7/16/2018 11:32	Effluent	Metals	Copper	0.72 I	ug/L	0.2	0.8
7/16/2018 11:32	Effluent	Metals	Potassium	12.2	mg/L	0.3	1.2
7/16/2018 11:32	Effluent	Metals	Arsenic	0.23	ug/L	0.05	0.2
7/16/2018 11:32	Effluent	Metals	Silver	0.010 U	ug/L	0.01	0.04
7/16/2018 11:32	Effluent	Metals	Iron	130	ug/L	30	120
7/16/2018 11:32	Effluent	Metals	Zinc	39	ug/L	5	20
7/16/2018 11:32	Effluent	Metals	Cadmium	0.020 U	ug/L	0.02	0.08
7/16/2018 11:32	Effluent	Metals	Nickel	2.60	ug/L	0.2	0.8
7/16/2018 11:32	Effluent	Metals	Selenium	0.20 U	ug/L	0.2	0.8
7/16/2018 11:32	Effluent	Metals	Calcium	30.3	mg/L	0.075	0.3
7/16/2018 11:32	Effluent	Metals	Chromium	0.40 U	ug/L	0.4	1.6
7/16/2018 11:32	Effluent	Metals	Sodium	79.6	mg/L	0.5	2
7/16/2018 11:32	Effluent	Metals	Lead	0.050 U	ug/L	0.05	0.2
7/16/2018 11:32	Effluent	Nutrients	Color (true)	4.4 I	PCU	2.5	6
7/16/2018 11:32	Effluent	Nutrients	Chloride	77	mg Cl/L	2	6
7/16/2018 11:32	Effluent	Nutrients	Kjeldahl Nitrogen	0.66	mg N/L	0.08	0.2
7/16/2018 11:32	Effluent	Nutrients	Total Alkalinity	73 A	mg CaCO3/L	0.65	2.5
7/16/2018 11:32	Effluent	Nutrients	Fluoride	0.37	mg F/L	0.035	0.1
7/16/2018 11:32	Effluent	Nutrients	O-Phosphate-P	0.66	mg P/L	0.04	0.1

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 11:32	Effluent	Nutrients	Turbidity	0.60	NTU	0.1	0.13
7/16/2018 11:32	Effluent	Nutrients	Sulfate	110	mg SO4/L	2	6
7/16/2018 11:32	Effluent	Nutrients	TSS	2 I	mg/L	2	10
7/16/2018 11:32	Effluent	Nutrients	Ammonia-N	0.038	mg N/L	0.002	0.005
7/16/2018 11:32	Effluent	Nutrients	NO2NO3-N	2.0	mg N/L	0.04	0.1
7/16/2018 11:32	Effluent	Nutrients	Organic Carbon	5.4 A	mg C/L	1	2
7/16/2018 11:32	Effluent	Pesticides	Hexazinone	0.028 U	ug/L	0.028	0.11
7/16/2018 11:32	Effluent	Pesticides	Naled	0.038 UJ	ug/L	0.038	0.15
7/16/2018 11:32	Effluent	Pesticides	Norflurazon	0.028 U	ug/L	0.028	0.11
7/16/2018 11:32	Effluent	Pesticides	Prometon	0.019 U	ug/L	0.019	0.076
7/16/2018 11:32	Effluent	Pesticides	Metolachlor	0.057 U	ug/L	0.057	0.23
7/16/2018 11:32	Effluent	Pesticides	Naproxen	0.0080 U	ug/L	0.008	0.032
7/16/2018 11:32	Effluent	Pesticides	Parathion Ethyl	0.019 U	ug/L	0.019	0.076
7/16/2018 11:32	Effluent	Pesticides	Prometryn	0.019 U	ug/L	0.019	0.076
7/16/2018 11:32	Effluent	Pesticides	Malathion	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Atrazine Desethyl	0.020 I	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Ethion	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Metalaxyl	0.038 U	ug/L	0.038	0.15
7/16/2018 11:32	Effluent	Pesticides	Atrazine Desisopropyl	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Butylate	0.019 U	ug/L	0.019	0.076
7/16/2018 11:32	Effluent	Pesticides	Diazinon	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Fenamiphos	0.028 U	ug/L	0.028	0.11
7/16/2018 11:32	Effluent	Pesticides	Fonofos	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Metribuzin	0.019 U	ug/L	0.019	0.076
7/16/2018 11:32	Effluent	Pesticides	Disulfoton	0.0047 U	ug/L	0.0047	0.019
7/16/2018 11:32	Effluent	Pesticides	Sucralose	46	ug/L	0.1	0.4
7/16/2018 11:32	Effluent	Pesticides	Chlorpyrifos Ethyl	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Simazine	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Alachlor	0.057 U	ug/L	0.057	0.23
7/16/2018 11:32	Effluent	Pesticides	Ametryn	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Ibuprofen	0.020 U	ug/L	0.02	0.08
7/16/2018 11:32	Effluent	Pesticides	Bromacil	0.038 U	ug/L	0.038	0.15
7/16/2018 11:32	Effluent	Pesticides	Azinphos Methyl	0.019 U	ug/L	0.019	0.076
7/16/2018 11:32	Effluent	Pesticides	Chlorpyrifos Methyl	0.0094 U	ug/L	0.0094	0.038

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 11:32	Effluent	Pesticides	Ethoprop	0.0047 U	ug/L	0.0047	0.019
7/16/2018 11:32	Effluent	Pesticides	Mevinphos	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Parathion Methyl	0.0094 U	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Pesticides	Phorate	0.0047 U	ug/L	0.0047	0.019
7/16/2018 11:32	Effluent	Pesticides	Atrazine	0.030 I	ug/L	0.0094	0.038
7/16/2018 11:32	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	ug/L	1.9	7.5
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Dimethyl phthalate	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Fluoranthene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	9.4 U	ug/L	9.4	38
7/16/2018 11:32	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Chrysene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	9.4 U	ug/L	9.4	38
7/16/2018 11:32	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Anthracene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Diethyl phthalate	1.9 U	ug/L	1.9	7.5
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Fluorene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Isophorone	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Acenaphthylene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	0.047 U	ug/L	0.047	0.19

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Naphthalene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Pentachlorophenol	0.47 U	ug/L	0.47	1.9
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Pyrene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	1,4-Dioxane	0.66	ug/L	0.02	0.08
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8 U	ug/L	2.8	11
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	0.094 U	ug/L	0.094	0.38
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Benzidine	9.4 U	ug/L	9.4	38
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Nitrobenzene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	4-Nitrophenol	9.4 U	ug/L	9.4	38
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Acenaphthene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	ug/L	1.9	7.5
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	0.94 U	ug/L	0.94	3.8
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.5
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Phenanthrene	0.024 U	ug/L	0.024	0.094
7/16/2018 11:32	Effluent	Priority Organic Pollutants	Phenol	0.047 U	ug/L	0.047	0.19
7/16/2018 11:32	Effluent	Nutrients	Temperature	29.0	C		
7/16/2018 11:32	Effluent	Nutrients	pH	5.7			
7/16/2018 11:32	Effluent	Nutrients	Dissolved Oxygen	6.88	mg/L		
7/16/2018 11:32	Effluent	Nutrients	Sample Depth	1	m		
7/16/2018 13:45	Test Site	AGP/LN	Algal Growth Potential	15.6	mg DryWt/L	0.3	0.9
7/16/2018 13:45	Test Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.85 I	ug/L	0.4	1.2
7/16/2018 13:45	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	4.3	ug/L	0.55	1.7
7/16/2018 13:45	Test Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.6 I	mg/L	0.2	2
7/16/2018 13:45	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	5.0	ug/L	0.4	1.2
7/16/2018 13:45	Test Site	Overflow	Fecal Coliforms-Membrane Filter	190 B	cfu/100 mL	1	1

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 13:45	Test Site	Overflow	Escherichia Coli-Quanti-Tray	57	MPN/100 mL	1	1
7/16/2018 13:45	Test Site	Metals	Arsenic	0.31	ug/L	0.05	0.2
7/16/2018 13:45	Test Site	Metals	Calcium	22.7	mg/L	0.075	0.3
7/16/2018 13:45	Test Site	Metals	Iron	150	ug/L	30	120
7/16/2018 13:45	Test Site	Metals	Magnesium	3.62	mg/L	0.04	0.16
7/16/2018 13:45	Test Site	Metals	Chromium	0.40 U	ug/L	0.4	1.6
7/16/2018 13:45	Test Site	Metals	Nickel	0.50 I	ug/L	0.2	0.8
7/16/2018 13:45	Test Site	Metals	Copper	2.41	ug/L	0.2	0.8
7/16/2018 13:45	Test Site	Metals	Silver	0.010 U	ug/L	0.01	0.04
7/16/2018 13:45	Test Site	Metals	Cadmium	0.020 U	ug/L	0.02	0.08
7/16/2018 13:45	Test Site	Metals	Selenium	0.20 U	ug/L	0.2	0.8
7/16/2018 13:45	Test Site	Metals	Potassium	3.9	mg/L	0.3	1.2
7/16/2018 13:45	Test Site	Metals	Zinc	5.4 I	ug/L	5	20
7/16/2018 13:45	Test Site	Metals	Aluminum	100 I	ug/L	60	240
7/16/2018 13:45	Test Site	Metals	Sodium	25.5	mg/L	0.5	2
7/16/2018 13:45	Test Site	Metals	Lead	0.13 I	ug/L	0.05	0.2
7/16/2018 13:45	Test Site	Nutrients	NO2NO3-N	0.22	mg N/L	0.004	0.01
7/16/2018 13:45	Test Site	Nutrients	Turbidity	3.2	NTU	0.1	0.13
7/16/2018 13:45	Test Site	Nutrients	Sulfate	27	mg SO4/L	0.2	0.6
7/16/2018 13:45	Test Site	Nutrients	Fluoride	0.070 I	mg F/L	0.035	0.1
7/16/2018 13:45	Test Site	Nutrients	Kjeldahl Nitrogen	0.63	mg N/L	0.08	0.2
7/16/2018 13:45	Test Site	Nutrients	Color (true)	22	PCU	2.5	6
7/16/2018 13:45	Test Site	Nutrients	Total Alkalinity	53	mg CaCO3/L	0.65	2.5
7/16/2018 13:45	Test Site	Nutrients	Ammonia-N	0.025	mg N/L	0.002	0.005
7/16/2018 13:45	Test Site	Nutrients	Total-P	0.091	mg P/L	0.005	0.05
7/16/2018 13:45	Test Site	Nutrients	Organic Carbon	5.3	mg C/L	0.5	1
7/16/2018 13:45	Test Site	Nutrients	Chloride	31	mg Cl/L	0.2	0.6
7/16/2018 13:45	Test Site	Nutrients	TSS	5 I	mg/L	2	10
7/16/2018 13:45	Test Site	Pesticides	Sucralose	8.4	ug/L	0.01	0.04
7/16/2018 13:45	Test Site	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Acenaphthene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Acenaphthylene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Fluoranthene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Hexachlorobutadiene	0.048 U	ug/L	0.048	0.19

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Anthracene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Chrysene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Fluorene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Hexachlorocyclopentadiene	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Nitrobenzene	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	3,3'-Dichlorobenzidine	9.6 U	ug/L	9.6	38
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Benzo(b)fluoranthene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	ug/L	1.9	7.7
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Isophorone	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9 U	ug/L	2.9	12
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2-Nitrophenol	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Benzo(a)anthracene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Benzo(a)pyrene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Benzo(k)fluoranthene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	ug/L	1.9	7.7
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2,4-Dichlorophenol	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2,6-Dinitrotoluene	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Pyrene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	1,4-Dioxane	0.020 UY	ug/L	0.02	0.08
7/16/2018 13:45	Test Site	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2-Chloronaphthalene	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Di-n-octyl phthalate	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Diethyl phthalate	1.9 U	ug/L	1.9	7.7
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Dimethyl phthalate	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Hexachlorobenzene	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.7

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Pentachlorophenol	0.48 U	ug/L	0.48	1.9
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Phenol	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2,4-Dinitrophenol	9.6 U	ug/L	9.6	38
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Naphthalene	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2,4-Dimethylphenol	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2,4-Dinitrotoluene	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	2-Chlorophenol	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Benzidine	9.6 U	ug/L	9.6	38
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Butyl benzyl phthalate	0.96 U	ug/L	0.96	3.8
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Hexachloroethane	0.048 U	ug/L	0.048	0.19
7/16/2018 13:45	Test Site	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	0.096 U	ug/L	0.096	0.38
7/16/2018 13:45	Test Site	Priority Organic Pollutants	Phenanthrene	0.024 U	ug/L	0.024	0.096
7/16/2018 13:45	Test Site	Nutrients	Temperature	29.1	C		
7/16/2018 13:45	Test Site	Nutrients	Dissolved Oxygen	80.3	%Sat		
7/16/2018 13:45	Test Site	Nutrients	Sample Depth	0.1	m		
7/16/2018 13:45	Test Site	Nutrients	Specific Conductance	280.6	umhos/cm		
7/16/2018 13:45	Test Site	Nutrients	pH	7.24			
7/16/2018 9:30	Control Site	AGP/LN	Algal Growth Potential	2.27	mg DryWt/L	0.3	0.9
7/16/2018 9:30	Control Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1.3	ug/L	0.4	1.2
7/16/2018 9:30	Control Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	5.8	ug/L	0.4	1.2
7/16/2018 9:30	Control Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.5 I	mg/L	0.2	2
7/16/2018 9:30	Control Site	Overflow	Fecal Coliforms-Membrane Filter	230 B	cfu/100 mL	1	1
7/16/2018 9:30	Control Site	Overflow	Escherichia Coli-Quanti-Tray	120	MPN/100 mL	1	1
7/16/2018 9:30	Control Site	Metals	Silver	0.010 U	ug/L	0.01	0.04
7/16/2018 9:30	Control Site	Metals	Cadmium	0.020 U	ug/L	0.02	0.08
7/16/2018 9:30	Control Site	Metals	Selenium	0.20 U	ug/L	0.2	0.8
7/16/2018 9:30	Control Site	Metals	Aluminum	150 I	ug/L	60	240
7/16/2018 9:30	Control Site	Metals	Potassium	2.7	mg/L	0.3	1.2
7/16/2018 9:30	Control Site	Metals	Iron	200	ug/L	30	120
7/16/2018 9:30	Control Site	Metals	Magnesium	2.53	mg/L	0.04	0.16
7/16/2018 9:30	Control Site	Metals	Lead	0.20	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Metals	Sodium	18.0	mg/L	0.5	2

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 9:30	Control Site	Metals	Nickel	0.24 I	ug/L	0.2	0.8
7/16/2018 9:30	Control Site	Metals	Calcium	23.8	mg/L	0.075	0.3
7/16/2018 9:30	Control Site	Metals	Zinc	5.0 U	ug/L	5	20
7/16/2018 9:30	Control Site	Metals	Copper	2.17	ug/L	0.2	0.8
7/16/2018 9:30	Control Site	Metals	Chromium	0.40 U	ug/L	0.4	1.6
7/16/2018 9:30	Control Site	Metals	Arsenic	0.32	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Nutrients	Chloride	24 A	mg Cl/L	0.2	0.6
7/16/2018 9:30	Control Site	Nutrients	Color (true)	28	PCU	2.5	6
7/16/2018 9:30	Control Site	Nutrients	NO2NO3-N	0.054	mg N/L	0.004	0.01
7/16/2018 9:30	Control Site	Nutrients	Total-P	0.023	mg P/L	0.002	0.005
7/16/2018 9:30	Control Site	Nutrients	Fluoride	0.036 I	mg F/L	0.035	0.1
7/16/2018 9:30	Control Site	Nutrients	Organic Carbon	5.2	mg C/L	0.5	1
7/16/2018 9:30	Control Site	Nutrients	TSS	10	mg/L	2	10
7/16/2018 9:30	Control Site	Nutrients	Sulfate	17 A	mg SO4/L	0.2	0.6
7/16/2018 9:30	Control Site	Nutrients	Ammonia-N	0.024	mg N/L	0.002	0.005
7/16/2018 9:30	Control Site	Nutrients	Kjeldahl Nitrogen	0.48	mg N/L	0.08	0.2
7/16/2018 9:30	Control Site	Nutrients	O-Phosphate-P	0.004 U	mg P/L	0.004	0.01
7/16/2018 9:30	Control Site	Nutrients	Total Alkalinity	56	mg CaCO3/L	0.65	2.5
7/16/2018 9:30	Control Site	Nutrients	Turbidity	5.1	NTU	0.1	0.13
7/16/2018 9:30	Control Site	Pesticides	Sucralose	2.5	ug/L	0.01	0.04
7/16/2018 9:30	Control Site	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Anthracene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Benzo(a)anthracene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Di-n-butyl phthalate	2.0 U	ug/L	2	7.9
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Hexachloroethane	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	N-Nitrosodimethylamine	2.0 U	ug/L	2	7.9
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Naphthalene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Phenol	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	1,4-Dioxane	0.020 U	ug/L	0.02	0.08
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Benzo(b)fluoranthene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Benzo(k)fluoranthene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.050 U	ug/L	0.05	0.2

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Diethyl phthalate	2.0 U	ug/L	2	7.9
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Phenanthrene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2,4-Dinitrotoluene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2,6-Dinitrotoluene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2-Chlorophenol	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2,4-Dimethylphenol	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2,4-Dinitrophenol	9.9 U	ug/L	9.9	40
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Hexachlorocyclopentadiene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Nitrobenzene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Pentachlorophenol	0.50 U	ug/L	0.5	2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2-Nitrophenol	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	3,3'-Dichlorobenzidine	9.9 U	ug/L	9.9	40
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Dimethyl phthalate	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	0.099 U	ug/L	0.099	0.4
7/16/2018 9:30	Control Site	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Acenaphthene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Benzidine	9.9 U	ug/L	9.9	40
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Benzo(a)pyrene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Fluoranthene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Pyrene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2,4-Dichlorophenol	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2-Chloronaphthalene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.0 U	ug/L	3	12
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Isophorone	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Acenaphthylene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	4-Nitrophenol	9.9 U	ug/L	9.9	40
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	2.0 U	ug/L	2	7.9
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Chrysene	0.025 U	ug/L	0.025	0.099

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Di-n-octyl phthalate	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Fluorene	0.025 U	ug/L	0.025	0.099
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Hexachlorobenzene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Priority Organic Pollutants	Hexachlorobutadiene	0.050 U	ug/L	0.05	0.2
7/16/2018 9:30	Control Site	Nutrients	Dissolved Oxygen	82.1	%Sat		
7/16/2018 9:30	Control Site	Nutrients	Specific Conductance	233.7	umhos/cm		
7/16/2018 9:30	Control Site	Nutrients	pH	7.3			
7/16/2018 9:30	Control Site	Nutrients	Temperature	26.9	C		
7/16/2018 9:30	Control Site	Nutrients	Sample Depth	0.05	m		
7/16/2018 10:02	Field Blank	Metals	Aluminum	60 U	ug/L	60	240
7/16/2018 10:02	Field Blank	Metals	Iron	30 U	ug/L	30	120
7/16/2018 10:02	Field Blank	Metals	Sodium	0.50 U	mg/L	0.5	2
7/16/2018 10:02	Field Blank	Metals	Silver	0.010 U	ug/L	0.01	0.04
7/16/2018 10:02	Field Blank	Metals	Lead	0.050 U	ug/L	0.05	0.2
7/16/2018 10:02	Field Blank	Metals	Calcium	0.075 U	mg/L	0.075	0.3
7/16/2018 10:02	Field Blank	Metals	Potassium	0.30 U	mg/L	0.3	1.2
7/16/2018 10:02	Field Blank	Metals	Chromium	0.40 U	ug/L	0.4	1.6
7/16/2018 10:02	Field Blank	Metals	Copper	0.20 U	ug/L	0.2	0.8
7/16/2018 10:02	Field Blank	Metals	Selenium	0.20 U	ug/L	0.2	0.8
7/16/2018 10:02	Field Blank	Metals	Zinc	5.0 U	ug/L	5	20
7/16/2018 10:02	Field Blank	Metals	Arsenic	0.050 U	ug/L	0.05	0.2
7/16/2018 10:02	Field Blank	Metals	Cadmium	0.020 U	ug/L	0.02	0.08
7/16/2018 10:02	Field Blank	Metals	Magnesium	0.040 U	mg/L	0.04	0.16
7/16/2018 10:02	Field Blank	Metals	Nickel	0.20 U	ug/L	0.2	0.8
7/16/2018 10:02	Field Blank	Nutrients	Sulfate	0.20 U	mg SO4/L	0.2	0.6
7/16/2018 10:02	Field Blank	Nutrients	Total Alkalinity	0.65 U	mg CaCO3/L	0.65	2.5
7/16/2018 10:02	Field Blank	Nutrients	Color (true)	2.5 U	PCU	2.5	6
7/16/2018 10:02	Field Blank	Nutrients	Total-P	0.002 U	mg P/L	0.002	0.005
7/16/2018 10:02	Field Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2
7/16/2018 10:02	Field Blank	Nutrients	Turbidity	0.15	NTU	0.1	0.13
7/16/2018 10:02	Field Blank	Nutrients	NO2NO3-N	0.005 I	mg N/L	0.004	0.01
7/16/2018 10:02	Field Blank	Nutrients	Fluoride	0.035 U	mg F/L	0.035	0.1
7/16/2018 10:02	Field Blank	Nutrients	O-Phosphate-P	0.004 U	mg P/L	0.004	0.01
7/16/2018 10:02	Field Blank	Nutrients	Ammonia-N	0.002 U	mg N/L	0.002	0.005

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 10:02	Field Blank	Nutrients	Chloride	0.20 U	mg Cl/L	0.2	0.6
7/16/2018 10:02	Field Blank	Pesticides	Bromacil	0.038 U	ug/L	0.038	0.15
7/16/2018 10:02	Field Blank	Pesticides	Disulfoton	0.0047 U	ug/L	0.0047	0.019
7/16/2018 10:02	Field Blank	Pesticides	Atrazine Desethyl	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Chlorpyrifos Methyl	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Fonofos	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Metalaxyl	0.038 U	ug/L	0.038	0.15
7/16/2018 10:02	Field Blank	Pesticides	Phorate	0.0047 U	ug/L	0.0047	0.019
7/16/2018 10:02	Field Blank	Pesticides	Naproxen	0.0080 U	ug/L	0.008	0.032
7/16/2018 10:02	Field Blank	Pesticides	Atrazine	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Demeton	0.023 UJ	ug/L	0.023	0.091
7/16/2018 10:02	Field Blank	Pesticides	Ethion	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Hexazinone	0.028 U	ug/L	0.028	0.11
7/16/2018 10:02	Field Blank	Pesticides	Fenamiphos	0.028 U	ug/L	0.028	0.11
7/16/2018 10:02	Field Blank	Pesticides	Metolachlor	0.057 U	ug/L	0.057	0.23
7/16/2018 10:02	Field Blank	Pesticides	Ibuprofen	0.020 U	ug/L	0.02	0.08
7/16/2018 10:02	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Diazinon	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Mevinphos	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Parathion Ethyl	0.019 U	ug/L	0.019	0.076
7/16/2018 10:02	Field Blank	Pesticides	Parathion Methyl	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Alachlor	0.057 U	ug/L	0.057	0.23
7/16/2018 10:02	Field Blank	Pesticides	Atrazine Desisopropyl	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Azinphos Methyl	0.019 U	ug/L	0.019	0.076
7/16/2018 10:02	Field Blank	Pesticides	Butylate	0.019 U	ug/L	0.019	0.076
7/16/2018 10:02	Field Blank	Pesticides	Naled	0.038 UJ	ug/L	0.038	0.15
7/16/2018 10:02	Field Blank	Pesticides	Prometon	0.019 U	ug/L	0.019	0.076
7/16/2018 10:02	Field Blank	Pesticides	Prometryn	0.019 U	ug/L	0.019	0.076
7/16/2018 10:02	Field Blank	Pesticides	Norflurazon	0.028 U	ug/L	0.028	0.11
7/16/2018 10:02	Field Blank	Pesticides	Sucralose	0.010 U	ug/L	0.01	0.04
7/16/2018 10:02	Field Blank	Pesticides	Ametryn	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Ethoprop	0.0047 U	ug/L	0.0047	0.019
7/16/2018 10:02	Field Blank	Pesticides	Malathion	0.0095 U	ug/L	0.0095	0.038
7/16/2018 10:02	Field Blank	Pesticides	Simazine	0.0095 U	ug/L	0.0095	0.038

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2-Chlorophenol	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Chrysene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Fluoranthene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	0.095 U	ug/L	0.095	0.38
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	4-Nitrophenol	9.5 U	ug/L	9.5	38
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Anthracene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	9.5 U	ug/L	9.5	38
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Acenaphthene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	ug/L	1.9	7.6
Date_Sampled	UDL	SCH_Group	Component	Result	Units_Word_Result	MDL	PQL
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Phenanthrene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	1,4-Dioxane	0.020 U	ug/L	0.02	0.08
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9 U	ug/L	2.9	11
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	9.5 U	ug/L	9.5	38
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Diethyl phthalate	1.9 U	ug/L	1.9	7.6
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Fluorene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Isophorone	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Naphthalene	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Pentachlorophenol	0.48 U	ug/L	0.48	1.9
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Hexachloroethane	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Phenol	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	0.048 U	ug/L	0.048	0.19

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2-Nitrophenol	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Benzidine	9.5 U	ug/L	9.5	38
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.6
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Nitrobenzene	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Butyl benzyl phthalate	0.95 U	ug/L	0.95	3.8
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Pyrene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.024 U	ug/L	0.024	0.095
Date_Sampled	UDL	SCH_Group	Component	Result	Units_Word_Result	MDL	PQL
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.024 U	ug/L	0.024	0.095
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.048 U	ug/L	0.048	0.19
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	ug/L	1.9	7.6
7/16/2018 10:02	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	0.048 U	ug/L	0.048	0.19