

Biological Assessment of

The City of White Springs Wastewater Treatment Plant

Hamilton County

NPDES #FL0031275

Sampled June 1995

October 1995

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: City of White Springs WWTP
County: Hamilton
NPDES Number: FL0031275
State Permit Expiration Date: 31 May 1995

Toxics Sampling Inspection (XSI)

Date Sampled: 12 June 1995

Results: No organic pollutants were detected in the effluent. None of the metals analyzed exceeded Class III standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 12 June 1995

Results: The effluent sample was not acutely toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

Impact Bioassessment Inspection (IBI)

Date Sampled: 12 June 1995

Results: Macroinvertebrate differences between the reference and test sites may have been more related to loss of artificial substrates at the test site than to characteristics of the discharge. While there were decreases in taxa richness, the Florida Index, and the EPT Index, 73.5% of the test site population consisted of sensitive ephemeropterans (*Stenonema exiguum*) and trichopterans (*Chimarra* sp., *Neureclipsis* sp., and *Oecetis* sp.), suggesting the discharge was not causing adverse biological effects. The current results indicate biological improvements at the test site since it was last sampled (in November, 1993). With the exception of increased biomass at the test site, periphyton communities did not appear to be much affected by the discharge. Periphyton chlorophyll *a* at the test site was almost double that of the upstream reference site, and was similar to the highest values measured in the undisturbed upper Suwannee River. Similarly, periphyton density increased considerably at the test site. This relatively high biomass at the test site suggests that nutrient concentrations there may have been higher during periphytometer incubation than indicated by the single nutrient grab sample collected during this survey.

Water Quality Inspection (WQI)

Date Sampled: 12 June 1995

Results: No violations of fecal or total coliform bacteria were found in the effluent, reference site, or test site samples. Although some effluent nutrient concentrations were elevated (*e.g.*, total phosphorus was 3.1 mg/L and nitrate-nitrite was 13 mg/L), no significant increases in test site nutrients were observed. Algal growth potential (AGP) increased from 1.9 mg dry wt/L at the reference site to 4.8 mg dry wt/L at the test site, but both values were below the 5 mg dry wt/L "problem threshold". The effluent AGP was only 1.2 mg algal dry wt/L. Considering the nutrient content of the effluent, this low AGP suggests the presence of algal inhibition.

Introduction

The City of White Springs Wastewater Treatment Plant is located in Hamilton County, Florida (see maps in Appendix). It is a 0.150 MGD contact stabilization sewage treatment plant, with chlorination for disinfection, and subsequent dechlorination. Effluent flows to an unlined holding pond, through a 500 feet long unnamed ditch, and then to the Suwannee River, an Outstanding Florida Waterway. During this survey, the facility was discharging 0.100 MGD. The average flow from this facility has been 0.090 MGD.

Permit limits are as follows: flow (0.150 MGD as an annual average), BOD and TSS (20 mg/L as an annual average, 30 mg/L as a monthly average, 45 mg/L as a weekly average, and 60 mg/L as a one time maximum), pH (6.0 to 8.5 SU), fecal coliform bacteria (200 organisms/100 mL as an annual average), TKN (20 mg/L as an annual average), nitrate (12 mg/L as an annual average), and total residual chlorine (minimum of 0.5 mg/L for disinfection, maximum of 0.01 mg/L at discharge) (see Appendix).

This facility has had a number of problems in the past few years, as documented by FDEP (1993). These deficiencies included extremely low dissolved oxygen (0.1 mg/L) in the aeration tank, insufficient duration of facility operation, flow meter inaccuracies, and permit or water quality standards violations for unionized ammonia, TSS, BOD, fecal coliforms, total residual chlorine, and dissolved oxygen. Additionally, the plant's clarifier was not in operation from October, 1993, until the end of 1994. The facility is currently operating under OCG Consent Order #93-2061.

In January, 1995, major repairs were made to the plant and a new operator was hired. Since then, the plant has shown dramatic improvements and effluent parameters have complied with permit limits.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in the Suwannee River, 150 feet upstream of the discharge) and a test site (also located in the Suwannee River, 100 feet downstream of the discharge). Habitat assessment was performed *in situ* to establish comparability

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Hester-Dendy		
Number of Taxa	24	19
Florida Index	14	11
Shannon-Weaver Diversity	3.5	2.8
EPT Index	7	4
% Coleoptera	0.7	2.4
% Decapoda	0.7	0
%Diptera	36.9	19.3
% Ephemeroptera	20.1	20.5
%Tr ichoptera	38.3	53.0
% Other	3.4	4.8
% Predators	18.9	12.1
% Above Surface Deposit Feeders	16.0	14.3
% Filterers/ Suspension Feeders	33.9	49.8
% Scrapers	11.1	11.5
% Shredders	2.4	1.2
% Scavengers	0.3	0.6
% Unknown	16.8	9.4
Periphyton Algae		
Number of Taxa	36	30
Shannon-Weaver Diversity	4.1	3.6
Algal Density (#/sq. cm)	458,179	678,331
Chlorophyll a (mg/sq. m)	28.1	48.9
Diatom/Diatom + B-G Abundance Ratio	0.95	0.99
% Blue-green	4.4	0.9
% Green	6.9	3.3
% Diatoms	88.7	95.8
Algal Growth Potential (mg dry wt/l)	1.9	4.8

between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on the effluent, the reference site, and the test site. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at the reference and test sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Unfortunately, these samples were inadequately preserved (the organisms decomposed) rendering the results invalid. Invertebrates were also collected with Hester-Dendy artificial substrates (three from the reference site and two from the test site) which were incubated for 28 days (Ross 1990). Only two artificial substrates were collected from the test site because a third had become dislodged and was not recovered. Periphyton was sampled at the reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Chlorophyll *a* was also determined for periphyton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

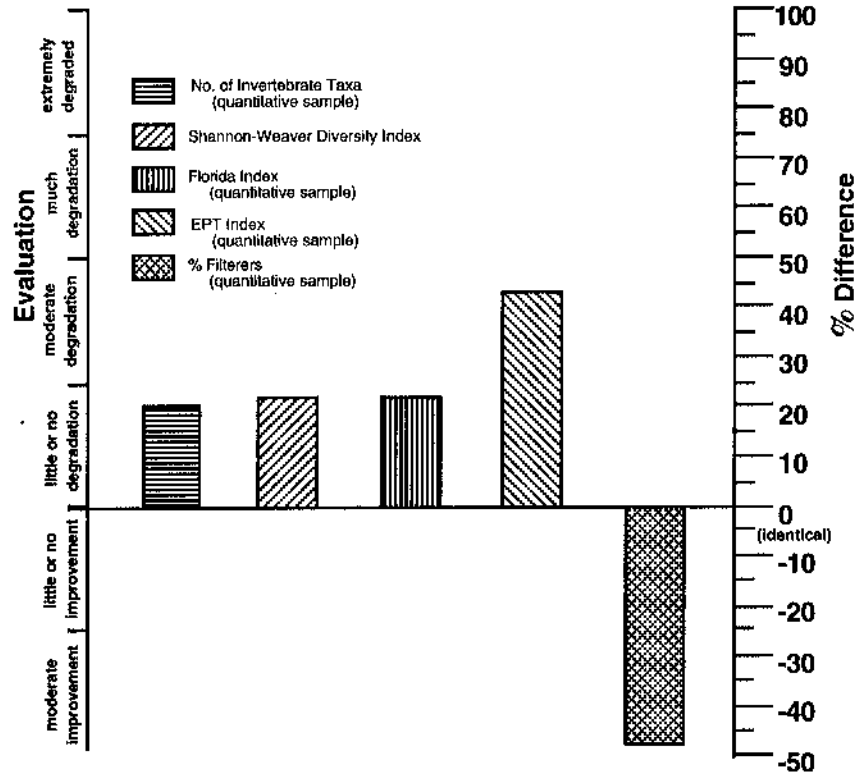
Several different measurements of macroinvertebrate and algal community health have been employed to determine the effects of a discharge. These are briefly discussed here.

Taxa richness: Stress tends to reduce the number of different types of organisms present in a system, although moderate nutrient enrichment may sometimes be correlated with increased algal taxa richness.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Excessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is a related measure which is also associated with disturbance.

Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy. Species sensitivity data from other sources, such as Hulbert (1990), Hudson *et al.* (1990), Lenat (1993), Farrell (1992), Chang *et al.* (1992), and Whitmore (1989), are used as appropriate.

Ephemeroptera/Plecoptera/Trichoptera Index: This index is the sum of the number of EPT taxa present. Higher EPT values are associated with healthier systems.



Effect of discharge on the benthic macroinvertebrate community.

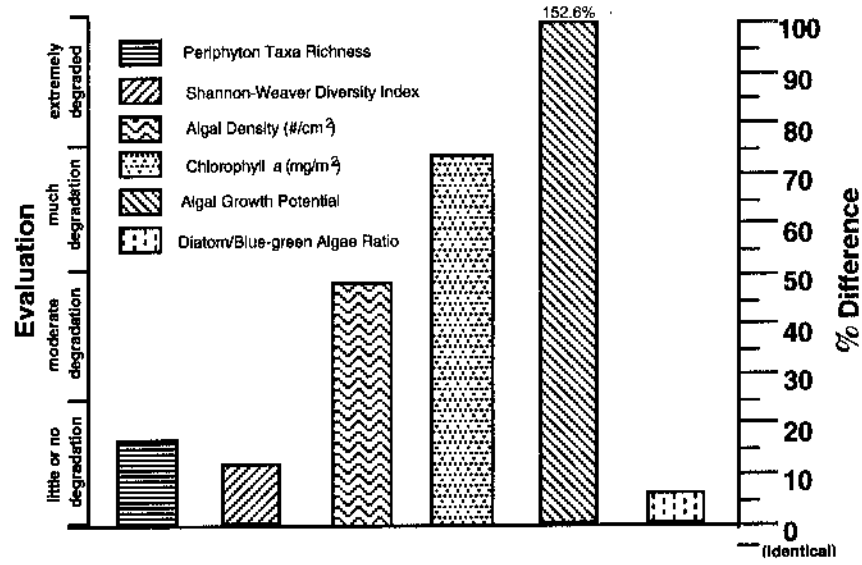
Community structure: Substantial shifts in proportions of major groups of organisms, compared to reference conditions, may indicate degradation. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered indicators of disturbance (Engel *et al.* 1994).

Algal biomass: High algal biomass (algal density or chlorophyll *a*) implies nutrient stress. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions in flowing streams.

Trophic composition/feeding guilds: Disturbance can shift the feeding strategies of invertebrates. In Florida for example, pollution may be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

The Stream Invertebrate Index for Florida (SIIF) is a composite macroinvertebrate metric (EA Engineering 1994). The SIIF assigns points to a variety of parameters, depending on how closely each parameter approaches an expected reference condition (see SIIF calculation table in Appendix).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the EPT Index, the Florida Index, the diatom to blue-green algae ratio, and the % filter-feeders are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving algal density, chlorophyll *a*, and the algal growth potential are measured as the test site minus reference site divided by the reference site.



Effect of discharge on the algal community.

The following personnel were involved in this investigation: Tim McKelvey, Ruth Bouman, and Kristen Smeltzer (DEP Northeast District), and Lyn Burton, Michael Corrigan, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathleen Lurding, Tina Mikulski, Elizabeth Miller, Urania Quintana, Bart Richard, Lisa Tamburello, David Whiting, Vicki Whiting, Landon Ross, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Bioassessment Review Committee, consisting of Jan Mandrup-Poulsen, Wayne Magley, and Mike Tanski, as well as District representatives.

Results and Discussion

Habitat quality at both sites was excellent, with each station scoring 126 points. The Suwannee River drainage basin, in this vicinity, is heavily forested and largely undisturbed. Both the test and reference sites had ample substrates for benthic community success (*e.g.*, snags, roots, limerock rubble, and undercut banks). Water velocity was greater than 0.25 m/sec at both sites. The depth of the Suwannee River ranges from 0.3 m to 3.5 m in this area, and the river is moderately wide (15 to 20 m). Physical/chemical measurements at both sites were essentially identical: Dissolved oxygen (5.5 to 5.6 mg/L), specific conductance (49 to 50 µmhos/cm), pH (4.2 to 4.3 SU), and temperature (29 to 30 °C).

No organic pollutants were detected in the effluent. Of the metals analyzed for, only iron (46 µg/L) and zinc (35 µg/L) were found in the effluent at concentrations above the practical quantitation limit.

None of these levels exceeded Class III water quality standards.

The effluent sample was not acutely toxic to the invertebrate, *Ceriodaphnia dubia,* or to the fish, *Cyprinella leedsi.*

Fecal coliform bacteria at the reference site (<20 organisms/100 mL) and at the test site (40 organisms/100 mL) complied with Class III water quality standards. Similarly, total coliform bacteria at the reference and test sites (230 organisms/100 mL and 300 organisms/100 mL, respectively) also did not exceed water quality standards. Effluent fecal coliforms (800 organisms/100 mL) and total coliforms 2400 organisms/100 mL) were equal to their respective Class III limits, and therefore, not in violation.

Although some effluent nutrient concentrations were elevated (*e.g.*, total phosphorus was 3.1 mg/L and nitrate-nitrite was 13 mg/L), no significant increases in test site nutrients were observed. For example, total phosphorus was 0.15 mg/L at the reference site, increasing minimally to 0.16 mg/L at the test site. Similarly, TKN increased only slightly, from 1.1 mg/L at the reference site to 1.2 mg/L at the test site. Nitrate-nitrite and ammonia were below quantitation limits at both sites.

Algal growth potential (AGP) increased from 1.9 mg dry wt/L at the reference site to 4.8 mg dry wt/L at the test site, but both values were below the 5 mg dry wt/L "problem threshold" (Raschke and Schultz 1987). The effluent AGP was only 1.2 mg algal dry wt/L. Considering the nutrient content of the effluent, this low AGP suggests the presence of algal inhibition.

Most measures of macroinvertebrate health indicated that the discharge was not adversely affecting the community. The Figure on p. 2 indicates the degree of difference between the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference site. The relative abundance of each individual taxon appears in the Appendix.

Because one test site Hester-Dendy sampler was not recovered, some differences seen between the reference and test sites may be due to differences in sampling effort (which was 33% less at the test site). A few invertebrate measures were reduced at the test site. Taxa richness decreased from 24 taxa at the reference site to 19 taxa at the test site. The Florida Index decreased from 14 points at the reference site to 11 points at the test site. Although Shannon-Weaver diversity decreased by 21% from the upstream site to the downstream site, the results indicate compliance with the biological integrity criterion. The Ephemeroptera/Plecoptera/Trichoptera Index decreased from 7 at the reference site to 4 at the test site. However, 73.5% of the test site population consisted of sensitive ephemeropterans (*Stenonema exiguum*) and trichopterans (*Chimarra* sp., *Neureclipsis* sp., and *Oecetis* sp.), suggesting that the discharge was not having adverse biological effects. Filter feeders were more abundant at the test site, an indication of improvement. Overall, macroinvertebrate differences between the reference and test stations sites may have been more related to loss of artificial substrates at the test site than to characteristics of the discharge. The current results suggest biological improvements at the test site since it was last sampled (in November, 1993).

With the exception of increased biomass at the test site, periphyton communities did not appear to be much affected by the discharge (see Figure on p. 3). Taxa richness (36 taxa at the reference site and 30 taxa at the test site) and Shannon-Weaver diversity (4.1 at the reference site and 3.6 at the test site) were only slightly lower at the downstream station. The diatom to blue green algae ratio increased from 0.95 at the reference site to 0.99 at the test site. However, periphyton chlorophyll *a* at the test site (48.9 mg/m^2) was almost double that of the upstream reference site (28.1 mg/m^2). It should be noted that the test site chlorophyll *a* value was similar to the highest recorded (approximately 50 mg/m^2) in the undisturbed upper Suwannee River (FDER 1985). Similarly, periphyton density rose from 458,179 organisms/cm^2 at the reference site to 678,331 organisms/cm^2 at the test site. This somewhat elevated biomass at the test site suggests that nutrient concentrations in the river may have been higher at times during periphytometer incubation than indicated by the single nutrient sample collected during this survey.

Conclusions

No organic pollutants were detected in the effluent. None of the metals analyzed exceeded Class III water quality standards.

The effluent sample was not acutely toxic to the invertebrate, *Ceriodaphnia dubia,* or to the fish, *Cyprinella leedsi.*

No violations of fecal or total coliform bacteria were found in the effluent, reference site, or test site samples.

Although some effluent nutrient concentrations were elevated (*e.g.*, total phosphorus was 3.1 mg/L and nitrate-nitrite was 13 mg/L), no significant increases in test site nutrients were observed.

Algal growth potential (AGP) increased from 1.9 mg dry wt/L at the reference site to 4.8 mg dry wt/L at the test site, but both values were below the 5 mg dry wt/L "problem threshold". The effluent AGP was only 1.2 mg algal dry wt/L. Considering the nutrient content of the effluent, this low AGP suggests the presence of algal inhibition.

Macroinvertebrate differences between the reference and test site sites may have been more related to equipment loss at the test site than to characteristics of the discharge. While there were decreases in taxa richness, the Florida Index, and the EPT Index, 73.5% of the test site population consisted of sensitive ephemeropterans (*Stenonema exiguum*) and trichopterans (*Chimarra* sp., *Neureclipsis* sp., and *Oecetis* sp.), suggesting that the discharge was not having adverse biological effects. The current results indicate biological improvements at the test site since it was last sampled (in November, 1993).

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Chemistry summary table for

City of White Springs WWTP	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
	none detected		
Metals (ug/L)			
Aluminum	100 U		
Arsenic	10 U		
Cadmium	0.1 U		
Copper	6 I		
Chromium	10 U		
Iron	46		
Lead	10 U		
Mercury	0.10 U		
Nickel	4 U		
Selenium	30 U		
Silver	0.05 U		
Zinc	35		
Nutrients (mg/L)			
Ortho-phosphate	3.3 A	0.11	0.19
Total phosphorus	3.1	0.15	0.16
Ammonia	0.72 A	0.020 U	0.024 I
Nitrate+Nitrite	13	0.020 I	0.026 I
TKN	1.9	1.1	1.2
General Phys-Chem Parameters			
Habitat Assessment		126	126
D.O. (mg/L)	4.1	5.5	5.6
pH (SU)	7.1	4. 2	4.3
Conductivity (µmhos/cm)	480	49.6	48.9
Temperature (°C)	27.8	29.5	29.3
Turbidity (NTU's)		0.7	2.2
TSS (mg/L)	3	2	10
BOD (mg/L)	2	2 U	2 U
Hardness (mg CaCO3)	172.8		
Algal Growth Potential (mg dry wt/L)	1.2	1.9	4.8
Toxicity			
Bioassay Fish	Not toxic		
Bioassay Invertebrate	Not toxic		
Microbiological Communities (org/100 mL)			
Fecal coliform	800	20 U	40
Total coliform	2400	230	300

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

I - Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit

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

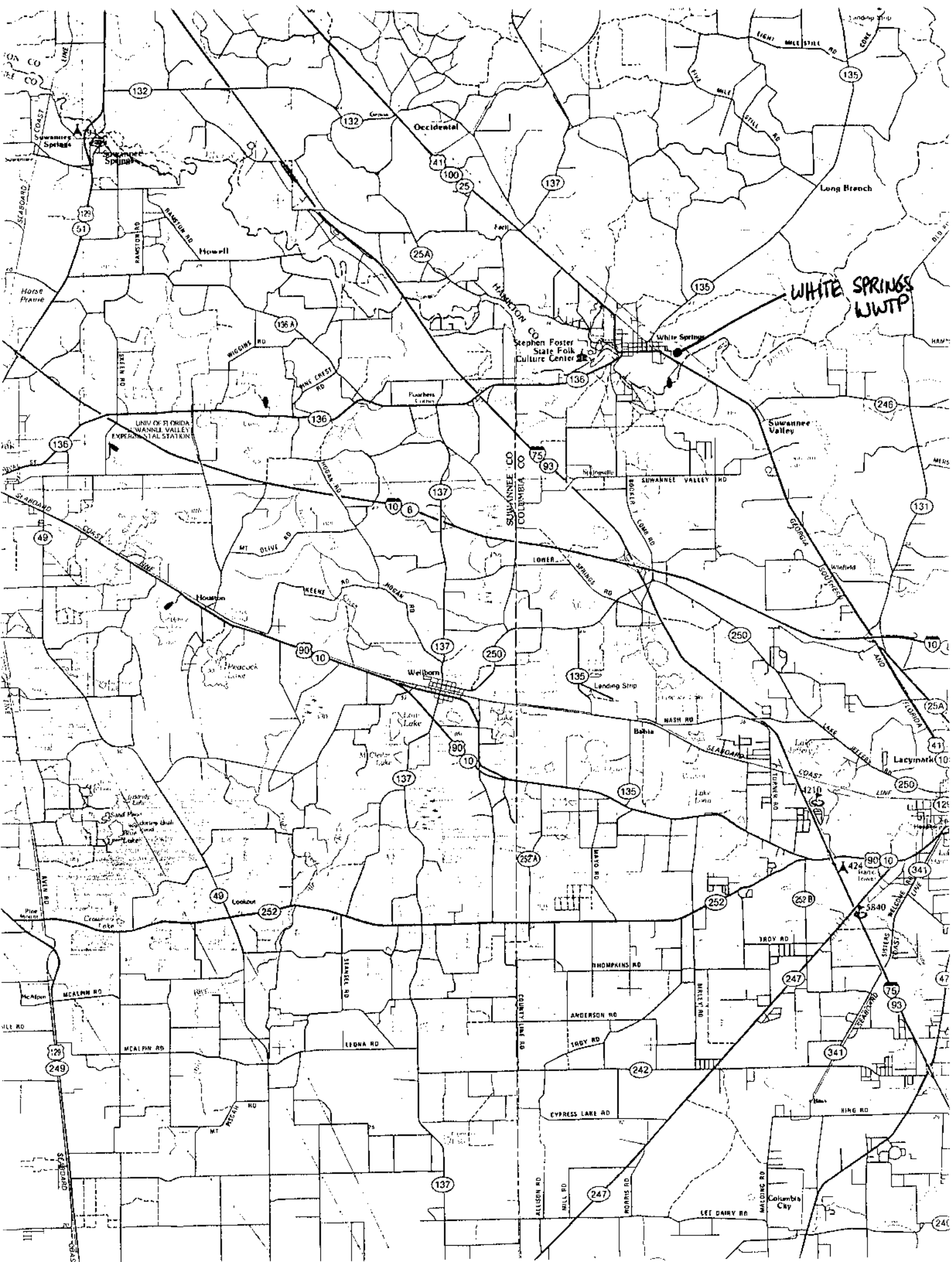
Typical Values for Selected Parameters in Florida Waters

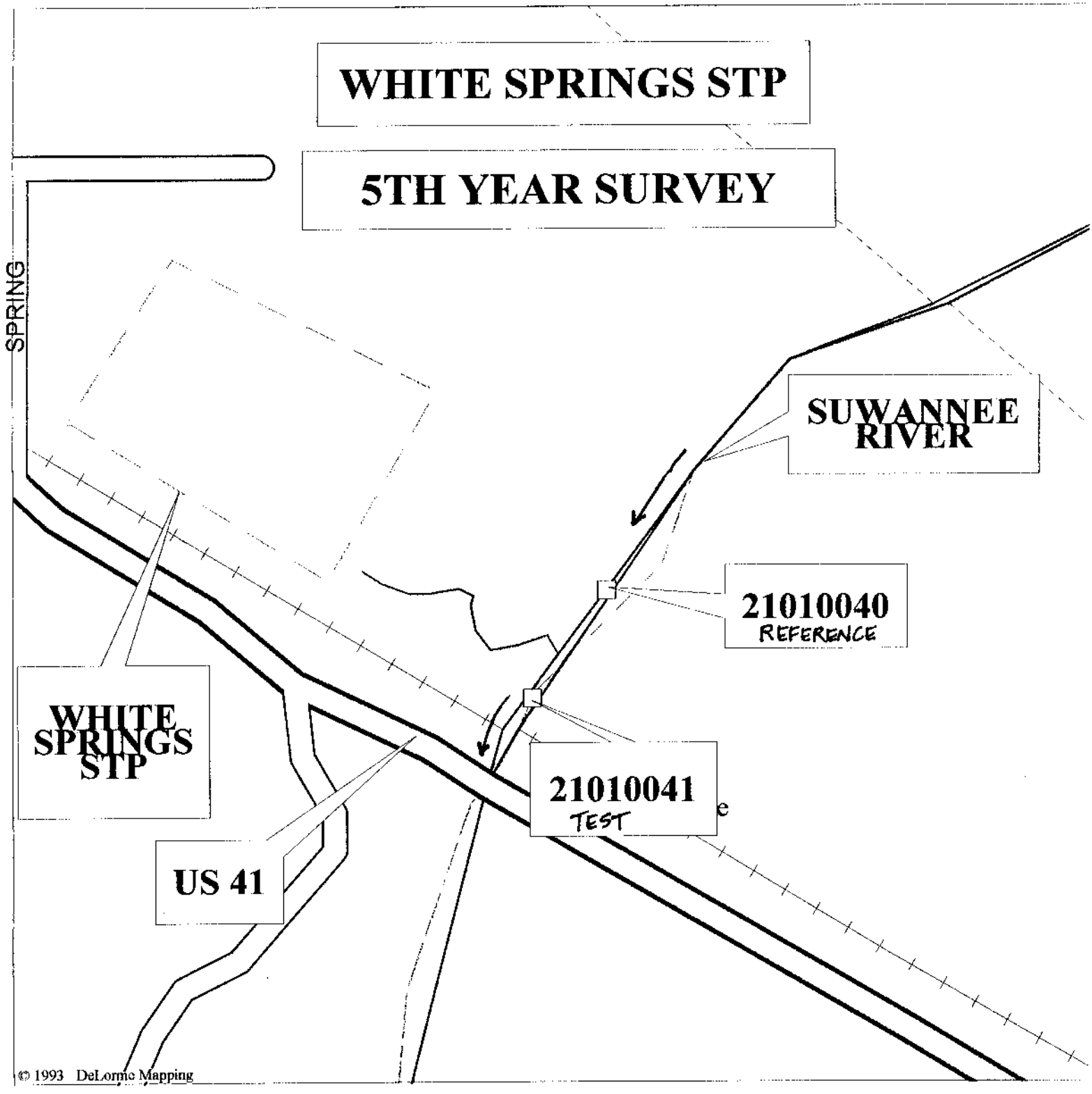
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

Percentile Distribution

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	53.00
H-D Taxa Richness	6.00	6.50	9.00	11.50	13.00	15.00	17.00	21.50	26.00	29.00	32.00
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51
Ortho Phosphorus	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30
LAKES (477 stations)											
Phytoplankton Chlorophyll *a*	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10	47.20	65.44	113.90
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3.15	3.17
Dredge Taxa Richness	3.00	5.00	6.50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40	1.51	1.68	2.11	3.46
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10	0.14	0.23
Total Phosphorus	0.01	0.02	0.02	0.03	0.05	0.07	0.09	0.11	0.14	0.23	0.42
Ortho-Phosphorus	0.00	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.21	0.32
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	26.00	40.00
ESTUARIES (690 stations)											
Phytoplankton Chlorophyll *a*	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphorus	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

Units:
Phytoplankton Chlorophyll *a* (ug/L), Periphyton Chlorophyll *a* (mg/m^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates


WHITE SPRINGS WWTP
Occidental
Howell
Horse Prairie
Lang Branch
Stephen Foster State Folk Culture Center
White Springs
Suwannee Valley
UNIV OF FLORIDA SUWANNEE VALLEY EXPERIMENTAL STATION
Houston
Wellborn
Landing Strip
Bahia
Lacymarsh
Lookout
Peacock Lake
Mirror Lake
Lake Jeffery
Lake Lena
Lake Crosby
Lake Hybrids
Sand Mine
Pine Mount
Crosby Lake
McAlpin
Columbia City
HAMILTON CO
SUWANNEE CO
COLUMBIA CO
COUNTY LINE RD
EIGHT MILE STILL RD
RAMSTON RD
WIGGINS RD
PINE CREST RD
HOGAN RD
MT OLIVE RD
KREENE RD
LOWER SPRINGS RD
SUWANNEE VALLEY RD
WASH RD
JEFFERY RD
TROY RD
THOMPKINS RD
ANDERSON RD
LEONA RD
MCALPIN RD
CYPRESS LAKE RD
KING RD
LEE DAIRY RD
MALONE RD
ALLISON RD
MILL RD
MORRIS RD
BIRLEY RD
SEABOARD COAST LINE
GEORGIA SOUTHERN AND FLORIDA
SEABOARD
SISTERS WELCOME RD
NASH RD
MAYO RD
FLOWER RD
NASH RD



LEGEND

- Geo Feature
- County Boundary
- Street, Road
- US Highway
- Railroad
- River
- Utility (powerline)

Scale 1:3,906 (at center)

200 Feet

100 Meters

Mag 16.00
Wed Jun 07 10:42:46 1995

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name: TOWN OF WHITE SPRINGS STP		Date Summary Prepared: 6-13-95
Location (attach detailed map):	County: Hamilton	District: Northeast
Federal Permit # FL0031275 and expiration date: expired on 5-15-95	State GMS # and 3124M03485 State expiration date: expired on 11/29/88	Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: TO

Description of treatment process: A 0.150 MGD contact stabilization plant with a chlorinated and dechlorinated effluent which discharges to a pond on-site. The pond discharges to a ditch which discharges to the Suwannee River just North of the CR-41 bridge. The length of the ditch before the river is approximately 500'.

Receiving waters: Suwannee River	Classification: I II (III) - OFW	
Design Flow: 0.150 MGD	Mean Flow: 0.090 MGD	Flow during survey: 0.100 MGD

Discharge is: (Continuous) Intermittent Seasonal Rainfall dependent
Other (describe)

therefore, the best time to sample is: no good time, flow proportioned composite sample would be better than grab

If facility has a mixing zone, give details (size, parameters affected, etc.): none

List effluent limits (if necessary, attach relevant paperwork):

Parameter	Limit (units)
* Flow	0.150 MGD
BOD5	20 mg/l annual average
TSS	20 mg/l ↓
TKN	20 mg/l annual average
NO3	12 mg/l
pH	6.0 - 8.5
Chlorine	0.5 mg/l after ccc
Chlorine	0.01 mg/l before discharge
Fecal	200 no./100 (ml)

Describe special permit conditions and permit modifications:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

(Facility)

Description of permitted outfall(s): see treatment description

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: plant's clarifier was inoperable from some time in October 1993 to the end of 1994. A new contract operator was hired in January, 1995 after major repairs were made to the plant. The plant has shown dramatic improvements with the new operator and repairs.

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:

Previous 5th year: 11/15/93

Toxics: no metals or priority pollutants found

Biomonitoring: was not toxic to the invertebate C. dubia (water fleas) but was acutely toxic to the fish cyprinella leedsa (minow) All died within 24 hours.

Impact Bioassessment: Downstream site was very degraded, Hester Dendys were set 25' downstream from discharge (within plume)

Water Quality: Effluent ammonia was 15mg/L unionz. Nria was 0.033 End fecal coliform was 30,000 count per 100/mL - All exceed

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set: Since January 1995, the plant has shown dramatic improvements. 3124x10451
All results are within previous permitted limits.

Additional information:

Staff contributing to this review (signature):

Tim McKelvey (Biologist)

Kristen Smeltzer (Inspector)

Kristen Smeltzer (Engineer)

( )

( )

( )

Florida Department of Environmental Regulation

Northeast District • 3426 Bills Road • Jacksonville, Florida 32207 • 904-798-4200

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary
Ernest Frey, Deputy Assistant Secretary

PERMITTEE:

Mr. Charles E. Lucas
Superintendent of Public Works
Town of White Springs
Post Office Drawer D
White Springs, Florida 32096

I.D. Number: 3124M03485
Permit/Cert Number: DC24-161771
Date of Issue: March 23, 1990
Expiration Date: March 23, 1993
County: Hamilton
Lat/Long: 30°19'42"N/82°44'11"W
Section/Township/Range: 8/ 2S/16E
Project: Town of White Springs STP

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-3, 17-4, 17-600, 17-7, 17-602 and 17-19. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

To construct a new chlorine contact chamber, flow recorder with a concrete block basin and a sulfur dioxide dechlorination facility to serve the Town of White Springs 0.150 MGD contact stabilization sewage treatment plant (STP). The STP effluent flows into an unlined holding pond to a chlorine contact pond with chlorinated effluent discharge to an unnamed ditch to the Suwannee River. Upon completion of construction, chlorinated effluent will discharge to the unlined holding pond to a dechlorination pond with dechlorinated effluent discharge to an unnamed ditch to the Suwannee River.

The permittee is also authorized to operate the subject sewage treatment plant under the specific conditions of this permit.

Located south of White Springs on U.S. 41, Hamilton County, Florida.

In accordance with the application received March 9, 1989 and revised November 13, 1989.

13. Appropriate warning signs shall be posted around the site boundaries to designate the nature of the project area.

14. The monitoring requirements and effluent limitations for this plant are as follows:

PARAMETER	ANNUAL AVERAGE	MINIMUM FREQUENCY	SAMPLE TYPE	SAMPLE LOCATION
Flow (mgd)	0.150	Daily, 5/week	See A	See B
*BOD_5 (mg/l)	20	Every 2 weeks	8-hour composite	Influent and Effluent
*TSS (mg/l)	20	Every 2 weeks	8-hour composite	Influent and Effluent
TKN (mg/l)	20	Every 2 weeks	8-hour composite	Effluent
NO_3 (mg/l)	12.0	Every 2 weeks	8-hour composite	Effluent
pH Units	6.0 - 8.5	Daily, 5/week	Grab	Effluent
Chlorine Residual(mg/l)	See (C) and (D)	Daily, 5/week	Grab	Effluent
Fecal Coliform: no./100 (ml)	200	Quarterly	Grab	Effluent

* or 90% removal, whichever is more stringent.

	ANNUAL	MONTHLY	WEEKLY	ONE TIME MAXIMUM
BOD_5	20	30**	45**	60**
TSS	20	30**	45**	60**
TKN	20	25**	30**	60**

** Rule 17-600.740

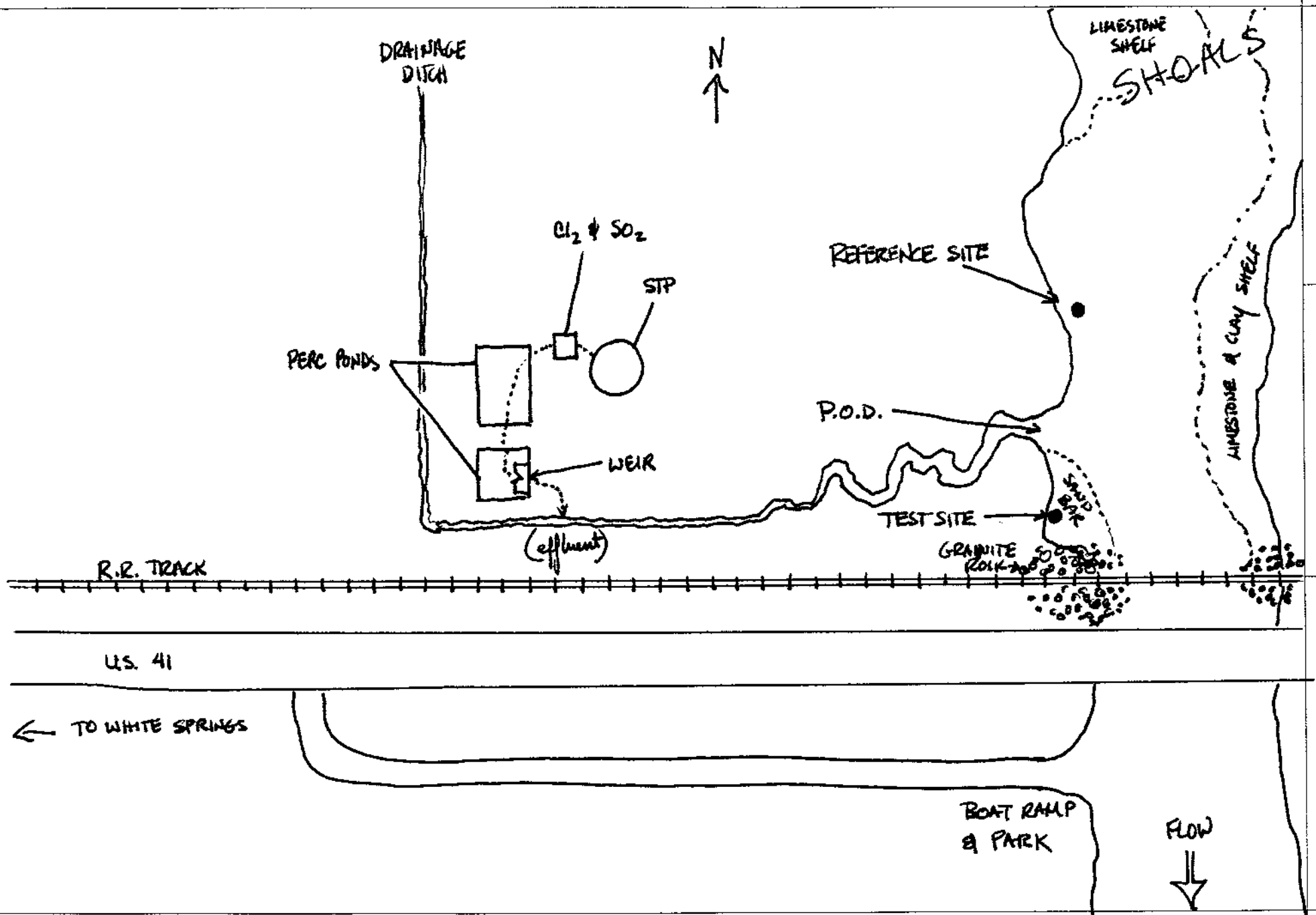
A. Recording flowmeter and totalizer required.

B. Flow shall be measured prior to discharge to the unlined holding pond and unnamed ditch.

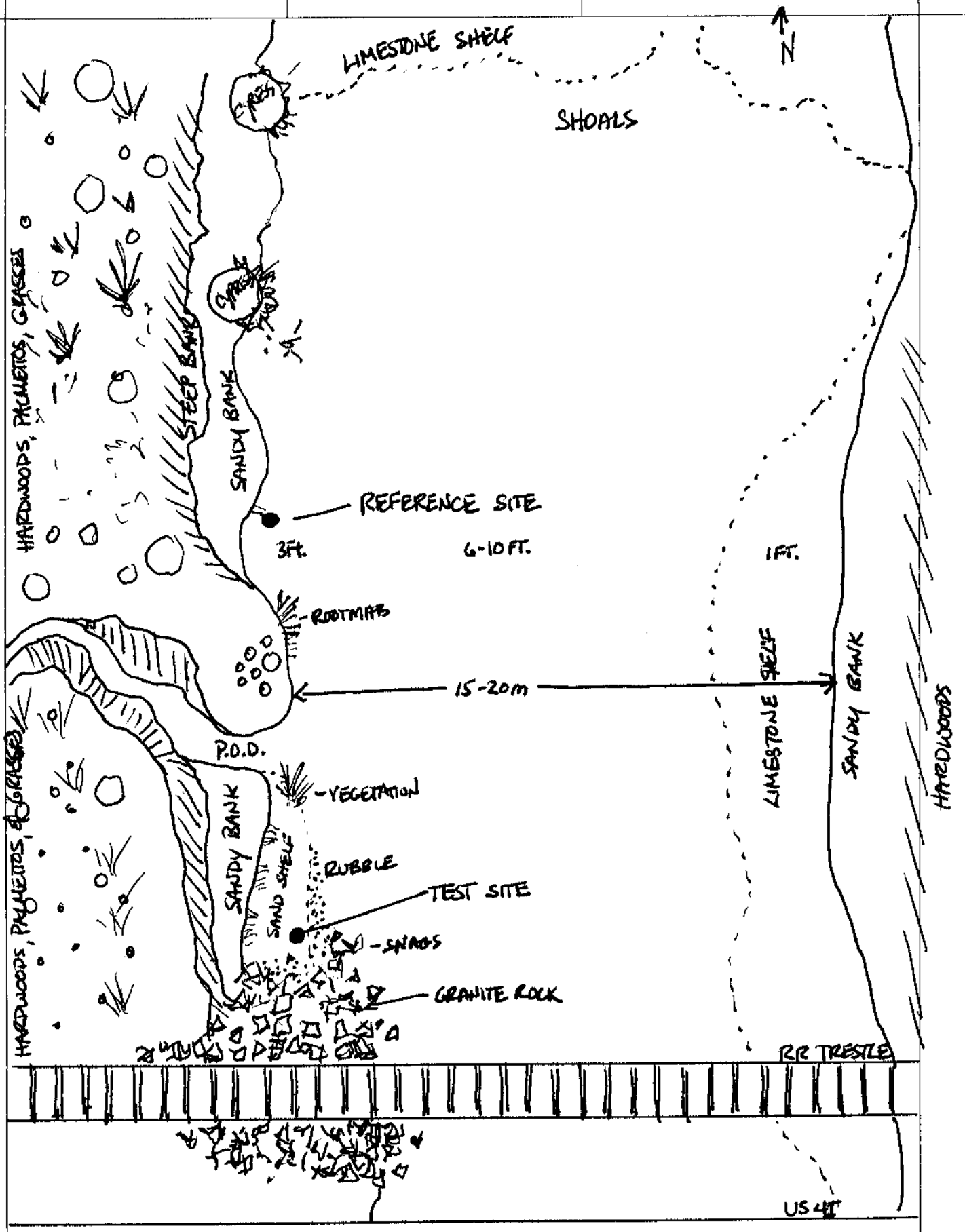
C. A minimum total residual chlorine (TRC) of 0.5 mg/l shall be maintained at the exit from the chlorine contact chamber or daily coliform monitoring shall be required.

D. Dechlorination to levels less than 0.01 mg/l shall be maintained at the exit from the dechlorination basin, as required by FAC Rule 17-3.121(10).

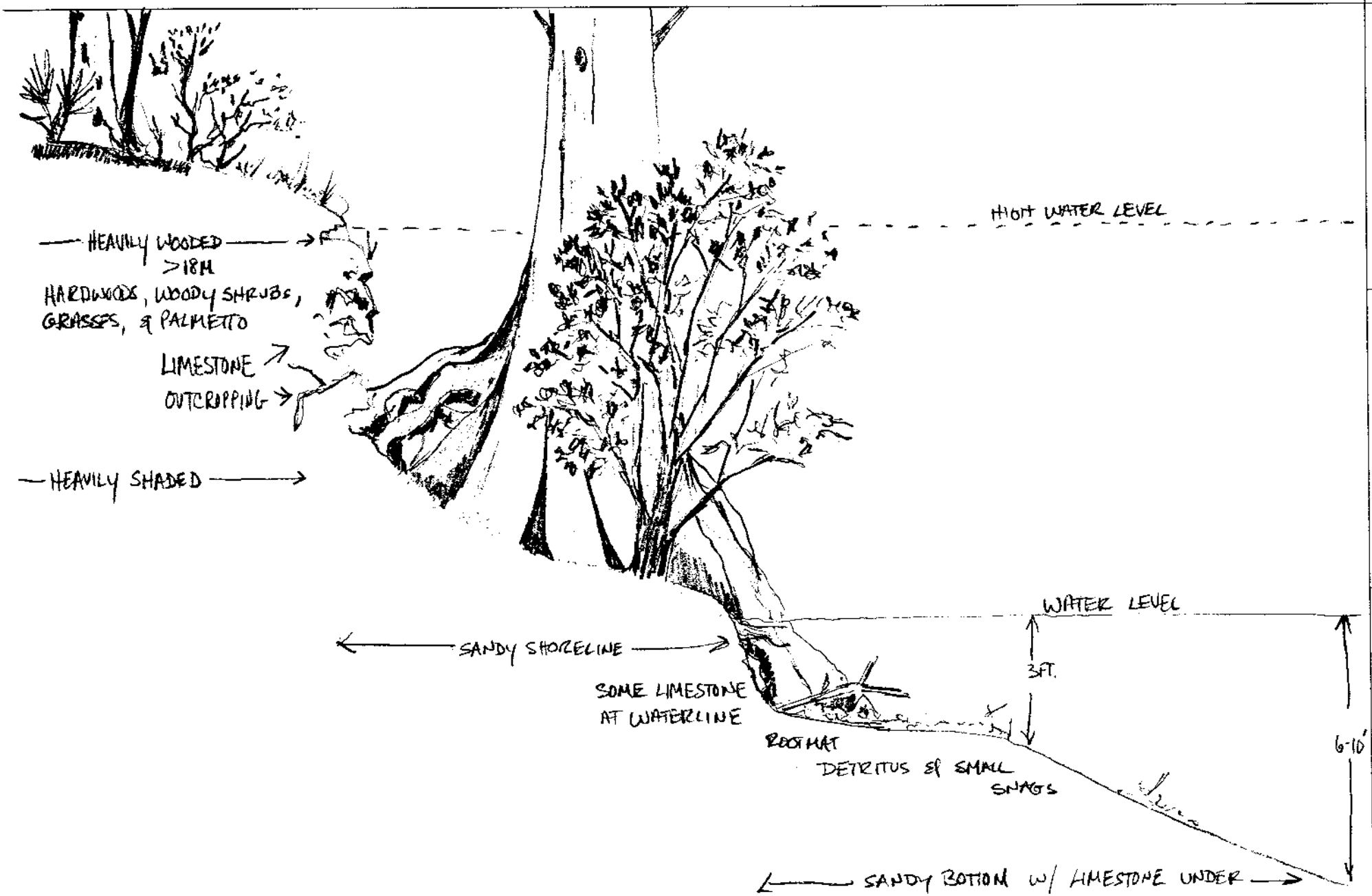
15. The effluent limitations specified under Specific Condition No. 14 are to be achieved at the exit from the chlorine contact chamber with the exemption of total residual chlorine which must also be sampled at the exit from the dechlorination basin.



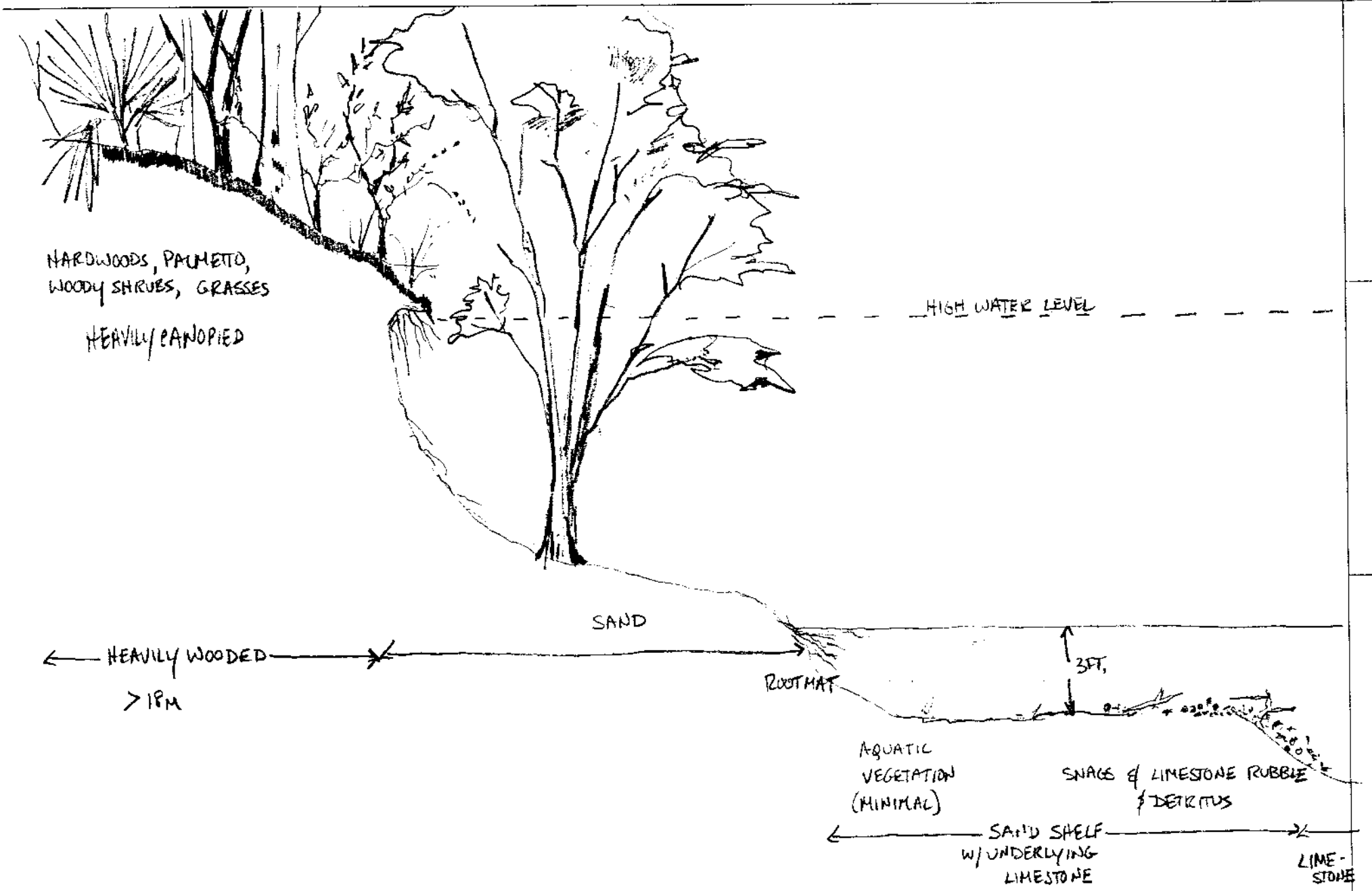
TOWN OF WHITE SPRINGS FYI 5 6-12-95


LIMESTONE SHELF
SHOALS
N
SPRING
SPRING
STEEP BANK
SANDY BANK
HARDWOODS, PALMETTOS, GRASSES
REFERENCE SITE
3ft.
6-10 FT.
1FT.
ROOTMATS
15-20m
LIMESTONE SHELF
SANDY BANK
HARDWOODS
P.O.D.
VEGETATION
RUBBLE
SAND SHELF
SANDY BANK
HARDWOODS, PALMETTOS, GRASSES
TEST SITE
SNAGS
GRANITE ROCK
RR TRESTLE
US 41

National Brand
42-382 100 SHEETS EYE EASE 5 SQUARE
42-389 200 SHEETS EYE EASE 5 SQUARE
42-392 100 RECYCLED WHITE 5 SQUARE
42-399 200 RECYCLED WHITE 5 SQUARE
Made in U.S.A.



TOWN OF WHITE SPRINGS FY15 6-12-95 REFERENCE SITE 150FT UPSTREAM OF P.O.D.



TOWN OF WHITE SPRINGS FYI5 - 6-12-95 TEST SITE 100FT DOWNSTREAM OF P.O.D.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: DEP-NED	STORET STATION NUMBER: 21010040	DATE (M/D/Y): 6-12-95	TIME: 1500	RECEIVING BODY OF WATER: SUWANNEE RIVER

REMARKS:	LOCATION: APPROX. 150 FT. UPSTREAM OF WHITE SPRINGS P.O.D.	FIELD ID/NAME: REFERENCE SITE

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
100							

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☑ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Some potential sources ☑ Obvious sources ☐

Width of riparian vegetation (m) on least buffered side: >18m

List & map dominant vegetation on back

Artificially Channelized ☑ no ☐ recent, severe ☐ some recovery ☐ mostly recovered, more sinuous

Artificially Impounded ☐ yes

High Water Mark (m above ~~bed~~ SURFACE): 3m

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)

width ~ 20m
depth ~ 1 - 10ft.
velocity > .25M/sec

Canopy Cover % : Open : ☐ Lightly Shaded (11-45%): ☑ Moderately Shaded (46-80%): ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☑ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none slight (moderate) severe Silt smothering: (none) slight moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	6	dipnet	Riffles			
Leaf Packs or Mats	~~0~~			Sand	50	2	dipnet
Aquatic Vegetation	~~0~~			Mud/Muck/Silt			
Rock or Shell Rubble	15	6	dipnet	Other:			
Undercut Banks/Roots	25	6	dipnet	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	TURBIDITY NTU's	SALINITY ppt.	Secchi (m):
Top	0.0							
Mid-depth	0.3	29.54	4.19	5.47	49.6	0.7	0.0	.6
Bottom	1.1							

System Type : Stream: ☐ (1st - 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☑ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:
OVERCAST, 80°F, no wind, slight rain in p.m. water level up 2ft. since HD deployed. HD blocks may have been disturbed by local fishermen & swimmers.

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☑	☐
Fish	☐	☐	☑	☐
Aquatic Macrophytes	☐	☑	☐	☐
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
TIM McKELVEY / RUTH BOWMAN	Timothy R. McKelvey	6/12/95

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: DEP-NED	STORET STATION NUMBER: 21010040	DATE (M/D/Y): 6-12-95	RECEIVING BODY OF WATER: SUWANNEE RIVER

REMARKS: below shoal area.	LOCATION: ABOVE WHITE SPRINGS STP (150 FT UPSTREAM OF WHITE SPRINGS POD)	FIELD ID/NAME: REFERENCE SITE

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [16]	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 (16)	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity [20]	Max. observed: >0.25 m/sec. but < 2 m/sec (20) 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization [20]	No artificial channelization or dredging. Stream with normal, sinuous pattern (20) 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Deposition [15]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation (15) 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [10]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. (10) 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [20]	Width of native vegetation (least buffered side) greater than 18 m (20) 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality [20]	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. (20) 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

[5] Add 5 points if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

Comments

[126] **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
6-12-95	TIM McKENNEY, RUTH BOUMAN	Tim McKenney

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP-NED	STORET STATION NUMBER: 21010041	DATE (M/D/Y): 6-12-95	TIME: 1445	RECEIVING BODY OF WATER: SUWANNEE RIVER

REMARKS: one hester-dendy rack missing from block	LOCATION: APPROX. 100 FT DOWNSTREAM OF WHITE SPRING P.O.D. (WEST BANK)	FIELD ID/NAME: TEST SITE

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
100							

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☑ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Some potential sources ☑ Obvious sources ☐

Width of riparian vegetation (m) on least buffered side: >18m

List & map dominant vegetation on back

Artificially Channelized ☑ no ☐ recent, severe ☐ some recovery ☐ mostly recovered, more sinuous

Artificially Impounded ☐ yes

High Water Mark (m above bed): surface 3m

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)

width: ~ 15 m
depth: 1 - 6 ft.
velocity: ≥ .25 m/sec

Canopy Cover % : Open : ☐ Lightly Shaded (11-45%): ☑ Moderately Shaded (46-80%): ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☑ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none slight (moderate) severe Silt smothering: (none) slight moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	15	5	dipnet	Riffles			
Leaf Packs or Mats	0			Sand	50	0	
Aquatic Vegetation	5	5	dipnet	Mud/Muck/Silt			
Rock or Shell Rubble	15	5	dipnet	Other:			
Undercut Banks/Roots	15	5	dipnet	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	TURBIDITY NTU's	SALINITY ppt.	Secchi (m):
Top	0.0							.5
Mid-depth	1.0	29.34	4.29	5.60	48.9	2.2	0.0	
Bottom	2.0							

System Type : Stream: ☐ (1st - 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☑ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:
OVERCAST, 80°F, no wind, slight rain in p.m., water level up 2Ft since H.D. deployed, only 2 HD recovered.

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☑	☐
Fish	☐	☐	☑	☐
Aquatic Macrophytes	☐	☑	☐	☐
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
Tim McKelvey / Ruth Bowman	Timothy R. McKelvey	6-12-95

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: DEP-NED	STORET STATION NUMBER: 21010041	DATE (M/D/Y): 6-12-95	RECEIVING BODY OF WATER: SUWANNEE RIVER

REMARKS: one H.D. rock missing from block.	LOCATION: BELOW WHITE SPRINGS STP	FIELD ID/NAME: TEST SITE

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [16]	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 (16)	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity [20]	Max. observed: >0.25 m/sec. but < 2 m/sec (20) 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization [20]	No artificial channelization or dredging. Stream with normal, sinuous pattern (20) 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Deposition [15]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation (15) 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [10]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods (10) 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [20]	Width of native vegetation (least buffered side) greater than 18 m (20) 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality [20]	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. (20) 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

[5] Add 5 points if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

[126] **TOTAL SCORE**

Comments: H.D. block & periphyton rock caught up in snag.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
6-12-95	TIM McKELVEY RUTH BOUMAN	Tim McKelvey

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: White Springs
County: Hamilton
Contact / District: Tim McKelvey / NE
NPDES Permit #: FL0031275
LIMS Sample #: 108154 **LIMS Job #:** 95-JUN-13-14
(sample log 6/15/95)

Sample Collection: Date 6/12/95 Time 1215
Test Beginning: Date 6/13/95 Time 1300
Test Ending: Date 6/15/95 Time 1300
Organism Batch #: 30 **Diluent Batch #:** 25
Organism Age: < 24 hrs

Test Organism: Ceriodaphnia dubia

Test Type: Screening | (Definitive)
(Static) | Static Renewal | Flow-through

Test Number: 1 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.5 @ 23.4	8.3 @ 24.5 °C	101.4 @ 100.0 997 @ 1001 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.4 @ 24.5	8.3 @ 24.6 °C	____ @ ____ ____ @ ____ @ ____ °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.1	8.2 @ 24.3 °C	999 @ 100.0 1012 @ 1001 @ 24.4 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
Control	A	5	5	5	8.1		8.2	23.6		24.6	8.0		7.5	175		180
Control	B	5	5	5			8.2			24.5	~~8.0~~		7.5			180
Control	C	5	5	5			8.2			24.5			7.7			185
Control	D	5	5	5			8.2			24.2			7.7			185
25%	A	5	5	5	7.9		8.3	23.7		24.4	8.0		7.7	270		275
25%	B	5	5	5			8.3			24.4			7.7			295
25%	C	5	5	5			8.3			24.2			7.7			295
25%	D	5	5	5			8.3			24.1			7.7			295
50%	A	5	5	5	7.7		8.4	23.7		24.3	7.7		7.7	360		390
50%	B	5	5	5			8.4			24.3			7.7			395
50%	C	5	5	5			8.4			24.2			7.7			390
50%	D	5	5	5			8.4			24.2			7.7			390
75%	A	5	5	5	7.6		8.4	23.8		24.2	7.7		7.7	460		490
75%	B	5	5	5			8.4			24.2			7.7			480
75%	C	5	5	5			8.4			24.1			7.7			480
75%	D	5	5	5	~~7.~~		8.4			24.1			7.7			490
100%	A	5	5	5	7.5		8.5	23.9		24.3	7.2		7.5	555		565
100%	B	5	5	5			8.5			24.2			7.6			570
100%	C	5	5	5			8.5			24.2			7.6			570
100%	D	5	5	5			8.5			24.1			7.6			575
Recorded by:		JRS	MF	MF	TR		MF	TR		MF	TR		MF	TR		THF
Measured/Loaded by:		JRS	MF	MF	JLS		TR	JLS		TR	JLS		TR	JLS		TR

Investigators' Signatures

Jennifer Sarapani
Robin C. Raden
Marshall Faircloth
Reviewer

	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			—	—	—
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR-100	TR
Alkalinity (mg/L as $CaCO_3$):	—	70	135	Hach	TR
Hardness (mg/L as $CaCO_3$):	—	80	195	Hach	TR
Total ammonia (mg/L as N):	—	<0.017	0.561	Orion	JN

Ammonia Meter #98136 Meter Slope: -57.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: White Springs
County: Hamilton
Contact / District: Tim McKelvey / NE
NPDES Permit #: FL0031275
LIMS Sample #: 108154 **LIMS Job #:** 95-JUN-13-14
sample log 6/15/95

Sample Collection: Date 6/12/95 Time 1215
Test Beginning: Date 6/13/95 Time 1300
Test Ending: Date 6/15/95 Time 1300
Organism Batch #: 23 **Diluent Batch #:** Well
Organism Age: 11 days old
Test Organism: Cyprinella leedsi

Test Type: Screening (Definitive)
(Static) Static Renewal | Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.5 @ 23.4	8.3 @ 24.5 °C	101.Y @ 100.0 997 @ 1001 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.4 @ 24.5	8.3 @ 24.6 °C	1066 @ 100.0 1004 @ 1001 @ 25 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.1	8.2 @ 24.3 °C	999 @ 101.0 1012 @ 1001 @ 24.4 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
Control A	142	5	5	5	7.6	8.2	8.3	24.3	23.3	22.7	7.7	8.4	7.7	250	255	260
Control B	399	5	5	5	7.6	8.2	8.3	24.3		23.5	7.7	8.4	7.7	250	245	250
Control C	308	5	5	5	7.6	8.2	8.3	24.3		23.5	7.7	8.5	7.7	250	250	255
Control D	92	5	5	5	7.6	8.2	8.3	24.3		23.7	7.7	8.6	7.8	250	250	255
~~6.25%~~ A	53	5	5	5	7.7	8.2	8.3	24.3	23.1	23.4	8.0	8.2	7.7	330	320	325
~~6.25%~~ B	10	5	5	5	7.7	8.2	8.3	24.4		23.3	8.2	8.2	7.7	330	320	320
~~6.25%~~ C	183	5	5	5	7.7	8.2	8.3	24.4		23.2	8.2	8.2	7.7	330	320	325
12.5% D	41	5	5	5	7.7	8.2	8.3	24.4		23.4	8.2	8.4	7.8	330	325	330
25% A	198	5	5	5	7.6	8.1	8.2	24.5	23.1	23.4	7.9	8.3	7.7	410	400	405
25% B	476	5	5	5	7.6	8.1	8.2	24.6		23.3	8.1	8.0	7.7	410	400	400
25% C	18	5	5	5	7.6	8.1	8.2	24.6		23.2	8.2	8.0	7.7	410	400	405
25% D	604	5	5	5	7.6	8.1	8.2	24.6		23.4	8.2	8.2	7.8	410	400	410
50% A	504	5	5	5	7.5	8.1	8.2	24.8	23.5	23.5	7.8	7.7	7.6	495	480	485
50% B	775	5	5	5	7.5	8.1	8.2	24.8		23.3	7.7	7.8	7.6	495	480	485
50% C	605	5	5	5	7.5	8.1	8.2	24.8		23.3	7.8	7.7	7.6	495	480	485
50% D	302	5	5	5	7.5	8.1	8.2	24.8		23.4	7.9	7.7	7.6	495	485	490
100% A	333	5	5	5	7.3	7.9	8.1	24.8	23.9	23.7	7.5	7.6	7.5	580	565	565
100% B	888	5	5	5	7.3	7.9	8.1	25.3		23.7	7.6	7.8	7.5	580	565	565
100% C	287	5	5	5	7.3	7.9	8.1	25.3		*26.6	7.7	7.8	7.5	580	560	565
100% D	716	5	5	5	7.3	7.9	8.1	25.2		*26.6	7.7	7.7	7.5	580	565	575
										*23.6						
										**23.6						
										incorrect data entered in MC6/SAS						
Recorded by:		TR	MF	MF	TR	MF	MF	TR	MF	MF	TR	MF	MF	TR	MF	MF
Measured/Loaded by:		TR	MF	MF	JLS	JLS	TR	JLS	JLS	TR	JLS	JLS	TR	JLS	JLS	TR

JRS blanks were using Cond 115 25% conc

Investigators' Signatures

Jennifer Sparagana
Robin G. Rader
Marshall Faircloth
Reviewer

Water Quality Parameters	Salt Water: Well Water / 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):				
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	DR-100	TR
Alkalinity (mg/L as $CaCO_3$):	125	135	Hach	TR
Hardness (mg/L as $CaCO_3$):	120	195	Hach	TR
Total ammonia (mg/L as N):	<0.017	0.561	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 10/05/94

Benthic macroinvertebrate taxa list for White Springs WWTP, collected via Hester-Dendy artificial substrates in the Suwannee River, on 12 June, 1995. Densities, in number/m^2, represent the mean of three replicates for the reference site and two for the test site.

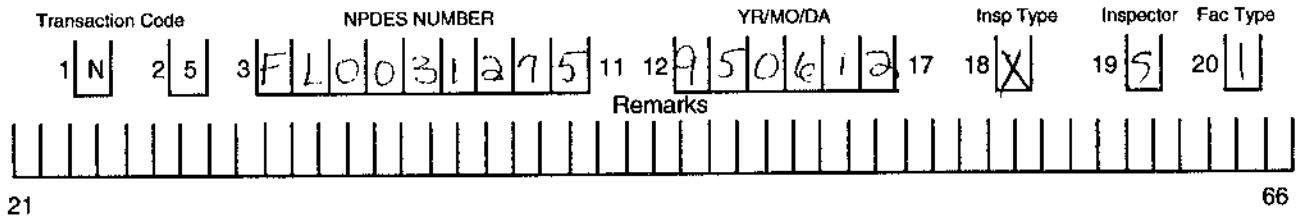
	Reference Site	Test Site
Decapoda		
Undetermined Cambaridae	3	–
Ephemeroptera		
Stenonema exiguum	61	48
Stenonema smithae	3	–
Undetermined Heptageniidae	16	20
Odonata		
Argia sp.	8	4
Argia moesta	5	12
Coleoptera		
Dineutus sp.	–	4
Stenelmis sp.	3	4
Trichoptera		
Cernotina sp.	5	–
Cheumatopsyche sp.	19	–
Chimarra sp.	106	155
Neureclipsis crepuscularis	3	12
Oecetis sp.	19	8
Diptera		
Ablabesmyia rhamphe grp.	8	–
Conchapelopia sp.	–	4
Hayesomyia sp.	–	4
Larsia decolorata	8	–
Meropelopia sp.	24	–
Nilothauma sp.	3	–
Orthocladius annectens	3	–
Polypedilum convictum	–	4
Polypedilum convictum grp.	11	–
Polypedilum illinoense	5	–
Psectrocladius elatus	5	4
Rheopelopia sp.	3	8
Rheotanytarsus exiguus grp.	–	4
Stelechomyia perpulchra	–	4
Tanytarsus sp	–	4
Tanytarsus sp. A Epler	3	4
Tanytarsus sp. D Epler	42	4
Tanytarsus sp. L Epler	16	–
Tanytarsus sp. U Epler	–	4
Tribelos fuscicornis	5	4
Tvetenia discoloripes grp.	3	4
Chironomidae	8	8

Periphyton taxa list and densities (#/cm^2) for White Springs WWTP, collected via glass microscope slides in the Suwannee River, on 12 June, 1995.

	Reference Site	Test Site
Cyanophyceae		
Anabaena sp.	4055	2485
Dactylococcopsis sp.	–	1242
Lyngbya sp.	–	1242
Microcystis sp.	14191	1242
Phormidium sp.	2027	–
Bacillariophyceae		
Achnanthes exigua	1014	3727
Achnanthes hustedtii	4055	33544
Asterionella formosa	5068	16151
Caloneis sp.	1014	–
Cocconeis placentula	1014	–
Cyclotella meneghiniana	–	3727
Desmogonium sp.	15205	6212
Eunotia sp.	48656	33544
Eunotia curvata	1014	–
Eunotia diodon	3041	–
Eunotia flexuosa	3041	2485
Eunotia pectinalis	4055	14908
Eunotia vanheurcki	8109	6212
Frustulia rhomboides	31424	73299
Gomphonema parvulum	–	2485
Melosira granulata	13178	21120
Navicula arvensis	5068	22363
Navicula confervacea	1014	8697
Navicula gastrum	–	2485
Navicula minima	15205	99389
Navicula pupula	1014	3727
Neidium affine	1014	–
Nitzschia palea	40547	73299
Nitzschia romana	1014	–
Pinnularia sp.	1014	–
Stauroneis sp.	1014	–
Undetermined Bacillariophyta	199693	222383
Chlorophyceae		
Chlamydomonas sp.	7096	1242
Chlorococcum sp.	1014	–
Closterium sp.	1014	–
Coleochaete sp.	2027	–
Cosmarium sp.	2027	1242
Dictyosphaerium sp.	–	2485
Gloeocystis sp.	5068	1242
Mougeotia sp.	–	2485

Oedogonium sp.	4055	–
Pediastrum sp.	1014	–
Scenedesmus sp.	4055	3727
Selenastrum sp.	1014	–
Staurastrum sp.	–	1242
Ulothrix sp.	3041	2485
Undetermined Chaetophorales	–	3727
Undetermined Chlorophyta	–	2485

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI - RI Optional)



Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI - RI Optional)

