

Biological Assessment of

City of Wauchula Wastewater Treatment Plant

Hardee County

NPDES #FL0023949

Sampled January 1996

July 1996

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 Wauchula WWTP
County:	Hardee County
NPDES Number:	FL0023949
State Permit Expiration Date:	20 October 1996

Toxics Sampling Inspection (**XSI**)

Date Sampled: 8 January 1996

Results: Diazinon (1.1 µg/L) was found in the effluent at an acutely toxic level. All metals detected in the effluent were within Class III water quality standards.

Compliance Biomonitoring Inspection (**CBI**)

Date Sampled: 8 January 1996

Results: The effluent sample was acutely toxic to the water flea, *Ceriodaphnia dubia*, resulting in 100% mortality during the 48 hour acute bioassay (violating Rules 62-302.500(1)(d), 62-302.530(62), and 62-4.244(3)(a) FAC). The effluent was not acutely toxic to the fish, *Cyprinella leedsi*.

Impact Bioassessment Inspection (**IBI**)

Date Sampled: 8 January 1996

Results: Measures of macroinvertebrate community health indicated the discharge was adversely affecting the receiving water community. Substantial decreases in taxa richness, the Florida Index, and the EPT Index occurred between the reference and test sites. The Stream Condition Index (SCI) score at the reference site (27 points) placed it in the lowest range of the "excellent" category, while the test site SCI value (13 points) placed it into the "severely degraded" category. Effluent toxicity and elevated diazinon probably contributed to these observed effects. The phytoplankton results indicated that, despite the elevated nutrients and AGP at the test site, the discharge was not having a significant impact on the immediate receiving water algal community. It is possible, however, that eutrophication effects may occur farther downstream in the Peace River, depending upon flow, sunlight, and assimilative capacity of the system.

Water Quality Inspection (**WQI**)

Date Sampled: 8 January 1996

Results: Some nutrient enrichment, attributable to the discharge, was observed at the test site. Ortho-phosphate (0.47 mg/L) and total phosphorus (0.58 mg/L) levels at the test site were higher than those found in 80% of other Florida streams. The ammonia level of test site (0.15 mg/L) was higher than those found in 70% of other Florida streams. The nitrate/nitrite concentration at both sites was 1.8 mg/L, apparently due to other sources in the watershed. These nitrate/nitrite values exceeded those found in 95% of Florida streams. Algal Growth Potential (AGP) greatly exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (55.6 mg dry wt/L) and the test site (90.9 mg dry wt/L). The effluent AGP was 77.5 mg dry wt/L.

Introduction

The City of Wauchula Wastewater Treatment Plant is a municipal wastewater treatment plant located in Hardee County, Florida (see maps in Appendix). Wastewater is treated in a Type I, activated sludge, carousel oxidation ditch and receives nitrification, chlorination, and subsequent dechlorination. The effluent from this 1.0 MGD facility discharges to an unnamed tributary which flows eastward for approximately 1000 feet to the Peace River.

State permit limits are as follows: flow (1.0 MGD) as a three month average), pH (6.0-8.5 SU), dissolved oxygen (minimum of 6.0 mg/L), total suspended solids (maximum of 20.0 mg/L as a monthly average, 45 mg/L as a weekly average), BOD (maximum of 10 mg/L as a monthly average, 15 mg/L as a weekly average), chlorine (maximum of 0.01 mg/L at discharge), ammonia (2.0 mg/L as a monthly average, 3.0 mg/L as a weekly average), TKN (3.0 mg/L as a monthly average, 4.5 mg/L as a weekly average), and fecal coliforms (maximum of 200 organisms/100 mL). Additionally, acute toxicity tests are required to be performed on the effluent.

In 1994, and in 1995, the facility exceeded its three month average flow limit, with three month averages of 1.47 MGD and 1.7 MGD, respectively. Flows as high as 2.0 MGD have been recorded. During the present survey, flow was 0.753 MGD. In addition, the required bioassays and ambient monitoring have not been conducted according to permit requirements. DEP issued a warning letter for the flow exceedances.

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	33	14
Florida Index	13	1
SCI	27	13
EPT Index	2	0
% Contribution of Dominant Taxon	16.3	56.3
% Oligochaeta	8.2	21.9
% Diptera	49.6	71.4
% Ephemeroptera	2.2	0
% Amphipoda	1.5	0
% Gastropoda	9.6	4.2
% Pelecypoda	0	1.7
% Predators	40.4	4.6
% Above Surface Deposit Feeders	23	36.1
% Below Surface Deposit Feeders	5.9	21.9
% Suspension Feeders	2.6	2.1
% Scrapers	10.7	4.2
% Shredders	11.5	31.1
Phytoplankton Algae		
Number of Taxa	5	10
Shannon-Weaver Diversity	2.2	3.06
Algal Density (#/mL)	92	347
Chlorophyll a (µg/L)	2	2.8
% Blue-green	55.6	63.6
% Green	33.3	30.3
% Diatoms	11.1	3
Algal Growth Potential (mg dry wt/l)	55.6	90.9

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 upstream of the discharge in an unnamed tributary of the Peace River) and a test site (in the same tributary downstream of the discharge). A habitat assessment was performed *in situ* to establish comparability 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 and study sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at the study sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additional invertebrate collections, attempted with Hester-Dendy multiplate samplers, were unsuccessful, due to high water conditions. Phytoplankton was sampled via subsurface grabs. Chlorophyll *a* was also determined for phytoplankton 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.

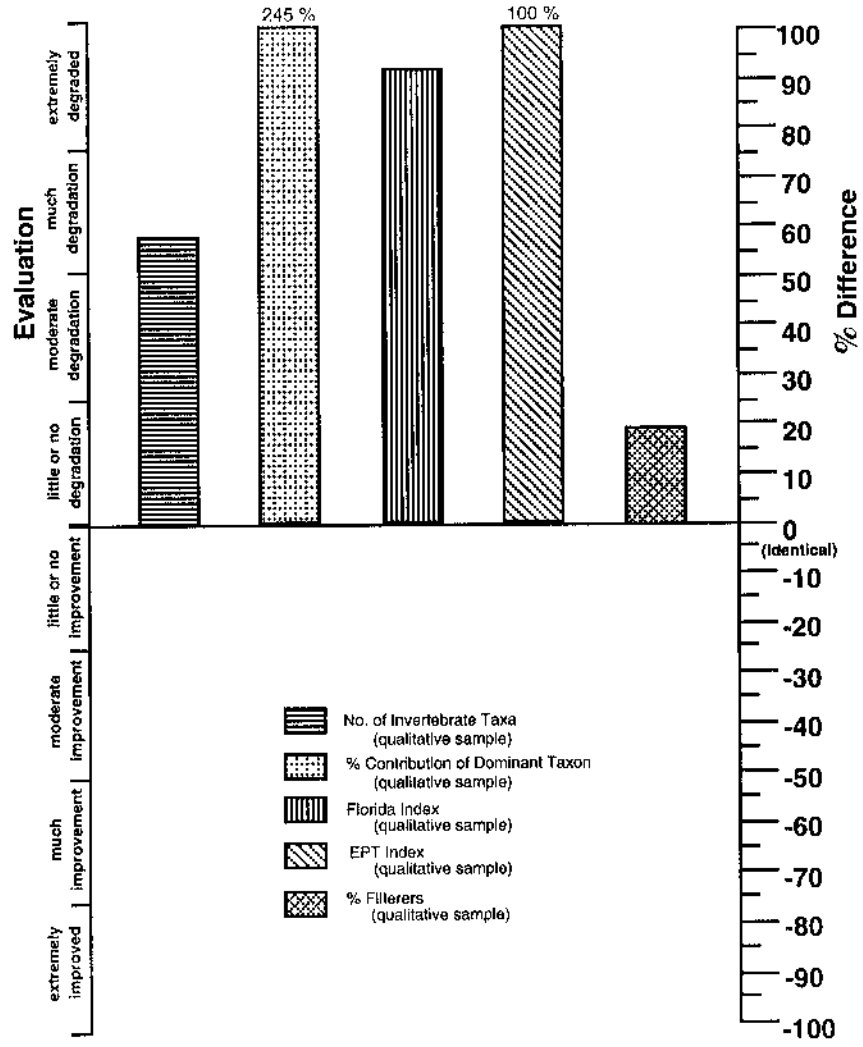
Habitat Assessment: Seven attributes known to have potential effects on the stream biota were evaluated and scored, with 20 possible points for each factor. Based on the sum of these individual scores, overall habitat quality is assigned to one of four categories: Optimal (105-140 points); Suboptimal (70-104 points); Marginal (35-69 points); and Poor (0-34 points).

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 Hudson *et al.* (1990), Lenat (1993), 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



Effect of discharge on the benthic macroinvertebrate community.

present. Higher EPT values are associated with healthier systems.

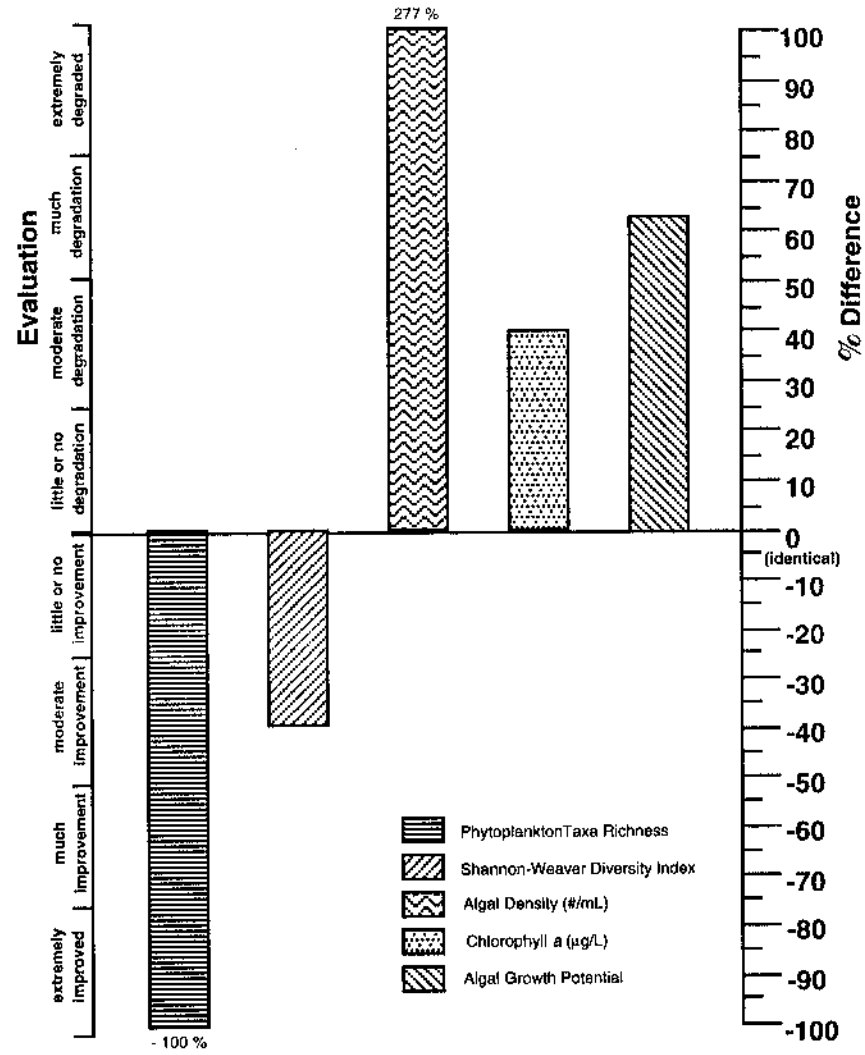
Community structure: Substantial shifts in proportions of major groups of organisms, compared to reference conditions, may indicate degradation. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered 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 condition Index for Florida (SCI) is a composite macroinvertebrate metric (Barbour *et al.* 1996). The SCI assigns points to a variety of parameters, depending on how closely each parameter approaches an expected reference condition (see SCI 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 Florida Index, the EPT 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 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: Lisa Carter and Brent Johnson (DEP Southwest District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Tina Mikulski, Elizabeth Miller, Urania Quintana, Bart Richard, Lisa Tamburello, David Whiting, Vicki Whiting, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

Results and Discussion

Both sites scored an identical 67 points for habitat quality, placing them in the "marginal" category. As expected from a ditch receiving urban stormwater runoff, both sites in this unnamed tributary of the Peace River received low scores for bottom substrate, water veloci-

ty, and artificial channelization. The reference site also received low scores in riparian buffer zone width and riparian zone vegetation quality, while the test site had additional low scores for deposition and bank stability. Approximately two weeks prior to this survey, the Peace River flooded, causing deeper than usual water at the test site. Physical/chemical measurements were comparable at the two sites. Dissolved oxygen levels complied with Class III standards at the reference site (9.4 mg/L), as well as the test site (8.3 mg/L). The pH (ranging from 6.4 SU to 6.7 SU) and temperature (from 14.4 °C to 15.7 °C) were similar at both sites. Specific conductance measured 393 µmhos/cm at the reference site and 603 µmhos/cm at the test site. This increase in conductivity at the test site suggests that, at the time of sampling, the effluent was a major contributor to stream flow.

The effluent sample was acutely toxic to the water flea, *Ceriodaphnia dubia*, resulting in 100% mortality during the 48 hour acute bioassay (violating Rules 62-302.500(1)(d), 62-302.530(62), and 62-4.244(3)(a) FAC). The effluent was not acutely toxic to the fish, *Cyprinella leedsi* (see Appendix).

Diazinon was present in the effluent at 1.1 µg/L. This concentration of diazinon is more than twice the acutely toxic level to *Ceriodaphnia dubia* (LC_{50} = 0.5 µg/L) and more than ten times the LC_{50} for *Chironomus* sp. (AQUIRE 1991). The elevated level of diazinon is the probable cause of the acute toxicity to *Ceriodaphnia dubia* in the bioassay, and depending upon the dilution in the receiving waters, could cause degradation in the macroinvertebrate community downstream of the discharge as well. Bromacil (0.68 µg/L) was found in the effluent at less than the minimum quantitation limit.

All metals detected in the effluent were within Class III water quality standards.

Some nutrient enrichment, attributable to the discharge, was observed at the test site. For example, at the reference site, the ortho-phosphate (0.05 mg/L) and total phosphorus (0.11 mg/L) levels were less than those found in 60% of other Florida streams (see Table of Typical Water Quality Parameters in Appendix). At the test site, ortho-phosphate (0.47 mg/L) and total phosphorus (0.58 mg/L) levels were higher than those found in 80% of other Florida streams. Effluent ortho-phosphate and total phosphorus concentrations were 0.67 mg/L and 0.84 mg/L, respectively. The ammonia level also increased between the reference site (0.03 mg/L) and test site (0.15 mg/L). Effluent ammonia was 2.4 mg/L. The nitrate-nitrite concentration at both sites was 1.8 mg/L, which exceeds the level found in 95% of Florida streams. This was apparently due to other sources in the watershed, since the effluent nitrate-nitrite was only 0.72 mg/L. TKN levels at both receiving water sites were low, ranging from 0.19 mg/L to 0.81 mg/L. Effluent TKN was 3.0 mg/L.

Algal Growth Potential (AGP) greatly exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (55.6 mg dry wt/L) and at the test site (90.9 mg dry wt/L) (Raschke and Schultz 1987), probably due to the high nitrate-nitrite found at both sites. The effluent AGP result (77.5 mg dry wt/L) suggested that it contributed to the higher AGP level downstream of the discharge.

Measures of macroinvertebrate community health indicated the discharge was adversely affecting the receiving water community. The Figure on p. 2 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean the test site is better than the reference site.

Based upon the results of dip net collections, taxa richness decreased from a normal 33 taxa at the reference site, to only 14 taxa at the test site. The Florida Index decreased precipitously, from 13 points at the reference site to only 1 point at the test site. Further, the EPT Index decreased from 2 at the reference site (a somewhat low score, probably due to marginal habitat) to zero (0) at the test site. The percent contribution of the dominant taxon (a measure similar to diversity) also indicated degradation associated with the discharge. At the reference site, the dominant taxon (the dipteran, *Hemerodromia* sp.) made up only 16% of the total taxa found. At the test site, the dominant taxon (*Polypedilum scalaenum* grp.) made up 56% of the total. Filter-feeders were uncommon at both sites.

The Stream Condition Index (SCI) score at the reference site (27 points) placed it in the lowest range of the "excellent" category, while the test site SCI value (13 points) placed it into the "severely degraded" category (see SCI calculation sheet in Appendix). The SCI results confirm the previously noted community impairment, showing the test site to be adversely affected by the discharge, compared to the reference site. Effluent toxicity and elevated diazinon probably contributed to these observed effects.

The Figure on p. 3 represents changes in the phytoplankton algal community. As was noted with the macroinvertebrates, larger differences (that is, higher percentages) correspond with greater degrees of deg-

radation. Phytoplankton taxa richness at the reference site (with 5 taxa) was less than that of the test site (10 taxa), mainly due to an increase in the number of cyanophytes at the test site. Algal diversity was lower at the reference site (2.2) than the test site (3.1). Algal density increased by 277% at the test site; however, chlorophyll *a* levels were low at both sites (less than 2.9 µg/L). These results indicate, that despite the elevated nutrients and AGP at the test site, the discharge was not having a significant impact on the immediate receiving water algal community. It is possible, however, that eutrophication effects may occur farther downstream in the Peace River, depending upon flow, sunlight, and assimilative capacity of the system.

Conclusions

The effluent sample was acutely toxic to the water flea, *Ceriodaphnia dubia*, resulting in 100% mortality during the 48 hour acute bioassay (violating Rules 62-302.500(1)(d), 62-302.530(62), and 62-4.244(3)(a) FAC). The effluent was not acutely toxic to the fish, *Cyprinella leedsi*.

Diazinon was present in the effluent at 1.1 µg/L, a concentration known to be acutely toxic to invertebrates (AQUIRE 1991). All metals detected in the effluent were within Class III water quality standards.

Some nutrient enrichment, attributable to the discharge, was observed at the test site. Orthophosphate (0.47 mg/L) and total phosphorus (0.58 mg/L) levels at the test site were higher than those found in 80% of other Florida streams. The ammonia level of the test site (0.15 mg/L) was higher than those found in 70% of other Florida streams. The nitrate-nitrite concentration at both sites was 1.8 mg/L, apparently due to other sources in the watershed. These nitrate-nitrite values exceeded those found in 95% of Florida streams.

Algal Growth Potential (AGP) greatly exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (55.6 mg dry wt/L) and at the test site (90.9 mg dry wt/L). The effluent AGP result (77.5 mg dry wt/L) suggested that it contributed to the higher AGP level downstream of the discharge.

Measures of macroinvertebrate community health indicated that the discharge was adversely affecting the receiving water community. Substantial decreases in taxa richness, the Florida Index, and the EPT Index occurred between the reference and test sites. The Stream Condition Index (SCI) score at the reference site (27 points) placed it in the lowest range of the "excellent" category, while the test site SCI value (13 points) placed it into the "severely degraded" category. Effluent toxicity and elevated diazinon probably contributed to these observed effects.

The phytoplankton results indicated that despite the elevated nutrients and AGP at the test site, the discharge was not having a significant impact on the immediate receiving water algal community. It is possible, however, that eutrophication effects may occur farther downstream in the Peace River, depending upon flow, sunlight, and assimilative capacity of the system.

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Chemistry summary table for

City of Wauchula WWTP	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
Bromacil	0.68 I		
Diazinon	1.1		
Metals (ug/L)			
Aluminum	100 U		
Arsenic	10 U		
Cadmium	0.08 U		
Copper	7 I		
Chromium	10 U		
Iron	407		
Lead	10 U		
Mercury	0.1 U		
Nickel	4 U		
Selenium	30 U		
Silver	0.05 U		
Zinc	26		
Nutrients (mg/L)			
Ortho-phosphate	0.67 A	0.05 I	0.47 A
Total phosphorus	0.84 A	0.11	0.58
Ammonia	2.4 A	0.03 I	0.15 A
Nitrate+Nitrite	0.72 A	1.8	1.8 A
TKN	3 A	0.19	0.81
General Phys-Chem Parameters			
Habitat Assessment		67	67
D.O. (mg/L)	8.4	9.4	8.3
pH (SU)	6.8	6.4	6.7
Conductivity (µmhos/cm)	746	393	603
Temperature (°C)	20.3	14.4	15.7
Hardness (mg CaCO3)	280		
Algal Growth Potential (mg dry wt/L)	77.5	55.6	90.9
Toxicity			
Bioassay Fish-Dechlorinated	Not toxic		
Bioassay Invertebrate-Dechlorinated	100% Mortality		

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

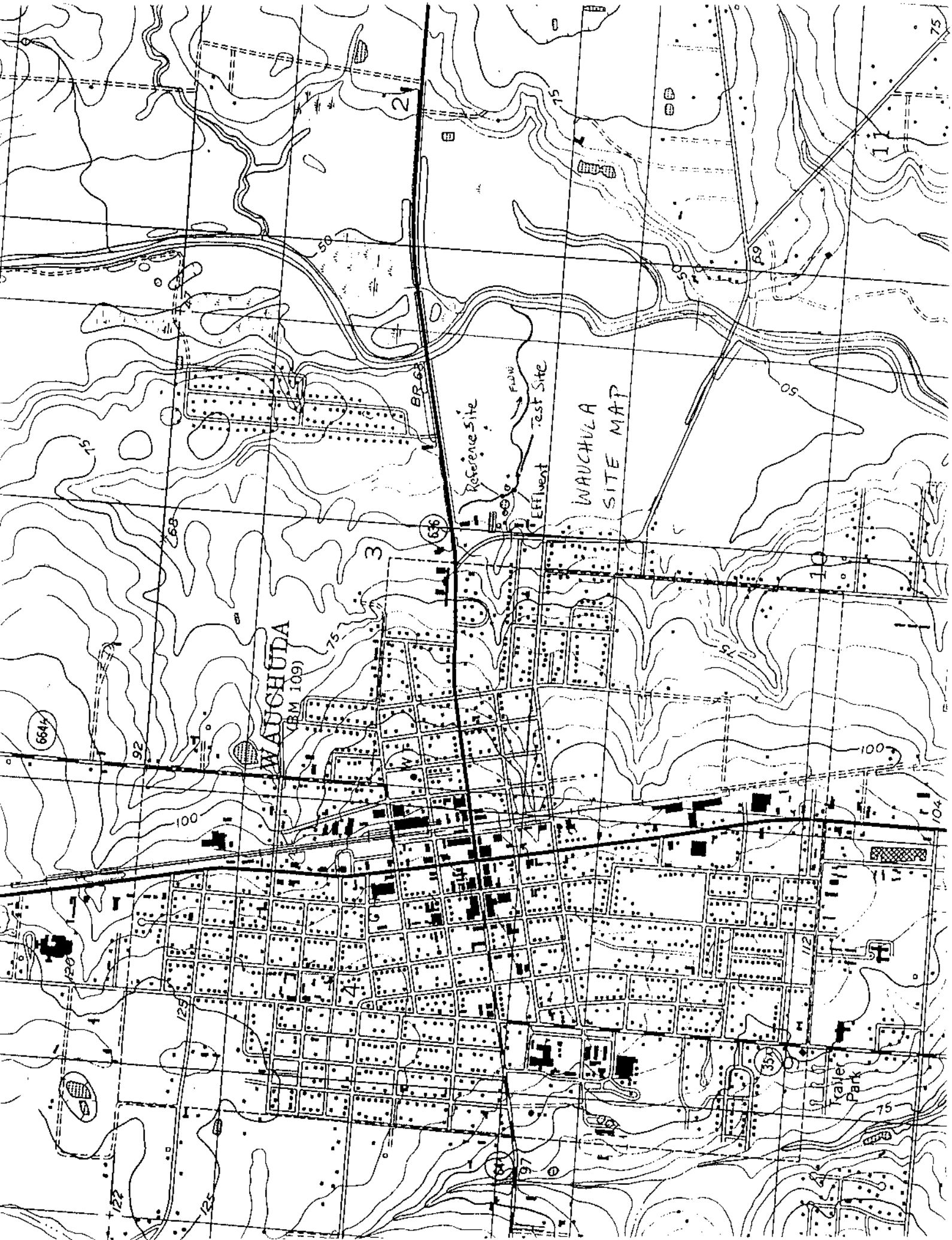
Typical Values for Selected Parameters in Florida Waters

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 Phosphate	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-Phosphate	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-Phosphate	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


WAUCHULA
SITE MAP
Reference Site
Effluent Test Site
FLOW
BR 62
WAUCHULA
(BM 109)
Trailer Park

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name: City of Wauchula WWTP		**Date Summary Prepared :** 12/5/95
Location (attach detailed map): S.R. 652 and 64 East Wauchula, FL	**County** Hardee	**District** SouthWest
Federal Permit # and expiration date: FL0023949	**State GMS # and State expiration date:**	**Facility Type:** Industrial (Municipal) Federal Agricultural Other (list):

Function of facility:
Waste Water Treatment

Description of treatment process: Type I
activated sludge (carrousel oxidation ditch) with nitrification chlorination and dechlorination

Receiving waters: Peace River		**Classification:** I II (III)
Design Flow: 1.0 MGD	**Mean Flow:**	**Flow during survey:**

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

therefore, the best time to sample is:

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

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

Parameter	Limit (units)
See attached Permit	

Describe special permit conditions and permit modifications:
See attached Permit modification

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

City of Wauchula WWTP
(Facility)

Description of permitted outfall(s):
* 001 is to a continuously flowing drainage ditch which flows estimated 1000 feet to the Peace River

List permit violations (from MOR data or other source) and plant upsets that occurred within past year:
- Facility exceeded the 3-month average flow limit of 1.0 mgd in 1995 w/ a 1.7 mgd average: the 1 month high was 2.0 mgd. The 3-month average was also exceeded in 1994 w/ a 1.47 mgd average and a 1-month high of 1.60 mgd.
- Bioassays and ambient monitoring have not been conducted per permit requirements

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
- Warning letter issued for flow exceedances
- Initial WQBEL was done for the Peace River for multiple facilities, including Wauchula in about 1980; it was not done for the receiving stream.

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set:
Data is consistent

Additional information:

Staff contributing to this review (signature):

Brent Johnson	(Biologist)
Joe Scuteri	(Inspector)
Hubert D. Hinkle	(Engineer)
	( )
	( )
	( )

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347

Lawton Chiles, Governor 813-623-5561 Carol M. Browner, Secretary

PERMITTEE:
City of Wauchula
Dept. of Public Works
P. O. Box 818
Wauchula, FL 33878

Attn: Warren May, Jr.
Superintendent

PERMIT/CERTIFICATION
GMS ID No: 4025M00323
Permit No: DO25-198893
Date of Issue: 10/30/91
Expiration Date: 10/20/96
County: Hardee
Lat/Long: 27° 32' 59"
81° 47' 59"
Sec/Town/Range: 03/34S/25E
Project: City of Wauchula WWTP
Processor: S. G. Thompson

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-3, 17-4 and 17-600 Series. 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:

Operation of a 1.0 MGD Type I activated sludge (carrousel oxidation ditch) with nitrification sewage treatment plant with chlorination and dechlorination of the effluent. The effluent enters an existing drainage ditch before discharging into the Peace River approximately 1,000 feet east of the treatment plant.

Location: S.R. 652 and 64 East, Wauchula, Florida

Replaces Permit No.: DC25-144511B and Expired 8/30/91
DT25-160306 and Expired 8/30/91

Recycled Paper

PERMITTEE: City of Wauchula GMS ID No. 4025M00323
Dept. of Public Works PERMIT No. DO25-198893

SPECIFIC CONDITIONS:

1. Drawings, plans, documents or specifications submitted by the permittee, not attached hereto, but retained on file at the Southwest District Office, are made a part hereof.

2. The zone of discharge boundary shall extend horizontally 100 feet from the site boundary or to the installation's property boundary, whichever is less, and vertically to the base of the shallow water table aquifer. (Rule 17-28.700, F.A.C.)

3. The water quality standards for Class G-II groundwater shall not be exceeded at the boundary of the zone of discharge. (Rule 17-3.402, Rule 17-3.404, F.A.C.)

4. In accordance with Chapter 17-602, F.A.C., the required certified operator on site time is: A Class C or better operator on site for 9 hours a day for seven days a week for the next 12 months of operation. On October 20, 1992, the City shall provide a Class B operator as the lead operator for the facility and shall increase the on-site operator time to 16 hours a day for seven days a week.

5. The discharge from the post aerator shall be sampled in accordance with Chapter 17-601, F.A.C. and shall meet the following limitations:

Parameter	Unit	Min-imum	Maximum	Type Sample	Frequency
✓BOD	mg/L	0	10.0 monthly avg. 15.0 monthly avg.	8 hr. composite	Weekly
✓TSS	mg/L		20.0 monthly avg. 45.0 weekly avg.	8 hr. composite	Weekly
✓Dissolved Oxygen	mg/L	6.0		grab	Weekly
✓Organic Nitrogen	mg/L	0	3.0 monthly avg. 4.5 weekly avg.	8 hr. composite	Weekly
✓NH3-N	mg/L	0	2.0 monthly avg. 3.0 weekly avg.	8 hr. composite	Weekly
✓Fecal coliform	#/100	0	200 Annual Average	grab	Weekly
✓Permitted Capacity (daily flow)	mgd	.000	1.0 3-MA*	meter	Continuous
✓pH	std un	6.00	8.50	grab	Continuous
✓Cl_2 (after deCl_2)	mg/L	0.0	0.01	grab	Continuous

The results shall be reported monthly on DER Form 17-601.900(1).

*3-MA-Three Month Average

6. The sludge shall be sampled after final treatment in accordance with Rule 17-601 F.A.C. but prior to land application for the parameters listed below every 3 months. A copy of the analyses shall be submitted with the monthly operation report for the following parameters:

SPECIFIC CONDITIONS: (cont'd)

6. (con't):

Total Nitrogen - % dry weight
Total Phosphorus - % dry weight
Total Potassium - % dry weight
Cadmium - mg/kg dry weight
Copper - mg/kg dry weight
Lead - mg/kg dry weight
Nickel- mg/kg dry weight
Zinc - mg/kg dry weight
pH - standard units
Total Solids - %

7. If historical or archaeological artifacts, such as Indian canoes, are discovered at any time within the project site, the permittee shall notify the DER Southwest District office and the Bureau of Historic Preservation, Division of Archives, History and Records Management, R.A. Gray Building, Tallahassee, Florida 32301, telephone number (904) 487-2073.

8. The domestic wastewater residuals for this facility are classified as stabilization Class B.

a. The domestic wastewater residuals shall be land applied only at City of Wauchula WWTP Residual Remediation Site (as identified in the Agricultural Use plan or Dedicated Site plan submitted with the application).

b. Annual update reports, summaries, and revised agricultural site plans are due not later than one year from the issuance of the permit. The reports shall be submitted annually thereafter, and not later than this anniversary date to the Department and the Local Program (if applicable).

c. The permittee shall comply with all provisions of Chapter 17-640, F.A.C. and shall report any non-compliance or changes from the approved use plan to the Department and Local Program (if applicable).

9. The plant shall be equipped with a functional flow meter with a strip chart and totalizer to measure flow. The flow meter shall be calibrated every six (6) months with evidence of calibration kept at the flow meter. Certification of Calibration shall be submitted to the Department upon request.

10. The permittee shall provide a weatherproof location for an on/site log book to monitor the daily activities of the certified operator. This log book shall record sign in/out times of the certified operator, list any maintenance performed and contain the signature and certification number of the operator.

SPECIFIC CONDITIONS:

11. The permittee shall maintain all audible and visual alarm systems on the lift station(s) in operating condition at all times.

12. A reduced pressure zone backflow preventer shall be installed on any potable water supply to the treatment facility. No potable water outlet intended for human contact shall be located down-line of the backflow preventer.

13. The disinfection system shall be operated to maintain a minimum chlorine residual of 0.5 mg/l at the outfall from the chlorine contact chamber. A metering device for dosing chlorine to the effluent shall be utilized and the chlorine supply tank shall be inspected regularly to ensure proper operation.

14. Prior to sixty days before the expiration of this permit, the permittee shall apply for a renewal of the permit on forms and in a manner prescribed by the Department of Environmental Regulation.

15. The permittee shall summarize the results of the ambient monitoring program for the first year of operation and shall submit a report no later than 15 months from the issuance of this permit. The report shall summarize the water quality data for the first year and describe the observed water quality changes.

16. In order to provide the Department with reasonable assurance that the discharge from the outfall does not violate the toxicity requirements of Section 17-3.05.(1)(d), F.A.C., the permittee shall perform the toxicity test as specified below and submit the results to the Department for review:

a. The permittee shall initiate the series of tests described below within sixty (60) days of the effective date of this permit to evaluate wastewater toxicity. The permittee shall conduct 96 hour static renewal acute toxicity screening tests on the test species, Ceriodaphnia dubia and Pimephales promelas, once every two months (bi-monthly) on samples of 100% whole effluent. Such static renewal tests will be conducted on four separate grab samples of 100% whole effluent. Such static renewal acute toxicity screening tests will be conducted on four separate grab samples of 100% final effluent collected at evenly spaced (6-hour) intervals over a 24-hour period and used in four separate acute toxicity screening tests in order to account for daily variations in effluent quality.

17. Once the permittee has demonstrated to the satisfaction of the Department that there are no effluent toxicity peaks and no diurnal toxicity variations resulting in violations, the frequency of the above described requirement for bi-monthly testing may be changed to become once every 6 months thereafter for the duration of the permit, unless notified otherwise by the Department.

SPECIFIC CONDITIONS:

b. If control mortality exceeds 10% of either species in any test, the test(s) for the species (including the control) shall be repeated. A test will be considered valid only if control mortality does not exceed 10% for either species. If, in any separate grab sample test, 100% mortality occurs prior to the end of the test, and control mortality is less than 10% at that time, that test (including the control) shall be terminated with the conclusion that the sample demonstrates unacceptable acute toxicity.

c. If any such bi-monthly acute toxicity screening test indicates that unacceptable toxicity (less than 80% survival of test organisms in 100% effluent) is found in any sample of effluent, additional (definitive-acute static renewal toxicity testing involving the determination of 96-hour LC50 values with 95% confidence limits will be required. A minimum of three (3) such 96-hour additional tests are required to be conducted within 30 days from the date that any screening test indicates the presence of toxicity. Preferably, the first of these additional tests shall be initiated within seven days of a failed screening test. The second test shall be initiated at least seven (7) days after completion of the first additional test. Such tests shall be conducted using that test species which exhibited the most toxic response in the screening tests above, and shall be taken at the same time of day and day of the week during which the greatest toxicity was exhibited.

The results of each toxicity test shall be submitted to the Department concurrently with monthly discharge monitoring reports.

d. All test procedures, and quality assurance criteria used shall be in accordance with Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA-600/4-85-013. If the test organisms specified in Sub-Part (a), are unavailable or unsuitable for use in the toxicity tests, appropriate substitutes from the list of recommended test organisms in the above referenced bioassay manuals may be used.

This, and any other deviation from the standard bioassay procedures, shall be submitted to the Department for review and approval prior to use.

18. The permittee shall provide the Department with the results of any toxicity bio-monitoring required by U.S.E.P.A.

PERMITTEE: City of Wauchula GMS ID No. 4025M00323
Dept. of Public Works PERMIT No. DO25-198893

SPECIFIC CONDITIONS:

20. The permittee shall be aware of and operate under the attached "General Permit Conditions #1 thru #15". General Permit Conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Richard D. Garrity, Ph.D.
Director of District Management

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	25020135	1/8/96	1330	Suwannee River & tribs

REMARKS:	LOCATION:	FIELD ID/NAME:
Water depth same equal to 1st visit	City of Wauchula WWTP	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)
50				20	10	20	

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: 0m

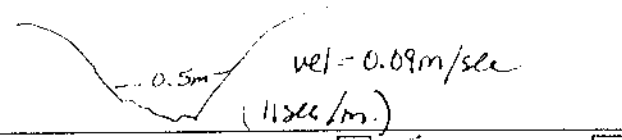
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 0.5m

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



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	5	dipnet	Sand	1	3	dipnet
Leaf Packs or Mats				Mud/Muck/Silt	1	2	dipnet
Aquatic Vegetation				Other:			
Rock or Shell Rubble	78	5	dipnet	Other:			
Shorezone (Roots/Veg.)	10	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):			Secchi (m):
Top								
Mid-depth								
Bottom								

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:
Windy, cold, clear skies, 35°F
Water was same depth as at HD deployment/ret.

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

SAMPLING TEAM: Carter Johnson

SIGNATURE: Carter Johnson Dave Johnson

DATE: 1/9/96

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	25020135	1-8-96	unnamed ditch to Peace Creek

REMARKS:	LOCATION:	FIELD ID/NAME:
Site was not flooded as west Site was.	City of Wauchula WWTP	Reference Site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover 9	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 10	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 10	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 13	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 12	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 6	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 8	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

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

67 TOTAL SCORE

Comments: Reference site is bordered by WWTP property which affects the riparian buffer + vegetative qualities.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1/9/96	Carter / Johnson	Carter M. Carter Brent Johnson

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	250201 39	1-8-95	1130	unnamed ditch/stream to Peace Cr

REMARKS:	LOCATION:	FIELD ID/NAME:
Re-sampled reach	City of Wauchula WWTP	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)
70		10	10			10	

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

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

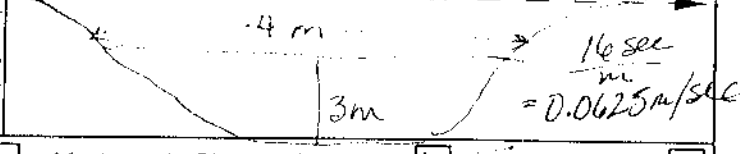
Width of riparian vegetation (m) on least buffered side: >10

List & map dominant vegetation on back

Artificially Channelized ☐ no ☐ ☑ ☐ Artificially Impounded ☐ yes
(recent, severe / some recovery / mostly recovered, more sinuous)

High Water Mark (m above bed): 7m

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



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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☑ (Slightly) 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%	5	dipnet	Sand	75%	5	dipnet
Leaf Packs or Mats	5%	5	dipnet	Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Shorezone (Roots/Veg.)	10%	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):			Secchi (m):
Top								
Mid-depth								
Bottom								

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:
Very cold. Site is flooded. Local rain fall has been unusually heavy.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Carter / Johnson	Brent Johnson	1/9/95

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	25020139	1-8-96	unnamed ditch to the Peace River

REMARKS:	LOCATION:	FIELD ID/NAME:
Site was flooded - see attached notes.	City of Wauchula WWTP	Test site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [7]	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 [6]	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 (16 sec/m = 0.045 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 [10]	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 [8]	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 [2]	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 [16]	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 [18]	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

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

[67] TOTAL SCORE

Comments
Stream meanders through woods (100' before reaching Peace River.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1/9/96	Carter Johnson	Carter Johnson / Brent Johnson

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Wauchula
County: Hardee
Contact / District: Carter / Brent Johnson / SW
NPDES Permit #: FL0023949
LIMS Sample #: 126691 (sample log 1/22/96) **LIMS Job #:** 96-Jan-09-13-01

Sample Collection: Date 1-8-96 Time 1415
Test Beginning: Date 1-9-96 Time 13:00
Test Ending: Date 1-10-96 Time 12:00
Organism Batch #: 2 **Diluent Batch #:** 1
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia

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

Test Number: 1 of 2

Remarks:
Test Terminated @ 24 hrs
100% mortality in the 100% sample

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	19.8 @ 19.9	8.8 @ 21.6 °C	103.8 @ 106.2 1000 @ 1025 @ 23.0 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.9 @ 22.0	8.4 @ 24.1 °C	1020 @ 1062 985 @ 1025 @ 22.7 °C
48 hr	___ @ 7.0 ___ @ ___	___ @ ___	___ @ ___ °C	___ @ ___ ___ @ ___ @ ___ °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) 0 hr	UNCORRECTED Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (µmhos/cm) 48 h
Control	A	5	5		8.3	8.2		22.3	23.7		7.8	7.7		165	185	
Control	B	5	5			8.2			23.8			7.7			190	
Control	C	5	5			8.2			23.8			7.4			185	
Control	D	5	5			8.2			23.8			7.5			190	
100%	A	5	0		8.4	8.4		24.3	23.6		7.8	7.5		755	800	
100%	B	5	0			8.4			23.7			7.6			790	
100%	C	5	0			8.4			23.7			7.7			790	
100%	D	5	0			8.4			23.7			7.7			795	
Measured/Loaded by:		TM	TM		JN	TM		JN	TM		JN	TM		JN	TM	
Recorded by:		MF	TM		MF	TM		MF	TM		MF	TM		MF	TM	

Investigators' Signatures
Marshall Faircloth
Jennifer Sparagana
Robert C. Ruder
Tina Mikuelis

reviewer

form updated 5/05/95

Water Quality Parameters

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			Not Measured		
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR-100	JRS
Alkalinity (mg/L as $CaCO_3$):	—	70	110	HACH	JRS
Hardness (mg/L as $CaCO_3$):	—	80	250	HACH	JRS
Total ammonia (mg/L as N):	—	<0.017	1.99	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.9 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Wauchula
County: Hardee
Contact / District: L. Carter / Brent Johnson / SW
NPDES Permit #: FL00 23949
LIMS Sample #: 126691 LIMS Job #: 96-Jan-09-13-01
sample log 1/22/96

Sample Collection: Date 1-8-96 Time 1415
Test Beginning: Date 1-9-96 Time 13:15
Test Ending: Date 1-11-96 Time 13:15
Organism Batch #: 81 Diluent Batch #: Well
Organism Age: 12 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	19.8 @ 19.9	8.8 @ 21.6 °C	103.8 @ 106.2 1000 @ 1025 @ 23.0 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.9 @ 22.0	8.4 @ 24.1 °C	102.0 @ 106.2 985 @ 1025 @ 22.7 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.5 @ 21.6	8.6 @ 22.8 °C	104.6 @ 106.2 1008 @ 1025 @ 23.8 °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
CTL A	309	5	5	3 20	7.9	8.3		24.4	22.4		7.3	7.9		250	240	
CTL B	210	5	5	5	7.9	8.3		24.5	22.1		7.4	7.9		250	240	
CTL C	44	5	5	5	7.9	8.3		24.5	22.0		7.4	8.0		250	240	
CTL D	88	5	5	5	7.9	8.3		24.5	22.2		7.4	8.0		250	240	
100% A	414	5	5	5	7.2	7.9		24.9	22.6		7.7	7.8		795	755	
100% B	306	5	5	5	7.2	7.9		25.0	22.4		7.8	7.7		795	755	
100% C	380	5	5	5	7.2	7.9		25.0	22.3		7.9	7.6		795	750	
100% D	333	5	5	5	7.2	7.9		25.2	22.5		7.9	7.7		795	755	
Measured/Loaded by:		TM	TM	TM	JN	TM		JN	TM		JN	TM		JN	TM	
Recorded by:		TM	TM	TM	MF	TM		MF	TM		MF	TM		MF	TM	

Investigators' Signatures
Marshall Fairbrother
Joseph Smith
Jennifer Sparapani
Gina Mikulski

Reviewer

form updated 5/05/95

Water Quality Parameters	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			not measured		
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR-100	JRS
Alkalinity (mg/L as $CaCO_3$):	120	—	110	HACH	JRS
Hardness (mg/L as $CaCO_3$):	125	—	250	HACH	JRS
Total ammonia (mg/L as N):	<0.017	—	1.99	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.9 Ammonia Blank: <0.017
Control Salinity: 0 ppt
Sample Salinity: 0 ppt

Wauchula WWTP

Reference Site

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	33	≥27	26-14	<14		≥ 27	26-14	<14	5	≥18	17-9	<9	
EPT Index	2	≥6	5-3	<3		≥ 4	3-2	<2	3	-	≥3	<3	
# Chironomid Taxa	14	≥9	8-5	<5		≥9	8-5	<5	5	≥4	3-2	<2	
% Contribution of Dominant Taxon	16	≤25	26-62	>62		≤30	31-65	>65	5	≤37	38-69	>69	
% Diptera	50	-	≤60	>60		-	≤52	>52	3	-	≤67	>67	
Florida Index	13	≥ 13	12-7	<7		≥10	9-5	<5	5	≥ 6	5-3	<3	
% Suspension feeders/Filterers	3	≥ 13	12-7	<7		≥15	14-8	<8	1	≥ 25	25-13	<13	
Total Score		Panhandle				Peninsula			27	Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Test Site

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	14	≥27	26-14	<14		≥ 27	26-14	<14	3	≥18	17-9	<9	
EPT Index	0	≥6	5-3	<3		≥ 4	3-2	<2	1	-	≥3	<3	
# Chironomid Taxa	8	≥9	8-5	<5		≥9	8-5	<5	3	≥4	3-2	<2	
% Contribution of Dominant Taxon	56	≤25	26-62	>62		≤30	31-65	>65	3	≤37	38-69	>69	
% Diptera	71	-	≤60	>60		-	≤52	>52	1	-	≤67	>67	
Florida Index	1	≥ 13	12-7	<7		≥10	9-5	<5	1	≥ 6	5-3	<3	
% Suspension feeders/Filterers	2	≥ 13	12-7	<7		≥15	14-8	<8	1	≥ 25	25-13	<13	
Total Score		Panhandle				Peninsula			13	Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Benthic macroinvertebrate taxa list for the City of Wauchula WWTP, collected by 20 discrete dipnet sweeps on January 8, 1996, in an unnamed drainage ditch which flows to the Peace River approximately 1000 feet downstream of the discharge.

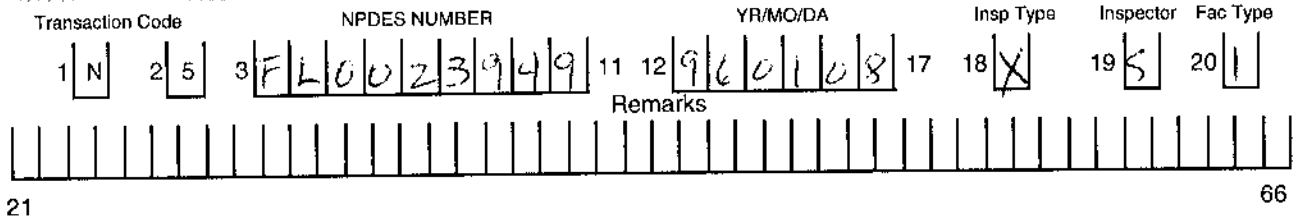
	Reference Site	Test Site
Amphipoda		
Hyalella azteca	2	–
Coleoptera		
Curculionidae	1	–
Diptera		
Ablabesmyia mallochi	1	–
Antillocladius sp.	1	–
Chironomus sp.	4	1
Cricotopus bicinctus	4	–
Cryptochironomus sp.	4	4
Dicrotendipes simpsoni	1	–
Fittkauimyia serta	1	–
Goeldichironomus sp.	1	–
Goeldichironomus holoprasinus	3	–
Hemerodromia sp.	22	1
Kiefferulus sp.	2	–
Larsia sp.	1	–
Limonia sp.	1	–
Paracladopelma sp.	–	1
Paracladopelma nereis	–	2
Parametriocnemus sp.	–	1
Polypedilum sp.	2	–
Polypedilum illinoense grp.	6	6
Polypedilum scalaenum	2	67
Polypedilum tritum	2	–
Simulium sp.	2	–
Tanytarsus sp. A Epler	–	1
Tipula sp.	4	–
Tribelos sp.	2	1
Orthocladiinae	1	–
Ephemeroptera		
Caenis sp.	3	–
Gastropoda		
Micromenetus sp.	4	–
Physella sp.	1	–
Planorbidae	8	–
Gastropoda	–	5
Hirudinea		
Helobdella triserialis sp.	2	–
Mooreobdella sp.	1	–

Odonata		
Argia sp.	17	–
Argia fumipennis	7	–
Argia sedula	1	–
Calopteryx maculata	1	–
Enallagma sp.	11	–
Coenagrionidae	–	1
Oligochaeta		
Dero trifida	1	–
Eclipidrilus sp.	–	2
Limnodrilus hoffmeisteri	–	24
Lumbriculus variegatus	3	–
Nais communis	3	–
Lumbriculidae	1	–
Pelecypoda		
Corbicula fluminea	–	2
Trichoptera		
Cheumatopsyche sp.	1	–

Phytoplankton taxa list and densities (#/mL) for the City of Wauchula WWTP, collected via subsurface grabs on January 8, 1996 in an unnamed drainage ditch which flows to the Peace River approximately 1000 feet downstream of the discharge.

	Reference Site	Test Site
Bacillariophyceae		
Coscinodiscus sp.	–	11
Pennales	10	–
Chlorophyceae		
Chlorococcum sp.	31	21
Dictyosphaerium sp.	–	11
Oocystis sp.	–	11
Chlorophyta	–	63
Cryptophyceae		
Cryptomonas sp.	–	11
Cyanophyceae		
Aphanothece sp.	–	42
Chroococcus sp.	–	32
Lyngbya sp.	21	32
Microcystis sp.	–	21
Oscillatoria sp.	21	95
Spirulina sp.	10	–

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)

