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An Assessment of

City of Plant City WWTP

Hillsborough County

NPDES #FL0026557

Sampled March 1998

December 1998

Biology Section
Division of Administrative and Technical Services
Bureau of Laboratories

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection

Results of Inspections

Discharger: Plant City WWTP
County: Hillsborough
NPDES Number: FL0026557
State Permit Expiration Date: 02 February 2002

Toxics Sampling Inspection (XSI)

Date Sampled: 02 March 1998

Results: The herbicide, atrazine, was detected in the facility's effluent (0.14 µg/L) at a concentration below chronically toxic levels (AQUIRE 1991). Aluminum, copper, iron, lead, and zinc were detected in the effluent at levels that complied with Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 02 March 1998

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

Impact Bioassessment Inspection (IBI)

Date Sampled: 02 March 1998

Results: Benthic macroinvertebrates were not collected due to extreme flooding. Phytoplankton communities did not reflect the elevated nutrients or AGP values. The control site had more taxa (35 taxa) and higher diversity (4.1) than the test site (25 taxa and 3.9 diversity). The algal density was lower at the test site compared to the control site. Both values were low relative to the nutrient levels. Chlorophyll *a* was undetected at both sites.

Water Quality Inspection (WQI)

Date Sampled: 02 March 1998

Results: Most of the nutrients were higher at the control site than at the test site. Orthophosphate was 0.64 mg/L at the control site and 0.46 mg/L at the test site. Total phosphorus and ammonia followed the same trend. However, nitrate+nitrite levels were higher at the test site (0.49 mg/L) than the control site (0.11 mg/L). The effluent nitrate+nitrite was 1.8 mg/L. TKN was comparable at both sites. AGP at the control site (13.1 mg dry wt/L) and the test site (29.6 mg dry wt/L) were above the 5 mg dry wt/L "problem threshold" (Raschke and Shultz 1987). The effluent had an AGP value of 49.1 mg dry wt/L.

Introduction

The city of Plant City WWTP is a domestic wastewater treatment facility and disposal site located in Hillsborough County, Florida (see maps in Appendix). The facility is a Type I activated sludge plant with screening and degritting, followed by aeration and clarification. Flow is polished in a hyacinth treatment pond, then filtered, chlorinated, and dechlorinated prior to discharge. A portion of the effluent is reused and the remaining effluent is discharged into the East Canal. The design flow, and the flow during this study was 8 MGD. Six million gallons were discharged into the receiving waters and the other two million gallons were reused.

The purpose of this investigation was to establish a baseline for the Plant City WWTP as it has changed its outfall from the Westside Canal to the East Canal. This baseline study was requested by Domestic Wastewater Compliance personnel.

This facility has had previous violations of fecal coliform counts, total suspended solids, total residual chlorine, and calibration of equipment (see Facility Summary in Appendix). During this study, the facility diverted its discharge to another facility without the department's consent for approximately ten days.

Benthic macroinvertebrates were not collected for this study due to extreme flooding. Without this information, a complete inspection of the facility's impact on the receiving waters could not be made.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was to be made between a control site (located in East Canal, 100 meters upstream of Knight's Griffin Road) and a test site (located in East Canal, 100 meters downstream of Knight's Griffin Road), however no benthic data was collected due to flooding (see maps in Appendix).

Supplemental physical/chemical data were also collected on the effluent and study sites. The effluent was analyzed for nutrients, metals, and for organic constituents (base neutral and acid extractables, and pesticide extractables). Methods used for all chemical analyses are on file at the DEP Central Chemistry Laboratory in Tallahassee.

Acute screening toxicity bioassays, using the invertebrate, *Ceriodaphnia dubia* and the fish, *Cyprinella leedsi,* as test organisms, were performed on an effluent sample.

Phytoplankton were sampled at both control and test sites via subsurface grabs. Chlorophyll *a* was also determined for phytoplankton communities. *Selenastrum capricornutum* was used as the test organism for the algal growth potential tests.

All field and laboratory biological methods were carried out following Biology Section Standard Operating Procedures (SOP's). The latest version of the SOP's can be viewed on our web site: "www.dep.state.fl.us/labs/sops.htm".

Several different measurements of algal community health have been employed to determine the effects of the discharge. These measurements include: taxa richness, Shannon-Weaver Diversity Index, and algal biomass, For a discussion of each of these measures see the *Explanation of Measurements of Community Health* in Appendix.

Results

A habitat assessment was not performed due to flooding. Dissolved oxygen was highest at the effluent (10.2 mg/L) and fairly low at the control site (5.5 mg/L) and the test site (4.4 mg/L) (see Physical/ Chemical Data Sheets in Appendix). The dissolved oxygen concentration at the test site represents a violation of Class III water quality standards (Rule 62-302.530(31) FAC). The pH was neutral at the test site (7.0 SU) and slightly basic at the control site (6.4 SU), and in the effluent (6.7 SU). Conductivity was lowest at the control site (195 µhmos/cm) and somewhat higher at the test site (302 µhmos/cm). Conductivity of the effluent was 821 µhmos/cm. The temperature ranged from 21.3 °C at the effluent to 17.7 °C at the control site (Table 1).

The facility's effluent was not toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

The herbicide, atrazine, was detected in the facility's effluent (0.14 µg/L) at a concentration below chronically toxic levels (ACQUIRE 1991).

Aluminum, copper, iron, lead, and zinc were detected in the facil-

ity's effluent. All levels complied with Class III water quality standards (Table 1).

Most of the nutrients were higher at the control site than at the test site (Table 1). Ortho-phosphate was 0.64 mg/L at the control site and 0.46 mg/L at the test site. Total phosphorus followed the same trend, with 0.76 mg/L at the control site and 0.58 mg/L at the test site. Ammonia values were also higher at the control site (0.12 mg/L) than at the test site (0.079 mg/L). Nitrate+nitrite levels, on the other hand, were higher at the test site (0.49 mg/L) than the control site (0.11 mg/L). The effluent value for nitrate+nitrite was 1.8 mg/L. TKN was comparable between the two sites (0.93 mg/L and 0.86 mg/L at the control and test sites, respectively).

Algal Growth Potential (AGP) values at the control site (13.1 mg dry wt/L) and the test site (29.6 mg dry wt/L) were above the 5 mg dry wt/L "problem threshold" for freshwater (Raschke and Schultz 1987). The effluent had an AGP value of 49.1 mg dry wt/L.

The effects of the increased nutrients at the test site can be seen in Figure 1. The phytoplankton communities at the control site had more taxa (n = 35) and higher diversity (4.1) than the test site (25 taxa and diversity = 3.9). The algal density was lower at the test site (938 cells/mL) than the control site (1,285 cells/mL), both values were low relative to the nutrient levels. The dominant cell at both sites was *Scenedesmus* sp., a green alga. Chlorophyll *a* was undetected at both sites.

Discussion

The purpose of this investigation was to establish a baseline for the Plant City WWTP as it has changed its outfall from the Westside Canal to the East Canal. This baseline study was requested by Domestic Wastewater Compliance personnel. Benthic macroinvertebrates were not collected for this study due to extreme flooding. Without this information, a complete inspection of the facility's impact on the receiving waters could not be made.

The dissolved oxygen concentration at the test site (4.4mg/L) represents a violation of Class III water quality standards (Rule 62-302.530(31) FAC).

The facility's effluent was not toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

The herbicide, atrazine, was detected in the facility's effluent at a concentration below chronically toxic levels. Aluminum, copper, iron, lead, and zinc were detected in the facility's effluent at levels that complied with Class III water quality standards.

There appear to be sources of nutrients in the receiving waters in addition to the facility's input. With the exception of nitrate+nitrite, nutrients were higher at the control site compared to the test site.

The additional nutrients from the facility seemed to have elevated the test site AGP (29.6 mg dry wt/L), above the already high background levels (13.1 mg dry wt/L) and well above the 5 mg dry wt/L "problem threshold" for freshwater

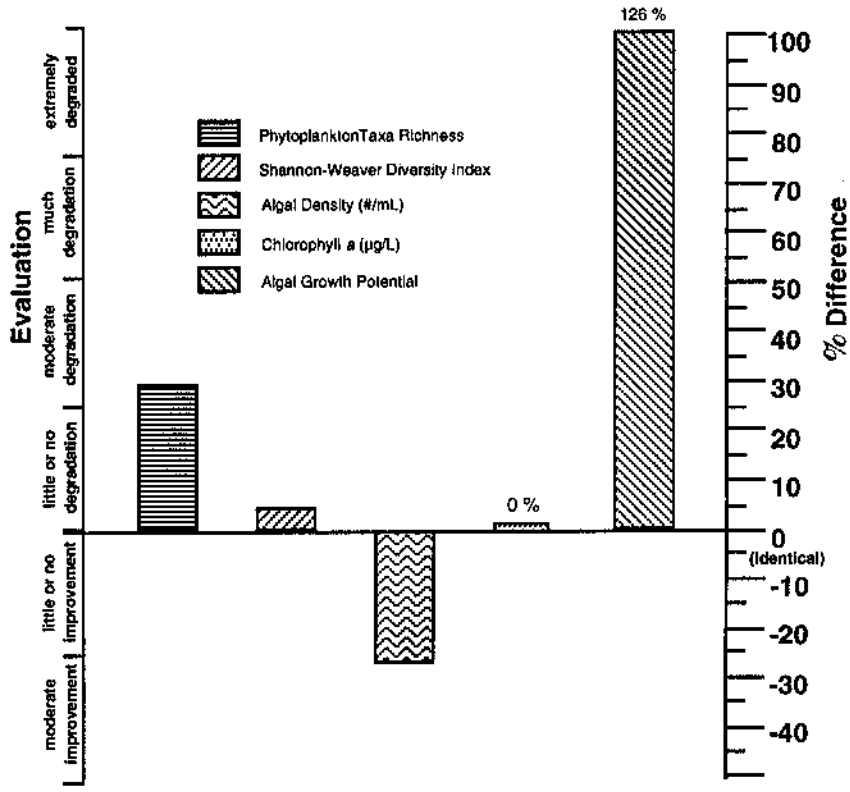


Figure 1. Effect of discharge on the benthic macroinvertebrate community.

Table 1. Effluent permit limits and summary of chemistry data.

City of Plant City W W TP	Effluent Sample	Control Site	Test Site
Organic Constituents (µg/L)			
Atrazine	0.14 I	-	-
Metals (µg/L)			
Aluminum	41 I	-	-
Arsenic	40 U	-	-
Cadium	0.02 U	-	-
Chromium	10 U	-	-
Copper	2.8	-	-
Iron	74	-	-
Lead	0.2 I	-	-
Mercury	0.10 U	-	-
Nickel	7 U	-	-
Selenium	50 U	-	-
Silver	0.05 U	-	-
Zinc	15 I	-	-
Nutrients (mg/L)			
Ortho-phosphate	0.054	0.64	0.46
Total phosphorus	0.084 A	0.76	0.58
Ammonia	0.017 I	0.12	0.079
Nitrite+Nitrate	1.8	0.11	0.49
TKN	0.72 A	0.93	0.86
Total Nitrogen	2.5	1.0	1.4
General Phys-Chem Parameters			
D.O. (mg/L)	10.2	5.2	4.4
pH (SU)	6.7	6.4	7.0
Conductivity (µmhos/cm)	821	195	302
Temperature (°C)	21.3	17.7	18.3
Tot. Residual Chlorine (mg/L)	0.01	-	-
Flow (MGD)	8.0	-	-
Hardness (mg $CaCO_3$)	172.4	-	-
AGP (mg dry wt/L)	49.1	13.1	29.6
Toxicity			
Bioassay Fish	5% Mortality	-	-
Bioassay Invertebrate	No 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

Table 2. Major characteristics of algae community structure of control and test sites.

City of Plant City WWTP	Control Site	Test Site
Phytoplankton Algae		
Number of Taxa	35	25
Shannon-Weaver Diversity	4.1	3.9
Chlorophyll a (µg/L)	1.1 U	1.1 U
Algal Density (#/mL)	1284.7	938.3
% Blue-green	16.2	14.2
% Green	46.9	32.3
% Cryptophytes	13.5	19.7
% Diatoms	13.5	18.9
% Prasinophyceae	6.3	11.9
% Other	3.6	3.2
AGP (mg dry wt/L)	13.1	29.6

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

systems. The effluent had an AGP value of 49.1 mg dry wt/L.

Phytoplankton communities did not reflect the elevated nutrients or AGP values. This may be a result of the flooding or the diversion of the facility's effluent. The control site had more taxa (n = 35) and higher diversity (4.1) than the test site (25 taxa and diversity = 3.9). The algal density was low and chlorophyll *a* was undetected at both sites.

This study did not effectively examine the impacts of the facility's effluent on the receiving waters due to the flooding in the canal and the diversion of the effluent by the facility for approximately 35% of the study period.

Literature Cited

Aquatic Toxicity Information Retrieval Data Base (ACQUIRE). 1991. U.S. EPA Environmental Research Laboratory, Duluth, Mn.

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. U. S. Environ. Prot. Agency, EPA-600/9-78-018. 126 p.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

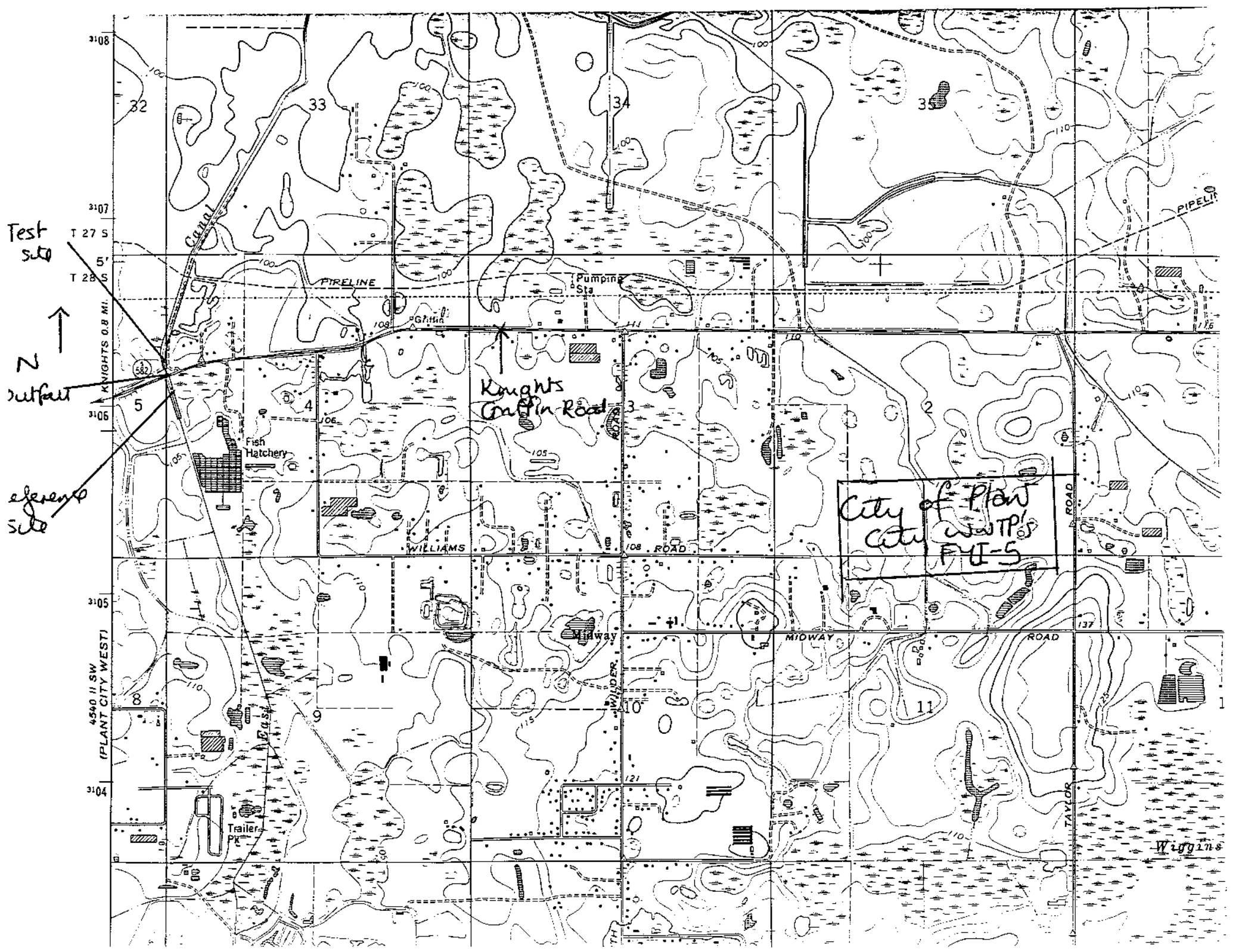
Weber, C. I. 1993. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027F. U. S. EPA, Cincinnati, Ohio. 216 pp.

Typical Values for Selected Parameters in Florida Waters

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

Parameter	Percentile Distribution 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


Test site
N
outfall
effluent site
Knights Griffin Road
City of Plow
WWTP's
FY1-5
T 27 S
T 28 S
KNIGHTS 0.8 MI.
PIPELINE
Pumping Sta
Griffin
Fish Hatchery
WILLIAMS
ROAD
Midway
MIDWAY
ROAD
WILDER
TAYLOR
Trailer Pk
East
Canal
4540 II SW
(PLANT CITY WEST)
Wiggins

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: City of Plant City WWTP		Date Summary Prepared: 2/27/98
Location (attach detailed map):	County: Hillsborough	District: SW District
Federal Permit # and expiration date: FL0026557 2/19/2002	~~State GMS # and~~ State expiration date: 29-264610 2/19/2002	Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: Domestic wastewater treatment and disposal Site

Description of treatment process: This is a type I activated sludge plant w/ screening and degritting, followed by aeration & clarification. Flow is "polished" in a hyacinth treatment pond, then filtered, chlorinated and reaerated and dechlorinated prior to discharge. A portion of the flow is reused and not discharged to surface waters.

Receiving waters: East Canal		Classification: I II (III)
Design Flow: 8.0	Mean Flow: 6.0 MGD, 3 month ADF	Flow during survey: 8.0 MGD (6.0 to surface waters)

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.):

N/A

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

Parameter	Limit (units)
See attachments	

Describe special permit conditions and permit modifications:

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

(Facility)

Description of permitted outfall(s):

Outfall is to East Canal at 25°04' 39" N & 82°07' 22" West, with a short cascade structure prior to entering surface waters.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: Outfall Discharge started 3/1/97, with a 3-month period to achieve compliance. See attached letter for specific violation from 6/1-8/1/97. Additional violations occurred, many attributable to excess rains causing plant upsets. TN and TP violations have occurred in Oct 97-Jan 98, see attached worksheet.

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

New discharge as of 3/1/97

Warning letter issued 9/24/97: negotiations on-going.

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

N/A

Additional information:

Staff contributing to this review (signature):

Andrea Grannon (Biologist)

Joe Gustitus (Inspector)

(Engineer)

( )

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4. **Outfall D002 to the East Canal.** During the period beginning upon placing the new and modified facilities into operation and lasting through the expiration date of this permit, the permittee is authorized to discharge effluent from Outfall D002 to the East Canal north of Knights Griffin Road (County Road 582) east of State Road 39. Such discharge shall be limited and monitored by the permittee as specified below:

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Maximum/Minimum	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow	mgd	Maximum	2.68 (1)	-	-	-	Continuous (2)	RFMT (3)	OUT-02	See Condition I. A. 7.
Carbonaceous Biochemical Oxygen Demand (five day)	mg/L	Maximum	5.0	6.25	7.5	10.0	Daily, 5/wk (2)	FPC - 24 (4)	OUT-02	
Total Suspended Solids	mg/L	Maximum	5.0	6.25	7.5	10.0	Daily, 5/wk (2)	FPC - 24 (4)	OUT-02	See Condition I. A. 13.
Total Nitrogen	mg/L	Maximum	3.0	3.75	4.5	6.0	Daily, 5/wk (2)	FPC - 24 (4)	OUT-02	
Total Phosphorus	mg/L	Maximum	1.0	1.25	1.5	2.0	Daily, 5/wk (2)	FPC - 24 (4)	OUT-02	
Total Residual Chlorine (for dechlorination)	mg/L	Maximum	-	-	-	0.01	Continuous (2)	Meter	OUT-02	
Fecal Coliform Bacteria	See Permit Condition I. A. 9.						Daily,5/wk (2)	Grab	OUT-02	
Dissolved Oxygen	mg/L	Minimum	-	-	-	5.0	Daily,7/wk (2)	Grab	OUT-02	
Whole Effluent Toxicity							Every six months	Three FPC - 24 (4)	OUT-02	See Condition I. A. 12.

(1) Discharge of reclaimed water in excess of the stated flow rate shall be permitted under the following conditions:

(a) In the event of any force majuere, including without limitation, any hurricane, tropical storm, reuse distribution system line breakage, or other extraordinary event beyond the reasonable control of permittee, the permittee shall be allowed to discharge sufficient flow to maintain wastewater facility functionability and operation.

(b) During any period of time that reuse by any year-round industrial or commercial user, including without limitation CF Industries or Lloyd & Rings Nursery, is interrupted due to facility maintenance, construction, emergency or other abnormal operating condition at the industrial or commercial user's facility reduces the combined consumption of such facilities to less than 2.395 mgd, then permittee shall be permitted to discharge to Outfall 002 any such volume not so consumed to OUT-002.

(2) During discharge.

(3) RFMT = Recording Flow Meter and Totalizer.

(4) FPC - 24 = Flow-proportioned composite sample taken during a period of twenty-four hours.

5. Effluent samples shall be taken at the monitoring site locations listed in Permit Conditions I. A. 1. Through I. A. 4. and as described below:

Monitoring Location Site Number	Description of Monitoring Location
PPI-01	Discharge from the clarifiers
PPI-04	Discharge from CCC-1, the chlorine contact chamber between the clarifiers and the polishing pond
OUT-01	Outfall D001 to the Westside Canal
OUT-02	Outfall D002 to the East Canal

6. Hourly measurement of total residual chlorine for disinfection during the period of required operator attendance may be substituted for continuous measurement. [62-601, Figure 2, Footnote 2, 5/31/93]

7. Recording flow meters and totalizers shall be utilized to measure flow and shall be calibrated at least annually. [62-601.200(17) and .500(6), 5/31/93]

8. Basic Level Disinfection. The arithmetic mean of the monthly fecal coliform values collected during an annual period shall not exceed 200 per 100 mL of effluent sample. The geometric mean of the fecal coliform values for a minimum of ten samples of effluent each collected on a separate day during a period of thirty consecutive days (monthly), shall not exceed 200 per 100 mL of sample. No more than 10 percent of the samples collected during a period of thirty consecutive days shall exceed 400 fecal coliform values per 100 mL of sample. Any one sample shall not exceed 800 fecal coliform values per 100 mL of sample. [62-600.440(4)(c), 6/8/93]

9. Intermediate Disinfection. The arithmetic mean of the monthly fecal coliform values collected during an annual period shall not exceed fourteen per 100 mL of effluent sample. The median value of the fecal coliform values for a minimum number of ten samples of effluent each collected on a separate day during a period of thirty consecutive days (monthly), shall not exceed fourteen per 100 mL of sample. No more than 10 percent of the samples collected during a period of thirty consecutive days shall exceed forty-three fecal coliform values per 100 mL of sample. Any one sample shall not exceed eighty-six fecal coliform values per 100 mL of sample. [62-600.440(6)(c),6/8/93]

10. A minimum of 0.5 mg/L total residual chlorine must be maintained for a minimum contact time of fifteen minutes based on peak hourly flow. [62-600.440(4)(b), 6/8/93]

11. Florida water quality criteria and standards shall not be violated as a result of the discharge. [62-600.500, 6/8/93]

12. 12. The permittee shall perform the series of tests described below to evaluate whole effluent toxicity of the discharges. All test species, procedures, and quality assurance criteria used shall be in accordance with the procedures included in the EPA publication entitled Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA/600/4-91/002, Third Edition, July 1994, or the most current edition. The publication as described above is referred to as "EPA Chronic Toxicity" and the reference shall mean the most current edition of the publication. The control and dilution water will be moderately hard water as described in Table 3 of Section 7.2.3 in EPA Chronic Toxicity. A standard reference toxicant quality assurance chronic toxicity test shall be conducted concurrently with each species used in the toxicity tests, and the results submitted with the bioassay report. Additionally, monthly QA/QC reference toxicant test results must be submitted. Any deviation from the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Nettie Draughon, City Manager
City of Plant City
1802 West Spooner Drive
Plant City, FL 33566-9288

September 24, 1997
Hillsborough County

PC
~~PC2~~
PC3

WARNING LETTER NUMBER WL97-0021DW29SWD

Re: City of Plant City WWTP / Permit No. FL0026557

MODS from 10/31 mtng

Dear ~~Ms. Draughon~~ Nettie:

Inspections conducted of the referenced facility on April 29, and July 30, 1997, by Department personnel and a review of the information on file indicates that a violation of Chapter 403 [and/or Chapter 376], Florida Statutes, and the rules promulgated thereunder may exist at the above described facility. Department personnel observed the following:

1. The effluent is not in compliance with the limits imposed by the permit.

1. Permit exceedances reported on the June discharge monitoring report ("DMR") for effluent discharged to the public-access reuse system are as follows:
   a. Fecal Coliform single sample limit of 25 cts/100ml: 6/2 - 245; 6/9 - 58; 6/13 - 60. ✓
   b. The minimum TRC of 1.0 mg/l was not met on eight separate days in June. 6 days
   c. The single sample limit of 5 mg/L for TSS: 6/23 - 5.2; 6/26 - 5.5; 6/27 - 11.5; 6/29 - 5.5. ✓

2. Permit exceedances reported on the June DMR for effluent discharged to the East Canal are as follows:
   a. The single sample limit of 5 mg/L for TSS: 6/24 - 16.3. ✓
   b. Fecal Coliform single sample limit of 86 cts/100ml: 6/2 - 282; 6/4 - 150; 6/5 - 580; 6/13 - 600; ✓ 6/19 - 280; 6/23 - 580; 6/25 - 350.
   c. The monthly and annual limit for fecal coliform of 14 cts/100ml was exceeded with averages of 59 and 18.3.

3. Permit exceedances on the July DMR for the effluent discharged to the East Canal are as follows:
   a. Fecal Coliform, at the DRF, single sample limit of 86 cts/100ml: 7/4 - 1210; 7/9 - 2400; 7/10 - 360; 7/11 - 6000; 7/16 - 2100; 7/17 - 500; 7/18 - 200; 7/22 - 1200; 7/25 - 130; 7/30 - 90. ✓
   b. The maximum TRC of 0.01 mg/l at the DRF was not met on three separate days in July. 2 days

c. The monthly and annual limit for fecal coliform of 14 cts/100ml was exceeded with averages of 165 and 47.6. ✓

4. Permit exceedances reported on the July DMR for effluent discharged to the public-access system are as follows:
   a. The minimum TRC of 1.0 mg/l was not met on six separate days in July. delete
   b. The single sample limit of 5 mg/L for TSS: 7/31 - 6.2. ✓

5. From abnormal events reported to the DEP for the discharge to the East canal:
   a. Fecal Coliform single sample limit of 86 cts/100ml: 8/6 - 190; 821 - 25,700; 8/22 - 160. ✓
   → b. Fecal Coliform single sample limit of 86 cts/100ml: 9/2 - 200; 9/3 - 180. ✓

2. The sampling schedule and collection method imposed in the permit has not be followed.

1. None of the composite samplers were set to take flow-proportioned composites. no change, but fixed
2. All strainers for the composite samplers were attached to the side walls. no change, but fixed
3. Numerous samples were not collected for June and July as required by the permit. no change, but fixed

3. Proper calibration of equipment used for compliance purposes is not being maintained.

1. The in-line meters (Chlorine, pH and Turbidity) must be calibrated with standards weekly, with the procedure and results documented. The meters are only checked daily against another meter. no change, but fixed
2. The influent flow meter had not been calibrated for over a year. no change, but fixed
3. The flow meter for the discharge to the East Canal has not been recording properly. A calibration has been requested previously, but never submitted. no change, but fixed

4. The Operating Protocol for the public-access reuse system is not being followed.

1. The in-line turbidity meter was not in service, as required by the approved operating protocol. Days in which the equipment was reported or found off line off line are 6/8 and 7/31. However, reclaimed water was being sent to the public-access reuse system. no change
2. The in-line chlorine analyzer was not in service, as required by the approved operating protocol. Days in which the equipment was reported or found off line off line are 6/1 - 4, 6/28/ 6/30, 7/8, 7/15, 7/27. 7/29, 8/1 -4, 8/15, 8/18, 9/5. However, reclaimed water was being sent to the public-access reuse system. no chan

3. It appears that for a given turbidity value above the reject setpoint, a sample is taken and analyzed to confirm a TSS >5 prior to reject. Reject may be delayed in excess of one hour. no change

4. Numerous times reports have been provided showing flow to the reuse system occurred when the total residual chlorine was below 1.0 mg/l or the turbidity was over 2.5 NTUs for over ten minutes, or when either in-line meter was out of service. no change

5. The compliance schedule of the permit issued 2/19/97 was not followed. mod applied for

   1. Section VII. 4. contained a compliance schedule for the pretreatment program; a preliminary draft of the local limits and sewer use ordinance ("SUO") was due to be submitted by June 30, 1997; only the SUO was submitted.

STATUTES AND RULES ALLEGEDLY VIOLATED:

1. To violate or fail to comply with any permit issued by the Department pursuant to its legal authority; 403.161(1)(b), Florida Statutes.

2. To fail to meet the effluent limits imposed for a discharge to a tributary of the Hillsborough River; 403.086(4)(b), Florida Statutes.

3. To fail to calibrate flow meters on an annual basis; Rule 62-601.500(6), Florida Administrative Code ("FAC").

4. To fail to comply with the minimum sampling schedule for sampling and testing parameters at a wastewater treatment plant; Rule 62-601.500(2), FAC.

5. To fail to take flow-proportioned composite samples; Rule 62-601.500(3)(c), FAC.

6. To fail to meet the effluent limits, TSS and fecal coliform, for discharge to a public-access reuse system; Rule 62-610.460(1), FAC.

7. To fail to have continuous monitoring equipment for TRC and turbidity and the failure to properly calibrate the on-line equipment; Rule 62-610.463(2), FAC.

8. To fail to follow an approved operating protocol; Rule 62-610.460(2), FAC.

   To fail to take a representative sample due to the location of the strainers on the composite samplers; Rule 62-160.300(5), FAC and specifically 4.2.4.4 of DER-QA-001/92.

Operation of a facility in violation of state statutes or rules may result in liability for damages and restoration, and the judicial imposition of civil penalties up to $10,000 per violation per day pursuant to Sections 403.141 and 403.161, Florida Statutes. In applying the *Guidelines for Characterizing Domestic Wastewater Violations* to the alleged violations, a penalty in excess of $10,000 has been calculated.

YOU ARE REQUESTED TO CONTACT Joe Squitieri of this office at 744-6100, Extension 309 within 15 days of receipt of this Warning Letter to arrange a meeting with Department personnel to discuss the issues raised in this Warning Letter. You may wish to consult an attorney and to have the attorney attend the meeting with the Department.

PLEASE BE ADVISED that this Warning Letter is part of an agency investigation preliminary to agency action in accordance with Section 120.57(4), Florida Statutes. The purpose of this letter is to advise you of potential violations and to set up a meeting to discuss possible resolutions to any potential violations that may have occurred for which you may be responsible. If the Department determines that an enforcement proceeding should be initiated in this case, it may be initiated by issuing a Notice of Violation or by filing a judicial action in accordance with Section 403.121, Florida Statutes. If the Department issues a Notice of Violation, and you are named as a party, you will be informed of your rights to contest any determination made by the Department in the Notice of Violation. The Department can also resolve any violation through entry into a Consent Order.

Sincerely,

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

cc: Chris Dunn P.E. HCEPC
David York, DEP-Tall. (e mail)
Jennifer Fitzwater, OGC (e mail)
Ed Snipes, DEP-SWD (e mail)
Mike Hickey, DEP-SWD (e mail)

Rain 4 - 3.45 , 1 - 1.82
12 1.0 13 - 2.7 27 - 3.56

Flow exceedences ~~Abv event 6, 7, 8, 9, 13, 18, 19, 21~~, 16?, 31

Dec. 97

TRC deadline 12/29 - 0.44

	TN -	TP -
	12/1 - 6.4	12/1 - 6.9
	12/3 7.0	2 - 3.9
	12/4 7.2	3 - 6.0
	12/5 6.9	4 - 3.8
	12/8 6.4	5 - 2.9
weekly	1st - 6.69 Adj 5.9	8 7.5
monthly	Av - 3.75	9 - 4.7
		10 - 3.2
		11 - 3.0
		12 3.0
		15 8.4
		16 2.9
		17 3.1
		18 2.9
Ann Av Flow - 2.48		19 2.9
(Limit = 2.68)		22 2.3
		23 2.3

Fecals - Annual Av - 30

weekly - ALL 1 - 4.71
8 4.30
15 2.82
22 1.84

monthly Av. 1.25
Annual 1.29

Nov 97

Flows above 8.0 - none

TN		TP	
3	9.56	3	2.47
4	9.85	4	2.54
5	11.15	5	4.03
6	12.89	6	2.88
7	10.98	7	2.5
10	8.06	11	2.5
11	10.14	12	6.85
12	9.28	13	7.64
13	9.44	14	2.22
14	9.67	17	4.08
24	7.39		
~~27~~	~~5.62~~	18	4.27
~~25~~	6.8	19	4.71
		20	4.25
		21	4.35
		24	6.41
		25	6.17
		26	4.38
		27	4.33
		28	4.54

weekly - all 4

monthly - 7.88

weekly - all

monthly - 1.25

Annual - 1.08

TRC - 11/14 - 0.049 (72 mins)
11/22 .15 (10 mins)

Fecal, DOU - 11/7 - 15,000

11/25 - 5,000

Fecal Annual - 33

Fecal ROU 12/26 - 58

Oct

Flow > 8.0 mgd - 3, 4

TSS - D001 -

10/7	17.5
10/8 -	10.8
11 -	6.6
12	7.4
14 -	7.2
16 -	13.7
17 -	6.8
20 -	6.0
21 -	6.8

TP - 1 - 4.22

2	3.52
3	2.12
13	2.17
14	2.24
15	2.05
16	2.99
20	2.37
21	2.05
29	2.61
30	2.16

TN

1	9.88
2	9.56
3	7.2
13	11.89
14	10.37
15	7.88
16	8.68
17	19.74
21 -	9.45
27	7.05
28	6.11
29	8.98
30	6.60
31	6.35

TRC decklor 1 0.71

TRC disinf 1 .8

2 .5

Fecal D002 1 550 Ammonia - 37

2 1400

3 16,000

Fecal R001 monthly - 10

TRC < 1 10/1 - .8 (1 hr)

10/2 .5 (1 hr)

TRC > 0.1 10/1 .708 (12 hrs)

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Plant City WWTP
County:
Contact / District: K. Edwards SW Dist
NPDES Permit #: FL00 26557
LIMS Sample #: 310254 **LIMS Job #:** 1998-03-04-01 (24H)
sample log: 3/6/98 DW

Sample Collection: Date 3/2/98 Time 0919
Test Beginning: Date 3/3/98 Time 1505
Test Ending: Date 3/4/98 Time 13:45
Organism Batch #: 14 **Diluent Batch #:** Well H_2O
Organism Age: 13 days
Test Organism: Cyprinella leedsi

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Temperature range: room 24.0–25.0 °C
incubator 25.0–26.5 °C
Test Number: 2 of 2
Remarks: D = dead, M = missing

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	21.7 @ 21.7	8.2 @ 24.8 °C	98.4 @ 96.3; 981 @ 1005 @ 24.2 °C
24 hr	7.0 @ 7.0; 9.0 @ 9.0	22.1 @ 22.1	8.2 @ 24.9 °C	98.0 @ 96.3; 990 @ 1005 @ 24.5 °C
48 hr	7.0 @ 7.0; 9.0 @ 9.0	22.4 @ 22.4	8.2 @ 25.2 °C	99.6 @ 96.3; 985 @ 1005 @ 25.4 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm))			
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	
Control A	F1	5	5	5	8.0	8.2	~~7.9~~ (B)	25.4	25.7	24.5	7.8	7.5	7.4	255	260	316	(B) 8.3 (FW)
Control B	F2	5	5	5	8.0	8.2	8.3	25.4	25.3	24.5	7.8	7.4	7.5	255	260	273	
Control C	F3	5	5	5	8.0	8.3	8.3	25.4	~~24.5~~ (A)	24.6	7.8	7.4	7.2	255	260	267	(A) 24.5 (FW)
Control D	F4	5	5	5	8.0	8.2	8.2	25.4	25.0	25.3	7.8	7.6	7.2	255	260	~~747~~	290
100% A	F5	5	5	4	7.5	7.9	8.2	25.6	25.3	25.3	8.6	7.6	7.1	770	765	769	
100% B	F6	5	5	5	7.5	7.9	8.2	25.6	25.1	24.8	8.6	7.8	7.5	775	770	774	
100% C	F7	5	5	5	7.5	7.9	8.2	25.6	25.1	24.4	8.6	7.7	7.5	775	770	767	
100% D	F8	5	5	5	7.5	7.9	8.4	25.6	25.7	24.7	8.6	7.7	7.5	725	780	747	
Measured/Loaded by:		MF	MF	FW	MF	MF	DAW	MF	MF	DAW	MF	MF	DAW	MF	MF	DAW	
Recorded by:		MF	MF	FW	MF	FW	FW	MF	FW	FW	MF	FW	FW	MF	FW	FW	

Investigators' Signatures

Marshall Fairclot
[signature]
[signature]

Water Quality Parameters (verified by MF)

Salt Water / (Well Water) / 20% Min Water		Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		0.01		A. Grainger
Lab Total Residual Cl2 (mg/L):	<0.03	.004	DR100	DAW
Alkalinity (mg/L as $CaCO_3$):	120	90	Hach	DAW
Hardness (mg/L as $CaCO_3$):	132	172	Hach	DAW
Total ammonia (mg/L as N):	<0.017	<0.017	Orion	FW

Ammonia Ammonia Ammonia Control Sample

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Plant City WWTP
County:
Contact / District: K. Edwards SW Dist
NPDES Permit #: FL0026557 TLH
LIMS Sample #: 310254 LIMS Job #: 1998-03-04-01
sample log: 3/6/98 DW
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Temperature range: room 24.0-25.0 °C
incubator 23.9-25.4
Test Number: 1 of 2
Remarks: D = dead, M = missing

Sample Collection: Date 3/2/98 Time 0919
Test Beginning: Date 3/3/98 Time 1440
Test Ending: Date 3/4/98 Time 13:45
Organism Batch #: 12 Diluent Batch #: 10
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia

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	21.7 @ 21.7	8.2 @ 24.8 °C	98.4 @ 96.3 981 @ 1005 @ 24.2 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.1 @ 22.1	8.2 @ 24.9 °C	98.0 @ 96.3 990 @ 1005 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.4 @ 22.4	4.2 @ 24.2 °C	996 @ 96.3 985 @ 1005 @ 24.4 °C

(B), B mistake FW

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	A	5	5	5	8.2	~~9.0~~	8.0	22.2		23.6	7.9	~~8.4~~	7.4	165		258
Control B	B	5	5	5		~~4~~	8.0			23.6		7.6	7.6			184
Control C	C	5	5	5			8.1			23.4			7.5			195
Control D	D	5	5	5			8.0			23.2			7.7			201
100% A	A	5	5	5	7.6		8.0	22.6		23.6	8.6		7.4	700		705
100% B	B	5	5	5			8.1			23.5			7.6			794
100% C	C	5	5	5			8.2			23.5			7.5			824
100% D	D	5	5	5			8.3			~~23.4~~ 23.2			~~7.6~~ 7.5			892
Measured/Loaded by:		MF	MF	FW	MF		DAW	MF		DAW	MF		DAW	MF		DAW
Recorded by		MF	MF	FW	MF		FW	MF		FW	MF		FW	MF		FW

Investigators' Signatures
Marshall Faircloth
Tom Mitchell
Don Whitaker

reviewer

form updated 4/01/96

Water Quality Parameters (verified by MF)

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L)			0.01		A. Brainger
Lab Total Residual Cl2 (mg/L)		<0.03	<0.01	DR-100	DAW
Alkalinity (mg/L as $CaCO_3$)		72	90	Hach	DAW
Hardness (mg/L as $CaCO_3$)		90	172	Hach	DAW
Total ammonia (mg/L as N)		<0.017	<0.017	ORION	FW

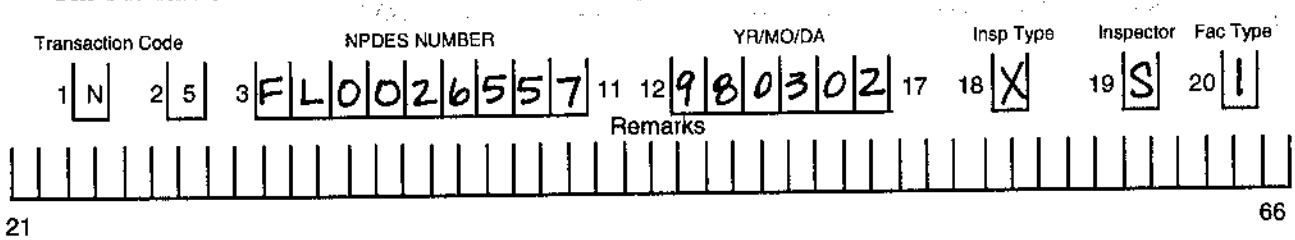
Ammonia Meter #98136 Ammonia Meter Slope: -58.1 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

Phytoplankton taxa list and densities (#/mL) for City of Plant City WWTP, collected via subsurface grabs in East Canal, on 02 March, 1998.

	Control Site	Test Site
Bacillariophyceae		
Cocconeis sp.	12	15
Cyclotella sp.	6	–
Cylindrotheca sp.	6	15
Melosira sp.	69	7
Navicula sp.	6	22
Neidium sp.	6	–
Nitzschia sp.	29	74
Undetermined Pennate diatom	41	44
Chlorophyceae		
Actinastrum sp.	–	7
Chlamydomonas sp.	75	15
Chlorogonium sp.	6	–
Coelastrum sp.	–	7
Cosmarium sp.	6	–
Crucigenia sp.	23	15
Dunaliella sp.	127	7
Euastrum sp.	6	–
Pandorina sp.	6	–
Scenedesmus sp.	272	199
Schroederia sp.	12	–
Selenastrum sp.	–	7
Staurastrum sp.	6	7
Tetraedron sp.	6	7
Tetrastrum sp.	6	7
Undetermined Chlorophyceae	52	22
Chrysophyceae		
Dinobryon sp.	6	–
Mallomonas sp.	12	–
Synura sp.	6	7
Cryptophyceae		
Chroomonas sp.	81	59
Cryptomonas sp.	93	126
Cyanophyceae		
Anabaena sp.	6	–
Dactylococcopsis sp.	133	96
Merismopedia sp.	58	37
Microcystis sp.	12	–
Dinophyceae		

Ceratium sp.	6	–
Euglenophyceae		
Euglena sp.	12	22
Phacus sp.	6	–
Prasinophyceae		
Pyramimonas sp.	75	81
Spermatozoopsis sp.	6	30

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)