

Biological Assessment of

Weathersfield Subdivision Sewage Treatment Plant

Seminole County, Florida

NPDES #FL0025925

Sampled 11 September, 1990

November, 1990

Biology Section
Division of Administrative and Technical Services

Introduction

The Weathersfield Sewage Treatment Plant is located in Altamonte Springs in Seminole County (see map in Appendix). This extended aeration facility has a design capacity of 0.36 MGD. Effluent is discharged into the Little Wekiva River, which is classified as an Outstanding Florida Water. The permit limitations are as follows:

Parameter	DER Permit	NPDES Permit
BOD	30 mg/l	30*
TSS	20 mg/l	20*
Ammonia	1.0 mg/l*	4.6 mg/l*

*monthly average

For the previous 12 month period (annual average flow was 0.21 MGD) no permit violations were apparent.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. An acute screening toxicity test using *Notropis leedsi* as the test organism, was performed on an effluent sample (Peltier and Weber 1985, FDER 1985). A Microtox® test, using the bacterium, *Photobacterium phosphoreum*, to evaluate toxicity, was also performed. Additionally, the effluent was analyzed for organic constituents (base neutrals, acid extractables, and pesticide extractables) metals, and nutrients. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

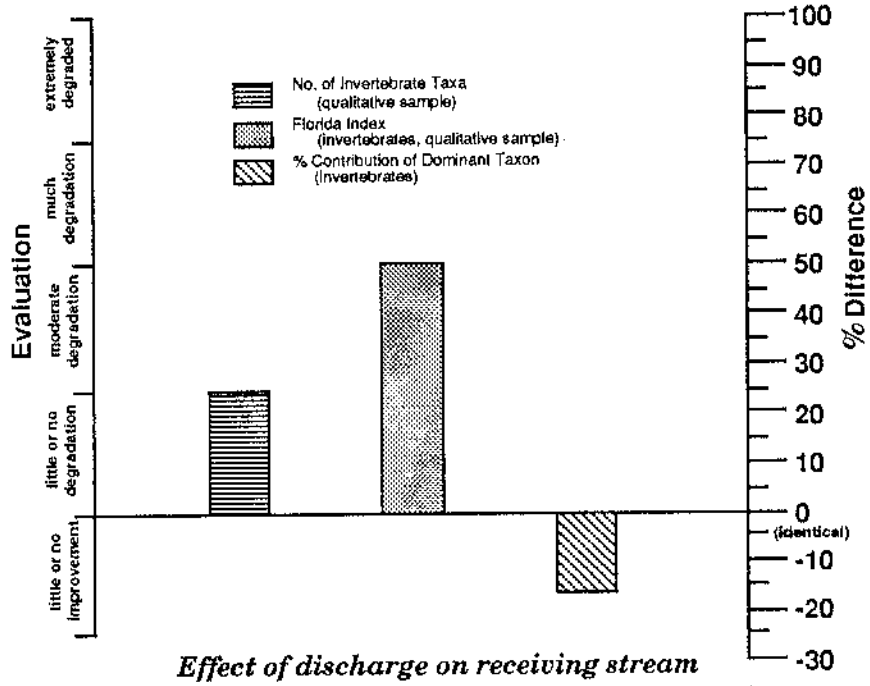
Benthic macroinvertebrate communities were evaluated at a control site (located in the Little Wekiva River, upstream of the discharge) and a test site (also in the Little Wekiva River, downstream of the plant). Collection methods consisted of a timed (one hour per site) multi-substrate (e.g., snags, vegetation, sediment) semi-quantitative effort. A habitat assessment was performed *in situ* to establish comparability between the two sites.

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate community health have been employed. Many of these, such as the number of taxa and the Shannon-Weaver Diversity Index are well known. Others are briefly explained here. 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 (i.e., many clean-water organisms are present). Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually associated with disturbance. Czekanowski's Similarity Index is a multivariate ordination procedure which compares organism abundance and taxonomic structure between sites. The determination of the Quantitative Similarity Index (for taxonomic % contribution) is a two step process. First, the relative proportions of major taxonomic groups are calculated for

Major characteristics of community structure of control and test sites.

Macroinvertebrate Qualitative	Control Site	Test Site
Number of Taxa	24	18
Florida Index	16	8
% Contribution of Dominant Taxon	50.5	42.0
% Pelycepoda	50.5	42.0
% Gastropoda	8.1	25.9
% Malacostraca	3.6	13.0
% Diptera	11.7	6.2
% Trichoptera	3.6	7.4
% Coleoptera	7.2	0.6
% Ephemeroptera	4.5	0.6
% Odonata	3.6	3.7
% Hemiptera	2.7	0.6
% Collector-Filterers	57.7	49.4
% Scrapers	12.6	25.9
% Collector-Gatherers	16.2	14.2
% Predators	9.0	6.8
% Shredders	4.5	3.7



Effect of discharge on receiving stream
(measured as difference between control and test sites).

each site. Then, the lesser of the two percentages for each discrete taxonomic group is totaled. A QSI (% composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (functional feeding groups).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, and the Florida Index are measured as the control site minus test site divided by the control site. The percent difference between sites involving the percent contribution of dominant taxon is measured as the test site minus control site divided by the control site.

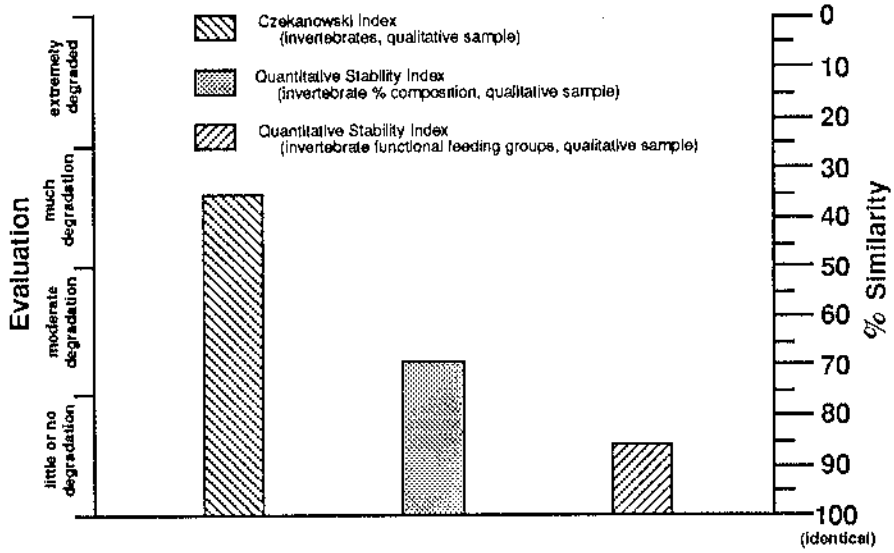
The following personnel were involved in this investigation: Phillip Kane (DER Central District) and Lyn Burton, Russel Frydenborg, Kathleen Lurding, and Sandra McClure (Tallahassee Biology Laboratory).

Results and Discussion

The effluent did not cause mortality to *Notropis leedsi* in the 48 hour static acute toxicity test. Results of the Microtox® test indicated that the discharge was stimulatory to *Photobacterium phosphoreum*.

All organic constituents analyzed for in the effluent were below detection limits (Appendix). The metals cadmium (0.2 µg/l), copper (17 µg/l), and zinc (15 µg/l) were found (Appendix). These levels of cadmium and zinc were not high enough to cause water quality problems. However, in soft water, copper has been shown to be toxic to *Daphnia pulicaria* at a concentration of 16.78 µg/l. Nutrient analysis of the treated wastewater sample indicated high levels of total phosphorus and nitrate-nitrite, at 4.0 mg/l as P and 7.5 mg/l as N, respectively. Ammonia was detected at a concentration of 0.073 mg/l as N (Appendix). While this ammonia level did not violate DER permit limits, it could have caused the stimulatory effect in the Microtox® toxicity test.

Habitat quality at both the control and test sites was identical (Habitat Score = 52, Appendix). All aspects of the physical/chemical characterization were equivalent (Appendix). Flow was similar (approximately 0.17 m/sec) and dissolved oxygen was more than sufficient (9.1 mg/l at mid-depth). Water was basic (pH = 8.7) and conductivity was fairly high at 510 µmho/cm².



Effect of discharge on receiving stream
(measured as similarity between control and test sites).

Measurements of macroinvertebrate community health indicated that the test site was somewhat degraded (Table and Figures). Both sites were dominated by the clam, *Corbicula manilensis*, though the percent contribution of this taxon was slightly lower downstream of the plant. Fewer taxa were collected from the test site (see taxa list in Appendix). Perhaps the most important difference between the two sites was the 50% decrease in the Florida Index. Certain pollution sensitive organisms, e.g., *Pentaneura inconspicua*, *Rheocricotopus robacki*, and *Macromia taeniolata*, were collected upstream but not downstream of the discharge. The two sites were very similar with respect to the functional feeding groups represented (QSI FFG = 86.7%). Similarity was not as great in terms of percent composition (QSI % Comp. = 68.9%), indicating slight impairment. Czekanowski's Similarity Index indicated moderate degradation at 34.6%.

Conclusions

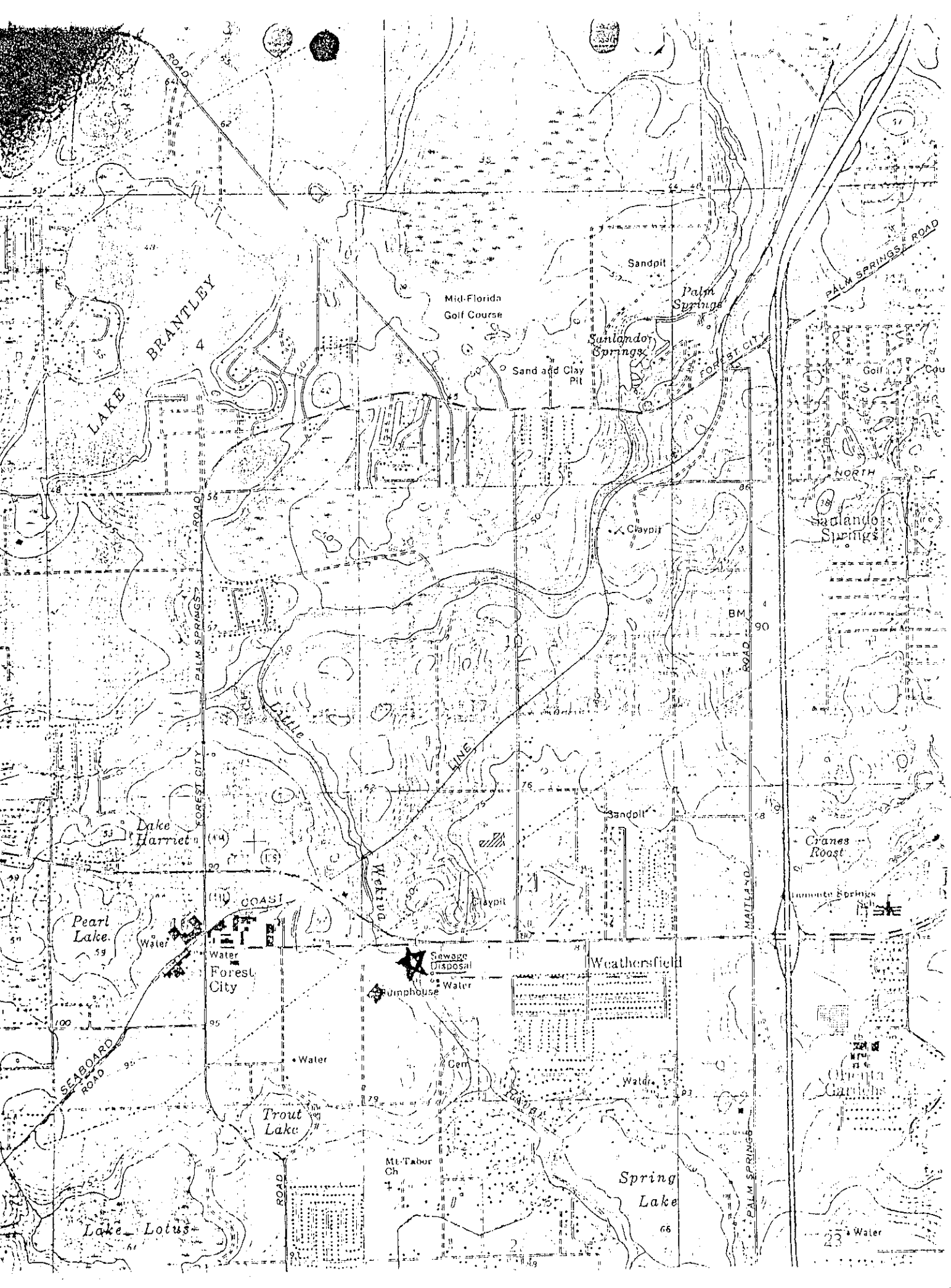
Discharge from the Weathersfield Subdivision Sewage Treatment Plant was found to be causing moderate degradation to the benthic macroinvertebrate community. Certain pollution sensitive organisms were eliminated downstream of the discharge. Nitrate-nitrite and total phosphorus were measured at high levels in the discharge, which could contribute to overabundant algal or macrophyte growth in the Little Wekiva River.

Literature Cited

Florida Department of Environmental Regulation. 1985. Quality assurance manual for performing acute toxicity tests. 2nd edition. Fla. Dept. Environmental Regulation, Biology Section, Tallahassee. 53 pp.

Peltier, W. H. and C. I. Weber. 1985. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 3rd edition. EPA/600/4-85/013. U. S. EPA, Cincinnati, Ohio. 216 pp.

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


Mid-Florida
Golf Course
Sandpit
Palm
Springs
Sanlando
Springs
Sand and Clay
Pit
PALM SPRINGS ROAD
FOREST CITY
LAKE
BRANTLEY
Claypit
Sanlando
Springs
BM
90
PALM SPRINGS
ROAD
LINE
Lake
Harriet
Sandpit
Cranes
Roost
COAST
Pearl
Lake
Water
Forest
City
Wekiva
Claypit
MAITLAND
Sewage
Disposal
Water
Pumphouse
Weathersfield
SEABOARD
ROAD
Water
Cem
Trout
Lake
Spring
Lake
Lake Lotus
Water

DER Biology Sectio Acute Bic ch Sheet

Sample Source: Weatherfield
Address/City:
County:
Contact/District:
NPDES Permit #: **Outfall #:**

Sample C on: Date 9-11-90 Time
Test Beginning: Date 9-12-90 Time 1110
Test Ending: Date 9-14-90 Time 1100
Test Organism: N. seedsi
Life Stage/Age: 1 Day

Test Number: 2 of 2 **Test Type:** Screening | Definitive
Static | Static Renewal | Flow-through

Remarks:

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7@7, 9@9	8.5@24°	1381@24.3	24.1°
24 hr	7@7, 9@9	8.5@24°	1373@23.8	23.3°
48 hr				

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	16	5	5	5	7.6	8.6	8.4	7.8	8.2	8.4	23.0	22.9	22.8			
"	86	5	5	5	7.8	8.5	8.2	7.8	8.2	8.4				239		240
100%	62	5	5	5	8.1	8.0	7.6	8.3	8.5	8.4	24.2	22.8	22.8			
"	174	5	5	5	8.1	8.0	7.8	8.1	8.0	8.4				526		527
Measured/Loaded by:		KHL	MF	MF	SMS	AM	JMF	SMS	AM	JMF	SMS	AM	JMF	SMS	AM	JMF
Recorded by:		KHL	MF	MF	LB	LB	KHL	LB	LB	KHL	LB	LB	KHL	LB	LB	KHL

Investigators' Signatures

Sandy McClure
Marshall Faircloth
KAHLuding

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:					
Alkalinity:					
Hardness:	115				
Total Ammonia:					

Ammonia meter slope:

Phillip N Kane

MICROTOX™ Data Reduction Sheet

SOURCE: Weather Field STP

GRAPH CALC EC _____ (_____ MIN, _____ ° C) = _____ %SAMPLE mg/L

SAMPLE DATA:

SAMPLE TYPE (EFFLUENT, LEACHATE, ETC.):

DATE ASSAYED: 9/12/90 TIME:

VISUAL COLOR: CORRECTION REQUIRED: YES NO

VISUAL TURBIDITY: SEPARATION REQUIRED: YES NO

INITIAL pH: pH ADJUSTED TO: WITH:

OSMOTICALLY ADJUSTED WITH: MOAS (DRY NaCl) OTHER

PRIMARY DILUTION OF SAMPLE:

OPERATOR: BS Cooper REAGENT VIAL LOT NO. M-

REMARKS:

MICROTOX™ TEST

SAMPLE CUVETTE	% SAMPLE	READINGS 5 MIN	READINGS 15 MIN	Γ5	Γ15	NOTES 0
A1	0	124	103			
B1		116	93			60
C1		114	89			153
A2	12.38	135	113			170
B2		122	97		-.103	159
C2		102	54			145
A3	24.75	117	95			149
B3		108	90		.014	148
C3		105	90			148
A4	49.5	134	114			166
B4		131	104		-.10	156
C4		124	100			154
A5	99	134	104			159
B5		122	103		-.10	151
C5		136	117			163
EC_{50} (MIN, ° C)				Stimulatory		

REVIEWED BY:
DATE:

Sample Number: 90-SEP-12-06-01
Sample Location: Weathersfield STP
Field ID: 3&4
Date/Time Collected: 11-SEP-1990 11:50:23.10
Comments:

Sample Status: Authorized by Liang T. Lin
Matrix: Effluent
Storet Station Number:

Sample Number: 90-SEP-12-06-01
Analysis Id: W-ENA

Test status: Authorized by Laura Harrison
Analysis Description: base-neutral-acid water analysis

Storet Number	Analyte	Result	Units
34205	Acenaphthene	10 U	ug/L
34200	Acenaphthylene	10 U	ug/L
39330	Aldrin	10 U	ug/L
34220	Anthracene	10 U	ug/L
34526	Benzo(a)anthracene	10 U	ug/L
34230	Benzo(b)fluoranthene	10 U	ug/L
34242	Benzo(k)fluoranthene	10 U	ug/L
34247	Benzo(a)pyrene	10 U	ug/L
34521	Benzo(g,h,i)perylene	15 U	ug/L
34292	Benzyl butyl phthalate	10 U	ug/L
	a-BHC	10 U	ug/L
39337	b-BHC	10 U	ug/L
39340	d-BHC	10 U	ug/L
	g-BHC	10 U	ug/L
39120	Benzidine	10 U	ug/L
34273	Bis(2-chloroethyl)ether	10 U	ug/L
34278	Bis(2-chloroethoxy)methane	15 U	ug/L
34283	Bis(2-chloroisopropyl)ether	15 U	ug/L
39100	Bis(2-ethylhexyl)phthalate	10 U	ug/L
34636	4-Bromophenyl phenyl ether	10 U	ug/L
34581	2-Chloronaphthalene	10 U	ug/L
34641	4-Chlorophenyl phenyl ether	10 U	ug/L
34320	Chrysene	10 U	ug/L
39310	4,4'-DDD	10 U	ug/L
39320	4,4'-DDE	10 U	ug/L
39300	4,4'-DDT	10 U	ug/L
34556	Dibenzo(a,h)anthracene	15 U	ug/L
39110	Di-n-butyl phthalate	10 U	ug/L
34536	1,2-Dichlorobenzene	10 U	ug/L
34566	1,3-Dichlorobenzene	10 U	ug/L
34571	1,4-Dichlorobenzene	10 U	ug/L
34631	3,3'-Dichlorobenzidine	10 U	ug/L
39380	Dieldrin	10 U	ug/L
34336	Diethylphthalate	10 U	ug/L
34341	Dimethylphthalate	10 U	ug/L
34611	2,4-Dinitrotoluene	10 U	ug/L
34626	2,6-Dinitrotoluene	10 U	ug/L
34596	Di-n-octyl phthalate	10 U	ug/L
34361	Endosulfan-I	10 U	ug/L

Continued

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Cont. from previous page for Sample Number: 90-SEP-12-06-01 Analysis_id: W-ENA

34356	Endosulfan-II	10 U	ug/L
34351	Endosulfan-sulfate	10 U	ug/L
39390	Endrin	10 U	ug/L
34366	Endrin-aldehyde	10 U	ug/L
34376	Fluoranthene	10 U	ug/L
34381	Fluorene	10 U	ug/L
39410	Heptachlor	10 U	ug/L
39420	Heptachlor-epoxide	10 U	ug/L
39700	Hexachlorobenzene	15 U	ug/L
34391	Hexachlorobutadiene	10 U	ug/L
34396	Hexachloroethane	60 U	ug/L
34386	Hexachlorocyclypentadiene	10 U	ug/L
34403	Indeno(1,2,3-cd)pyrene	10 U	ug/L
34408	Isophorone	10 U	ug/L
34696	Naphthalene	10 U	ug/L
34447	Nitrobenzene	10 U	ug/L
34438	N-Nitrosodimethylamine	50 U	ug/L
34428	N-Nitrosodi-n-propylamine	10 U	ug/L
34433	N-Nitrosodiphenylamine	15 U	ug/L
34671	PCB-1016	10 U	ug/L
39488	PCB-1221	10 U	ug/L
39492	PCB-1232	10 U	ug/L
39496	PCB-1242	10 U	ug/L
39500	PCB-1248	10 U	ug/L
39504	PCB-1254	10 U	ug/L
39508	PCB-1260	10 U	ug/L
	PCB-1262	10 U	ug/L
34461	Phenanthrene	10 U	ug/L
34469	Pyrene	10 U	ug/L
39400	Toxaphene	10 U	ug/L
34551	1,2,4-Trichlorobenzene	10 U	ug/L
34462	4-Chloro-3-methyl phenol	15 U	ug/L
34586	2-Chlorophenol	15 U	ug/L
34601	2,4-Dichlorophenol	15 U	ug/L
34606	2,4-Dimethylphenol	15 U	ug/L
34616	2,4-Dinitrophenol	30 U	ug/L
34657	2-Methyl-4,6-dinitrophenol	30 U	ug/L
34591	2-Nitrophenol	15 U	ug/L
34646	4-Nitrophenol	50 U	ug/L
39032	Pentachlorophenol	15 U	ug/L
34694	Phenol	15 U	ug/L
34621	2,4,6-Trichlorophenol	15 U	ug/L

Comments (1):
(2):
(3):
(4):
(5):
(6):

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N/A - Not applicable NR - Not requested

Sample Number: 90-SEP-12-07-01 Sample Status: Authorized by Tim Fitzpatrick
Sample Location: Weathersfield SIP Matrix: Fresh Surf Water
Field ID: #7 Storet Station Number:
Date/Time Collected: 11-SEP-1990 11:50:34.65
Comments:

Sample Number: 90-SEP-12-07-01 Test status: Authorized by Jack Merritt
Analysis Id: HG-H-W Analysis Description: Mercury by cold vapor using hydride sys.-water

Storet Number	Analyte	Result	Units
71900	Mercury	.2 U	ug/L

Sample Number: 90-SEP-12-07-01 Test status: Authorized by Jack Merritt
Analysis Id: CD-G-W Analysis Description: Cadmium by graphite furnace for water saple

Storet Number	Analyte	Result	Units
01027	Cadmium	0.2	ug/L

Sample Number: 90-SEP-12-07-01 Test status: Authorized by Tim Fitzpatrick
Analysis Id: W-ICP-23 Analysis Description: ICP multielement analysis for water samples

Storet Number	Analyte	Result	Units
01106	Aluminum	100 U	ug/L
01002	Arsenic	NR	ug/L
01097	Antimony	NR	ug/L
01007	Barium	NR	ug/L
01012	Beryllium	NR	ug/L
01027	Cadmium	NR	ug/L
00916	Calcium	NR	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	NR	ug/L
01042	Copper	17	ug/L
01045	Iron	NR	ug/L
01051	Lead	15 U	ug/L
00927	Magnesium	NR	mg/L
01055	Manganese	NR	ug/L
01067	Nickel	5 U	ug/L
00937	Potassium	NR	mg/L
01147	Selenium	NR	ug/L
01077	Silver	NR	ug/L
00929	Sodium	NR	mg/L
01082	Strontium	NR	ug/L
01059	Thallium	NR	ug/L

Continued

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Cont. from previous page for Sample Number: 90-SEP-12-07-01 Analysis_id: W-ICP-23

01087	Vanadium	NR	ug/L
01092	Zinc	15 A	ug/L

Sample Number: 90-SEP-12-07-02
Sample Location: Weathersfield STP
Field ID: #8
Date/Time Collected: 11-SEP-1990 11:50:34.65
Comments:

Sample Status: Authorized by Tim Fitzpatrick
Matrix: Field Blank
Storet Station Number:

Sample Number: 90-SEP-12-07-02
Analysis Id: HG-H-W

Test status: Authorized by Jack Merritt
Analysis Description: Mercury by cold vapor using hydride sys.-water

Storet Number	Analyte	Result	Units
71900	Mercury	0.2 U	ug/L

Sample Number: 90-SEP-12-07-02
Analysis Id: CD-G-W

Test status: Authorized by Jack Merritt
Analysis Description: Cadmium by graphite furnace for water saple

Storet Number	Analyte	Result	Units
01027	Cadmium	0.2 U	ug/L

Sample Number: 90-SEP-12-07-02
Analysis Id: W-ICP-23

Test status: Authorized by Tim Fitzpatrick
Analysis Description: ICP multielement analysis for water samples

Storet Number	Analyte	Result	Units
01106	Aluminum	100 U	ug/L
01002	Arsenic	NR	ug/L
01097	Antimony	NR	ug/L
01007	Barium	NR	ug/L
01012	Beryllium	NR	ug/L
01027	Cadmium	NR	ug/L
00916	Calcium	NR	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	NR	ug/L
01042	Copper	5 U	ug/L
01045	Iron	NR	ug/L
01051	Lead	15 U	ug/L

Continued

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N/A - Not applicable NR - Not requested

Sample Number: 90-SEP-12-08-01
Sample Location: Weathersfield SIP
Field ID: #9
Date/Time Collected: 11-SEP-1990 11:50:03.81
Comments:

Sample Status: Authorized by Yuh-Hsu Pan
Matrix: Fresh Surf Water
Storet Station Number:

Sample Number: 90-SEP-12-08-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TP Analysis Description: Analysis for total phosphorus in water

Storet Number	Analyte	Result	Units
00665	Total Phosphorus	4.0	mg P/L

Sample Number: 90-SEP-12-08-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TKN Analysis Description: TKN for water sample

Storet Number	Analyte	Result	Units
00625	N KJEL TOT	1.5	mg N/L

Sample Number: 90-SEP-12-08-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NO2NO3 Analysis Description: Analysis for nitrite+nitrate in water

Storet Number	Analyte	Result	Units
00630	NO2NO3-N	7.5 A	mg N/L

Sample Number: 90-SEP-12-08-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NH3 Analysis Description: Analysis for ammonia in water

Storet Number	Analyte	Result	Units
00610	Ammonia-N	0.073 A	mg N/L

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N/A - Not applicable NR - Not requested

STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

Benthic Habitat Assessment Field Data Sheet

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 09/11/90	RECEIVING BODY OF WATER: LITTLE WEKIVA RIVER

REMARKS: FOER PERMIT # DO 59 71649 NPDES PERMIT # FL0025925	LOCATION: WEATHERSFIELD STP	FIELD ID/NAME:

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover **18**	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. 16-20 points	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. 11-15 points	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. 6-10 points	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. 0-5 points
Flow/ Water Velocity **18**	Greater than 0.3 m/sec. 16-20 points	0.1 to 0.3 m/sec 11-15 points	0.05 to 0.1 m/sec 6-10 points	Less than 0.05 m/sec 0-5 points
Channel Alteration & Sediment Effects **3**	No channelization, Less than 5% of bottom affected by deposition or scouring. 12-15 points	Some channelization, Evidence of deposition in pools or scouring in 5-20% of bottom. 8-11 points.	Moderate channelization. Sediment deposition or scouring in 30-50% of bottom. 4-7 points.	Extensive channelization. Siltation and sediment deposition or scouring in 50% or more of bottom. 0-3 points.
Bank Stability **4**	Stable. No evidence of erosion or bank failure. Little potential for future problems. 9-10 points.	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 6-8 points.	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 3-5points.	Unstable. Many raw, eroded areas. Obvious bank sloughing. 0-2 points.
Riparian Zone Vegetation Quality **9**	Over 80% of streambank surfaces consist of native plants, classified as: A. bottomland hardwoods, B. understory shrubs, or C. non-woody macrophytes. 9-10 points	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. 6-8 points	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. 3-5 points	Less than 25% of streambank sufaces are vegetated. Poor plant community (e.g. grass monoculture) present. 0-2 points.
Total score **52**	Comments:			

ANALYSIS DATE:	ANALYST:	SIGNATURE:
09/11/90	PHILIP N. KANE, Ed.D.	Philip N. Kane, Ed.D.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 09/11/90	RECEIVING BODY OF WATER: LITTLE WEKIVA RIVER

REMARKS: FDER PERMIT # DO59 71649 NPDES PERMIT # FL0025925	LOCATION: WEATHERSFIELD STP	FIELD ID/NAME: UP & DOWNSTREAM OF DISCHARGE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other
10			80	10		

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

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

Point-Source Pollution (list location and describe):

WEATHERSFIELD STP DISCHARGE

Estimated Stream Width (range, m):	3.5M	Estimated Stream Depth (range, m):	0.5 to 1.0+/-	yes
High Water Mark (m above bed):	1.0M	Velocity (range, m/s):	1M/6/S	Impounded ☐ Channelized ☐

Canopy Cover % (check box): Open: ☐ Lightly Shaded: ☑ Moderately Shaded: ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☑ Shell: ☐ Other: ☐

Substrate Types (estimated % surface coverage):

Limestone:		Sand/Silt/Clay Mix:	
Consolidated Clay:		Clay/Silt (inorganic):	
Gravel/Shell		Coarse Organic Debris:	
Sand:		Mud/Muck (organic):	

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):		
Top			Secchi Depth (m):	
Mid-depth	26.5	9.1	pH (SU):	8.7
Bottom			Conductivity (µmho/cm):	510
			Other Parameters:	

Stream Type (check box): Blackwater: ☐ Deep Aquifer Fed: ☐ Surficial Aquifer Fed: ☑ Alluvial: ☐ Other: ☐

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

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

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

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

Weather Conditions: HAZY SUN

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

ANALYSIS DATE:	ANALYST:	SIGNATURE:
09/11/90	PHIL N. KANE, EdD	Philip N. Kane

APPENDIX

Macroinvertebrate taxa list for Weathersfield Subdivision Sewage Treatment Plant, Seminole County, Fla., collected September 11, 1990.

	Control Site	Test Site
Coleoptera		
Dineutes serrulatus serrulatus	+	–
Dineutus sp.	+	+
Stenelmis sp.	+	–
Diptera		
Cricotopus/Orthocladius grp. sp.	+	–
Cryptochironomus fulvus grp.	–	+
Glyptotendipes lobiferus	–	+
Goeldichironomus holoprasinus	–	+
Pentaneura inconspicua	+	–
Polypedilum convictum grp.	+	+
Polypedilum halterale grp.	+	–
Polypedilum illinoense	+	–
Polypedilum scalaenum	–	+
Pseudochironomus fulviventris	+	–
Rheocricotopus robacki	+	–
Stenochironomus hilaris	+	+
Ephemeroptera		
Baetis sp.	+	–
Caenis diminuta	+	+
Stenacron interpunctatum	+	–
Gastropoda		
Melanoides turricula	+	+
Physella heterostropha pomila	–	+
Hemiptera		
Rheumatobates hungerfordi	+	+
Malacostraca		
Hyalella azteca	+	+
Palaemonetes paludosus	+	–
Procambarus fallax	–	+
Odonata		
Argia sedula	+	+
Enallagma sp.	+	–
Gomphus plagiatus	–	+
Hetaerina titia	–	+
Macromia taeniolata	+	–
Oligochaeta		
Limnodrilus hoffmeisteri	+	–
Pelycepoda		
Corbicula manilensis	+	+
Trichoptera		
Cheumatopsyche sp.	+	+
TOTAL	24	18

Department of Environmental Regulation

Results of Fifth Year Inspections

Discharger: Weathersfield Sewage Treatment Plant
County: Seminole
NPDES Number: FL0025925
State Permit Expiration Date:

Toxics Sampling Inspection (XSI)

Date Sampled: 9-11-90
Results: Cadmium 0.2 µg/l, Copper 17 µg/l, Zinc 15 µg/l

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 9-11-90
Results: No toxicity to *Notropis leedsi*

Impact Bioassessment Inspection (IBI)

Date Sampled: 9-11-90
Results: High concentrations of NO_2NO_3 and Total PO_4, which could cause algal blooms; macroinvertebrate community somewhat degraded.

Water Quality Inspection (WQI)

Date Sampled:
Results:

These fifth year inspections provide the necessary information to evaluate the facility's impact on its receiving waters and to provide specific condition recommendations for permit renewal to resolve any concerns.