

Biological Assessment of

City of Palatka Sewage Treatment Plant

Putnam County

NPDES #FL0040061

Sampled August 1992

December 1992

Biology Section
Division of Technical Services

Department of Environmental Regulation
Results of Fifth Year Inspections

Discharger: City of Palatka Sewage Treatment Plant
County: Putnam
NPDES Number: FL0040061
State Permit Expiration Date: 28 June 1993

Toxics Sampling Inspection (XSI)

Date Sampled: 24 August 1992

Results: No organic constituents were detected in the effluent, although the concentrations of both silver (0.3 µg/L) and copper (59 µg/L) in the discharge exceeded Class III standards. Hardness was 166 mg/L).

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 24 August 1992

Results The effluent sample was not acutely toxic to the fish, *Notropis leedsi.* The *Ceriodaphnia dubia*, bioassay was invalidated due to excessive control mortality.

Impact Bioassessment Inspection (IBI)

Date Sampled: 24 August 1992

Results: Macroinvertebrate communities were moderately degraded at both test sites. In dip net samples, taxa richness and Florida Index were both reduced in excess of 25% at the two study sites, compared to the control. Periphyton communities did not appear adversely affected by the Palatka WWTP discharge, with the exception of the increased % contribution of dominant taxon and chlorophyll *a* at test site 2. Phytoplankton communities at all three of the St. Johns River study sites were typical of eutrophic waters, with populations of over 90% blue-greens and high chlorophyll *a* levels.

Water Quality Inspection (WQI)

Date Sampled: 24 August 1992

Results: While effluent concentrations of nitrate-nitrite (9.4 mg/L), and phosphorus (both ortho and total = 1.4 mg/L) were elevated, no nutrient enrichment was observed at the test sites. Results of algal growth potential tests indicated that water from all three sites was below the eutrophication threshold. Fecal coliform levels were well within Class III standards in the effluent and at the study sites. Standards for total coliform bacteria were violated at the reference site and at Test Site 2, but not due to the Palatka STP.

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

Introduction

The City of Palatka Sewage Treatment Plant is a 3.0 MGD domestic wastewater treatment facility located in Putnam County (see maps in Appendix). The activated sludge/contact stabilization treatment system consists of screening, grit removal, one primary clarifier, two aeration tanks, two secondary clarifiers, chlorination, two anaerobic digesters, and a gravity thickener. The final effluent is discharged through a pipeline to the St. Johns River, where it enters this Class III waterway near mid-channel (see map in Appendix). The facility does not have a mixing zone. During this survey, the discharge from the facility exceeded the design flow by 0.15 MGD.

State permit limits are as follows: flow (monthly average of 3.0 MGD), BOD (monthly average of 30 mg/L, annual average of 20 mg/L), TSS (monthly average of 30 mg/L, annual average of 20 mg/L), organic nitrogen (monthly average of 5 mg/L), ammonia (monthly average of 20 mg/L), pH (6 to 8.5), fecal coliform (monthly average of 200 organisms/100 mL), chlorine residual (minimum of 0.5 mg/L, maximum of 1.0 mg/L), and dissolved oxygen (minimum of 2.0 mg/L). NPDES permit limits are similar (see Facility Summary in Appendix).

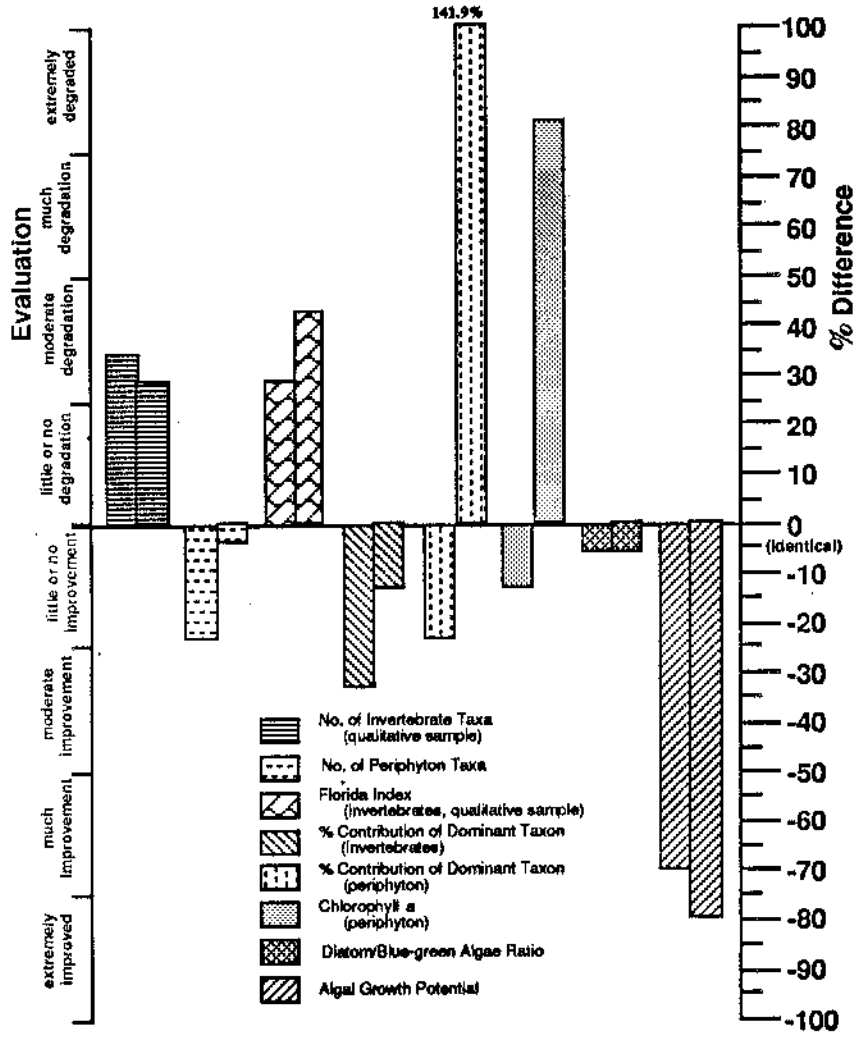
During the past two years, problems with the plant have been documented, including many failures to report permit parameters, exceeding limits for effluent flow, and failure to install a de-chlorination system. Enforcement action by both the EPA and the Northeast District Office is underway.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in the St. Johns River, approximately two miles upstream of the discharge) and two test sites bracketing the tidally influenced flow from the discharge (Test Site 1 was located about 200 m upstream of the discharge, Test Site 2 was located

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site 1	Test Site 2
Macroinvertebrate Qualitative			
Number of Taxa	39	26	28
Florida Index	14	10	8
% Contribution of Dominant Taxon	21.4	14.3	18.8
% Gastropoda	29.7	5.5	22.8
% Ephemeroptera	3.1	5.5	17.8
% Malacostraca	25.2	13.2	16.8
% Trichoptera	4.6	3.5	6.9
% Acarina	2.7	6.6	1.0
% Diptera	29.0	64.8	27.7
% Other	5.7	1.2	7.0
% Parasites	0	0	3.5
% Shredders	3.1	4.0	3.5
% Piercers	5.2	1.7	2.6
% Predators	10.1	11.7	15.9
% Collector-Gatherers	38.5	40.9	32.9
% Collector-Filterers	7.6	30.3	5.0
% Scrapers	35.5	11.7	15.9
Phytoplankton Algae			
Number of Taxa	20	25	22
% Contribution of Dominant Taxon	36.9	32.2	35.4
Chlorophyll a (ug/L)	25.3	28.4	20.9
Diatom/Blue-green Abundance Ratio	0.03	0.03	0.05
% Blue-green	93.9	90.8	91.6
% Green	2.7	6.0	3.3
% Diatoms	3.4	3.2	4.8
Periphyton Algae			
Number of Taxa	41	51	43
% Contribution of Dominant Taxon	12.4	9.6	30.0
Chlorophyll a (mg/m2)	30.6	23.2	55.4
Diatom/Blue-green Abundance Ratio	0.63	0.67	0.67
% Blue-green	35.1	30.3	31.8
% Green	4.5	7.6	4.7
% Diatoms	60.4	62.1	63.5
Algal Growth Potential (mg dry wt/l)	2.0	0.6	0.4



Effect of discharge on receiving water
(measured as difference between control and test sites).
(Left bar represents comparison between control site and test site 1; right bar represents comparison between control site and test site 2.)

about 400 m downstream of the discharge) (see maps in Appendix). 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 toxicity bioassays, using *Ceriodaphnia dubia* and *Notropis leedsi* as the 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 effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected from multiple substrates (e.g., snags, leaf packs, vegetation) using discrete dip net sweeps. Additional invertebrate collections were accomplished using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Unfortunately, the Reference Site H-D's were apparently disturbed during the incubation period, as evidenced by the loss of individual replicate samplers from the block. For this reason, dip net samples will be used for this assessment. Periphyton was sampled at reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Chlorophyll *a* was determined for periphyton communities. Phytoplankton was sampled at the reference site and at the test sites via subsurface grabs. Chlorophyll a was also determined for phytoplankton communities (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum*, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed. Many of these, such as the number of taxa and chlorophyll a 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. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillario-

phyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions. The determination of the Quantitative Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for 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 Florida Index, and the diatom to blue-green algae ratio are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the percent contribution of dominant taxon, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Scott Bulgrin (DER Northeast District), and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Kathleen Lurding, and Kim Pearce (Tallahassee Biology Laboratory).

Results and Discussion

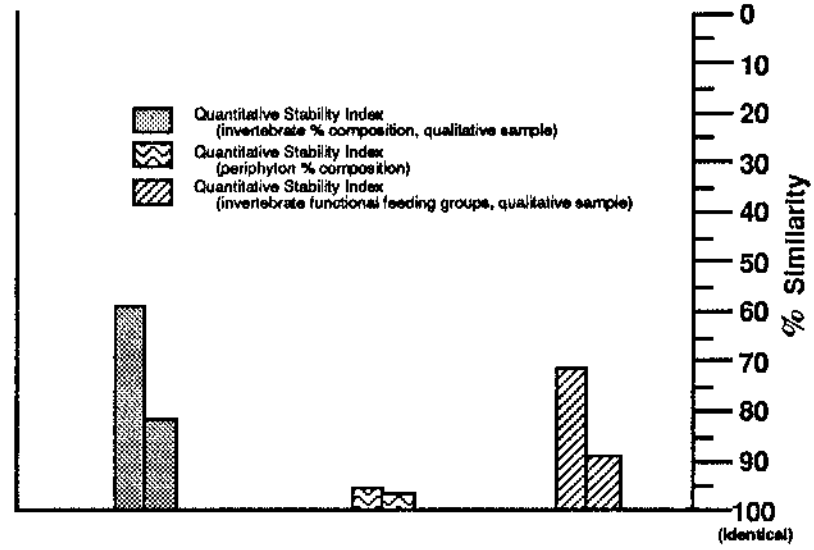
The study area (St. Johns River) is an unusual river system, in that it originated as a coast-parallel lagoon, is low gradient, very wide (300 to 400 m), and flows from south to north (Appendix). Although some land is used for residential and agricultural purposes in the area, the majority of the land cover consists of hydric hammocks, hardwood swamps, and pine flatwoods. All study sites were identical in terms of habitat quality scores (with 71 points). Most field parameters were similar between the reference and test sites (*e.g.*, conductivity was between 1180 µmhos/cm and 1200 µmhos/cm, dissolved oxygen ranged from 6.5 mg/L to 6.7 mg/L, and temperature was 30 °C at all sites). However, pH increased from 7.0 at the reference site to 8.0 at Test Site 2 and 8.1 at Test Site 1.

The full strength effluent sample was not acutely toxic to the fish, *Notropis leedsi*. The bioassay performed on the water flea, *Ceriodaphnia dubia*, was invalidated due to excessive control mortality.

No organic constituents were detected in the effluent, although the following metals were found above quantitation limits: aluminum (83 µg/L), iron (110 µg/L), copper (59 µg/L), silver (0.3 µg/L), and zinc (50 µg/L). At a hardness of 166 mg/L (measured in the effluent), the Class III copper standard is 18.2 µg/L. The Class III silver standard is 0.07 µg/L. Therefore, the concentrations of both silver and copper in the Palatka WWTP effluent exceeded Class III standards.

While effluent concentrations of nitrate-nitrite (9.4 mg/L), and phosphorus (both ortho and total = 1.4 mg/L) were elevated, no nutrient enrichment was observed at the test sites. In fact, with the exception of TKN, nutrients were near or below detection limits at all three stations studied. The TKN levels in the St. Johns River (1.1 mg/L to 1.3 mg/L) were unremarkable.

Results of algal growth potential tests indicate that water from all three sites was below the eutophication threshold. The AGP measured



Effect of discharge on receiving water (measured as similarity between control and test sites).
(Left bar represents comparison between control site and test site 1; right bar represents comparison between control site and test site 2.)

at the reference site (2.0 mg dry wt/L) was higher than the AGP's of the test sites (0.4 mg dry wt/L to 0.6 mg dry wt/L).

Fecal coliform levels were well within Class III standards in the effluent and at the reference and test sites. Standards for total coliform bacteria were violated only at the reference site (9000 organisms/100 mL) and at Test Site 2 (2400 organisms/100 mL). These results indicate sources other than the Palatka WWTP for the elevated total coliforms.

Measurements of macroinvertebrate community health suggested that biota at test sites experienced moderate degradation. The figure on p. 2 indicates the degree of difference between the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. The figure on p. 3 summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

In dip net samples, taxa richness and Florida Index were both reduced in excess of 25% at the two test sites, compared to the control. This suggests a moderate disturbance in the vicinity of the outfall. The test sites, however, were not dominated by taxa reported to be particularly pollution tolerant, and in terms of trophic relationships, the biota there were not too dissimilar from the control. Although Hester-Dendy samplers were physically disturbed at the reference site (rendering direct comparisons moot), it is noteworthy that Shannon-Weaver diversities calculated for the test sites were not unusually low (2.9 and 3.1) for the St. Johns system.

Periphyton communities did not appear adversely affected by the Palatka WWTP discharge, with the exception of the % contribution of dominant taxon and chlorophyll *a* at test site 2. *Nitzschia palea*, a diatom that thrives under oligotrophic or eutrophic conditions, was the dominant taxon at test site 2, making up 30% of the population. The periphyton chlorophyll *a* measured at test site 2 (55.4 mg/m^2) was higher than approximately 90% of other rivers, suggesting moderate eutrophication. This effect may possibly be explained by station location. Test site 2 was located downstream of the discharge, which receives effluent on an outgoing tide. It is possible that the nutrient-rich effluent plume, at times, influenced this area during the periphytometer's 28 day incubation period, although nutrient enrichment was not found in grab samples taken upon sampler retrieval. This may account for the increased chlorophyll *a* and % dominance at test site 2.

It should be noted that phytoplankton communities all three of the St. Johns study sites were typical of eutrophic waters. Symptoms of eutrophication include: phytoplankton populations consisting of over 90% blue-greens and chlorophyll *a* levels of between 20.9 µg/L and 28.4 µg/L in free water samples (which are greater than 85% of other Florida streams).

Conclusions

The full strength effluent sample was not acutely toxic to the to the fish, *Notropis leedsi*. The bioassay performed on the water flea, *Ceriodaphnia dubia*, was invalidated due to excessive control mortality.

No organic constituents were detected in the effluent, although the concentrations of both silver and copper in the Palatka WWTP effluent exceeded Class III standards.

While effluent concentrations of nitrate-nitrite (9.4 mg/L), and phosphorus (ortho and total both = 1.4 mg/L) were elevated, no nutrient enrichment was observed at the test sites. Results of algal growth potential tests indicate that water from all three sites was below the eutrophication threshold.

Fecal coliform levels were well within Class III standards in the effluent and at the reference and test sites. Standards for total coliform bacteria were violated only at the reference site and at Test Site 2. These results indicate sources other than the Palatka WWTP for the elevated total coliforms.

Measurements of macroinvertebrate community health suggested that biota at test sites experienced moderate degradation. In dip net samples, taxa richness and Florida Index were both reduced in excess of 25% at the two test sites, compared to the control. This suggests a moderate disturbance in the vicinity of the outfall, potentially related to the metals found in the effluent.

Periphyton communities did not appear adversely affected by the Palatka WWTP discharge, with the exception of the % contribution of dominant taxon and chlorophyll a at test site 2. Test site 2 was located downstream of the discharge, which receives effluent at an outgoing tide. It is possible that the nutrient-rich effluent plume, at times, influenced this area during the periphytometer's 28 day incubation period, although nutrient enrichment was not found in grab samples taken upon sampler retrieval. This may account for the

increased chlorophyll *a and % dominance at test site 2.*

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Literature Cited

American Public Health Assoc., American Water Works Assoc., and Water Pollution Control Federation. 1989. Standard Methods for the Examination of Water and Wastewater, 17th ed. New York, N.Y. 1268 p.

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.

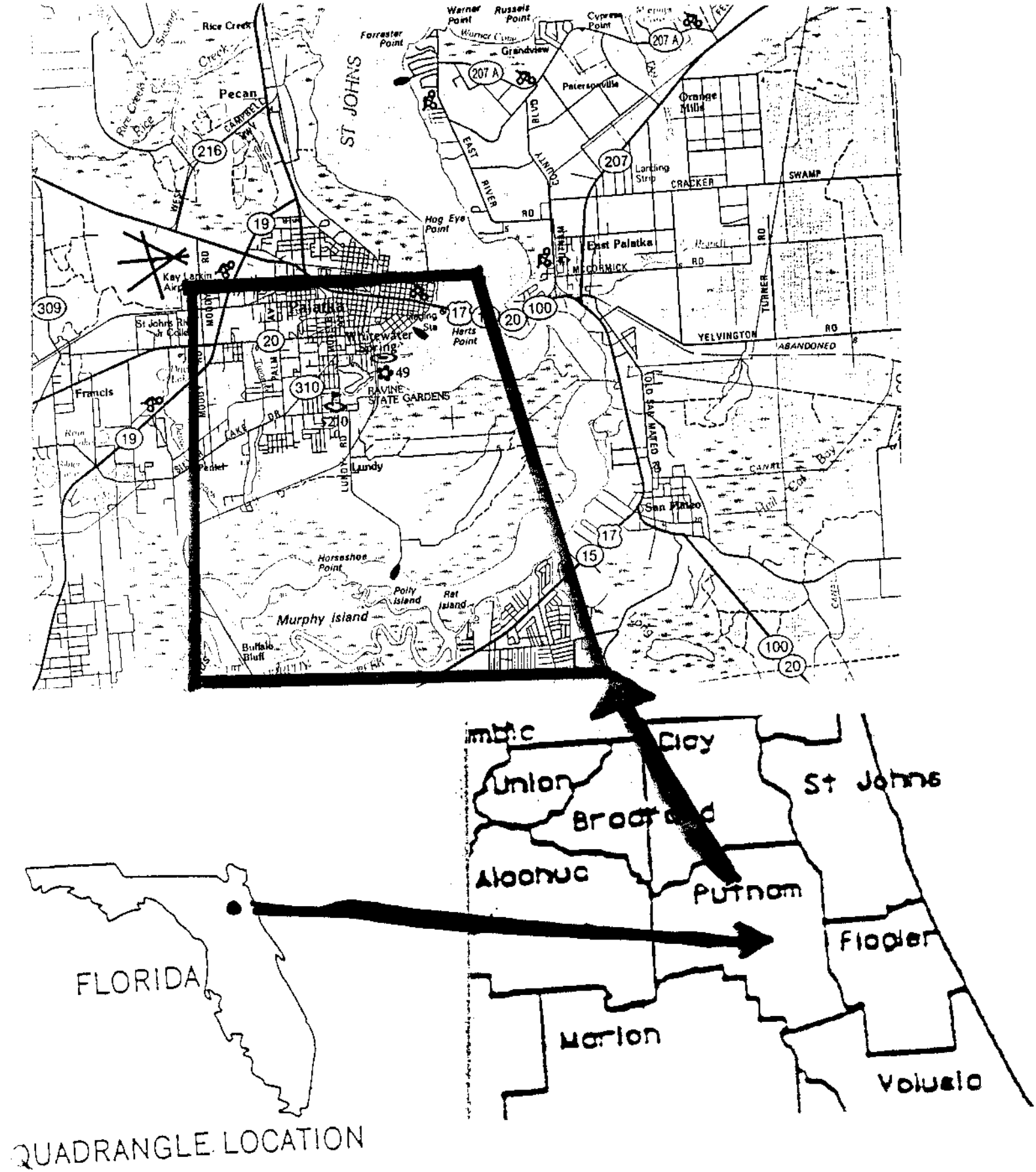
Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

Weber, C. I. 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 p.

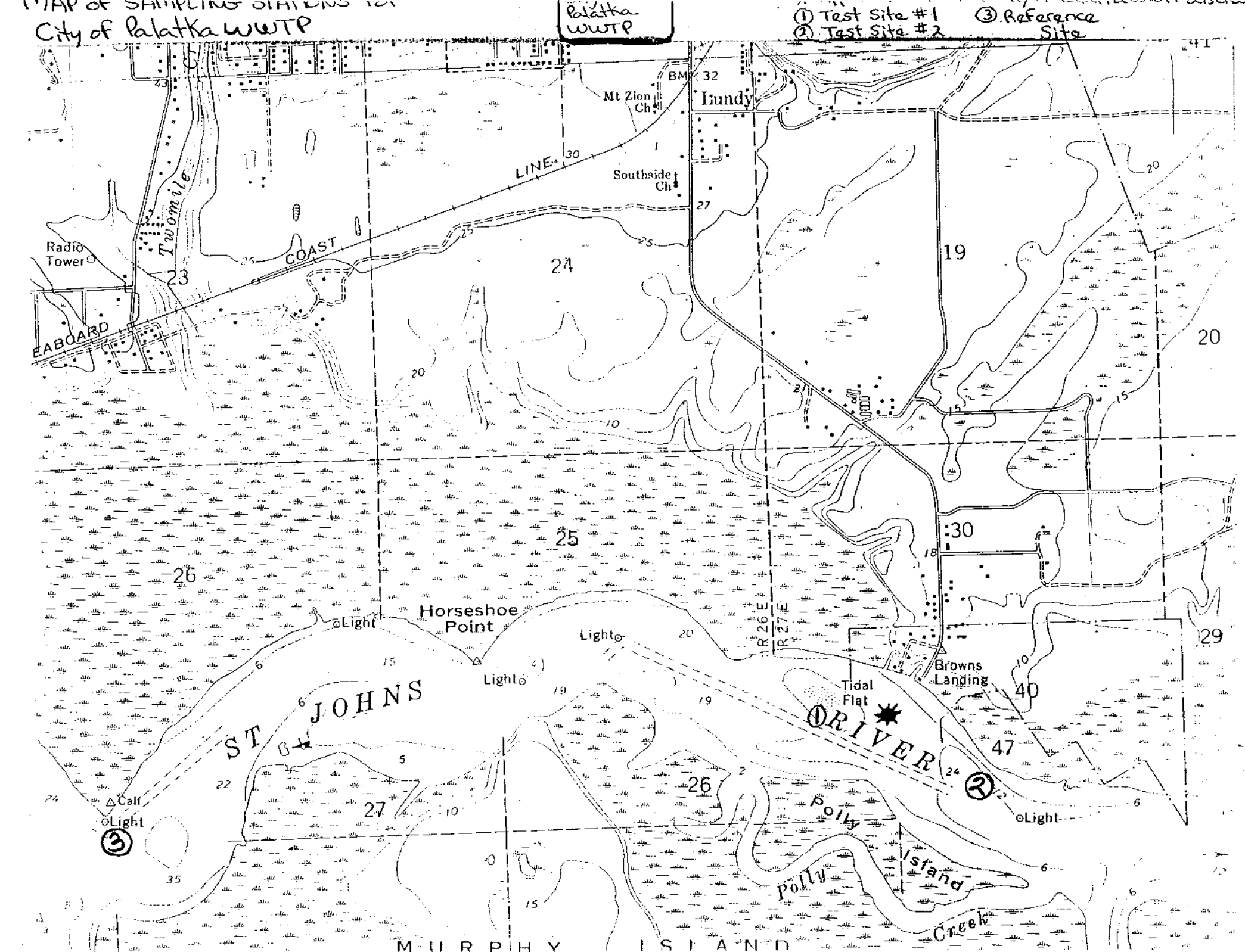
Chemistry summary table for Palatka WWTP

	Effluent	Control Site	Test Site 1	Test Site 2
Organic Constituents (ug/L)				
NONE DETECTED				
Metals (ug/L)				
Aluminum	83			
Arsenic	20 U			
Cadmium	0.08 U			
Copper	59			
Chromium	10 U			
Iron	110			
Lead	15 U			
Mercury	0.1 U			
Nickel	5 U			
Silver	0.3 A			
Zinc	50			
Nutrients (mg/L)				
Ortho-phosphate	1.4 A	0.02 U	0.024 T	
Total phosphorus	1.4	0.05	0.05 U	0.05 U
Ammonia	0.04	0.02 U	0.02 U	0.02 U
Nitrate+Nitrite	9.4	0.02 U	0.02 U	0.02 U
TKN	1.2	1.1 A	1.2	1.3
Other Parameters				
Habitat Assessment		71	71	71
D.O. (mg/L)		6.5	6.5	6.7
pH (SU's)		7.0	8.1	8.0
Conductivity (µmhos/cm)		1200	1180	1180
Temperature (°C)		30	30	30
AGP (mg dry wt/L)	49.0	2.0	0.6	0.4
Bioassay Fish	Not toxic			
Bioassay Invertebrate	Invalid			
BOD	2	2.2	2.3	2.4
TSS	4	12	14	13
Fecal coliform (org/100 ml)	40	40	90	20
Total coliform (org/100 ml)	130	9000	1300	2400
Color	30	70	60	60

A - Value reported is the mean of two or more determinations
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Not analyzed for this compound
T - Value reported is less than the practical quantitation limit
U - Material analyzed for but not detected; value reported is the minimum detection limit
Q - Evidence that analyte is present in sample is equivocal
NA - Not applicable
NR - Not requested



General Map of City of Palatka WWTP Study Area


MAP of SAMPLING STATIONS for
City of Palatka WWTP
Palatka WWTP
① Test Site #1
② Test Site #2
③ Reference Site
Mt Zion Ch
BM 32
Lundy
Southside Ch
LINE
Twomile
COAST
Radio Tower
EABOARD
Horseshoe Point
Light
Tidal Flat
Browns Landing
ST JOHNS
RIVER
Calf
Poly
Island
Creek
MURPHY ISLAND
R 26 E
R 27 E

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name: Palatka City of STP		Date Summary Prepared :
Location (attach detailed map): Lundy Road Palatka, FL	County: Putnam	District NorthEast District FDER
Federal Permit # FLCC4CC161 and expiration date: exp. 03/01/93	State GMS # and 3154MC1936 State expiration date: exp. DO54-150260 06/29/93	Facility Type: Industrial Municipal Federal Agricultural Other (list):

Function of facility: A municipal WWTP operating a 3.5 MGD activated sludge contact stabilization with 2 sewage pumping stations and with effluent disposal to the St. Johns R.

Description of treatment process:
3.5 MGD activated sludge contact stabilization [illegible] facility consisting of preliminary treatment, [illegible] removal), one primary clarifier, 2 aeration [illegible] secondary clarifiers, one chlorine contact [illegible] gravity thickener, and sludge [illegible] to sludge drying [illegible]

Receiving waters: St. Johns River	Classification: I II III	
Design Flow: 3.5 MGD	Mean Flow: 1.95 MGD (Annual Average)	Flow during survey:

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

therefore, the best time to sample is: Anytime

If facility has a mixing zone, give details (size, parameters affected, etc.):

Facility has no mixing zone

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

Parameter	Limit (units)
A. See attached	NPDES permit
B. See attached	FDER permit.

Describe special permit conditions and permit modifications:

Requires a Receiving Stream Monitoring Plan of the St. Johns River near the outfall for maintaining data on the impact of the discharge on the water quality of the river. Required as 05/24/89. Facility actually put one into effect 10/29/90.

Palatka City of
(Facility)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Description of permitted outfall(s): FDER and NPDES permitted outfall to the St. Johns River, mid-channel near Browns Landing.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year:

- 05/07/90 EPA sent letter assessing fine of $15,275.00 for [illegible] System (should have been installed, effective 02/[illegible]
- Total Residual Chlorine violation from 02/[illegible] - 07/[illegible]
- 10/[illegible]/90 EPA Administrative Complaint issued for [illegible] equipment in place. Docket # CWA-IV-90-[illegible]
- [illegible]/90 EPA Consent Agreement for penalties
- [illegible]/92 DER Notice of Permit Non-Compliance [illegible]

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

- [illegible] - BOD, TSS for week of 1-24 missing
- June-91 - Chart anomalies from for 07/01, 07/03, 07/05, 07/09, 07/[illegible]
- June-90 - No weekly readings of NH3 with 07/90, No [illegible] BOD, TSS, and [illegible] Chlorine for [illegible]
- June-90 - missing charts
- [illegible] - June 1991 - No weekly Readings of Chlorine for [illegible]
- [illegible] - Chart anomalies from for 04/07, 04/08-04/12, 04/[illegible]-04/27
- May 1991 - Missing TSS charts 05/24
- January 1992 - Missing BOD, TSS, NH3 N, Org N for week of 01/24

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

- 4/1992 EPA Notice of violation - CEI inspection showed [illegible] not performing correctly
- 6/4/92 EPA/DER CEI inspection showed [illegible] Total Residual Chlorine [illegible] not up to par.

Review of the MOR charts up to July 1992 shows that the City of Palatka WWTP staff do not complete the compliance MOR forms correctly, [illegible] on certain months and weeks.

Additional information: Area of outfall is just southeast from Dunns Creek, the outfall stream for Crescent Lake which is nutrient enriched by upstream farms.

Staff contributing to this review (signature):

Scott Bolyen Scott Bolyen (Biologist)

Cindy Payne [redacted] (Biologist)

(Engineer)

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FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: 6031 / SUBMITTING AGENCY NAME: FL D.E.R. Northeast District	STORET STATION NUMBER:	DATE (M/D/Y): 08/24/92	RECEIVING BODY OF WATER: St. Johns River

REMARKS: Reference Site for City of Palatka WWTP Fifth Year Study Area approved in letter dtd 3-5	LOCATION: St. Johns River 200 yds mid-channel at Channel marker #25	FIELD ID/NAME: Control Site

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 15	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity 16	Max. observed: >0.3 m/sec. but < 1 m/sec **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 15	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability 8	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. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality 10	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or 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 surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments 5	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	**TOTAL SCORE** 71

COMMENTS: River Sample taken at Channel Marker #25. Area location good and was South of City of Palatka WWTP discharge enough to be considered upstream.

ANALYSIS DATE: 08/24/92	ANALYST: SCOTT Bulgrin	SIGNATURE: Scott Bulgrin

Area used by fishermen and recreational use.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: 5031 SUBMITTING AGENCY NAME: FL D E R Northeast District	STORET STATION NUMBER:	DATE (M/D/Y): 08/24/92	RECEIVING BODY OF WATER: St. Johns River

REMARKS: Test Site #1 Southeast of City of Jacksonville WWTP discharge in the channel.	LOCATION: St. Johns River, Middle Channel Marker #19.	FIELD ID/NAME: Test Site #1

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 15	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity 15	Max. observed: >0.3 m/sec. but < 1 m/sec **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 15	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability 8	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. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality 10	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or 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 surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments 5	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE 71

COMMENTS: River Sample taken at Channel Marker 19. Grass beds in nearby areas. Most of River used by fishermen and recreation.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
09/24/92	SCOTT Bukyin	Scott Bukyin

FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: 6031 SUBMITTING AGENCY NAME: FL D.E.R. Northeast District	STORET STATION NUMBER:	DATE (M/D/Y): 08/24/92	RECEIVING BODY OF WATER:

REMARKS: Test Site #2 Northwest of City of Palatka water TP discharge.	LOCATION: St. Johns River, 300 yds Middle Channel, 150 yds west of Channel Marker #16	FIELD ID/NAME: Test Site #2

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 15	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. 23-30 points	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. 16-22 points	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. 8-15 points	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. 0-7 points
Water Velocity 16	Max. observed: >0.3 m/sec. but < 1 m/sec 23-30 points	Max. observed; 0.1 to 0.3 m/sec 16-22 points	Max. observed; 0.05 to 0.1 m/sec 8-15 points	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 0-7 points
Artificial Channel/ Flow Alteration 15	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. 12-15 points	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. 0-3 points
Bank Stability 8	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. 3-5 points	Unstable. Many raw, eroded areas. Obvious bank sloughing. 0-2 points
Riparian Zone Vegetation Quality 10	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or 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 surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. 0-2 points

Adjustments 5	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE 71

COMMENTS: River Sample taken closer to shore at this site since River is wider, greater than 25 ft. Area of River used by Fishermen

ANALYSIS DATE:	ANALYST:	SIGNATURE:
09/24/92	SCOTT Bulgin	Scott Bulgin

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 3)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL D.E.R. Northeast District	STORET STATION NUMBER:	DATE (M/D/Y): 08/24/92	TIME: 10:30	RECEIVING BODY OF WATER: St. Johns River
REMARKS: Reference Site for City of Palatka WWTP Fifth Year Study After Process Modifications	LOCATION: St. Johns River, 200 yards mid-channel at Channel Marker #25	FIELD ID/NAME: C Reference Site 1		

RIPARIAN ZONE/INSTREAM FEATURES Area used for Recreation

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

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

Local Watershed Erosion (check box): None [X] Slight Moderate [ ] Heavy [ ]

Local Watershed NPS Pollution (check box): No evidence [ ] Some potential sources [X] Obvious sources [ ]

Point-Source Pollution (list location and describe): None. Stormwater Runoff, Septic Tanks

Estimated System Width (range, m): 300-400	Estimated System Depth (range, m): 1-6		yes
High Water Mark (m above bed): 2-3	Velocity (range, m/s): 0-2	Impounded [ ] / Channelized [ ]	

Canopy Cover %: Open: [X] Lightly Shaded (11-45%): [ ] Moderately Shaded (46-80%): [ ] Heavily Shaded: [ ]

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Anaerobic: [ ] Other: [ ]

Sediment Oils: Absent: [X] Slight: [ ] Moderate: [ ] Profuse: [ ]

Sediment Deposits: Sludge: [ ] Paper Fiber: [ ] Mud: [X] Sand: [X] Shell: [ ] Other: [X]

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	25	7	D-NET	Rock or Shell Rubble			
Leaf Packs	10	3	D-NET	Sand	45	2	
Aquatic Vegetation	20	5	D-NET	Mud/Muck	15	2	
Submerged Roots				Other: Oysterbed			
Undercut Banks				Other:			

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	pH (SU):	Cond. (µmho/cm):	SALINITY			Secchi (m)
Top	30	6.5	6.97	1200	0.5			
Mid-depth	30	6.5	6.97	1200				
Bottom	29	6.5	6.97	1200				

System Type: Stream: [ ] (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: [ ] Wetland: [ ] Estuary: [ ] Other: [X] D-NET

Water Odors (check box): Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Other: [ ]

Water Surface Oils (check box): Slick: [ ] Sheen: [ ] Globs: [ ] None: [X]

Clarity (check box): Clear: [X] Slightly turbid: [ ] Turbid: [ ] Opaque: [ ]

Color (check box): Tannic: [ ] Green (algae): [X] → Slightly Clear: [X] Other: [ ]

Weather Conditions: windy, overcast, partly cloudy

Abundance:	Absent	Rare	Common	Abundant
Periphyton	[ ]	[ ]	[X]	[ ]
Fish	[ ]	[ ]	[X]	[ ]
Aquatic Macrophytes	[ ]	[ ]	[X]	[ ]
Iron/sulfur Bacteria	[X]	[ ]	[ ]	[ ]

ANALYSIS DATE:	ANALYST:	SIGNATURE:
08/24/92	SCOTT BULGRIN	Scott Bulgrin

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 3)

SUBMITTING AGENCY CODE: 4031 / SUBMITTING AGENCY NAME: FL D.E.R. Northeast DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 08/24/92	TIME: 1400	RECEIVING BODY OF WATER: [illegible]
REMARKS: Test Site #1 Southeast of City of Palatka WWTP discharge in [illegible]	LOCATION: St. Johns River, [illegible] Middle Channel Marker #3			FIELD ID/NAME: [illegible]

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			10 %			[illegible]

Local Watershed Erosion (check box): None [X] Slight Moderate [ ] Heavy [ ]

Local Watershed NPS Pollution (check box): No evidence [ ] Some potential sources [ ] Obvious sources [X]

Point-Source Pollution (list location and describe): City of Palatka WWTP discharge

Estimated System Width (range, m): 300-400	Estimated System Depth (range, m): 1-6		yes
High Water Mark (m above bed): 2-3	Velocity (range, m/s): [illegible]	Impounded [ ]	
		Channelized [ ]	

Canopy Cover %: Open: [X] Lightly Shaded (11-45%): [ ] Moderately Shaded (46-80%): [ ] Heavily Shaded: [ ]

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Anaerobic: [X] Other: [ ]

Sediment Oils: Absent: [X] Slight: [ ] Moderate: [ ] Profuse: [ ]

Sediment Deposits: Sludge: [ ] Paper Fiber: [ ] Mud: [X] Sand: [X] Shell: [ ] Other: [ ]

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	20	7	D-Net	Rock or Shell Rubble			
Leaf Packs	10	3	D-Net	Sand	25	2	
Aquatic Vegetation	25	5	D-Net	Mud/Muck	10	1	
Submerged Roots				Other: [illegible]	10	1	
Undercut Banks				Other:			

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	pH (SU):	Cond. (µmho/cm):	SALINITY			Secchi (m)
Top	30	6.5	8.06	1150	0.5			
Mid-depth	30	6.5	8.06	1150				1.0
Bottom	29	6.3	8.06	1150				

System Type: Stream: [ ] (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: [ ] Wetland: [ ] Estuary: [ ] Other: [X] [illegible]

Water Odors (check box): Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Other: [ ]

Water Surface Oils (check box): Slick: [ ] Sheen: [ ] Globs: [ ] None: [X]

Clarity (check box): Clear: [X] Slightly turbid: [ ] Turbid: [ ] Opaque: [ ]

Color (check box): Tannic: [ ] Green (algae): [X] → Somewhat Clear: [ ] Other: [ ]

Weather Conditions: Partly Cloudy, Overcast, windy

Abundance:	Absent	Rare	Common	Abundant
Periphyton	[ ]	[ ]	[X]	[ ]
Fish	[ ]	[ ]	[X]	[ ]
Aquatic Macrophytes	[ ]	[ ]	[X]	[ ]
Iron/sulfur Bacteria	[X]	[ ]	[ ]	[ ]

ANALYSIS DATE:	ANALYST:	SIGNATURE:
08/24/92	SCOTT BOLGRIN	Scott Bolgrin

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 3)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL D.E.R. Northeast District	STORET STATION NUMBER:	DATE (M/D/Y): 08/24/92	TIME: 1510	RECEIVING BODY OF WATER: City of [illegible] WWTP effluent discharge into [illegible] River
REMARKS: Test Site #2 Northeast of City of Palatka WWTP discharge. Area used for [illegible]	LOCATION: St. Johns River, 300 yards Middle Channel, 150 yards east of Channel Marker #16			FIELD ID/NAME: Test Site #2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			10%			90%

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

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

Point-Source Pollution (list location and describe): City of Palatka WWTP discharge

Estimated System Width (range, m): 200 - 400 m	Estimated System Depth (range, m): [illegible]		yes
High Water Mark (m above bed): 1 - 3'	Velocity (range, m/s): [illegible]	Impounded ☐	
		Channelized ☐	

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 Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☒ Sand: ☒ Shell: ☐ Other: ☒ [illegible]

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	25	7	DIPNET	Rock or Shell Rubble			
Leaf Packs	10	3	DIPNET	Sand	~5%	2	
Aquatic Vegetation	20	5	DIPNET	Mud/Muck	10	2	
Submerged Roots				Other: [illegible]	10	1	
Undercut Banks				Other:			

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	pH (SU):	Cond. (µmho/cm):	SALINITY			Secchi (m)
Top	30	6.7	8.0	1150	0.5			3
Mid-depth	30	6.7	8.0	1150				
Bottom	29	6.5	8.0	1156				

System Type : Stream: ☐ (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☒ [illegible]

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): ☒ → Somewhat Clear: ☒ Other: ☐

Weather Conditions: Partly cloudy, overcast, windy

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

ANALYSIS DATE:	ANALYST:	SIGNATURE:
08/24/92	SCOTT BULGRIN	Scott Bulgrin

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: CITY OF PALATKA WWTP
Address/City: _____
County: PUTNAM
Contact/District: SCOTT BULGRIN NE
NPDES Permit #: FL00 40061 Outfall #: _____

Sample Collection: Date 8-24-92 Time 1140
Test Beginning: Date 8-25-92 Time 1130
Test Ending: Date 8/27/92 Time 1300
Test Organism: C. DUBIA
Life Stage/Age: < 24 HRS

Test Number: 1 of 2 Test Type: (Screening) Definitive
(Static) Static Renewal | Flow-through

92-AUG-25-12 39997
extend 8/28

Remarks:
Test invalidated @ 48 hours
excessive control mortality
of 30%. MF 8/27/92 MF

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7; 10@10	8.5@24.0	24.0 @ 24.0	978@1K @24.0 9740@10K
24 hr	7@7; 10@10	8.5@24.5	24.1 @ 24.3	978@1K 9680@10K
48 hr	7@7; 10@10	8.5@24°C	24.2@24.2	993 @24.1 9910

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
control	A	5	5 MF	4	8.4		8.2	23.0		24.0	8.5		8.4	164		166
control	B	5	5	4			8.3						8.4			
control	C	5	5	3			8.3						8.4			
control	D	5	5	3			8.3						8.4			
100%	A	5	4 5 K	4	7.2		8.3	22.0		24.0	8.1		8.5	633		698
100%	B	5	5	4			8.3						8.5			
100%	C	5	4 5 K	4			8.3						8.5			
100%	D	5	5	2			8.3						8.5			
			* Removed fish by mistake MF 8/27/92													
Measured/Loaded by:		KP	MF	MF	KP		MF	KP		MF	KP		MF	KP		MF
Recorded by:		KP	MF	MF	KP		MF	KP		MF	KP		MF	KP		MF

Investigators' Signatures

Kim Pearce
Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			not	measured	
Lab Tot. Resid. Cl2:			0.0	DR-100	KP
Alkalinity:	127	72	75	Hach	KP
Hardness:	122	75	Hach	Hach	KP
Total Ammonia:			< 0.2	Hach	KP

Ammonia Meter Slope: _____ Ammonia Blank: _____ Salinity Sample: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: CITY OF PALATKA WWTP
Address/City: _____
County: PUTNAM
Contact/District: SCOTT BULGRIN NE
NPDES Permit #: FL0040061 Outfall #: _____

Sample Collection: Date 8-24-92 Time 1140
Test Beginning: Date 8-25-92 Time 1130
Test Ending: Date 8/27-92 Time 1400
Test Organism: N. LEEDSI
Life Stage/Age: 10 DAYS

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

92-AUG-25-12 39997
entered 8/28

Remarks:

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7;10@10	8.5@24	24.0@ 24.0	978@1K 9740@10K
24 hr	7@7;10@10	8.5@24.5	24.1@ 24.3	978@1K 9880@10K
48 hr	7@7;10@10	8.5@24	24.2@24.2	993 9910@24.1

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
control	16	5	5	5	7.8	8.3	8.5	24.0	24.0	23.3	8.1	8.5	8.5			
control	7	5	5	5	7.8	8.3	8.5				8.1	8.5	8.5	246	246	246
100%	92	5	5	5	7.2	7.8	8.1	22.0	23.8	23.3	8.0	8.4	8.5			
100%	261	5	5	5	7.2	7.8	8.1				8.0	8.4	8.5	661	687	688
											8.1					
											KP					
Measured/Loaded by:		KP	KP	MF	KP	MF	MF	KP	MF	MF	KP	MF	MF	KP	MF	MF
Recorded by:		KP	KP	MF	KP	KP	MF	KP	KP	MF	KP	KP	MF	KP	KP	MF

Investigators' Signatures

Kim Pearce

Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			not measured		
Lab Tot. Resid. Cl2:			0.0	DR-100	KP
Alkalinity:	127	72	75	Hach	KP
Hardness:	122	75	166	Hach	KP
Total Ammonia:			<0.2	Hach	KP

Ammonia Meter Slope: _____ Ammonia Blank: _____ Salinity Sample: _____ ppt

Taxa list for Palatka STP, collected via discrete dip net sweeps in the St. Johns River on 24 August 1992.

	Reference Site	Test Site 1	Test Site 2
Acarina			
Arrenurus sp.	12	–	–
Koenikea sp.	24	60	6
Oxus sp.	12	12	–
Diptera			
Ablabesmyia peleensis	–	12	–
Ablabesmyia rhamphe grp.	60	–	42
Asheum beckae	24	–	18
Atrichopogon sp.	–	24	–
Cladotanytarsus sp.	12	–	–
Coelotanypus concinnus	–	–	6
Cricotopus bicinctus	12	36	–
Dicrotendipes modestus	12	156	24
Dicrotendipes neomodestus	36	132	–
Dicrotendipes simpsoni	–	24	12
Dicrotendipes sp.	–	–	6
Dicrotendipes tritomus ?	–	24	–
Endochironomus nigricans	60	48	18
Endotribelos hesperium	12	–	–
Glyptotendipes meridionalis	12	24	24
Glyptotendipes paripes	24	–	–
Nanocladius distinctus	12	–	–
Nanocladius sp.	–	12	6
Palpomyia grp.	12	–	–
Parachironomus carinatus	–	–	6
Parachironomus directus	12	–	–
Polypedilum halterale grp.	12	–	–
Polypedilum sp.	12	–	–
Procladius sp.	36	12	–
Undetermined dipteran pupae	24	36	–
Rheotanytarsus exiguus grp.	48	144	–
Tanytarsus sp.	12	–	–
Thienemanniella sp.	–	–	6
Xenochironomus xenolabis	12	–	–
Zavreliella marmorata	–	24	–
Ephemeroptera			
Caenis sp.	48	60	108
Gastropoda			
Gyraulus parvus	48	12	–
Hebetancyclus excentricus	60	–	24
Littoridinops sp.	336	48	114
Physella sp.	23	–	–
Hemiptera			
Undetermined hemipteran sp.	36	–	–

Malacostraca			
Cassidinidea ovalis	108	12	24
Gammarus sp.	108	24	6
Hyalella azteca	168	84	6
Idotea metallica ?	–	12	–
Palaemonetes paludosus	12	–	6
Probopyrus floridensis	–	–	18
Sphaeroma destructor	–	–	42
Uromunna reynoldsi	–	12	–
Mysidacea			
Mysidopsis sp.	12	–	–
Odonata			
Argia sp.	12	–	–
Enallagma cardenium	–	–	18
Enallagma sp.	–	–	12
Ischnura posita	–	–	6
Oligochaeta			
Bratislava unidentata	24	–	–
Limnodrilus hoffmeisteri	–	12	6
Trichoptera			
Cyrnellus fraternus	12	–	6
Hydroptila sp.	36	36	30
Orthotrichia sp.	24	–	–
Triaenodes sp.	–	–	6

Taxa list for Palatka STP, collected via Hester-Dendy samplers in the St. Johns River on 24 September 1992. Reference site samplers were disturbed.

	Test Site 1	Test Site 2
Decapoda		
Rhithropanopeus harrisii	8	2
Diptera		
Ablabesmyia rhamphe grp.	156	137
Asheum beckae	1	–
Chironomus sp.	–	1
Cladotanytarsus sp.	5	4
Dicrotendipes modestus	5	1
Dicrotendipes neomodestus	2	–
Dicrotendipes simpsoni	130	64
Endochironomus subtendens	2	–
Glyptotendipes meridionalis	2	–
Glyptotendipes sp. B Epler	1	–
Nanocladius distinctus	196	45
Parachironomus carinatus	4	–
Parachironomus monochromus	1	–
Polypedilum halterale grp.	–	2
Polypedilum scalaenum	1	–
Procladius sp.	1	1
Undetermined dipteran pupae	5	3
Stenochironomus sp.	–	1
Tanytarsus sp.	12	8
Tribelos fuscicorne	12	12
Ephemeroptera		
Caenis sp.	9	2
Tricorythodes albilineatus	–	1
Gastropoda		
Littoridinops ? sp.	–	1
Malacostraca		
Corophium sp.	65	34
Gammarus sp.	61	59
Hyalella azteca	3	–
Uromunna reynoldsi	1	–
Oligochaeta		
Bratislava unidentata	–	3
Trichoptera		
Cyrnellus fraternus	140	122
Hydroptila sp.	5	–
Orthotrichia sp.	6	3
Undetermined trichopteran pupa	–	2

Chlorophyta			
Ankistrodesmus sp.	24	–	–
Characium sp.	12	11	–
Coelastrum sp.	–	–	11
Crucigenia sp.	12	–	23
Elakatothrix sp.	–	23	11
Mougeotia sp.	12	57	–
Pediastrum sp.	–	46	23
Scenedesmus sp.	143	103	136
Schroederia sp.	24	–	–
Spirogyra sp.	–	46	23
Staurastrum sp.	12	11	11
Stigeocolonium sp.	–	–	23
Cyanophyta			
Anabaena sp.	48	23	45
Aphanocapsa sp.	167	69	114
Chroococcus sp.	95	57	114
Cylindrospermopsis sp.	24	–	–
Dactylococcopsis sp.	–	46	11
Gloeocapsa sp.	60	34	45
Gloeothece sp.	36	34	–
Lyngbya contorta	585	378	625
L. limnetica	573	378	682
Merismopedia sp.	–	11	11
Microcystis sp.	203	92	68
Oscillatoria sp.	60	69	68

Periphyton taxa list for Panama City STP, collected via periphytometers in the St. Johns River on 24 September, 1992.

	Reference Site	Test Site 1	Test Site 2
Diatoms			
Achnanthes clevei	–	11	–
A. linearis	–	11	–
A. minutissima	155	103	–
Amphipleura sp.	24	–	–
Amphora sp.	–	80	–
Bacillaria paradoxa	–	–	23
Cocconeis placentula	95	46	91
Coscinodiscus sp.	95	321	318
Cyclotella meneghiniana	84	69	80
Cymatopleura sp.	–	11	–
Cymbella microcephala	–	23	11
C. minuta	155	23	11
Diploneis sp.	–	11	–
Epithemia sp.	–	11	–
Fragilaria brevistriata	–	57	–
F. construens v. *venter*	298	160	102
F. leptostauron	227	80	34
F. pinnata v. *trigona*	12	11	–
Gomphonema gracile	215	160	102
G. parvulum	334	264	114
G. subclavatum	12	–	34
G. subclavatum v. *mexicanum*	12	–	–
Melosira granulata	358	264	170
M. varians	–	–	91
Navicula viridula	24	23	68
Nitzschia amphibia	95	103	295
N. gracilis	–	11	–
N. ignorata	–	11	23
N. palea	72	115	1681
N. romana	–	34	91
Operophora sp.	119	–	11
Pinnularia sp.	–	11	–
Rhopalodia gibba	36	23	11
R. gibberula	–	–	11
Synedra fasciculata	–	11	–
S. miniscula	24	34	11
S. radians	60	34	11
S. rumpens	12	57	–
S. ulna	656	229	136
S. ulna v. *oxyrhynchus*	12	23	23

Phytoplankton taxa list for Palatka STP, collected via subsurface grabs in the St. Johns River, 23 August, 1992.

	Reference Site	Test Site 1	Test Site 2
Diatoms			
Achnanthes sp.	–	166	323
Coscinodiscus sp.	165	166	–
Cyclotella sp.	165	166	645
Melosira sp.	659	332	807
Nitzschia sp.	495	332	645
Rhizosolenia sp.	–	166	–
Synedra sp.	165	166	161
Chlorophyta			
Ankistrodesmus sp.	330	166	–
Crucigenia sp.	–	–	161
Elakatothrix sp.	–	166	–
Gloeocystis sp.	330	498	–
Lagerheimia sp.	–	–	161
Oocystis sp.	330	498	645
Scenedesmus sp.	–	498	484
Schroederia sp.	–	332	–
Selenastrum sp.	–	–	161
Staurastrum sp.	165	166	–
Tetraedron sp.	165	498	161
Cryptophyta			
Cryptomonas sp.	–	–	161
Cyanophyta			
Aphanocapsa sp.	2,802	2,491	968
Chroococcus sp.	3,627	3,155	1,614
Cylindrospermopsis sp.	330	1,660	2,582
Dactylococcopsis sp.	1,319	1,328	968
Gloeocapsa sp.	3,297	1,328	4,680
Lyngbya contorta	5,605	6,808	6,777
Lyngbya limnetica	17,968	15,110	19,041
Merismopedia sp.	2,802	1,162	2,420
Microcystis sp.	7,583	9,298	10,004
Oscillatoria sp.	330	332	–
Phormidium sp.	–	–	161

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

1 Transaction Code	2	3 NPDES NUMBER	11	12 YR/MO/DA	17	18 Insp Type	19 Inspector	20 Fac Type
N	5	FL0040061		920824		X	5	1

Remarks

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

1 Transaction Code	2	3 NPDES NUMBER	11	12 YR/MO/DA	17	18 Insp Type	19 Inspector	20 Fac Type
N	5	FL0040061		920824		B	5	1

Remarks

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