Florida

Department of Environmental Protection

Biological Assessment of

City of Jacksonville Southwest Regional Wastewater Treatment Plant #3

Duval County

NPDES #FL0026468

Sampled February 1993

November 1993

Biology Section
Division of Technical Services

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: City of Jacksonville Southwest Regional WWTP #3
County: Duval
NPDES Number: FL0026468
State Permit Expiration Date: 1 December 1993

Toxics Sampling Inspection (XSI)

Date Sampled: 8 February 1993

Results: Organic constituents in the effluent included diazinon at 0.39 µg/L (a toxic level), and the tentative identification of hexadecanoic and octadecanoic acids at estimated concentrations of 50 and 60 µg/L, respectively. Ethyl chlorpyrifos was also detected, but at a level below the practical quantitation limit (0.15 µg/L). The following metals were detected in the effluent: aluminum (540 µg/L), copper (21 µg/L), iron (354 µg/L), silver (0.5 µg/L), and zinc (36 µg/L). The concentrations of copper, iron, and silver were in violation of Class III standards, Rules 17-302.530(24) FAC, 17-302.530(39) FAC, and 17-302.530(60) FAC, respectively.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 8 February 1993

Results: Acutely toxic to the invertebrate, *Ceriodaphnia dubia*, killing all organisms within 24 hours. This toxicity is in violation of Rules 17-302.530(62) FAC and 17-302.500(1)(d) FAC. No mortality occurred during the *Notropis leedsi* bioassay.

Impact Bioassessment Inspection (IBI)

Date Sampled: 8 February 1993

Results: Most measures of macroinvertebrate health indicated that the discharge was not adversely affecting the benthic community. Taxa richness, diversity, and the numbers of pollution sensitive organisms were similar at the reference and test sites. These observations suggest that the toxic effluent was sufficiently diluted (at least during, and for some period prior to the study) that no discernible effects to the benthic community were noted. Phytoplankton populations were sparse at all study sites, with low density and taxa richness. Most measurements of community health did not indicate any notable degradation or improvement, except that the test sites had a higher proportion of the common diatom, *Skeletonema* sp. (thought to be caused by factors other than the discharger). Chlorophyll *a* was very low at all stations, corresponding to the low phytoplankton density.

Water Quality Inspection (WQI)

Date Sampled: 8 February 1993

Results: Nutrients were elevated in the effluent, including total phosphorus (0.95 mg/L), nitrate-nitrite (3.8 mg/L), and TKN (3.0 mg/L). While orthophosphate and TKN were elevated in the receiving waters, the data suggest that the facility contributed only to the observed nitrate-nitrite enrichment. Algal growth potential exceeded the "problem threshold" of 10 mg dry wt/L at both test sites. Growth of *Dunaliella tertiolecta* was severely inhibited by low salinity at the reference site, preventing comparisons with the test sites. Total and fecal coliforms were within water quality standards at effluent and study sites.

Introduction

The City of Jacksonville Southwest Regional Wastewater Treatment Plant #3 is a 10.0 MGD, complete mix activated sludge facility that serves the southwest portion of Duval County. Treatment consists of grit removal, biological treatment (activated sludge), clarification, and chlorination. Effluent is then dechlorinated and aerated prior to discharge into the St. Johns River, near the Jacksonville Naval Air Station fence line. Sludge is treated by aerobic digestion, thickened, and disposed of either by incineration or off-site land application (see diagram in Appendix). During the past eight months, the facility has been operating at about 60% of its capacity, averaging 5.85 MGD.

State and/or federal permit limits are as follows: BOD_5 and TSS (20 mg/L annual average, 30 mg/L monthly average, 45 mg/L weekly average, and 60 mg/L daily maximum), pH (6.0 to 8.5 SU's), chlorine residual (minimum 0.5 mg/L for disinfection, maximum 0.01 mg/L prior to discharge), and fecal coliform bacteria (weekly average 200 organisms/100 mL, daily maximum 800 organisms/100 mL).

For the past two years, the facility has experienced some minor problems, mostly due to failure to record parameter measurements and submit sludge volume and disposal reports. In 1991 and 1992, TSS, BOD, and fecal coliforms exceeded the permit limit several times. During the period May 2, 1990, through January 24, 1993, wastewater overflows into drainage systems occurred 48 times, attributed to blockages in the main line (see facility summary in Appendix).

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, 0.5 miles north of Buckman Bridge) and two test sites bracketing 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 screening toxicity bioassays, using *Ceriodaphnia dubia* and *Notropis leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on samples of effluent, as well as on water taken from the reference and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Collection methods consisted of three Ponar dredges per station. Phytoplankton was collected via subsurface grabs (Ross 1990). 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* for the freshwater effluent and *Dunaliella tertiolecta* as the test organism for the estuarine receiving water stations, followed Miller *et al.* (1978) and EPA (1974).

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed in this report. Many of these, such as the number of taxa, Shannon-Weaver Diversity Index, and chlorophyll *a* are well known. Others are briefly explained here. Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually asso-

ciated with disturbance. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions. 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 (for % composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (for 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 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 and chlorophyll *a* are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Scott Bulgrin and Lindy Payne (DEP Northeast District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Roberto Llansó, Kathleen Lurding, Elizabeth Miller, Urania Quintana, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site 1	Test Site 2
Macroinvertebrate Ponar			
Number of Taxa	20	23	23
Shannon-Weaver Diversity	2.7	2.5	2.4
% Polychaeta	4.4	52.7	26.7
% Pelecypoda	47.9	14.7	27.9
% Thoracica	23.8	18.4	37.5
% Malacostraca	12.5	8.2	5.0
% Diptera	7.8	1.2	1.6
% Oligochaeta	3.4	2.5	0.3
% Other	0.2	2.3	1.0
% Suspension Feeders	81.0	36.1	66.7
% Above-Surface Deposit Feeders	7.4	54.8	28.4
% Predator/Carnivores	7.2	4.1	3.4
% Below-Surface Deposit Feeders	3.5	2.5	0.4
% Other	0.9	2.5	1.1
Phytoplankton Algae			
Number of Taxa	15	13	15
% Contribution of Dominant Taxon	14.6	59.7	49.2
Chlorophyll a (µg/L)	1.2	1.7	1.7
Diatom/Blue-green Abundance Ratio	0.90	0.97	0.95
% Diatoms	85.4	93.5	88.5
% Greens	4.9	3.2	1.6
% Blue-greens	9.8	3.2	4.9
% Cryptophytes	0	0	4.9
Algal Growth Potential (mg dry wt/L)	*	14.6	12.5

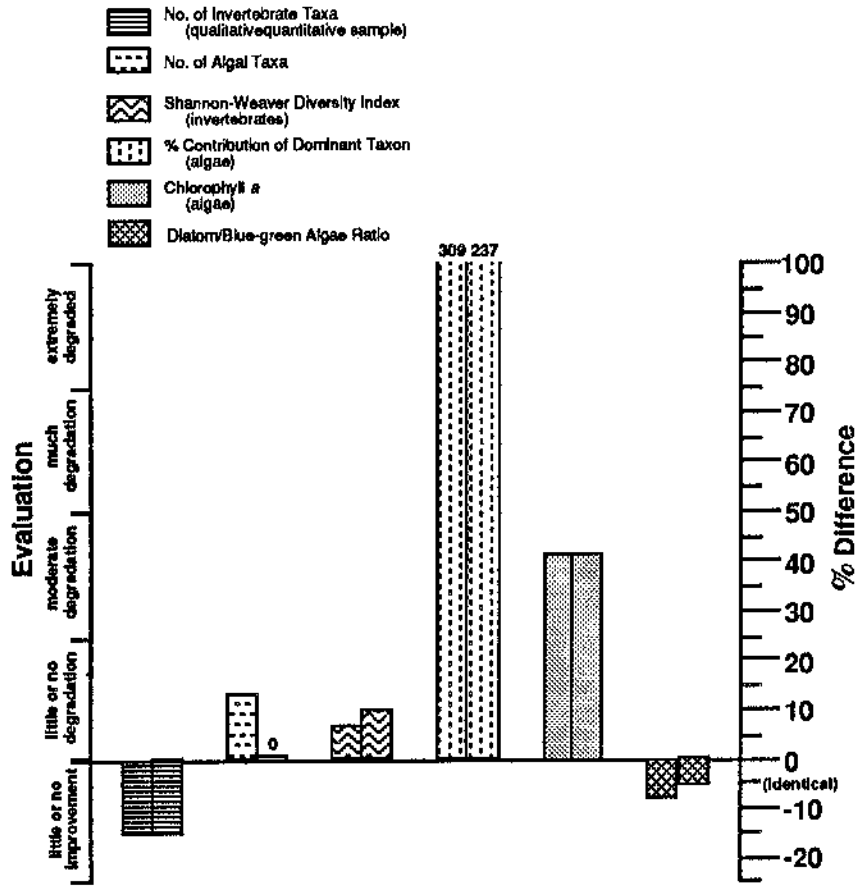
*Salinity of sample water was out of range for the test algae

Results and Discussion

Habitat quality was similar at all three study sites, with scores of 56, 50, and 52 for the reference site, test site 1, and test site 2, respectively. The reference site received a slightly higher score for having fewer littoral alterations and more community types present, as some grassbeds were observed among the riprap and vertical seawalls. This entire area of the St. Johns River is subject to stormwater runoff from surrounding residential areas, the Jacksonville Naval Air Station, and numerous sources farther upstream. Although the reference site was located in the vicinity of a marina and other point source discharges, it was considered to be unaffected by the Jacksonville #3 WWTP discharge, and representative of ambient conditions in this part of the St. Johns River. Physical-chemical attributes were nearly identical at test sites 1 and 2, with pH values of 7.8 and 7.9, respectively, and a salinity of 6 ppt at both sites. The reference site was slightly more acidic (7.1) and lower in salinity (2

ppt) than the test sites. All three stations were amply oxygenated (8.8 to 8.9 mg/L) (Appendix).

Analysis for organic constituents revealed the presence of diazinon (0.39 µg/L) and ethyl chlorpyrifos at 0.15 µg/L (below practical quantitation limit, or PQL). This is cause for concern, as both of these pesticides are known to be toxic to freshwater invertebrates at concentrations as low as 0.1 µg/L (AQUIRE 1991). Additionally, hexadecanoic acid and octadecanoic acid were tentatively identified at estimated concentrations of 50 and 60 µg/L, respectively. The following metals were detected in the effluent: aluminum (540 µg/L), copper (21 µg/L), iron (354 µg/L), silver (0.5 µg/L), and zinc (36 µg/L). Cadmium was reported at 0.11 µg/L, which is below the PQL (see chemistry summary table). In predominantly marine systems, the above concentrations of copper, iron, and silver are in violation of Class III standards, Rule 17-302.530(24) FAC, Rule 17-302.530(39) FAC, and Rule 17-302.530(60) FAC, respectively.



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.)

The effluent sample was acutely toxic to the water flea, Cerio*daphnia dubia*, with complete mortality occurring within 24 hours. This toxicity can be attributed to the excess of metals (copper, iron, and silver) and pesticides (ethyl chlorpyrifos and diazinon) found in the effluent, and is in violation of Rule 17-302.530(62) FAC and Rule 17-302.500(1)(d) FAC. The discharge was not toxic to the fish, Notropis leedsi, in the 48 hour bioassay (Appendix).

Some nutrient species were elevated in the effluent, including total phosphorus (0.95 mg/L), nitrate-nitrite (3.8 mg/L), and TKN (3.0 mg/L). Some nutrient compounds were elevated at the reference and test sites alike. For example, at all study sites, orthophosphate and TKN were higher than 60% to 82% of other estuaries in the state. This implies that the facility was not solely responsible for the elevated orthophosphate and TKN concentrations (see Table of Typical Water Quality Parameters in Appendix). In contrast, nitrate-nitrite was greater than 66% of other estuaries at the test sites, but was below average at the reference site, suggesting that the facility did contribute to the observed nitrate-nitrite enrichment.

Algal growth potential (AGP) in the effluent was extremely high, at 160.4 mg dry wt/L, in response to the bioavailable nutrient concentrations. Test sites 1 and 2 yielded AGP's of 14.6 and 12.5 mg dry wt/L, respectively. In marine waters, an algal growth potential value of 10 mg dry wt/L is considered a "problem threshold" for predicting the likelihood of nutrient enrichment effects, such as algal blooms or D.O. sags (Dr. Ron Raschke, U.S. EPA, personal communication). Sample water from the reference site was lower in salinity than that of the test sites (2 ppt, which is outside the tolerance range of *Dunaliella tertiolecta).* Because algal growth was severely inhibited at this site (due to the low salinity), no AGP comparisons could be made with the test sites.

Total and fecal coliform bacterial populations were well within Class III standards in the effluent, as well as at all study sites (see chemistry summary table).

Most measures of benthic macroinvertebrate community structure indicated no substantial differences between reference and test sites, particularly taxa richness and Shannon-Weaver diversity. The figure on p. 3 indicates the degree of difference between the control and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the control. The figure on this page summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation. The average abundance of each individual taxon appears in the Appendix.

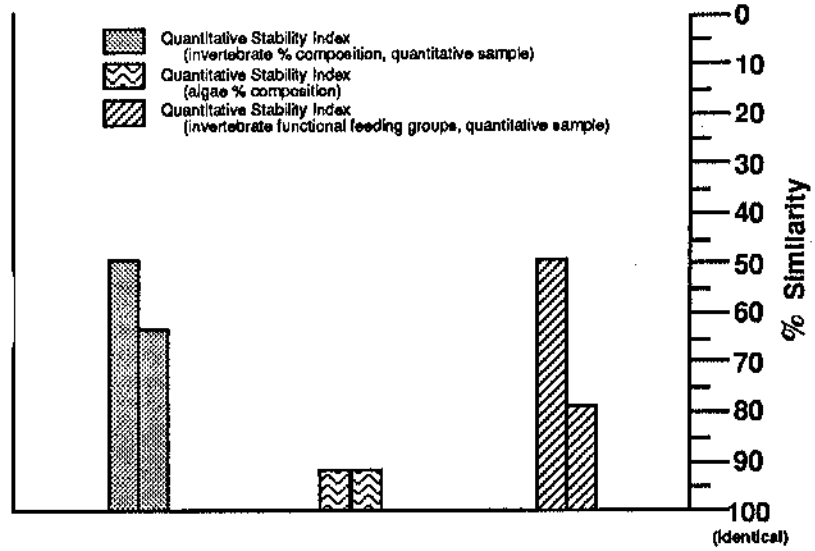
The macroinvertebrates present, in part, reflected the rapidly fluctuating salinity which is characteristic of this reach of the St. Johns River, with a mixture of fresh and salt water forms. Pelecypods dominated at the reference site (mainly *Mytilopsis leucophaeta*), while polychaetes were most abundant at both test sites, particularly *Scolecolepides viridis*. In light of the toxicity associated with the effluent, we thought that this variation in species composition might be related to the discharge, as polychaetes belonging to the family Spionidae are generally considered to be pollution tolerant. Upon closer examination of the data, however, it became apparent that there were similar numbers of pollution sensitive organisms (*e.g., Melita nitida, Monoculodes edwardsi, Cassidinidea ovalis,* and *Stenonema exiguum*) present at the test sites compared to the reference site. These observations suggest that the toxic effluent was sufficiently diluted (at least during, and for some period prior to the study) that no discernible effects to the benthic community were noted

As mentioned earlier, taxa richness (ranging from 20 to 23) and Shannon-Weaver diversity (ranging from 2.4 to 2.7) were similar between the test and reference sites. While taxa richness at the three sites was slightly above average for a Florida estuary, diversity was somewhat below average. The differences in the macroinvertebrate percent composition and functional feeding groups between the test and reference sites may be more related to the differences in salinity than to the discharge.

Phytoplankton populations at all three study sites were similar with regard to taxa richness and the diatom/blue-green algae ratio. The percent contribution of dominant taxon was elevated at the two test sites due to the dominance of *Skeletonema* sp., a common diatom found in a wide variety of environmental conditions. This taxon occasionally dominates even in relatively normal nutrient regimes. A complete taxa list, along with densities, appears in the Appendix. Quantitative Stability Indices for percent composition (see graph on p. 3) further demonstrate the degree of similarity among the three study sites. Although the percent differences in chlorophyll *a* values appear to indicate moderate degradation (see graph), the absolute values (1.7 µg/L or less) were lower than 90% of other Florida estuaries (Appendix).

Conclusions

The sample of effluent collected from the Jacksonville City Plant was acutely toxic to the invertebrate, *Ceriodaphnia dubia*, killing all organisms within 24 hours. This toxicity is in violation of Rules 17-302.530(62) FAC and 17-302.500(1)(d) FAC. No mortality occurred during the *Notropis leedsi* bioassay.



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.)

This toxicity can be attributed to one or more compounds. Diazinon was found in the effluent at 0.39 µg/L, a toxic concentration. Ethyl chlorpyrifos was also detected, but at a level below the practical quantitation limit (0.15 µg/L). Additionally, hexadecanoic and octadecanoic acids were tentatively identified at estimated concentrations of 50 and 60 µg/L, respectively. The following metals were detected in the effluent: aluminum (540 µg/L), copper (21 µg/L), iron (354 µg/L), silver (0.5 µg/L), and zinc (36 µg/L). The concentrations of copper, iron, and silver were in violation of Class III standards, Rules 17-302.530(24) FAC, 17-302.530(39) FAC, and 17-302.530(60) FAC, respectively.

Nutrients were elevated in the effluent, including total phosphorus (0.95 mg/L), nitrate-nitrite (3.8 mg/L), and TKN (3.0 mg/L). Some nutrient compounds were elevated at the reference and test sites alike. For example, at all study sites, orthophosphate and TKN concentrations were higher than 60% to 82% of other estuaries in the state. This implies that the facility was not solely responsible for the elevated orthophosphate and TKN concentrations. In contrast, nitrate-nitrite was greater than 66% at the test sites, but was below average at the reference site, suggesting that the facility did contribute to the observed nitrate-nitrite enrichment.

Algal growth potential (AGP) in the effluent was extremely high, at 160.4 mg dry wt/L, corresponding to the bioavailable nutrient levels. Test sites 1 and 2 yielded AGP's of 14.6 and 12.5 mg dry wt/L, respectively, exceeding the "problem threshold" of 10 mg dry wt/L. Salinity of the water from the reference site (2 ppt) was outside the tolerance range of *Dunaliella tertiolecta*. Severely inhibited algal growth in the reference site test prevented comparisons between the reference and test sites.

Total and fecal coliform bacterial populations were within Class III standards in the effluent, as well as at all study sites.

Most measures of macroinvertebrate health indicated that the discharge was not adversely affecting the community. Taxa richness, Shannon-Weaver diversity, and the numbers of pollution sensitive organisms were similar at the reference and test sites. These observations suggest that the toxic effluent was sufficiently diluted (at least during, and for some period prior to the study) that no discernible effects to the benthic community were noted.

Phytoplankton populations were sparse at all study sites, with low density and taxa richness. Most measurements of community health did not indicate any notable degradation or improvement. The percent contribution of dominant taxon was substantially higher at the two test sites, due to the proportion of the common diatom, *Skeletonema* sp. This is thought to caused by factors (*e.g.*, fluctuating salinities) other than the discharger. Chlorophyll *a* was very low at all stations, corresponding to the low phytoplankton density.

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.

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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.

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

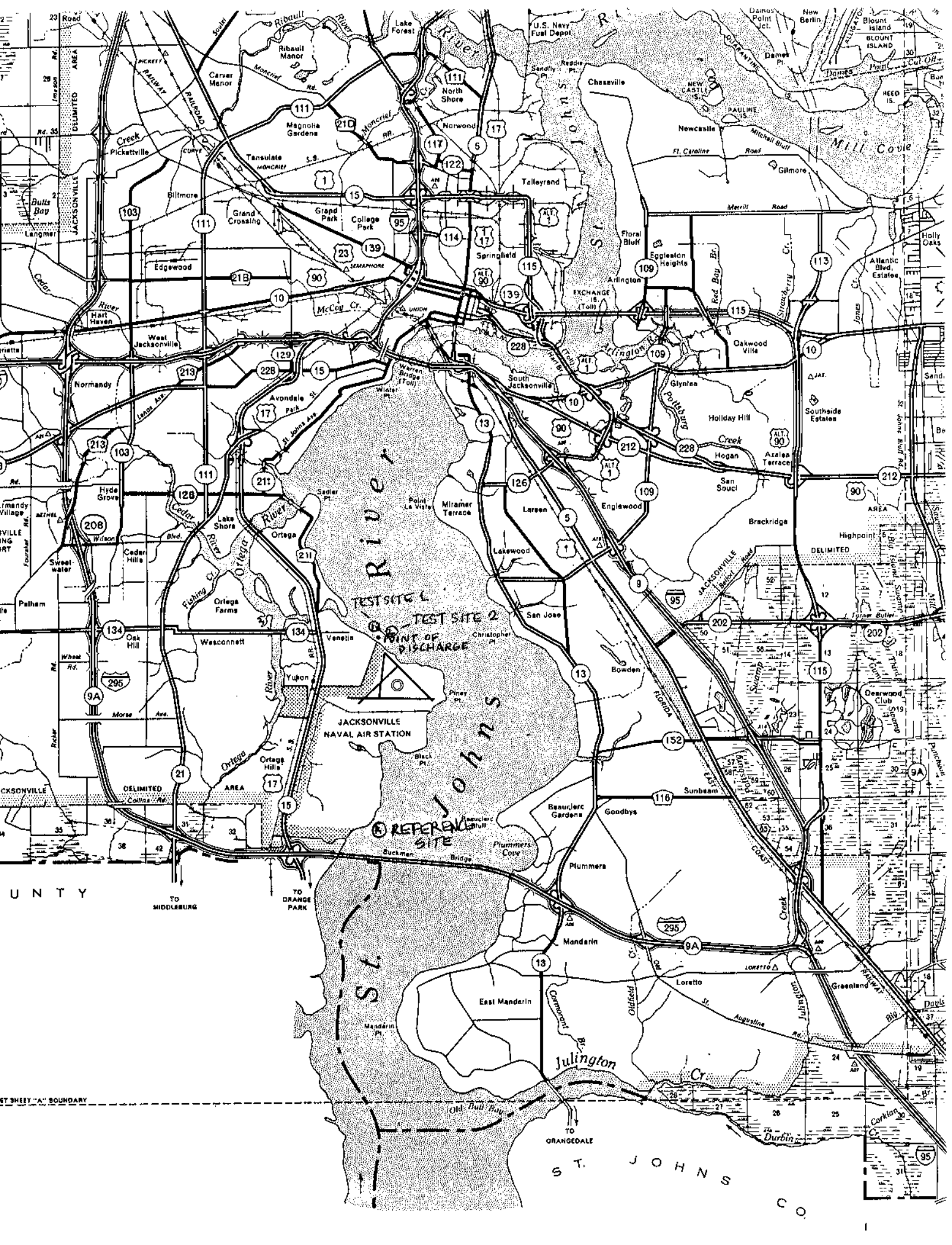
City of Jacksonville SW Regional Plant #3	Effluent	Reference Site	Test Site 1	Test Site 2
Organic Constituents (ug/L)				
Chlorpyrifos Ethyl	0.15 T			
Diazinon	0.39			
Tentative ID & Est. Conc.:				
Hexadecanoic acid	50			
Octadecanoic acid	60			
Metals (ug/L)				
Aluminum	540			
Antimony	15 U			
Arsenic	20 U			
Cadmium	0.11 T			
Copper	21			
Chromium	10 U			
Iron	354			
Lead	15 U			
Mercury	0.1 U			
Nickel	5 U			
Selenium	30 U			
Silver	0.5			
Zinc	36			
Nutrients (mg/L)				
Ortho-phosphate	0.41 A	0.075	0.077 A	0.084
Total phosphorus	0.95	0.093	0.11	0.096
Ammonia	0.46	0.053	0.041	0.042
Nitrate+Nitrite	3.8	0.12	0.42	0.42
TKN	3.0	1.0	0.77	0.76
Other Parameters				
Habitat Assessment		56	50	52
D. O. (mg/L)	7.5	8.9	8.8	8.8
pH (SU's)	6.7	7.1	7.8	7.9
Specific Conductance/Salinity (µmhos/cm or ppt)	550	2600/2	7500/6	7750/6
Temperature (°C)	20.3	13.3	13.3	13.3
BOD5 (mg/L)	8	1.3	0.5	0.4
TSS (mg/L)	30	12	8	12
Turbidity (NTU's)	8.9	8.1	6.9	5.9
Bioassay Fish	Not toxic			
Bioassay Invertebrate	24 hour LC50<100%			
Algal Growth Potential (mg dry wt/L)	160.4	*	14.6	12.5
Fecal Coliform (org/100 mL)	130	110	80	40
Total Coliform (org/100 mL)	1700	500	300	300

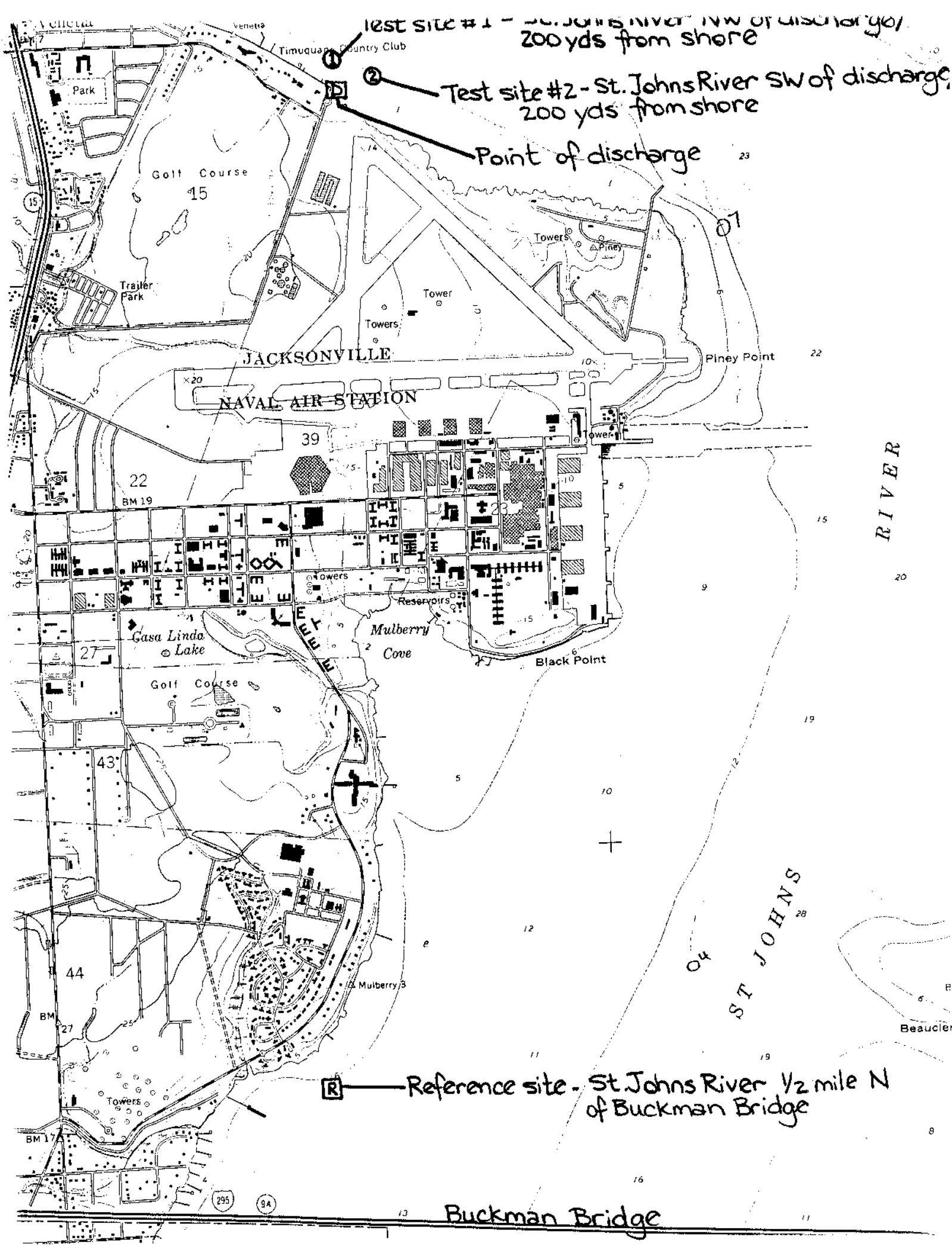
* - Salinity of sample water was out of range for the test algae

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

T - Value reported is less than the practical quantitation limit

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


St. Johns River
TEST SITE 1
TEST SITE 2
POINT OF DISCHARGE
REFERENCE SITE
JACKSONVILLE NAVAL AIR STATION
Mill Cove
Julington Cr.
Old Bull Bay
ST. JOHNS CO
TO MIDDLEBURG
TO ORANGE PARK
TO GRANGEDALE
Lake Forest
Ribault Manor
Carver Manor
Magnolia Gardens
North Shore
Norwood
Talleyrand
Springfield
Grand Crossing
Grand Park
College Park
Tansulate
Biltmore
Pickettville
Edgewood
Langmer
Bulls Bay
Hart Haven
West Jacksonville
Normandy
Hyde Grove
Sweetwater
Palmetto
Oak Hill
Cedar Hills
Lake Shore
Ortega
Ortega Farms
Wesconnett
Venetia
Yukon
Ortega Hills
Piney Pt.
Black Pt.
Buckman Bridge
Plummers Cove
Plummers
Beauclerc Gardens
Goodbys
Sunbeam
Bowden
San Jose
Lakewood
Englewood
Larsen
Miramar Terrace
Point La Vista
Sadler Pt.
Avondale
Winter Pt.
South Jacksonville
Arlington
Floral Bluff
Eggleston Heights
Chasville
Newcastle
Gilmore
Talleyrand
Oakwood Villa
Glynlea
Holiday Hill
Hogan Creek
Azalea Terrace
San Souci
Brackridge
Highpoint
Southside Estates
Atlantic Blvd. Estates
Holly Oaks
Dearwood Club
Mandarin
East Mandarin
Loretto
Greenland
Julington Cr.
Durbin
Corkan
Davis
Mandarin Pt.
Cormorant Br.
Oldfield Cr.
St. Augustine Rd.
Julington Br.
Strawberry Cr.
Red Bay Br.
McCoy Cr.
Cedar River
Ortega River
Fishing Cr.
Mill Cove
Pottsburg Creek
Swamp Gum Swamp
Florida Coast Railway
Seaboard Coast Line Railroad
Atlantic Coast Line Railroad
Jacksonville Beach Road
Arlington Expy.
Merrill Road
Monument Rd.
Collins Rd.
Wilson Blvd.
Wheat Rd.
Morse Ave.
Lenox Ave.
Park St.
St. Johns Ave.
Hendricks Ave.
Beach Blvd.
Atlantic Blvd.
Southside Blvd.
Blount Island
Dames Point
Dames Pt.
New Berlin
Reddie Pt.
Sandfly Pt.
Christopher Pt.
Winter Pt.
Mitchell Bluff
Pauline
Reed Is.
Newcastle Is.
Ft. Caroline Road
Ribault River
Lake Forest
U.S. Navy Fuel Depot
Quarantine
Cut Off
Pearl
Exchange Is. (Toll)
Warren Bridge (Toll)
Buckman Bridge
Jacksonville Delimited Area
Duval Co.
Clay Co.
Nassau Co.
Baker Co.
Union Co.
Bradford Co.
Alachua Co.
Putnam Co.
Flagler Co.
Volusia Co.
Seminole Co.
Orange Co.
Osceola Co.
Polk Co.
Lake Co.
Marion Co.
Sumter Co.
Citrus Co.
Hernando Co.
Pasco Co.
Hillsborough Co.
Pinellas Co.
Manatee Co.
Hardee Co.
DeSoto Co.
Charlotte Co.
Lee Co.
Hendry Co.
Glades Co.
Okeechobee Co.
Indian River Co.
St. Lucie Co.
Martin Co.
Palm Beach Co.
Broward Co.
Dade Co.
Monroe Co.
Collier Co.
Gulf of Mexico
Atlantic Ocean
Florida
Georgia
Alabama
South Carolina
North Carolina
Tennessee
Mississippi
Louisiana
Texas
Oklahoma
Kansas
Missouri
Arkansas
Illinois
Indiana
Ohio
Kentucky
West Virginia
Virginia
Pennsylvania
New York
Maryland
Delaware
New Jersey
Connecticut
Rhode Island
Massachusetts
Vermont
New Hampshire
Maine
Wisconsin
Michigan
Minnesota
Iowa
Nebraska
South Dakota
North Dakota
Montana
Wyoming
Colorado
New Mexico
Arizona
Utah
Nevada
California
Oregon
Washington
Idaho
Alaska
Hawaii


Test site #1 - St. Johns River NW of discharge, 200 yds from shore
Timuquana Country Club
Test site #2 - St. Johns River SW of discharge, 200 yds from shore
Point of discharge
Park
Golf Course
15
Trailer Park
Towers
Tower
JACKSONVILLE
NAVAL AIR STATION
Piney Point
39
22
BM 19
Reservoirs
Casa Linda Lake
Mulberry Cove
Black Point
RIVER
Golf Course
27
43
44
Mulberry
BM 17
Towers
ST JOHNS
Reference site - St Johns River 1/2 mile N of Buckman Bridge
Buckman Bridge
295
9A

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: City of Jacksonville Southwest Regional Plant # 3		Date Summary Prepared: 01/15/93
Location (attach detailed map): 5420 118th Street Jacksonville, FL	County DUVAL	District NorthEast District
Federal Permit # FL0026468 and expiration date: June 30, 1995	State GMS # and 3116M05144 State expiration date: December 1, 1993 D016-155085	Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: Operation of a 10.0 MGD complete mix waste activated sludge wastewater treatment facility with chlorination, dechlorination and post aeration discharging to St. Johns River and serving the Southwest part of Duval County

Description of treatment process: Treatment consists of preaeration, prechlorination Screening, vortex grit removal, followed by biological treatment using activated sludge, then clarification, chlorination, dechlorination and post aeration. Sludge is treated by aerobic digestion and thickner digestion with ultimate disposal either by incineration or off-site land application. (see Diagram)

Receiving waters: ST. Johns River	Classification: I II (III)	
Design Flow: 10 MGD	Mean Flow: 5.85 MGD (Averaged over 6 months 1992)	Flow during survey:

Discharge is: (Continuous) Intermittent Seasonal Rainfall 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)
See attached sheets	
A. NPDES	
B. State Permit	

Describe special permit conditions and permit modifications:

NPDES permit requires a 48-hour acute static toxicity test be conducted using Mysidopsis bahia and a 96-hour acute static-renewal toxicity test using Menidia beryllina on four separate grab samples.

City of Jacksonville SW
(Facility)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Description of permitted outfall(s): Effluent from the City of Jacksonville SW Regional Plant #3 leaves the facility and flows to the St. Johns River near the Jacksonville Naval Air Station Fencaline.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: Reviewing the past MOR data from 1990 to 1992 reveal that 1990 was the worst year.

Jan 5, 1990 Fecal Coliform data not recorded due to error
Jan 25, 1990 Fecal Coliform data not recorded due to error
February, March and April fecal coliform data not recorded due to error in 1990
A couple of high Fecal Coliform data occurred June 18, 1990 280/100ml
February 6, 1990 BOD data not recorded due to error. February 7, 1990 370/100ml
February 9, 1990 430/100ml
June 24, -28, 1990 BOD data not recorded, July 4, 1990 BOD data not recorded
July 11, 1990 BOD, TSS and pH not recorded.
August 14, 1990 Fecal Coliform data showed 600/100ml.

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
No current enforcements actions are being sought at this time.
EPA permit violation, notified 2/12/91 for failure to submit sludge volume and disposal report as required by Part I.(B)(2) of the NPDES permit. The City of Jacksonville SW plant responded by 02/20/91 with a copy of the report.

The City of Jacksonville Utilities and the Bioenvironmental Services Division of the City sample the St. Johns River monthly at several locations near and at the City of Jacksonville SW Plant discharge. This information is available from these organizations.

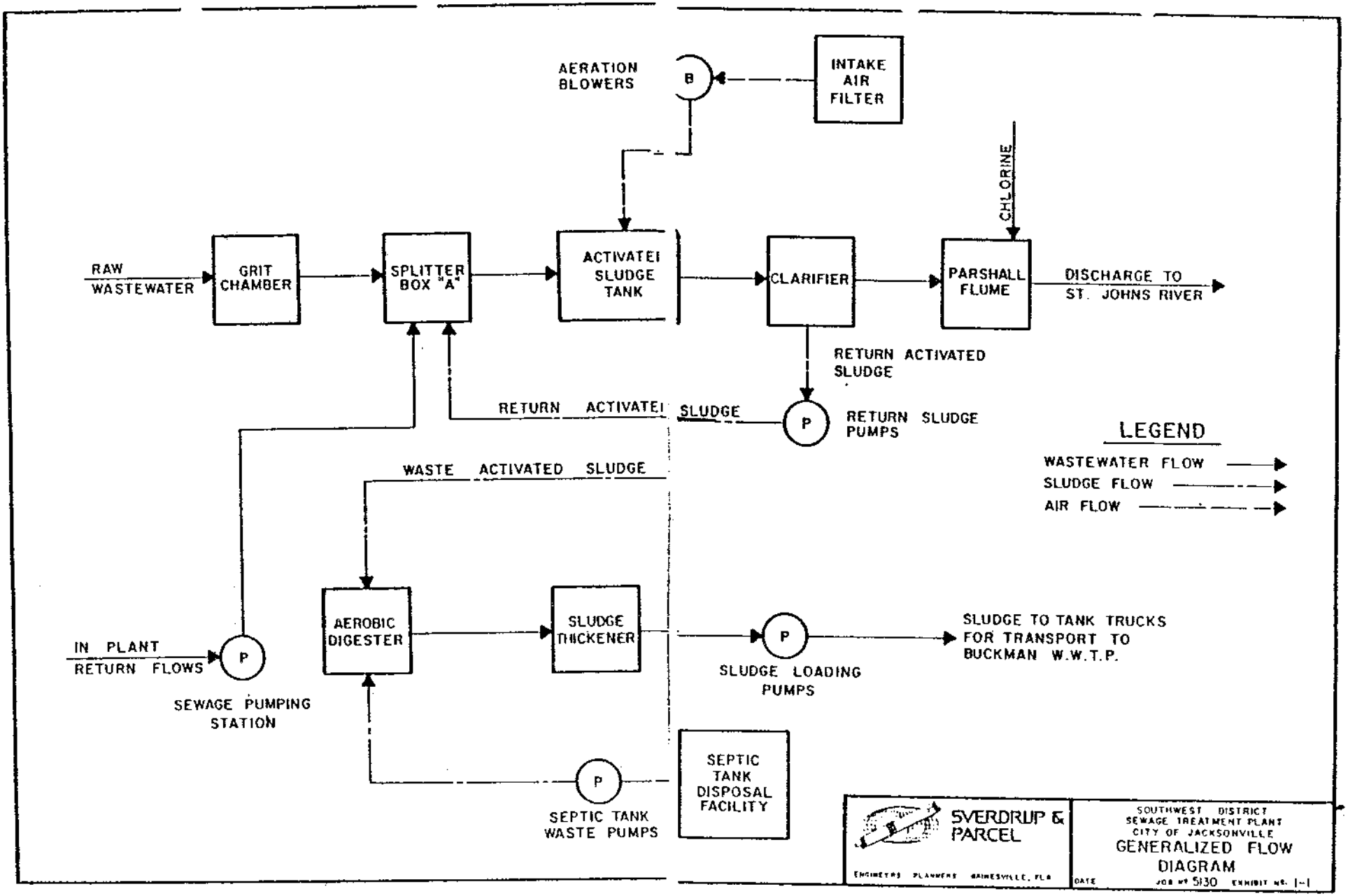
Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set:
Looking at the MOR data most of the permit violations for the 1991 year were from high flow on various days but the City of Jacksonville SW plant annual average flow was okay. A couple of high fecal coliform data occurred. In 1992 only a couple of high fecal coliform, BOD and TSS not reported. The City of Jacksonville SW Regional Plant #3

Additional information:
From May 2, 1990 to January 24, 1993, there occurred 48 wastewater overflows into drainage systems. These wastewater overflow reports were reported to the City of Jacksonville and appear to be primarily due to stoppage in mainline.

1/11/91 An EPA CEI (Compliance Evaluation Inspection) found the following deficiencies: 1) influent samples not collecting minimum 100ml sample 3) influent samplers suction line needs replacing due to algae growth inside line and 3) not recording actual values in Instrument Calibration Log.
City of Jacksonville SW plant responded by 09/13/93.

Staff contributing to this review (signature):
SCOTT BULGRIN Scott Bulgrin (Biologist)
Lindy Payne Lindy Payne ES I [redacted]
(Engineer)
( )
( )
( )

City of Jacksonville
Southwest Regional Plant #3



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

SUBMITTING AGENCY CODE: 8031 SUBMITTING AGENCY NAME: FL DER NE	STORET STATION NUMBER: 20.030.054	DATE (M/D/Y): 02/08/93	RECEIVING BODY OF WATER: St. Johns River near Duval/Clay County Border

REMARKS: West wind, Cold 50° Tide Incoming 300 NW River choppy	LOCATION: St. Johns River, ½ mile North of the Buckman Bridge on the west Bank	FIELD ID/NAME: (Reference Site)

Habitat Parameter score	Excellent	Good	Fair	Poor
Littoral Alterations 5	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 28	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 2	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 4	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 9	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	———	———	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 8	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 56

COMMENTS: Area sampled was the most unimpacted for the area. Best site in the vicinity for comparison. Marina nearby to the South.

ANALYSIS DATE:	ANALYST: SCOTT BULGRIN Cindy Payne	SIGNATURE: Scott Bulgrin Cindy Payne
02/08/93		

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DER NE	STORET STATION NUMBER: 20.030.634	DATE (M/D/Y): 02/08/93	RECEIVING BODY OF WATER: City of Jacksonville SW Regional #3 discharge into St. Johns River

REMARKS: West wind, Cold, 50° Tide Incoming, 300° NW River Choppy	LOCATION: St. Johns River NW of discharge / 200 yds From Shore on West Bank	FIELD ID/NAME: (TEST SITE #1)

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 2	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 25	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 2	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 4	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 9	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 8	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 50

COMMENTS: Area sampled has the Jacksonville naval Air Station and residential area influences. Several docks, riprap and Ortega River nearby.

ANALYSIS DATE:	ANALYST: SCOTT BULGRIN / Cindy Payne	SIGNATURE: Scott Bulgrin / Cindy Payne
02/08/93		

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DER NE	STORET STATION NUMBER: 20030.650	DATE (M/D/Y): 02/08/93	RECEIVING BODY OF WATER: City of Jacksonville SW Regional #3 discharge into St. Johns River

REMARKS: West wind, cold, 50° Tide Incoming 300°NW River choppy	LOCATION: St. Johns River SW of discharge / 200 yds from shore on west bank	FIELD ID/NAME: (TEST SITE #2)

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 4	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 25	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 2	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 4	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 9	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 8	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 52

COMMENTS: Area sampled has the Jacksonville Naval Air Station and residential area influences. Several docks, rip/rap and Ortega River nearby.

ANALYSIS DATE:	ANALYST: SCOTT BULGRIN / Cindy Payne	SIGNATURE: Scott Bulgrin / Cindy Payne
02/08/93		

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DER NE	STORET STATION NUMBER: 20.030.054	DATE (M/D/Y): 02/08/93	TIME: 1500	RECEIVING BODY OF WATER: St. Johns River near Duval/Clay County Borders

REMARKS: Area sampled was the most unimpacted for the area. Marina nearby to the south.	LOCATION: St. Johns River, ½ mile North of the Buckman Bridge on the west Bank	FIELD ID/NAME: (Reference Site)

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category): Jacksonville NAVAL Air Station

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			40			60

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

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

Point-Source Pollution (list location and describe): Town of Orange Park WWTP, marina, and Kingsley Service WWTP discharge into the St. Johns River South of the Buckman Bridge.

Estimated System Width (range, m): ~6666.00	Estimated System Depth (range, m): 0.3-10	yes
High Water Mark (m above bed): 0.3-1.0	Velocity (range, m/s): 0.10-0.25	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: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs				Sand	40	3	PONAR Petite
Aquatic Vegetation				Mud/Muck/Silt	45	3	PONAR Petite
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other: Shell	15	3	PONAR Petite

WATER QUALITY

	Depth (ft):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	Salinity		Secchi (m):
Top	SURFACE	13.3	7.08	8.94	2600	2		0.75
Mid-depth	7	13.4	6.85	8.72	3615	3		
Bottom	14	13.6	7.18	8.70	4000	3		

System Type : Stream: ☐ (Sand Bottomed, Sand Bot w/ Spring, Swamp & Bog, Calcareous, Alluvial, Misc.) Lake: ☐ Wetland: ☐ Estuary: ☒ Other: ☒ major River

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

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

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

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

Weather Conditions: Cold, 50° overcast. Rivas - choppy west wind, 300° NW.

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☒ not seen on this sampling date	☐	☐	☐
Fish	☒	☐	☐	☐
Aquatic Macrophytes	☐	☒ Some grass beds	☐	☐
Iron/sulfur Bacteria	☒	☐	☐	☐

SAMPLING TEAM: Scott Bulgrin, Cindy Payne	SIGNATURE: J. Scott Bulgrin, Cindy Payne	DATE: 02/08/93

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DER NE	STORET STATION NUMBER: 20.030.634	DATE (M/D/Y): 02/08/93	TIME: 1230	RECEIVING BODY OF WATER: City of Jacksonville SW Regional #3 discharge into St. Johns River

REMARKS: Area sampled has the Jacksonville Naval Air station and residential area influences.	LOCATION: St. Johns River NW of discharge / 200yds from shore on west bank	FIELD ID/NAME: (TEST SITE #1)

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category): Jacksonville Naval Air Station

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			60			40

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): City of Jacksonville Southwest Regional Plant #3 → Stormwater Runoff Ortega River

Estimated System Width (range, m): ~3940.00	Estimated System Depth (range, m): 0.3 - 10	yes
High Water Mark (m above bed): 0.3 - 1.0	Velocity (range, m/s): 0.10 - 0.25	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: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs				Sand	30	3	PONAR Petite
Aquatic Vegetation				Mud/Muck/Silt	40	3	PONAR Petite
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other:	30	3	PONAR Petite

WATER QUALITY

	Depth (~~m~~ ft):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	Salinity		Secchi (m):
Top	SURFACE	13.3	7.79	8.81	7500	6		0.80
Mid-depth	5	13.3	7.65	8.65	7750	6		
Bottom	10	13.3	7.93	8.95	7750	6		

System Type: Stream: ☐ (Sand Bottomed / Sand Bot w/ Spring; Swamp & Bog / Calcareous; Alluvial / Misc.) Lake: ☐ Wetland: ☐ Estuary: ☒ Other: ☐ major River

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

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

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

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

Weather Conditions: Cold, 50° overcast, Rivers - choppy west wind, 300° NW

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☒ not seen on this sampling data	☐	☐	☐
Fish	☒	☐	☐	☐
Aquatic Macrophytes	☒	☐	☐	☐
Iron/sulfur Bacteria	☒	☐	☐	☐

SAMPLING TEAM: Scott Bulgrin, Cindy Payne	SIGNATURE: Scott Bulgrin, Cindy Payne	DATE: 02/08/93

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DER NE	STORET STATION NUMBER: 20.030.650	DATE (M/D/Y): 02/08/93	TIME: 1330	RECEIVING BODY OF WATER: City of Jacksonville SW Regional #3 discharge into St. Johns River

REMARKS: Area sampled has the Jacksonville Naval Air Station and residential area influences.	LOCATION: St. Johns River NW of discharge / 200 yds from shore on West Bank	FIELD ID/NAME: (TEST SITE #2)

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category): JACKSONVILLE NAVAL AIR STATION

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			60			40

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): City of Jacksonville Southwest Regional Plant #3 → STORMWATER Runoff Ortega River

Estimated System Width (range, m): ~3940	Estimated System Depth (range, m): 0.3 - 10	yes
High Water Mark (m above bed): 0.3-1.0	Velocity (range, m/s): 0.15 - 0.25	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: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs				Sand	30	3	PONAR Petite
Aquatic Vegetation				Mud/Muck/Silt	40	3	PONAR Petite
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other: Shell	30	3	PONAR Petite

WATER QUALITY

	Depth (ft):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	Salinity		Secchi (m):
Top	SURFACE	13.3	7.92	8.81	7750	6		0.75
Mid-depth	5	13.3	8.01	8.72	8000	6		
Bottom	10	13.3	8.08	8.42	8250	6		

System Type : Stream: ☐ (Sand Bottomed, Swamp & Bog, Alluvial, Sand Bot w/ Spring, Calcareous, Misc.) Lake: ☐ Wetland: ☐ Estuary: ☒ Other: ☐ major River

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

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

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

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

Weather Conditions: Cold, 50° overcast. Rivers - choppy west wind, 300° NW

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☒ not seen	☐	☐	☐
Fish	☒ or this	☐	☐	☐
Aquatic Macrophytes	☒ sampling	☐	☐	☐
Iron/sulfur Bacteria	☒ data.	☐	☐	☐

SAMPLING TEAM: SCOTT BULGRIN, Cindy Payne	SIGNATURE: Scott Bulgrin, Cindy Payne	DATE: 02/08/93

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Jax City Plant
Location:
County:
Contact/District: S. Bulgrin / NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 2/8/93 Time 1030
Test Beginning: Date 2/9/93 Time 1530
Test Ending: Date 2/10/93 Time 1400
Organism Batch #: 6 Diluent Batch #: 2
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia

93 Feb 09 29 49423

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

Test Number: 1 of 2

Remarks: Test terminated after 24 hours.

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 10.06 @ 10.0	21.9 @ 22.0	8.4 @ 24.0	980 @ 1,000 @ 24°C 9770 @ 10,000
24 hr	7.0 @ 7.0 10.02 @ 10.0	22.1 @ 22.3	8.7 @ 24.0	975 @ 1,000 @ 23.6°C 9730 @ 10,000
48 hr	~~7.0~~ @ 7.0 Test terminated ~~10.0~~ @ ~~10.0~~	~~23.3~~ @ ~~23.4~~	~~8.5~~ @ ~~23.4~~	~~960~~ @ 1,000 @ ~~23.3~~°C ~~9660~~ @ 10,000

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	~~Cond. (mmhos/cm)~~ Cond. (µmhos/cm) 0	24	48
Control	A	5	5		8.2	8.3		22.6	22.5		8.3	7.8		190	180	
Control	B	5	5			8.3						7.8			170	
Control	C	5	5			8.3						7.8			170	
Control	D	5	5			8.3						7.8			170	
100%	A	5	0		7.3	8.4		22.7	22.7		8.1	7.8		540	575	
100%	B	5	0			8.4						7.8			580	
100%	C	5	0			8.4						7.8			570	
100%	D	5	0			8.4						7.8			570	
Measured/Loaded by:		MF	MF		MF	MF		MF	MF		MF	MF		MF	MF	
Recorded by:		MF-TR			TR	TR		TR	TR		TR	TR		TR	TR	

Investigators' Signatures

Mark Faircloth
Robin Rader

Reviewer

form updated 10/20/92

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			not measured		
Lab Total Residual Cl2:	.02	.02	.02	DR100	TR
Alkalinity:	125	75	120	Hach	TR
Hardness:	120	70	160	Hach	TR
Total Ammonia:	<0.017	<0.017	0.891	ORION	MF

Cl2 Blank: ____ Ammonia Meter Slope: -55.0 Ammonia Blank: <0.017 Sample Salinity: ____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Jax City
Location:
County:
Contact/District: S. Bulgrin / NE
NPDES Permit #: FL00 **Outfall #:**

Sample Collection: Date 2/8/93 Time 1030
Test Beginning: Date 2/9/93 Time 1530
Test Ending: Date 2/11/93 Time 1400
Organism Batch #: 4 **Diluent Batch #:** WELL
Organism Age: Neonates less than 12 hrs
Test Organism: N. LEEDSI

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

Test Number: 2 of 2

Remarks:

93 Feb 09 29 49423

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 10.06 @ 10.0	21.9 @ 22.0	8.4 @ 24.0	980 @ 1,000 9770 @ 10,000 @24
24 hr	7.0 @ 7.0 10.05 @ 10.0	22.1 @ 22.3	8.7 @ 24.0	975 @ 1,000 9730 @ 10,000 @23.6
48 hr	7.0 @ 7.0 10.0 @ 10.0	23.3 @ 23.4	8.5 @ 23.4	960 @ 1,000 9660 @ 10,000 @23.3

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			~~Cond. (mmhos/cm)~~ Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	43	5	5	5	7.8	8.2	8.3	22.9	22.3	22.4	8.2	7.7	8.5	240	240	240
Control	18	5	5	5	7.8	8.2	8.3				8.2	7.7	8.5	240	240	240
100%	41	5	5	5	7.1	7.7	8.0	23.3	22.2	22.4	8.0	7.1	8.0	575	560	565
100%	20	5	5	5	7.1	7.6	7.8				8.0	7.0	8.0	575	560	565
Measured/Loaded by:		MJT	TR	TM	MF	TR	TM	MF	TR	TM	MF	TR	TM	MF	TR	TM
Recorded by:		MF	TR	TR	TR	EM	TR	TR	EM	TR	TR	EM	TR	TR	EM	TR

Investigators' Signatures

Marshall Faircloth
Tobin Rader
Ed Miller

Reviewer

form updated 10/20/92

Water Quality Parameters	Salt Water/ (Well Water)	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			NM	NM	NM
Lab Total Residual Cl2:	.02	.02	.02	DR100	TR
Alkalinity:	125	75	120	Hach	TR
Hardness:	120	70	160	Hach	TR
Total Ammonia:	<0.017	<0.017	0.891	Orion	MF

Cl_2 Blank: 0.0 Ammonia Meter Slope: -55.0 Ammonia Blank: <0.017 Sample Salinity: ____ ppt

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 Phosphorus	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30
LAKES (477 stations)											
Phytoplankton Chlorophyll *a*	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10	47.20	65.44	113.90
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3.15	3.17
Dredge Taxa Richness	3.00	5.00	6.50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40	1.51	1.68	2.11	3.46
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10	0.14	0.23
Total Phosphorus	0.01	0.02	0.02	0.03	0.05	0.07	0.09	0.11	0.14	0.23	0.42
Ortho-Phosphorus	0.00	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.21	0.32
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	26.00	40.00
ESTUARIES (690 stations)											
Phytoplankton Chlorophyll *a*	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphorus	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

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

Benthic macroinvertebrate taxa list for City of Jacksonville Regional WWTP #3, collected via Ponar grab samples in the St. Johns River, on 8 February, 1993. Densities, in number/m^2, represent the mean of three replicates.

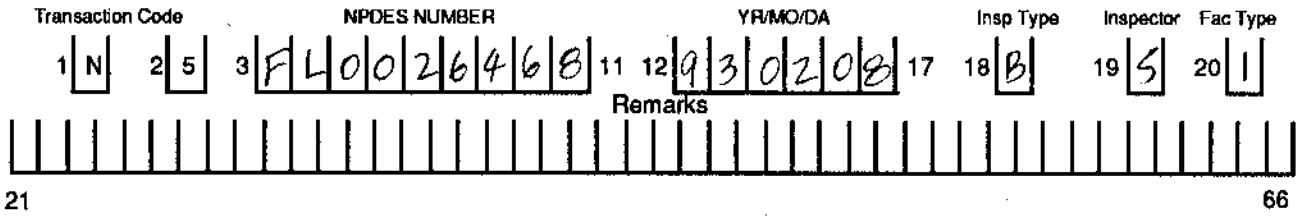
	Reference Site	Test Site 1	Test Site 2
Diptera			
Coelotanypus sp.	187.1	–	25.0
Cryptochironomus sp.	25.0	62.4	49.9
Dicrotendipes simpsoni	12.5	–	–
Djalmabatista pulcher	12.5	–	–
Polypedilum halterale grp.	25.0	–	–
P. scalaenum grp.	37.4	–	25.0
Undetermined Chironomidae	12.5	–	12.5
Ectoprocta			
Membranipora tenuis	–	25.0	25.0
Ephemeroptera			
Stenonema exiguum	–	25.0	–
Gastropoda			
Undetermined Hydrobiidae	–	12.5	–
Malacostraca			
Amphipoda			
Corophium lacustre	349.3	112.3	37.4
Gammarus sp.	12.5	–	–
Hyalella azteca	–	25.0	–
Melita nitida	49.9	–	25.0
Monoculodes edwardsi	–	12.5	–
Undetermined Amphilochidae ?	–	–	25.0
Decapoda			
Rhithropanopeus harrisii	74.9	49.9	124.8
Isopoda			
Cassidinidea ovalis	–	–	12.5
Cyathura polita	12.5	212.1	137.2
Nemertina			
Undetermined Nemertina	–	37.4	37.4
Oligochaeta			
Limnodrilus hoffmeisteri	–	25.0	–
Undetermined oligochaete	137.2	99.8	25.0
Pelecypoda			
Ischadium recurvum ?	12.5	49.9	49.9
Mytilopsis leucophaeta	1634.2	511.5	1771.5
Polymesoda caroliniana	–	12.5	37.4
Rangia cuneata	262.0	162.2	137.2
Polychaeta			
Boccardiella ligerica	25.0	49.9	37.4
Laeonereis culveri	–	12.5	12.5

Nereis succinea	12.5	12.5	–
Scolecolepides viridis	137.2	2544.9	1746.5
Streblospio benedicti	–	25.0	74.9
Undetermined Nereidae	–	–	37.4
Thoracica			
Balanus improvisus	948.1	923.2	2682.1
Trichoptera			
Cyrnellus sp.	–	12.5	–
Total	3979.8	5015.5	7148.5

Phytoplankton taxa list and densities (#/mL) for City of Jacksonville SW Regional Plant #3, collected via subsurface grabs in the St. Johns River, on 8 February, 1993.

	Reference Site	Test Site 1	Test Site 2
Diatoms			
Achnanthes sp.	–	–	50
Asterionella japonica	50	–	25
Chaetoceros sp.	–	100	–
Cocconeis sp.	–	25	–
Coscinodiscus sp.	100	75	125
Cyclotella sp.	100	25	25
Diploneis sp.	25	–	50
Eunotia sp.	25	–	–
Fragilaria sp.	75	–	–
Melosira sp.	50	–	50
Navicula sp.	50	–	–
Nitzschia sp.	151	100	50
N. delicatissima	–	–	25
N. longissima	–	25	–
Pleurosigma sp.	–	25	–
Rhaphoneis sp.	–	25	50
Skeletonema sp.?	125	75	150
Skeletonema sp.	125	928	753
Thalassiothrix sp.	–	50	–
Chlorophyta			
Unknown chlorophyte flagellate	25	50	25
Tetrastrum sp.	25	–	–
Cryptophyta			
Cryptomonas sp.	–	–	75
Cyanophyta			
Aphanocapsa sp.	–	–	25
Chroococcus sp.	50	50	50
Microcystis sp.	50	–	–

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



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