#260

Biological Assessment of

City of Sarasota WWTP

Sarasota County

NPDES #FL0040771

Sampled December 1998

October 1999

Biology Section
Division of Administrative and Technical Services
Bureau of Laboratories

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection

Results of Fifth Year Inspections

Discharger:	City of Sarasota WWTP
County:	Sarasota
NPDES Number:	FL0040771
Permit Expiration Date:	1/31/2004

Toxics Sampling Inspection (XSI)

Date Sampled: 1 December 1998

Results: Aluminum, copper, iron, lead, silver, and zinc were detected in the effluent sample at levels that complied with Class III marine water quality standards. Atrazine was detected at the control site at levels below the practical quantitation limit.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 1 December 1998

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

Impact Bioassessment Inspection (IBI)

Date Sampled: 1 December 1998

Results: The macroinvertebrate community health was extremely degraded at all three study sites. Taxa richness and Shannon-Weaver diversity were 80%-95% lower than other typical Florida estuaries at all three study areas. Test site 2 contained three polychaete taxa, one of which was the somewhat sensitive polychaete, *Prionospio heterobranchia.* Test site 1 and the control site had only one pollution-tolerant polychaete taxon. Pelecypods, normally "good water quality" indicators, were absent from both the control site and test site 2, and a single species, *Crassostrea virginica,* made up 8% of the community at test site 1. In general, phytoplankton community health was better at the test sites compared to the control site. The one exception was chlorophyll *a*, for which levels at test site 1 and 2 were greater than 95% and 70% of other Florida estuaries, respectively.

Water Quality Inspection (WQI)

Date Sampled: 1 December 1998

Results: The effluent nutrients complied with the facility's permit limits. Several of the nutrients at the test sites far exceeded levels found in other Florida estuaries. For example, nitrate+nitrite at the test sites was higher than 95% of levels normally found in other estuaries in Florida. The algal growth potential was below the 10 mg/L "problem threshold" at the control site, yet exceeded this level at both test sites. Effluent AGP was 24.6 mg dry wt/L.

This biological assessment was prepared by DEP staff to provide information to be used in reviewing an NPDES permit renewal application for the subject facility. This assessment will be used in conjunction with other information concerning the facility and its receiving water body to determine appropriate final permit conditions.

Introduction

The City of Sarasota Wastewater Treatment Plant is located in Sarasota County, Florida (see maps in the Appendix). This domestic waste facility provides advanced treatment by a "modified" Bardenpho process. Reclaimed water is used for irrigation of golf courses and agricultural lands. The facility has a submerged outfall located in the southwest corner of Whitaker Bayou under the Tamiami Trail Bridge. The design flow of the wastewater system is 10.2 MGD, while the mean flow was 8.0 MGD.

State permit limits for the City of Sarasota Wastewater Treatment Plant are listed in Table 1. According to the facility's monthly operating reports, the plant had a raw sewage spill in March, 1998, which was due to a break in the pipe system caused by corrosive gas entrapped in the line. As a result, 20 million gallons of raw sewage were discharged across plant grounds and ultimately into Sarasota Bay (see Facility Summary Sheet in Appendix). This Fifth Year Inspection report is part of a basin-wide study of Sarasota Bay and is available upon request.

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 control site (located within Bowlees Creek) and two test sites bracketing the discharge (both located within Whitaker Bayou) (see map in the Appendix). A habitat assessment was performed *in situ* to establish comparability between sites, and supplemental physical/chemical data were collected on the effluent and study sites on December 1, 1998, during an outgoing tide. The effluent and study sites were analyzed for nutrients, metals, and for organic constituents (base neutral and acid extractables, and pesticide extractables). Methods used for all chemical analyses are on file at the DEP Central Chemistry Laboratory in Tallahassee.

Acute screening toxicity bioassays, using the invertebrate, *Ceriodaphnia dubia*, and the fish, *Cyprinella leedsi*, as test organisms, were performed on an effluent sample. Sediments from control and test sites were analyzed for grain size and percent organic matter.

Phytoplankton were sampled at both control and test sites via subsurface grabs. Chlorophyll *a* was also determined for phytoplankton communities. Algal Growth Potential (AGP) tests were performed using *Selenastrum capricornutum* as the test organism for the freshwater effluent and *Dunaliella tertiolecta* for the marine receiving-water sites.

Benthic macroinvertebrate communities were evaluated at control and test sites using three replicate petite Ponar grabs. Several different measures of macroinvertebrate and algal community health have been employed to determine the effects of the discharge. These measurements include: taxa richness, Shannon-Weaver Diversity Index, community composition, functional feeding groups, and algal biomass. For discussion of each of these measures see the *Explanation of Measurements of Community Health* in the Appendix. All field and laboratory biological methods followed Biology Section Standard Operating Procedures (SOP's). The SOP's can be viewed on the website <www.dep.state.fl.us/labs/sops.htm>.

The following personnel were involved in this investigation: Andrea Grainger and Charles Kovach (DEP Southwest District), and Julie Baughman, Ken Espy, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Michael Heyn, Elizabeth Miller, Urania Quintana, Johnny Richardson, Lisa Homann, Amy Weaver, Steve Wolfe, David Whiting, and Vicki McGee (DEP Central Biology Laboratory in Tallahassee). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Chuck Ziegmont, and Michael Tanski, as well as District representatives.

Results

The test sites were situated within Whitaker Bayou, a heavily urbanized and channelized tidal creek, with shorelines that consisted mostly of vertical seawalls and some rip rap. At the control site in Bowlees Creek, the shoreline was mostly vertical seawalls. A marina and boatyard are present on the north side of Bowlees Creek (see Habitat Assessment Field Data Sheets in Appendix). Commercial, residential, and industrial land-uses dominated at all three sites. Only one productive community type was observed at the three study sites; mangroves made up the southern edge of test site 1, and were patchy at the control site and test site 2. Habitat scores were in the "fair" category at all three study sites, ranging from 42 points at test site 1, to 31 and 35 points at the

Table 1. Effluent limits and summary of chemistry data.

City of Sarasota WWTP	Effluent Limits	Effluent Samples	Control Site	Test Site 1	Test Site 2
Organic Constituents (µg/L)					
Atrazine	-	0.06 I			-
Metals (µg/L)					
Aluminum	1500 **	166 I	500 U	500 U	500 U
Arsenic	50 **	20 U	50 K	30 K	20 U
Cadmium	9.3 **	0.05 U	0.5 U	0.5 U	0.5 U
Chromium	50 **	10 U	20 U	20 U	20 U
Copper	2.9 **	2.6 A	1.9 I	2.5	2.34
Iron	300 **	39 I	150 U	150 U	150 U
Lead	5.6 **	0.3 I	1 U	1 U	1 U
Mercury	0.025 **	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	8.3 **	6 U	20 K	20 K	6.0
Selenium	71 **	40 U	400 U	400 U	400 U
Silver	2.3 **	0.1 I	0.4 U	0.4 U	0.4 U
Zinc	86 **	21 I	60 U	60 U	60 U
Nutrients (mg/L)					
Ortho-phosphate	-	0.02	0.04 I	0.03 I	0.021 I
Total phosphorus	1.0 *	0.07 A	0.13 A	0.19	0.11
Ammonia	-	0.04	0.01 U	0.02 I	0.04
Nitrate+Nitrite	-	0.13	0.02 U	0.27	0.5
TKN	-	0.62 I	0.76 A	1.2	0.75
Organic Nitrogen	-	0.58	0.75	1.18	0.71
Total Nitrogen	3.0 a	0.75	0.78	1.47	1.25
General Phys-Chem Parameters					
Habitat Assessment	-	-	31	42	35
D.O. (mg/L) surface	-	7.2	6.1	7.3	7.1
D.O. (mg/L) mid-depth	6.0 *	-	5.9	7.3	7.3
D.O. (mg/L) bottom	-	-	5.9	7.8	6.8
pH (SU) surface	-	7.8	7.8	7.6	7.7
pH (SU) mid-depth	6.0-8.5 *	-	7.7	7.8	7.8
pH (SU) bottom	-	-	7.5	7.7	7.7
Conductivity (µmhos/cm)surface	-	165	36,015	27,221	30,547
Conductivity (µmhos/cm) mid	-	-	46,137	34,909	37,382
Conductivity (µmhos/cm) bottom	-	-	47,907	47,377	46,209
Salinity (ppt) surface	-	≤ 1	23	17	19
Salinity (ppt) mid-depth	-	-	31	22	24
Salinity (ppt) bottom	-	-	33	32	31
Temperature (°C) surface	-	24.1	23.9	25	25.2
Temperature (°C) mid-depth	-	-	23.1	24.4	24.8
Temperature (°C) bottom	-	-	23.2	23.8	24.1
TRC (mg/L) after dechlorination	0.01 *	≤ 0.03	-	-	-
AGP (mg dry wt/L)	-	24.6	1.9	15.1	13.0
Toxicity (48-hour static, screening bioassay)					
Bioassay - Fish	-	Not Toxic	-	-	-
Bioassay - Invertebrate	-	Not Toxic	-	-	-
Microbiology (# counts/100ml)					
Fecal Coliforms	25 *	-	-	-	-

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

I - Value reported is less than the minimum quantitation limit, and ≥ the minimum detection limit

K - Actual value is known to be less than the value given

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

control site and test site 2, respectively. The substrate at the study sites consisted mainly of anaerobic mud and fine sand. Approximately 85% of all the sediment particles at the study sites were between 0.125 – 2.0 mm in diameter. The results of the sediment chemistry analysis are in Table 3.

The remaining chemical and biological results are in Tables 1 and 2.

Discussion

Physical/chemical parameters varied between the receiving water stations. The surface layer dissolved oxygen ranged from 6.1 mg/L at the control site to 7.3 mg/L at test site 1. The bottom layer dissolved oxygen ranged between 5.9 mg/L at the control site and 7.8 mg/L at test site 1. The surface salinity ranged from 23 ppt at the control site to 17 ppt at test site 1. The bottom salinities were higher at all three study sites – around 32 ppt at all three sites (Table 1). The pH was slightly above neutral at all sites and all depths.

Aluminum, copper, iron, lead, silver, and zinc were detected in the effluent sample at levels that complied with Class III marine water quality standards (Table 1). Due to matrix interference, the values reported for arsenic and nickel at the control site and test site 1 are known to be less than the values given (Table 1). Atrazine was detected in the control sample at a level below the practical quantitation limit (Table 1).

The effluent sample was not toxic to the fish, *Cyprinella leedsi,* or to the invertebrate, *Ceriodaphnia dubia,* during the 48-hour bioassay (Appendix).

Several of the nutrients at the test sites were greater than the control site and the elevation appears to be due to the effluent (Table 1). For example, TKN at test site 1 was 85% higher and test site 2 was 60% higher than other Florida estuaries (see *Typical Values for Selected Parameters in Florida Waters* in the Appendix). Exceptionally high levels of nitrate+nitrite were found at test sites 1 and 2. These levels were 95% higher than other typical Florida estuaries. Total phosphorus values at test sites 1 and 2 were greater than 70% and 50% of other Florida estuaries, respectively.

Table 2. Community structure of control and test sites.

City of Sarasota WWTP	Control Site	Test Site 1	Test Site 2
Macroinvertebrate Quantitative			
Number of Taxa	3	3	5
Shannon-Weaver diversity	1.4	1	2
No. Polychaete Taxa	1	1	3
Community Composition			
% Cirripedia	0	77	14
% Gastropoda	56	0	0
% Pelecypoda	0	8	0
% Polychaeta	11	15	72
% Tubificidae	33	0	14
Functional Feeding Groups			
% Burrowing Deposit Feeders	33	15	60
% Predators/Carnivores	11	0	0
% Scrapers	56	0	0
% Surface Deposit Feeders	0	0	13
% Suspension Feeders	0	85	27
Phytoplankton Algae			
Number of Taxa	9	17	12
Shannon-Weaver diversity	1.3	3	2.4
Chlorophyll *a* (µg/L)	8.7	27.4	10.3 A
Algal Density (#/mL)	9,327	1,196	1,561
% Blue-green	0	0	1
% Cryptophytes	1	8	5
% Diatoms	93	46	46
% Dinoflagellates	4	41	47
% Green	1	1	2
AGP (mg dry wt/L)	1.9	15	13

U - Analyzed for but not detected; value is the minimum detection limit

Many of the indicators of phytoplankton community health were better at the test sites compared to the control site (Figure 1). For example, although the algal density at the study sites was relatively low, the control site level was significantly higher than either test site (Table 2). Diversity was 130% higher at test site 1 and 85% higher at test site 2 compared to the control site. Likewise, taxa richness was 89% and 33% higher at test site 1 and 2 compared to the control site. Exceptions to this trend were the chlorophyll *a* and AGP values. At test site 1 and 2, the chlorophyll *a* values were 215% and 18% higher than the control site, respectively (Figure 1). Likewise, the AGP values were much higher at the test sites than the control site. The AGP was below the 10 mg dry wt/L "problem threshold" at control site but exceeded this level at both test sites (Ron Raschke, U.S. EPA, pers. comm.).

Although the macroinvertebrate commmunities were improved over the last Fifth Year Inspection of Sarasota WWTP (FDEP 1997) when no organisms were recovered from the Ponar grabs, the community health is still considered very poor at all three study areas. Taxa richness at all three sites was less than nearly 95% of all other estuaries in Florida. Similarly, Shannon-Weaver diversity was low at all three study sites (Table 2). The diversity was highest at test site 2, however, 70% of typical Florida estuaries have higher values. Nearly 95% of all estuaries in Florida have higher diversity values than the control site and test site 1. Test site 2 contained only 3 polychaete taxa; one of which was the somewhat pollution-sensitive polychaete, *Prionospio heterobranchia*. Test site 1 and the control site had only one polychaete taxon, a pollution-tolerant species (see Macroinvertebrate Taxa Lists in the Appendix). Pelecypods, normally indicators of "good water quality", were absent from both the control site and test site 2. Although pelecypods made up 8% of test site 1, there was only one species, *Crassostrea virginica*. Few pollution-sensitive organisms were found at the three study sites.

These results suggest that although the study area has recovered since the last Fifth Year Inspection, there is still severe degradation of the biological communities in the study area.

Literature Cited

EA Engineering, Science, and Technology and Tetra Tech, Inc. 1994. Bioassessment for the nonpoint source program (draft). Prepared for the Fla.

Table 3. Summary of sediment chemistry data.

City of Sarasota WWTP	Control Site	Test Site 1	Test Site 2
Organic Constituents (µg/kg)			
Total Organic Carbon (mg/kg)	33,000	27,000	34,000
TRPH (mg/kg)	70	100	150
Benzo(b)anthracene	540 U	500 U	1100 I
Benzo(b)pyrene	540 U	500 U	1300 I
Benzo(b)fluoranthene	1100 I	500 U	2700 I
Chrysene	540 U	500 U	1500 I
Fluoranthene	830 I	500 U	3100 I
Phenanthrene	540 U	500 U	1100 I
Pyrene	750 I	500 U	2500 I
Metals (mg/kg)			
Aluminum_308	2240 J	6490 J	2240 J
Arsenic	3.15 A	4.36	2.2
Cadmium	0.271	0.392	0.32
Chromium	12	17	13
Copper	21.4 A	8.28	32.6
Iron_271	2480 A	5980	3110
Lead	15.4 A	13.3	233
Mercury	0.050	0.037	0.060
Nickel	2.4 I	4.2 I	5.1
Selenium	0.5 U	0.5U	0.8 I
Silver	0.07 A	0.279	0.239
Zinc	58.7	32.7	86.8
Percent Organic Matter (%)	6.99	6.6	6.47

A - Value reported is the mean of two or more determinations
I - Value is < the minimum quantitation limit, and ≥ the minimum detection limit
J - Estimated value
U - Aanalyzed for but not detected; value is the minimum detection limit

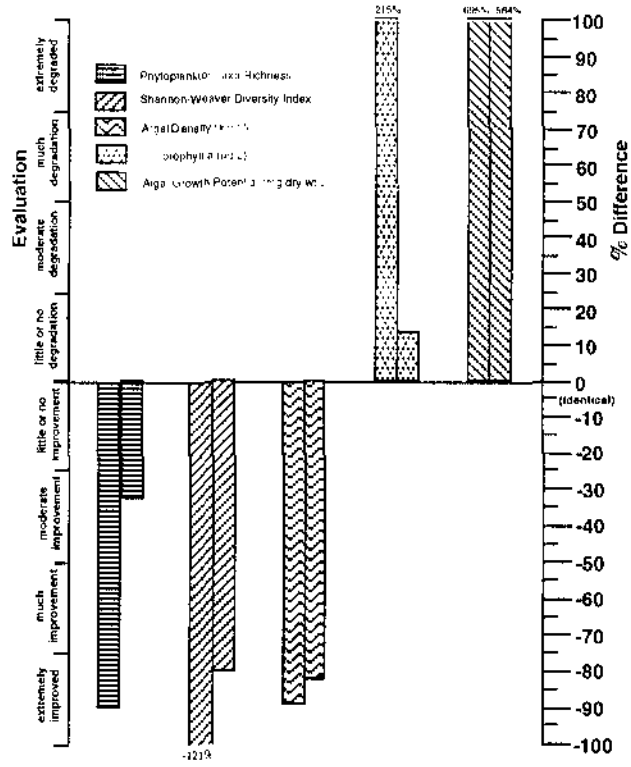


Figure 1. Effect of discharge on the phytoplankton community.

Dept. Environ. Protection. Unpaginated.

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

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

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

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

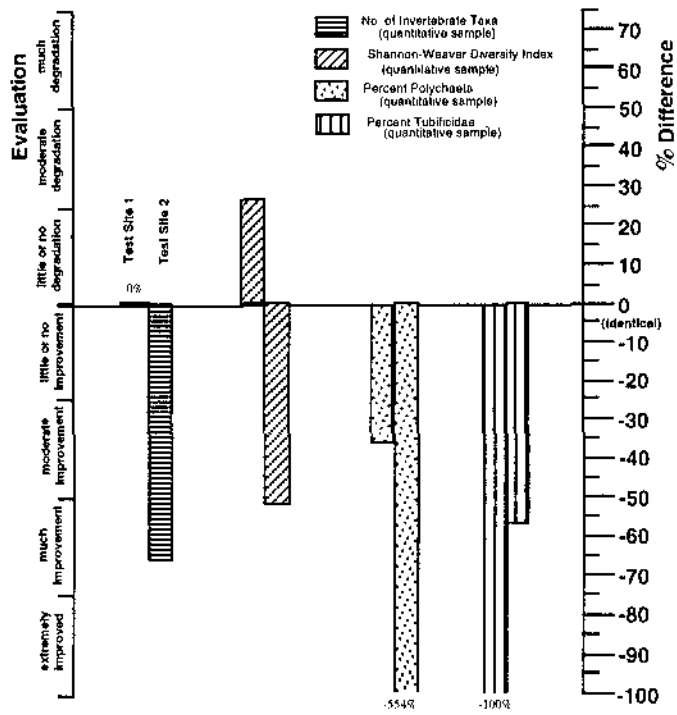


Figure 2. Effect of discharge on the macroinvertebrate community.

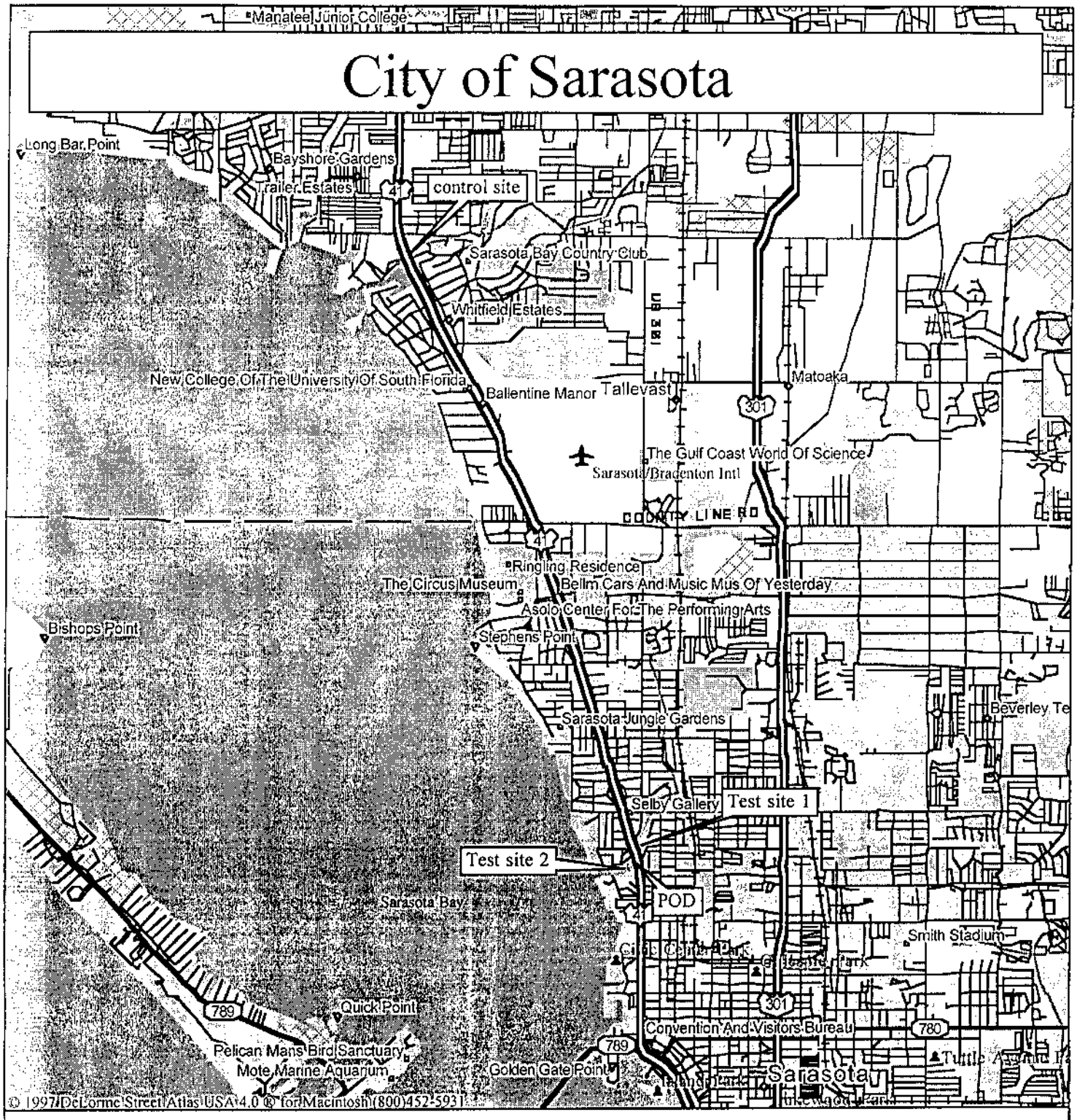
Typical Values for Selected Parameters in Florida Waters

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

Percentile Distribution

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	53.00
H-D Taxa Richness	6.00	6.50	9.00	11.50	13.00	15.00	17.00	21.50	26.00	29.00	32.00
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51
Ortho Phosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30
LAKES (477 stations)											
Phytoplankton Chlorophyll *a*	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10	47.20	65.44	113.90
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3.15	3.17
Dredge Taxa Richness	3.00	5.00	6.50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40	1.51	1.68	2.11	3.46
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10	0.14	0.23
Total Phosphorus	0.01	0.02	0.02	0.03	0.05	0.07	0.09	0.11	0.14	0.23	0.42
Ortho-Phosphate	0.00	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.21	0.32
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	26.00	40.00
ESTUARIES (690 stations)											
Phytoplankton Chlorophyll *a*	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphate	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

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



Mag 13.00
Thu May 13 15:00 1999
Scale 1:62,500 (at center)

1 Miles

2 KM

- Local Road
- Major Connector
- State Route
- US Highway
- Railroad
- Point of Interest
- Small Town
- Large City
- Geographic Feature
- Park/Reservation
- Sched Service Airport
- Locale
- Cemetery
- County Boundary

FACILITY SHEET FOR FYI-5

Facility Name: City of Sarasota WWTP Date Summary Prepared: 12/3/98

Location: 1750 12th Street North Sarasota County: Sarasota District: SW District

Function of Facility: Treatment of Domestic Wastewater

Description of Treatment Process: Advanced waste treatment by "modified" Bardenpho process with the reuse of reclaimed water for irrigation of urban access areas including golf courses and agricultural land used for pasture or jcitrus crops.

Receiving Waters: Whitaker Bayou Water Classification: Class III Marine

Design Flow: 10.2 MGD (Annual Average) and 13.0 MGD (Max. Monthly) Mean Flow: approx. 8.0 MGD

The Discharge is Continuous

If facility has a mixing zone, please give details (size, parameters, etc.): No mixing zone

List Effluent Limits:

Parameter	Limits	
Flow	10.2 MGD AA*	13.0 MMax
CBOD5	5.0 mg/L AA	3.0 mg/L (≥ 3.0 cfs)**
		2.0 mg/L (< 3.0 cfs)**
TSS	5.0 mg/L AA	6.25 mg/L MA 7.25 mg/L WA 10.0 mg/L Max
Total Nitrogen	3.0 mg/L AA	3.75 mg/L MA 4.5 mg/L WA 6.0 mg/L Max
Total Phosphorus	1.0 mg/L AA	1.25 mg/L MA 1.5 mg/L WA 2.0 mg/L Max
Dissolved Oxygen	6.0 mg/L Min	
pH	6.0 - 8.5 Range	
TRC (for disinfection)	1.0 mg/L Min	
TRC (after dechlorination)	0.01 mg/L Max	
Fecal Coliform 25 cfu/100 mL Max	75% nondetectable	

* AA=Annual Average MMax= Maximum Monthly MA=Monthly Average
WA=Weekly Average Max=Maximum single sample Min=Minimum single sample

** Flow stream rate of Whitaker Bayou at time of sampling

Description of permitted outfall: Outfall 001 discharges to Whitaker Bayou, in the southwest corner under the Tamiami Trail bridge (Hwy 41). The outfall is submerged.

List permit violations and plant upsets that occurred within past 3 years: On March 20, 1998, the facility experienced a spill of raw sewage due to a break in the 36 inch line between the headworks and the equalization tank. Approximately 20 million gallons of raw sewage was discharged across plant grounds and ultimately into Sarasota Bay. The spill was due to a catastrophic failure of the piping material of the 36 inch line, caused by corrosive gas entrapment within the line.

Describe previous impact bioassessments, WQBELs, and previous and current enforcement actions: A FYI-5 was conducted at this facility on October 28, 1998, which indicated that the macroinvertebrate and algal communities in Whitaker Bayou and Bowlees Creek were disturbed. It was due to those results that this study was conducted.

Staff contributing to this review:

Andrea Grainger (Biologist)
Michele Duggan (Inspector)

RQ-11-30-04 City of Sarasota

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Control Site

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24010049	12/1/98	1100	Bowlees Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Tide going out	Sarasota	SW-4 / City of Sarasota	Site SW-4 24884 → 24886

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	~~Other (Specify)~~ Golf Course
15		10		45	5		25

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

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

Width of riparian vegetation (m) on least buffered side: 0

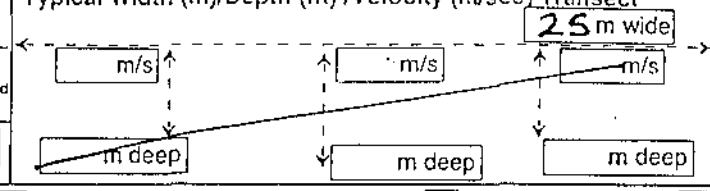
List & map dominant vegetation on back

Artificially Channelized ☐ no ☑ recent, severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes more sinuous

High Water Mark: 0.2 (m above present water level) + 2.0 (present depth in m) = 2.2 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposition: Sludge: ☑ Sand smothering: none ☐ slight ☐ moderate ☐ severe ☐ Silt smothering: none ☐ slight ☐ moderate ☐ severe ☐ Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or ~~Salinity (ppt)~~:			Secchi (m):
Top	0.1	23.90	7.81	6.06	36,015			1.0
Mid-depth	1.0	23.12	7.74	5.86	46,137			
Bottom	2.0	23.15	7.52	5.87	47,907			

System Type: Stream: ☐ (1st - 2nd order ☐ 3rd - 4th order ☐ 5th - 6th order ☐ 7th order or greater ☐) Lake: ☐ Wetland: ☐ Estuary: ☑ Other: ☐ _____

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

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

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

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

Weather Conditions/Notes:
Due to the original reference site for City of Sarasota in 1996. There is a marina/boat yard on north side of creek.

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

SAMPLING TEAM: Crangos / Kovach

SIGNATURE: Andrea Crangos

DATE: 12/13/98

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	24010049	1 /98	Bowlees Creek

REMARKS:	LOCATION:	FIELD ID/NAME:
Tide is going out	SW-4 / Cove of Sarasota	CONTROL SITE

Habitat Parameter / Score	Excellent	Good	Fair	Poor
Littoral Alterations: 0	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: 13	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) 13-25 points mangrove patch	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, o flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type: 3	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: 31

COMMENTS: Weather was warm, sunny.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1 /14/98	Granger	Andrea Granger

RQ - 1998 - 11 - 30 - 04

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

~~CONTROL~~ Test1

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24010051	12/1/98	1330	Whitaker Bayou

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Tide going out	Sarasota	SW-5 / City of Sarasota	Site SW-5 24887 → 24889

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
20		30		45	5		

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

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

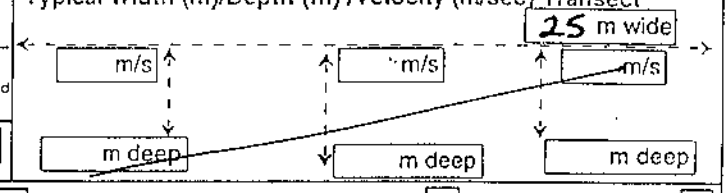
Width of riparian vegetation (m) on least buffered side: ○ | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.3 (m above present water level) + 1.5 (present depth in m) = 1.8 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposition: Sludge: ☑ Sand smothering: none slight moderate severe Silt smothering: none slight moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	24.97	7.75	7.34	27,221			1.0
Mid-depth	0.8	24.40	7.76	7.30	34,909			
Bottom	1.5	23.80	7.67	7.82	47,377			

System Type : Stream: ☐ (1st - 2nd order, 3rd - 4th order, 5th - 6th order, 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☑ Other: ☐

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

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

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

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

Weather Conditions/Notes: Sunny & Weather, ~~Alt~~ clear with few clouds. Tide going out. This site was upstream of outfall at time of sampling

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger / Kovach		12/14/98

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	24010051	12/1/98	Whitaker Bayou

REMARKS:	LOCATION:	FIELD ID/NAME:
Located east of Hwy 41	SW-5 / City of Sarasota	TEST SITE 1

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: 19	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 — mangroves on south side	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, flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type: 3	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: 42

COMMENTS: This site did not have a marina/boat repair facility. It was residential with few docks.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
12/14/98	Granger	

RQ - 11 - 30 - 04

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL PROTECTION ~~Test~~ Test 2

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24010052	12/1/98	1430	Whitaker Bayou

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
low tide	Sarasota	SW-6 / City of Sarasota	Site 6 24870 → 24892

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
20		30		45	5		

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

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

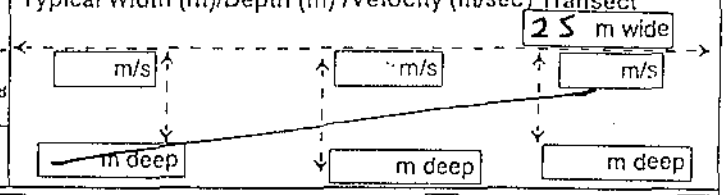
Width of riparian vegetation (m) on least buffered side: 0 | List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark: 0.3 (m above present water level) + 1.0 (present depth in m) = 1.3 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposition: Sludge: ☑ Sand smothering: none ☐ slight ☐ moderate ☐ severe ☐ Silt smothering: none ☐ slight ☐ moderate ☐ severe ☐ Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or ~~Salinity (ppt)~~:			Secchi (m):
Top	0.1	25.18	7.70	7.13	30,547			0.75
Mid-depth	0.5	24.78	7.75	7.30	37,382			
Bottom	1.0	24.14	7.66	6.83	46,209			

System Type : Stream: ☐ (1st - 2nd order ☐ 3rd - 4th order ☐ 5th - 6th order ☐ 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☑ Other: ☐

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

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

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

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

Weather Conditions/Notes:
At the time of sampling this site was downstream of outfall. There is a large marina/boat repair facility on south side + residences with docks on north side

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Kovach / Granger		12/1/98

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	24010052	12/1/98	Whitaker Bayou

REMARKS:	LOCATION:	FIELD ID/NAME:
Low tide	SW-6 / City of Sarasota	TEST SITE 2

Habitat Parameter / Score	Excellent	Good	Fair	Poor
Littoral Alterations **7.5**	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 **13**	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 mangrove patch 13	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, flow restricted by manmade structure so that velocities ar very high. 0-2 points
Sediment Type **2**	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 **23.5** AU

COMMENTS: Large marina/boat repair facility on south side of bayou. North side have boats moored in front of residencies.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
12/15/98	Granger	Granger

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Sarasota
County: Sarasota
Contact / District: Andrea Grainger / Southwest
NPDES Permit #: FL0040771
LIMS Sample #: 358233 LIMS Job #: TCH-1998-12-01-07
sample log 12/4/98 DW

Sample Collection: Date 11-30-98 Time 1245
Test Beginning: Date 12/1/98 Time 1430
Test Ending: Date 12/3/98 Time 1515
Organism Batch #: 52 Diluent Batch #: 60
Organism Age: <24hours SRT toxicant batch #: NA
Test organism: Ceriodaphnia dubia

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Remarks:
Test Number: 1 of 2
Incubator #2 Temperature Range 25.8°C-26.8°C
Room Temperature Range 23.0-25.0°C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED ~~Cond (mmhos/cm)~~ (Cond. (µmhos/cm))		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctr	A	5	4[10]	4	7.8		7.8	24.1		25.3	7.2		7.6	165		185
Ctr	B	5	5	5			8.0			25.2			7.7			185
Ctr	C	5	5	5			7.9			25.0			7.7			180
Ctr	D	5	5	5			7.9			24.9			7.7	1070		180
100%	A	5	5	5	7.2		8.3	24.5		25.1	7.5		7.8	~~220~~		1155
100%	B	5	5	5			8.3			25.1			7.7			1250
100%	C	5	5	4[10]			8.3			25.0			7.7	Overwritten in		1280
100%	D	5	4[10]	4			8.3			24.9			7.7	wrong place		1270
														DW 12/1/98		
measured by:		FW	FW	FW	CH		CH	CH		CH	CH		CH	CH		CH
recorded by:		DAW	FW	FW	DAW		CH	DAW		CH	DAW		CH	DAW		DAW

Investigators' Signatures

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			not measured			MF
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	DR400	CH	MF
Alkalinity (mg/L as $CaCO_3$):		85	148	Hach	CH	MF
Hardness (mg/L as $CaCO_3$):		86	177	Hach	CH	MF
Total ammonia (mg/L as N):		<0.017	<0.017	Orion	MF	MF
Salinity:	-	0	<1	YCT	DDW/MF	MF

reviewer form updated 5/22/96

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Sarasota
County: Sarasota
Contact / District: Andrea Grainger / SW
NPDES Permit #: FL00 40771
LIMS Sample #: 358233 LIMS Job #: TLH-1998-12-01-07
sample log 12/4/98 DW

Sample Collection: Date 11-30-98 Time 1245
Test Beginning: Date 12/1/98 Time 14:30
Test Ending: Date 12/3/98 Time 1330
Organism Batch #: 93 Diluent Batch #: Well H2O
Organism Age: 10 days SRT toxicant batch #: NA
Test organism: Cyprinella leedsi

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Remarks:
Test Number: 2 of 2
Incubator #3 Temperature Range 25.8°C ±.8°C
Room Temperature Range 23.0-25.0°C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED ~~Cond. (mmhos/cm)~~ Cond. (µmhos/cm) 0 hr	Cond. 24 h	Cond. 48 h
ctr A	09	5	5	5	7.6	8.0	8.0	25.2	23.7	25.2	7.2	7.3	7.5	255	255	250
ctr B	010	5	4 1D	4	7.5	8.0	8.0	25.0	23.9	25.4	7.5	7.5	7.5	250	250	265
ctr C	011	5	5	5	7.6	8.1	8.0	24.9	24.0	25.2	7.5	7.5	7.5	250	250	260
ctr D	012	5	5	5	7.6	8.1	8.1	25.1	23.7	25.3	7.5	7.6	7.5	250	250	265
100% A	013	5	5	5	7.3	7.9	8.1	24.8	23.6	25.3	8.2	7.1	7.5	1120	1060	1245
100% B	014	5	5	5	7.3	7.9	8.1	24.7	23.6	25.5	8.3	7.3	7.5	1205	1190	1315
100% C	015	5	5	5	7.3	7.9	8.1	24.7	23.9	25.1	8.3	7.1	7.5	1230	1220	1310
100% D	016	5	5	5	7.3	7.9	8.1	24.6	23.9	25.0	8.3	7.1	7.6	1245	1235	1300
measured by:		DAW	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
recorded by:		DAW	CH	CH	DAW	CH	CH	DAW	CH	CH	DAW	CH	CH	DAW	CH	CH

Investigators' Signatures
David A. Cunningham
Carolyn Ford
Marshall Mitchell
Fancy Newbold

	Salt Water / (Well Water)	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			not measured			MF
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DR-100	CH	MF
Alkalinity (mg/L as $CaCO_3$):	140		148	Hach	CH	MF
Hardness (mg/L as $CaCO_3$):	130		177	Hach	CH	MF
Total ammonia (mg/L as N):	<0.017		<0.017	Orion	MF	MF
Salinity:	0		<1	YSI	DJW/MF	MF

reviewer

form updated 5/22/98

Phytoplankton taxa list and densities (#/mL) for City of Sarasota WWTP, collected via subsurface grabs in Whitaker Bayou on 1 December, 1998.

	Control Site	Test Site 1	Test Site 2
Bacillariophyceae			
Amphora sp.	–	5	–
Asterionella sp.	–	5	–
Centrales sp.	–	–	21
Chaetoceros sp.	206	112	14
Cyclotella sp.	7317	63	14
Cylindrotheca sp.	206	–	–
Cymbella sp.	–	5	7
Entomoneis sp.	–	5	21
Leptocylindrus sp.	–	15	–
Navicula sp.	–	24	21
Nitzschia sp.	206	127	207
Pennales sp.	–	59	100
Rhizosolenia sp.	52	29	93
Skeletonema sp.	721	103	221
Chlorophyceae			
Pyramimonas sp.	–	29	–
Tetraselmis sp.	–	10	–
Cryptophyceae			
Chroomonas sp.	–	73	78
Cryptomonas sp.	103	24	–
Cyanophyceae			
Oscillatoria sp.	–	–	7
Dinophyceae			
Prorocentrum sp.	309	–	7
Undetermined dinophyceae	103	493	720
Euglenophyceae			
Euglena sp.	103	–	29
Eutreptia sp.	–	15	–

Benthic macroinvertebrate taxa list for City of Sarasota WWTP, collected via Ponar grab samples in Whitaker Bayou, on 1 December, 1998. Densities, in number/m^2, represent the mean of three replicates.

	Control Site	Test Site 1	Test Site 2
Gastropoda			
Pyrogophorus platyrachis	69	–	–
Maxillopoda			
Balanus sp.	–	139	125
Oligochaeta			
Tubificidae	42	–	125
Pelecypoda			
Crassostrea virginica	–	14	–
Polychaeta			
Prionospio heterobranchia	–	–	69
Streblospio benedicti	–	–	153
Arabellidae	14	–	–
Capitellidae	–	28	403

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0040771 11	12 981201 17	18 X	19 B	20 1

Remarks

21 66

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0040771 11	12 981201 17	18 X	19 S	20 1

Remarks

21 66