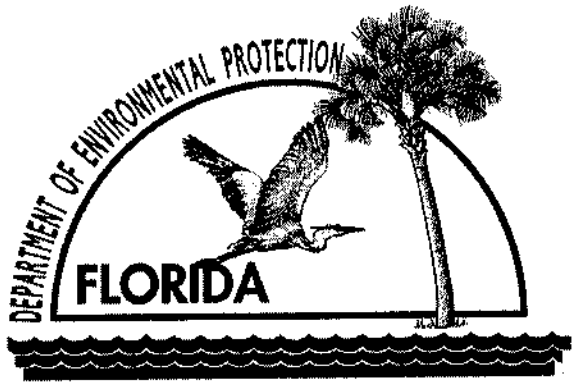


Biological Assessment of

Florida Cities Southgate Wastewater Treatment Plant

Sarasota County

NPDES #FL0032808

Sampled July and August 1996

February 1997

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Florida Cities Southgate WWTP
County: Sarasota
NPDES Number: FL0032808
State Permit Expiration Date: 4/15/97

Toxics Sampling Inspection (XSI)

Date Sampled: 29 July 1996

Results: No organic priority pollutants or problem levels of metals were detected in the effluent.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 29 July 1996

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

Impact Bioassessment Inspection (IBI)

Date Sampled: 29 July 1996, 1 August 1996, and 29 August 1996

Results: Quantitative measures of macroinvertebrate community health suggested only a moderate disturbance in the vicinity of the test sites. The Stream Condition Index, however, placed the reference site in the "excellent" category, test site 1 in the "poor" category, while test site 2 was rated "good". It should be noted that there are many potential stressors operating on the system near the test sites, including suboptimal to marginal habitat and urban stormwater inputs. Based on the results of this survey and on past data, the Southgate WWTP effluent quality appears to be consistently good. Therefore, it is reasonable to conclude that these other factors may be more responsible for the observed biological responses than was the discharge. The phytoplankton communities at all three sites were relatively depauperate. Taxa richness and algal density were low, and chlorophyll *a* was undetected throughout Phillippi Creek. In general, there was no evidence that the facility was negatively affecting the phytoplankton.

Water Quality Inspection (WQI)

Date Sampled: 29 July 1996

Results: Total and fecal coliforms were collected only at test site 2, where they complied with Class III water quality standards. Effluent nutrient concentrations were within AWT permit limits. Total phosphorus at the reference site (0.31 mg/L) was higher than the values found in approximately 75% of other Florida streams, increasing to 0.51 mg/L at test site 1 and 0.45 mg/L at test site 2. Conversely, nitrate-nitrite at the reference site (0.14 mg/L) was higher than the values found at the test sites (both were undetected). Algal growth potential levels were above the 5 mg dry weight/L "problem threshold" at all three stations. AGP was 17.9 mg dry wt/L at the reference site, 11.9 mg dry wt/L at test site 1, and 11.1 mg dry wt/L at test site 2. There is a major tributary draining residential and commercial areas and numerous additional residential sources on Phillippi Creek between the reference and test sites. In summary, there is no direct evidence which links the effluent to nutrient enrichment in Phillippi Creek.

Introduction

The Florida Cities Southgate Wastewater Treatment Plant is located in Sarasota County (see maps in Appendix). Treatment at this 1.36 MGD advanced domestic wastewater treatment facility consists of flow equalization, activated sludge processing, nitrification and denitrification, final clarification, filtering, chlorination, and dechlorination before discharge. In the three months prior to this survey, an average of 1.17 MGD of effluent was discharged into the Class III Phillippi Creek, which flows to Roberts Bay.

Permit limits, which are consistent with Grizzle-Figg legislation, are as follows: CBOD and TSS (5 mg/L annual average, 6.25 mg/L monthly average, 7.5 mg/L weekly average, and 10 mg/L maximum), fecal coliform bacteria (25 organisms/ 100 mL annual average and non-detectable in 75% of the samples), total nitrogen (3 mg/L as an annual average), total phosphorus (1.0 mg/L as an annual average), dissolved oxygen (5.0 mg/L minimum), flow (1.36 MGD maximum), and pH (6.0 to 8.5 SU).

Effluent flow intermittently exceeds the facility's design capacity, although effluent quality has apparently not suffered (see Facility Summary in Appendix). A previous bioassessment indicated there were no receiving water problems in Phillippi Creek associated with the discharge, although degradation from residential stormwater inputs was noted (FDER 1991).

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site 1	Test Site 2
Macroinvertebrate Qualitative			
Number of Taxa	48	20	33
Florida Index	13	1	7
SCI	31	17	25
EPT Index	6	1	4
% Contribution of Dominant Taxon	27.9	55.9	66.0
% Oligochaeta	0.1	8.9	8.5
% Diptera	30.0	12.3	7.4
% Ephemeroptera	16.9	2.2	3.1
% Odonata	5.6	0.6	0.3
% Trichoptera	2.4	0	0.9
% Gastropoda	36.2	55.9	69.1
% Coleoptera	3.6	5.0	4.0
% Pelecypoda	1.1	12.9	4.0
% Other	3.1	2.2	2.7
% Predators	16.5	11.2	2.1
% Above Surface Deposit Feeders	23.1	5.0	7.7
% Below Surface Deposit Feeders	0	8.9	8.2
% Suspension Feeders	7.3	14.0	4.7
% Scrapers	45.3	58.9	71.4
% Shredders	5.6	1.4	4.3
% Parasites	0.3	0	0.3
Macroinvertebrate Hester-Dendy			
Number of Taxa	31	33	32
Florida Index	19	12	13
Shannon-Weaver Diversity	3.3	3.6	2.9
EPT Index	8	3	6
% Gastropoda	3.2	8.0	23.7
% Diptera	19.4	68.0	66.1
% Ephemeroptera	32.2	2.0	2.8
% Trichoptera	35.1	19.0	5.2
% Odonata	3.0	0.2	0.7
% Coleoptera	6.6	1.4	1.5
% Other	0.5	1.4	0
% Predators	9.2	7.9	4.6
% Above Surface Deposit Feeders	27.5	36.0	35.5
% Plant Piercers	11.8	0.1	0.4
% Suspension Feeders	25.1	35.9	27.8
% Scrapers	22.6	9.3	25.7
% Shredders	3.8	10.8	6.0
Phytoplankton Algae			
Number of Taxa	14	8	10
Shannon-Weaver Diversity	3.0	2.4	2.5
Algal Density (#/sq. cm)	745.6	227.4	331.9
Chlorophyll a (ug/L)		1.38 U	1.25 U
% Euglenophytes	36.6	0	12.1
% Blue-green	1.4	0	0
% Green	46.5	26.1	15.1
% Diatoms	14.1	74.1	70.0
% Other	1.4	0	3.0
Algal Growth Potential (mg dry wt/l)	17.9	11.9	11.1

Methods

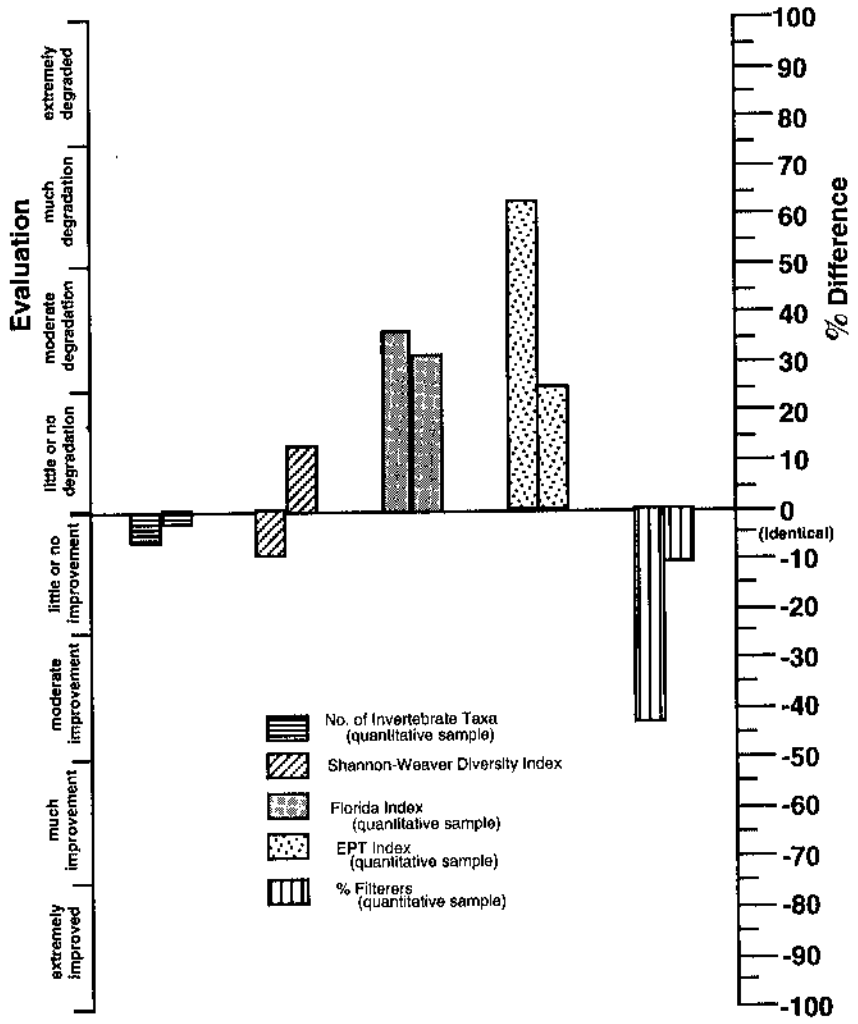
The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located approximately 1.5 miles east (and upstream) of the outfall in Phillippi Creek) and two test sites bracketing the discharge (see map in Appendix). In addition to the usual downstream test site (which receives effluent most of the time), an upstream test site was also used because it was noted that Phillippi Creek occasionally reverses flow near the discharge. 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 *Cyprinella 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 effluent, 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. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additional invertebrate collections were accomplished using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Periphyton was sampled at both reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Chlorophyll *a* was also determined for periphyton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed to determine the effects of a discharge. These are briefly discussed here.

Habitat Assessment: Seven attributes known to have potential effects on the stream biota were evaluated and scored, with 20 points possible for each factor.



Effect of discharge on the benthic macroinvertebrate community.

The left bar for each parameter shows differences between the reference site and test site 1. The right bar shows differences between the reference site and test site 2.

Based on the sum of these individual scores, overall habitat quality is assigned to one of four categories: Optimal (105-140 points); Suboptimal (70-104 points); Marginal (35-69 points); and Poor (0-34 points).

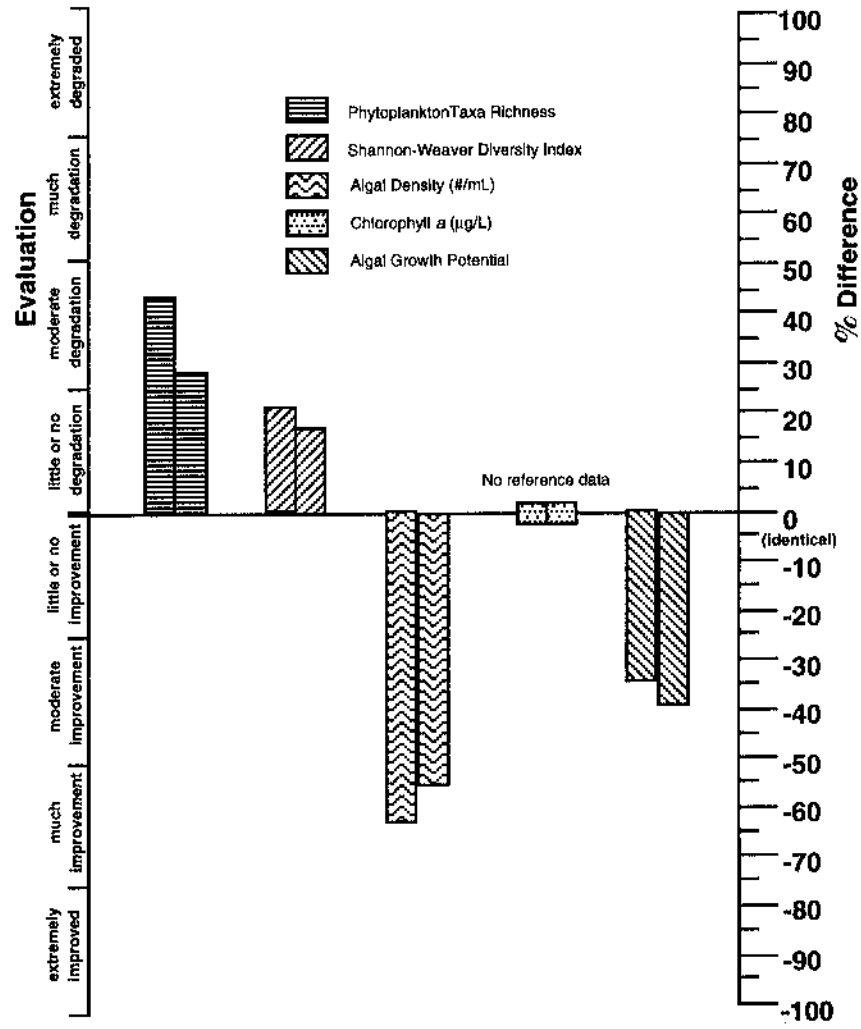
Taxa richness: Stress tends to reduce the number of different types of organisms present in a system, although moderate nutrient enrichment may sometimes be correlated with increased algal taxa richness.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity (Rule 62-302.530(11) FAC). Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Excessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is a related measure which is also associated with disturbance.

Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy. Species sensitivity data from other sources, such as Hudson *et al.* (1990), Lenat (1993), and Chang *et al.* (1992) are used as appropriate.

Ephemeroptera/Plecoptera/Trichoptera Index: This index is the sum of the number of EPT taxa present. Higher EPT values are associated with healthier systems.

Community structure: Substantial shifts in proportions of major groups of organisms, compared to reference conditions, may indicate degradation.



Effect of discharge on the algal community

(see figure on previous page for explanation).

Algal biomass: High algal biomass (algal density or chlorophyll *a*) implies nutrient stress. 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 in flowing streams.

Trophic composition/feeding guilds: Disturbance can shift the feeding strategies of invertebrates. In Florida for example, pollution may be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

The Stream Condition Index for Florida (SCI) is a composite macroinvertebrate metric (Barbour *et al.* 1996). The SCI assigns points to a variety of parameters, depending on how closely each parameter approaches an expected reference condition (see SCI calculation table in Appendix).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, the diatom to blue-green algae ra-

tio, and the % filter-feeders are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Andrea Grainger (DEP Northwest) and Lyn Burton, Jennifer Eichelberger, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Elizabeth Miller, Urania Quintana, Bart Richard, Lisa Tamburello, David Whiting, Vicki Whiting, 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.

Results and Discussion

Phillippi Creek is a sluggish (with water velocity of 0.07 m/sec or less) artificially channelized stream with stormwater inputs from predominantly residential areas. Habitat quality was suboptimal to marginal at all three sites, with 70 points at the reference site, 80 points at test site 1, and 57 points at test site 2. Specific habitat problems observed at all three stations included a lack of instream substrates, poor bank stability (resulting in erosion), and poor riparian buffer zone (see Appendix). Exotic plants, such as melaleuca, castor bean, and alligator weed, were common throughout the study area.

Most physical/chemical parameters were comparable at all three sites. For example, temperature ranged from 29.5°C to 30.2°C, while dissolved oxygen ranged from 5.8 mg/L to 6.4 mg/L. The pH values were between 7.0 SU to 7.4 SU. The conductivity was somewhat elevated throughout the stream, with 577 µmhos/cm at the reference site, 713 µmhos/cm at test site 1, and 700 µmhos/cm at test site 2. The higher specific conductance at the test sites will be discussed later.

The effluent was not acutely toxic to the fish, *Cyprinella leedsi*, or to the cladoceran, *Ceriodaphnia dubia*, in 48 hour acute bioassays.

No organic priority pollutants were detected in the effluent. With the exception of iron (190 µg/L), no metals were found above quantitation limits in the effluent. The iron value complied with Class III water quality standards.

Total and fecal coliforms were collected only at test site 2. The fecal coliforms (630 organisms/100 mL) and total coliform levels (2,400 organisms/100 mL) complied with Class III water quality standards, although it should be noted that the 6 hour sample holding time was exceeded.

Effluent nutrient concentrations were within AWT permit limits in both the flow proportionate sample and the timed composite sample. Most parameters were similar between the two sampling methods. For example, TKN was measured to be 1.6 mg/L in the timed composite sample and 1.5 mg/L in the flow proportionate sample. Ammonia was 0.056 mg/L in the timed composite and 0.077 in the flow proportionate sample. Total phosphorus was 0.99 mg/L in the timed composite and 0.86 mg/L in the flow proportionate sample. Nitrate-nitrite was 0.089 mg/L in the timed composite and 0.20 mg/L in the flow proportionate sample.

Although total phosphorus levels were somewhat higher at the two test sites (0.51 mg/L and 0.45 mg/L) than at the reference site (0.31 mg/L), it would be difficult to determine whether the facility or other sources were responsible for the increase without additional sampling. Note that the reference site total phosphorus value was already higher than those found in approximately 75% of other Florida streams (see Table of Typical Water Quality Values in Appendix). There is a major tributary draining residential and commercial areas and numerous additional residential sources on Phillippi Creek between the reference and test sites. Contrary to the phosphorus results, nitrate-nitrite at the reference site (0.14 mg/L) was higher than nitrate-nitrite of the test sites (both were undetected). Ammonia was also higher at the reference site (0.078 mg/L) than at the test sites (0.057 mg/L and 0.059 mg/L). In summary, there is no direct evidence which links the effluent to nutrient enrichment in Phillippi Creek.

Algal growth potential levels were above the 5 mg dry weight/L "problem threshold" at all three stations. AGP was 17.9 mg dry wt/L at the reference site, 11.9 mg dry wt/L at test site 1, and 11.1 mg/L dry wt/L at test site 2. Again the decrease in AGP near the discharge suggests the effluent is not causing nutrient enrichment. Effluent AGP was 15.0 mg/L dry wt/L.

Quantitative measures of macroinvertebrate community

health suggested only a moderate disturbance in the vicinity of the test sites. The figure on p. 2 indicates the degree of difference between the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference site.

In the Hester-Dendy samples, taxa richness (with 31 taxa at the reference site, 33 taxa at test site 1, and 32 taxa at test site 2) was very similar between stations. Following this same trend, Shannon-Weaver diversity values (3.3 at the reference site, 3.6 at test site 1, and 2.9 at test site 2) were comparable at all three sites. The Florida Index, however, was somewhat higher at the reference site (19), than at test site 1 (12), or test site 2 (13). The EPT Index was also higher at the reference site (8), than at either test site (3 at test site 1, and 6 at test site 2). The percent filter feeder metric was higher at test site 1 (35.9%) and test site 2 (27.8 %) than at the reference site (25.1%). It should be noted that there are many potential stressors operating on the system near the test sites (*e.g.*, suboptimal to marginal habitat, urban stormwater inputs). Based on the results of this survey and on past data, the Southgate WWTP effluent quality appears to be consistently good. Therefore, it is reasonable to conclude that other factors (stormwater, habitat) may be more responsible for the observed biological responses than was the discharge.

The dip net samples were mostly analogous to the Hester-Dendy results, except that test site 1 (upstream of the discharge) appeared to be more degraded than test site 2 (downstream of the discharge). The Stream Condition Index at the reference site (31) placed this station in the "excellent" category, while test site 1 (with an SCI score of 17) fell into the "poor" category and test site 2 (with an SCI of 25) was rated "good" (Appendix). As stated earlier, the lower SCI scores at the test sites could be due to a number of factors. There is an increase in urban stormwater inputs between the reference and test sites. While leaf packs, an important and productive substrate, were available at the reference site, they were absent from the test sites.

Because periphyton racks were not recovered at the reference site, the phytoplankton populations will be addressed instead. The figure on p. 3 represents changes in the phytoplankton algal community. As was noted with the macroinvertebrates, larger differences (that is, higher percentages) correspond with greater degrees of degradation. The phytoplankton communities at all three sites were relatively depauperate. Taxa richness ranged from 14 taxa at the reference site to 8 taxa at test site 1. Chlorophyll *a* was undetected at the test sites, and not sampled at the reference site. Algal density ranged from a high of 746 cells/mL at the reference site to a low of 227 cells/mL at test site 1. Algal Shannon-Weaver diversity was 3.0 at the reference site, 2.4 at test site 1, and 2.5 at test site 2. Chlorophytes were the most abundant algal group at the reference site (46.5%), followed by euglenophytes (36.6%), while diatoms were most abundant at the test sites (70.0% to 74.1% of the total populations). In general, there was no evidence that the facility was negatively affecting the phytoplankton.

Conclusions

The effluent was not acutely toxic to the fish, *Cyprinella leedsi*, or to the cladoceran, *Ceriodaphnia dubia*, in 48 hour acute bioassays.

No organic priority pollutants were detected in the effluent. With the exception of iron (190 µg/L), no metals were found above quantitation limits in the effluent. The iron value complied with Class III water quality standards.

Total and fecal coliforms were collected only at test site 2. The fecal coliforms (630 organisms/100 mL) and total coliform levels (2,400 organisms/100 mL) complied with Class III water quality standards.

Effluent nutrient concentrations were within AWT permit limits. Total phosphorus at the reference site (0.31 mg/L) was higher than the values found in approximately 75% of other Florida streams, increasing to 0.51 mg/L at test site 1 and 0.45 mg/L at test site 2. Conversely, nitrate-nitrite at the reference site (0.14 mg/L) was higher than the values found at the test sites (both were undetected). Ammonia was also higher at the reference site (0.078 mg/L) than at the test sites (0.057 mg/L and 0.059 mg/L). There is a major tributary draining residential and commercial areas and numerous additional residential sources on Phillippi Creek between the reference and test sites. In summary, there is no direct evidence which links the effluent to nutrient enrichment in Phillippi Creek.

Algal growth potential levels were above the 5 mg/L dry weight "problem threshold" at all three stations. AGP was 17.9 mg dry wt/L

at the reference site, 11.9 mg dry wt/L at test site 1, and 11.1 mg dry wt/L at test site 2. Again, the decrease in AGP near the discharge suggests the effluent is not causing nutrient enrichment.

Quantitative measures of macroinvertebrate community health suggested only a moderate disturbance in the vicinity of the test sites. There were no major differences between the reference and test sites regarding taxa richness or diversity, while the % filter feeders showed an improvement at the test sites. The test sites fared worse than the reference site on the Florida Index and EPT Index. The Stream Condition Index placed the reference site in the "excellent" category, test site 1 in the "poor" category while test site 2 in rated "good". It should be noted that there are many potential stressors operating on the system near the test sites, including suboptimal to marginal habitat and urban stormwater inputs. Based on the results of this survey and on past data, the Southgate WWTP effluent quality appears to be consistently good. Therefore, it is reasonable to conclude that these other factors may be more responsible for the observed biological responses than was the discharge.

The phytoplankton communities at all three sites were relatively depauperate. Taxa richness and algal density were low and chlorophyll *a* was undetected throughout Phillippi Creek. In general, there was no evidence that the facility was negatively affecting the phytoplankton.

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.

Barbour, M. T., J. Gerritsen, and J. S. White. 1996. Development of the Stream Condition Index for Florida. Prepared for the Fla. Dept. Environ. Protection. 105 p.

Chang, S., F. W. Steimle, R. N. Reid, S. A. Fromm, V. S. Zdanowicz, and R. A. Pikanowski. 1992. Association of benthic macrofauna with habitat types and quality in the New York Bight. Mar. Ecol. Prog. Ser. 89: 237-251.

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

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Fla. Dept. Environ. Prot. Biology Section, Tallahassee, Fla. 73 p.

FDER. 1991. Biological assessment of Florida Cities Southgate. Fla. Dept. Environ. Reg. Biology Section, Tallahassee, Fla. Unpaginated.

Hudson, P. L., D. R. Lenat, B. A. Caldwell, and D. Smith. 1990. Chironomidae of the Southeastern United States: A checklist of species and notes on biology, distribution, and habitat. U. S. Fish Wildl. Serv., Fish. Wildl. Res. 7. 46 pp.

Lenat, D. R. 1993. A biotic index for the southeastern United States: derivation and list of tolerance values, with criteria for assigning water-quality ratings. J. N. Am. Benthol. Soc. 12(3): 270-290.

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

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

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

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

Chemistry Summary Table for Florida Cities Southgate WWTP.	Effluent (Flow Proportionate)	Effluent (Timed Composite)	Effluent (Grab)	Reference Site	Test Site 1	Test Site 2
Organic Constituents (ug/L)						
None Detected			None Detected			
Metals (ug/L)						
Aluminum			100 U			
Arsenic			20 U			
Cadmium			0.05 U			
Copper			5 U			
Chromium			5 U			
Iron			190			
Lead			10 U			
Nickel			4 U			
Selenium			30 U			
Silver			0.04 U			
Zinc			5 I			
Nutrients (mg/L)						
Ortho-phosphate	0.63 A			0.17 A	0.38 A	0.35
Total phosphorus	0.86 A	0.99		0.31	0.51	0.45
Ammonia	0.077 A	0.056	0.066 A	0.078 A	0.059	0.057
Nitrate+Nitrite	0.089	0.20		0.14	0.020 U	0.020 U
Unionized Ammonia			0.00			
TKN	1.6 A	1.5		0.91	0.76	0.81
General Phys-Chem Parameters						
Habitat Assessment				70	80	57
Dissolved oxygen (mg/L)			6.3	5.8	5.9	6.4
pH (SU)			6.8	7.1	7.3	7.4
Specific Conductance (µmhos/cm)			527	577	713	700
Temperature (°C)			31.9	30.2	29.8	29.5
Hardness (mg CaCO3)			200.0			
Algal Growth Potential (mg dry wt/L)			15.0	17.9	11.9	11.1
Toxicity						
Bioassay Fish-Dechlorinated			No mortality			
Bioassay Invertebrate-Dechlorinated			No mortality			
Microbiological Communities (org/100 mL)						
Fecal Coliform						630 Q
Total Coliform						2400 Q

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

I - Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit

Q - Sample held beyond normal holding time

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

Typical Values for Selected Parameters in Florida Waters

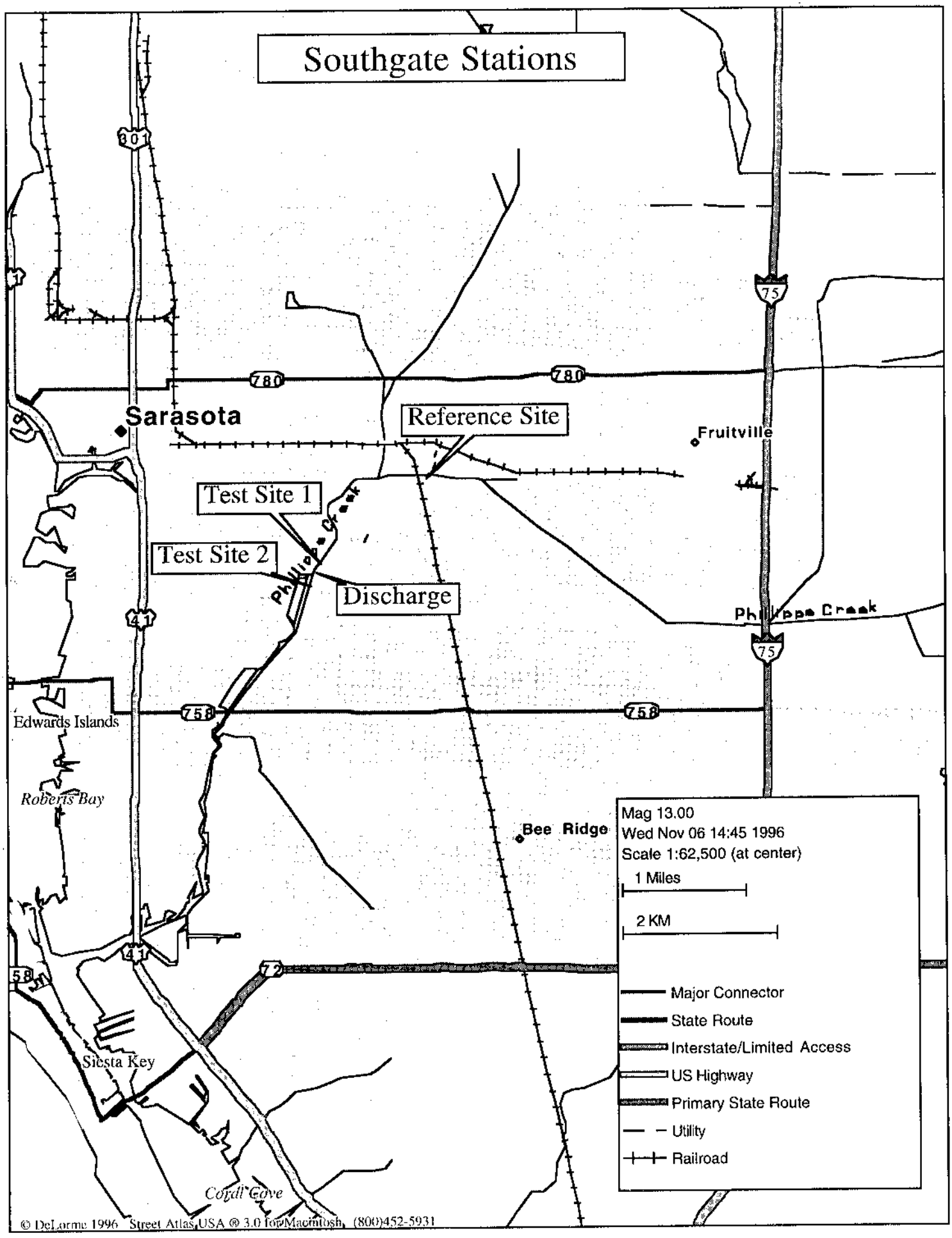
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

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 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


Southgate Stations
Sarasota
Reference Site
Fruitville
Test Site 1
Test Site 2
Discharge
Phillippe Creek
Edwards Islands
Roberts Bay
Bee Ridge
Siesta Key
Coyd Cove
Mag 13.00
Wed Nov 06 14:45 1996
Scale 1:62,500 (at center)
1 Miles
2 KM
Major Connector
State Route
Interstate/Limited Access
US Highway
Primary State Route
Utility
Railroad
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From Sarasota Quad Map.
Philippe Creek Outfall
Pipeline (1000ft)
Roberts Bay
Sarasota Heights
Hayden
Bay Point
Edwards Islands
Philippi Shores Sch
Riverview Jr High Sch
Brookside Jr High Sch
Shopping Plaza
Memorial Hosp.
Water Tank
Golf Course
Bee Ridge Park
Sewage Disposal
Philippe
Light
Light
Light
Light
Island
BAY
ROBERTS
BAY
PROSPECT AVE
HAWTHORNE AVE
HILLVIEW ST
CLEMATIS ST
BAHIA VISTA
FLOYD ST
IRVING ST
HYDE PARK
SIESTA DRIVE
TAMIAMI TRAIL
CAMINO REAL
PROCTOR ROAD
ASHTON ROAD
BEE RIDGE ROAD
WILKINSON ROAD
SOUTH LOCKWOOD RIDGE ROAD
SHADE AVE
ORANGE AVE
TUTTLE AVE
RIVERWOOD AVE
SWIFT ROAD
PHILIPPE PARKWAY
BRINK ROAD
DANE AVE
GULF COASTAL WATERWAY
PASS
Creek

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: Florida Cities South Gate		Date Summary Prepared: 6/26/96
Location (attach detailed map): See back pages	County: Sarasota	District: SW District
Federal Permit # and expiration date: FL0032808 4/30/97	State GMS # and State expiration date: 405SP01626	Facility Type: Industrial (Municipal) Federal Agricultural Other (list): PRIVATE DOMESTIC

Function of facility: AWT for a residential community

Description of treatment process: This is an AWT process starting with preliminary treatment and flow equalization, continuing with an activated sludge process then to rotating biological contactors, denitrification basins and filtration. Effluent is chlorinated, then dechlorinated prior to discharge

Receiving waters: Phillippi Creek → Roberts Bay	Classification: I II (III)	
Design Flow: 1.36	Mean Flow: 1.17 3month ADF	Flow during survey:

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

therefore, the best time to sample is:

If facility has a mixing zone, give details (size, parameters affected, etc.): None

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

Parameter	Limit (units)

Parameter	Unit	Minimum	Maximum	Type Sample	Frequency
Permitted Capacity (flow)	mgd	.000	1.36 annual avg.	***fmt	
pH	STD UN	6.00	8.50		Continuous
CBOD5*& Total Suspended Solids*	mg/L	0	5 annual 6.25 monthly 7.5 weekly	****fpc	Weekly
		10	any one sample	grab	Weekly
Total Nitrogen (as N)	mg/L	0	3 annual avg.	****fpc	Weekly
Dissolved Oxygen	mg/L	5.0	-	grab	Daily
CL2	mg/L	0	0.01	grab	Daily
Fecal coliform	#/100	0	**25	grab	4 Days/Wk
Total Phosphorus (as P)	mg/L	0	1 annual avg.	****fpc	Weekly

*Influent shall be monitored and reported monthly.
[Rule 17-601.300(1), F.A.C.]
**Non-detectable in at least seventy-five percent (75%) of the samples collected during the monthly reporting period.
***Flow meter and totalizer
****Flow proportional composite (16 hour)

Describe special permit conditions and permit modifications:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Florida Cities - South Gate
(Facility)

Description of permitted outfall(s): The effluent is discharged from the WWTP in a pipeline which runs underground and discharges the effluent from an outfall located in the bank side of the Phillippi Creek. The pipeline is 1000 ft long

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

Flow over design capacity intermittently, but does not appear to impact effluent quality.

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

An FY1-5 was conducted on this facility on July 23, 1991. I have enclosed the summary sheet (draft) of this FY1-5 within this submittal.

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

No data to compare.

Additional information:

There are 2 salinity barriers located along the Phillippi Creek. They are found between the WWTP outfall and Roberts Bay.

Staff contributing to this review (signature):

Candace H. Grainger (Biologist)

Joe Guttieri (Inspector)

(Engineer)

( )

( )

( )

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER
		8/1/96	Phillippi Creek (Sarasota Bay)

REMARKS:	LOCATION:	FIELD ID/NAME:
	Florida Cities - South Gate	Reference Site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [8]	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 **(8)** 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity [8]	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 **(8)** 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization [13]	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 **(13)** 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Deposition [14]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 **(14)** 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [6]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 7 **(6)**	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [3]	Width of native vegetation (least buffered side) greater than 18 m 20 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 **(3)** 2 1
Riparian Zone Vegetation Quality [13]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 **(13)** 12 11	25% to 50% of riparian zone is vegetated, but one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

[5] Add 5 points if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

[70] **TOTAL SCORE**

Comments
North side of bank is probably spoil site for previous dredging of area

ANALYSIS DATE:	ANALYST:	SIGNATURE:
8/1/96	Andrea Grainger	Andrea Grainger

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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:
		8/1/96	1330	Phillippi Creek (Sarasota Bay)

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Site 15 located 1 1/2 miles east of outfall	Sarasota	Florida Cities - South Creek	Reference Site

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)
		50%		50%			

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

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

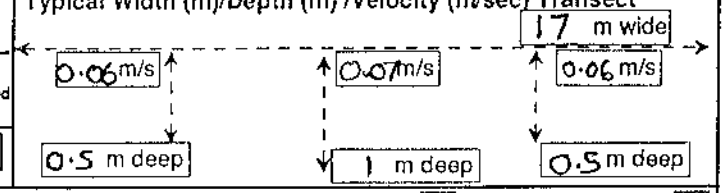
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.5 (m above present water level) + 1 (present depth in m) = 1.5 (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)	5	5		Sand	60	3	
Leaf Packs or Mats	10	5		Mud/Muck/Silt	10	2	
Aquatic Vegetation	15	5		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):	Conductivity		Secchi (m):
Top	0.3	30-15	7.05	5.81	0.3	0.577		VOB
Mid-depth								
Bottom								

System Type : Stream: 4 (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:
Hot, sunny, few clouds

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Andrea Grainger	Andrea Grainger	8/6/96

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		7/29/96	Phillippi Creek

REMARKS:	LOCATION:	FIELD ID NAME:
Upstream site was downstream	Florida Cities/Soulegate	Test 1

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover 9	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 (9) 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity 11	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 (11)	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization 11	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 (11)	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Deposition 16	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 (16)	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability 10	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. (10) 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width 5	Width of native vegetation (least buffered side) greater than 18 m 20 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities (5) 4 3 2 1
Riparian Zone Vegetation Quality 13	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 (13) 12 11	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

5 Add 5 **points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

80 **TOTAL SCORE**

Comments

ANALYSIS DATE:	ANALYST:	SIGNATURE:
7/29/96	Andrea Granger	Andrea Granger

Stormwater runoff
Septic tanks

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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:
		7/29/96	1130	Phillippi Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Upstream site was actually downstream	Sarasota	Florida Cities - Southgate	Test 1 TEST SITE 1

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)
				100%			

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: 3

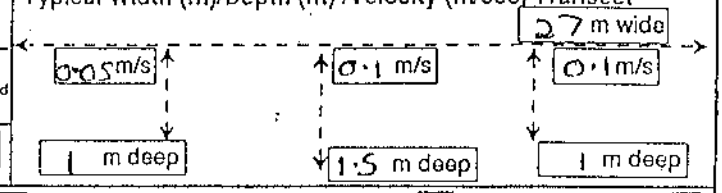
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark: 1 (m above present water level) + 1.2 (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)	20	5	net	Sand	55	3	net
Leaf Packs or Mats	–	–	–	Mud/Muck/Silt	10	2	net
Aquatic Vegetation	5	5	net	Other:	–	–	–
Rock or Shell Rubble	–	–	–	Other:	–	–	–
Undercut banks/Roots	10	5	net	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C): (measured near bank)	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.5	29.82	7.34	5.94	0.713			0.9
Mid-depth								
Bottom								

System Type : Stream: 4 (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, a few clouds, winds from the west.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Andrea Granger/Joe Squiteri	Andrea Granger/Joe Squiteri	7/31/96

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		7/29/96	Phillippi Creek

REMARKS:	LOCATION:	FIELD ID/NAME:
Downstream site was actually upstream of POD today	Florida Cities/South Gate	Test 2 TEST SITE 2

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover **6**	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 **(6)**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity **4**	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 **(4)** 3 2 1
Artificial Channelization **10**	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected **(10)** 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Deposition **16**	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 **(16)**	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability **10**	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **(10)** 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width **3**	Width of native vegetation (least buffered side) greater than 18 m 20 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 **(3)** 2 1
Riparian Zone Vegetation Quality **8**	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 **(8)** 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

50 Add 5 points if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

57 62 TOTAL SCORE

Comments

ANALYSIS DATE:	ANALYST:	SIGNATURE:
7/29/96	Andrea Grainger	Andrea Grainger

Stormwater runoff
Septic tanks

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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:
		7/29/96	1000	Phillippi Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
The downstream site was actually upstream today	Sarasota	Florida Cities - Southgate	Test 2 TEST SITE 2

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)
				100%			

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: 1/2

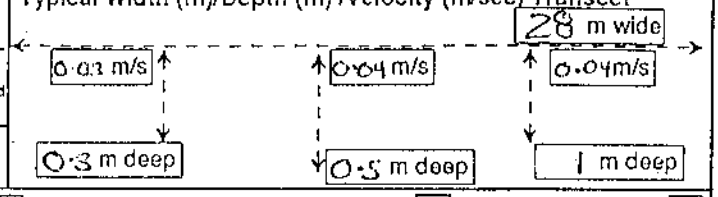
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark: 1 (m above present water level) + 0.5 (present depth in m) = 1.5 (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)	5	5	net	Sand	60	3	net
Leaf Packs or Mats	–	–	–	Mud/Muck (Silt)	20	2	net
Aquatic Vegetation	10	5	net	Other:			
Rock or Shell Rubble	–	–	–	Other:			
Undercut banks/Roots	5	5	net	*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): measured in the bank		Secchi (m):
Top	0.3	29.48	7.44	6.44	0.700		VOB
Mid-depth							
Bottom							

System Type : Stream: 4 (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, a few clouds, winds from the west

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Andrea Granger/Michelle Hennessy	Andrea Granger/M Hennessy	7/31/96

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida Cities
County: Sarasota
Contact / District: KENT EDWARDS / SWD
NPDES Permit #: FL00 32808 wrong # on Submittal Form DN 7/31/96
LIMS Sample #: 147098 LIMS Job #: 96-JUL-30-24
sample log 8-2-96 MF

Sample Collection: Date 7/29/96 Time 1445
Test Beginning: Date 7/30/96 Time 1330
Test Ending: Date 8-1-96 Time 1405
Organism Batch #: 32 Diluent Batch #: 32
Organism Age: neonate < 24 hours old

Test Organism: C. dubia
Ceriodaphnia

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

Test Number: 1 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm (Standard recorded first MF 8/2/96)
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.3 @ 24.3 °C	101.5 ↔ @ 107.0 1006 ↔ @ 1008 @ 24.9 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	25.1 @ 25.1	8.2 @ 24.8 °C	9959 @ 9860 102.7 @ 101.5 1011 @ 1006 @ 25.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.3 @ 24.4	8.4 @ 23.8 °C	103.4 @ 101.5 1004 @ 1006 @ 24.7 °C 9850 @ 9989

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	UNCORRECTED 24 h	UNCORRECTED 48 h
ctrl A	A	5	5	5	8.2		8.2	23.8		24.1	7.7		7.9	160		180
ctrl B	B	5	5	5			8.2			24.0			8.0			180
Ctrl C	C	5	5	5			8.3			24.0			7.9			180
ctrl D	D	5	5	5			8.3			24.0			8.0			200
100%	A	5	5	5	7.3		8.3	24.2		24.0	7.0		7.9	650		740
100%	B	5	5	5			8.3			23.9			8.0			740
100%	C	5	5	5			8.3			23.9			7.9			760
100%	D	5	5	5			8.3			23.9			8.0			790
Measured/Loaded by:		MF	TM	MF	DB	~~ND~~	ND	DB		ND	DB		ND	DB		ND
Recorded by:		MF	TM	TM	LM	~~D~~	DN	LM		DN	LM		DN	LM		DN

Investigators' Signatures
Deanna Nicholas
[signature]
[signature]
[signature]
[signature]
Marshall Faulk
Steven H Wolfe
reviewer form updated 4/01/96

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			Not measured		
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR-100	TM/DN
Alkalinity (mg/L as $CaCO_3$):	—	80	100	HACH	DN/DB
Hardness (mg/L as $CaCO_3$):	—	90	200	HACH	DN/DB
Total ammonia (mg/L as N):	—	<.017	<.017	Orion	LM/ND

Ammonia Meter #98136 Ammonia Meter Slope: -57.7 Ammonia Blank: <.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida Cities
County: Sarasota
Contact / District: Kent Edwards / SWD
NPDES Permit #: FL00 3208
LIMS Sample #: 147098 **LIMS Job #:** 96-Jul-30-24
sample log 8-2-96 MF
Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Test Number: 2 of 2
Remarks:

Sample Collection: Date 7/29/96 Time 1445
Test Beginning: Date 7/30/96 Time 1400
Test Ending: Date 8-2-96 Time 1420
Organism Batch #: 56 **Diluent Batch #:** well
Organism Age: 11 days
Test Organism: Cyprinella leedsi

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.3 @ 24.3°C	101.5 @ 107.6 1006 @ 1008 @ 25 9989 @ 9860
24 hr	7.0 @ 7.0 9.0 @ 9.0	25.1 @ 25.1	8.2 @ 24.8 °C	1027 @ 101.5 Incorrect cal pH 8 ~~9230~~ @ 9989 @ ~~9960~~
48 hr	7.0 @ 7.0 9.0 @ 9.0	* 8 @ 24.4 24.3 @ 24.4 * D.O Reading DN	8.4 @ 23.8 °C	103.4 @ 101.5 1004 @ 1006 @ 24 9850 @ 9869

@ 24hr Conductivity Calibrations 102.7@101.5 1011@1006@25.6°C

Conc.	Chamber #	Number Live 0 hr	24 h	48 h	pH 0 hr	24 h	48 h	Temperature (°C) 0 hr	24 h	48 h	D.O. (mg/L) 0 hr	24 h	48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
Ctrl A	B1	5	5	5	7.9	8.2	8.4	24.5	23.5	23.6	7.6	7.9	8.0	250	250	250
Ctrl B	B2	5	5	5	7.9	8.3	8.4	24.6	23.5	23.5	7.8	7.8	8.1	250	250	250
Ctrl C	B3	5	5	5	7.9	8.3	8.4	24.6	23.6	23.5	7.8	7.9	8.0	250	250	250
Ctrl D	B4	5	5	5	7.9	8.3	8.4	24.5	23.7	23.6	7.8	7.9	8.1	250	250	250
100% A	B5	5	5	5	7.3	7.6	7.9	24.9	23.5	23.6	6.6	7.7	7.6	750	740	750
100% B	B6	5	5	5	7.2	7.6	7.9	24.9	23.5	23.5	6.4	7.5	7.6	755	740	750
100% C	B7	5	5	5	7.1	7.6	7.9	24.9	23.6	23.5	6.1	7.2	7.4	755	740	740
100% D	B8	5	5	5	7.1	7.6	7.9	24.8	23.6	23.3	6.0	7.2	7.5	755	740	745
Measured/Loaded by:		MF	TM	TM	DB	DN	DN	DB	DN	DN	DB	DN	DN	DB	DN	DN
Recorded by:		TM	DN	TM	LM	LM	ND	LM	LM	ND	LM	LM	ND	LM	LM	ND

Investigators' Signatures
Deirna Nicholson
Lisa Morld
Tina Mikulski
Marshall Faircloth
Steven Wolfe
reviewer

form updated 4/01/96

Water Quality Parameters	Salt Water Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			Not measured		
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR-100	TM/DN
Alkalinity (mg/L as $CaCO_3$):	130	—	100	HACH	DN/DB
Hardness (mg/L as $CaCO_3$):	130	—	200	HACH	DN/DB
Total ammonia (mg/L as N):	<.017	—	<.017	Orion	LM/ND

Ammonia Meter #98136 Meter Slope: -57.7 Ammonia Blank: <.017 Control Salinity: 0 ppt Sample Salinity: 0 pp

Reference

Summer Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	**Panhandle**				**Peninsula**				**Northeast**			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	48	≥ 31	30-16	<16		≥ 26	25-14	<14	5	≥ 22	21-12	<12	
EPT Index	6	≥ 7	6-4	<4		≥ 4	3-2	<2	5	-	≥2	<2	
# Chironomid Taxa	13	≥9	8-5	<5		≥7	6-4	<4	5	≥7	6-4	<4	
% Contribution of Dominant Taxon	27.9	≤22	23-61	>61		≤29	30-64	>64	5	≤31	32-66	>66	
% Diptera	30.0	-	≤50	>50		-	≤37	>37	3	-	≤47	> 47	
Florida Index	13	≥ 16	15-8	<8		≥7	6-4	<4	5	≥ 8	7-4	<5	
% Suspension feeders/Filterers	17.3	≥ 12	11-6	<6		-	≥7	<7	3	-	≥7	<7	
Total Score		**Panhandle**				**Peninsula**			31	**Northeast**			
Interpretation of Score		**Excellent**			27-33	**Excellent**			26-32	**Excellent**			25-29
		Good			21-26	**Good**			20-25	**Good**			19-24
		Poor			14-20	**Poor**			13-19	**Poor**			13-18
		Severely Degraded			7-13	**Severely Degraded**			7-12	**Severely Degraded**			7-12

Test 1

Summer Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	**Panhandle**				**Peninsula**				**Northeast**			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	20	≥ 31	30-16	<16		≥ 26	25-14	<14	3	≥ 22	21-12	<12	
EPT Index	1	≥ 7	6-4	<4		≥ 4	3-2	<2	1	-	≥2	<2	
# Chironomid Taxa	6	≥9	8-5	<5		≥7	6-4	<4	3	≥7	6-4	<4	
% Contribution of Dominant Taxon	55.9	≤22	23-61	>61		≤29	30-64	>64	3	≤31	32-66	>66	
% Diptera	12.3	-	≤50	>50		-	≤37	>37	3	-	≤47	> 47	
Florida Index	1	≥ 16	15-8	<8		≥7	6-4	<4	1	≥ 8	7-4	<5	
% Suspension feeders/Filterers	14.0	≥ 12	11-6	<6		-	≥7	<7	3	-	≥7	<7	
Total Score		**Panhandle**				**Peninsula**			17	**Northeast**			
Interpretation of Score		**Excellent**			27-33	**Excellent**			26-32	**Excellent**			25-29
		Good			21-26	**Good**			20-25	**Good**			19-24
		Poor			14-20	**Poor**			13-19	**Poor**			13-18
		Severely Degraded			7-13	**Severely Degraded**			7-12	**Severely Degraded**			7-12

Test 2

Summer Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	**Panhandle**				**Peninsula**				**Northeast**			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	33	≥ 31	30-16	<16		≥ 26	25-14	<14	5	≥ 22	21-12	<12	
EPT Index	4	≥ 7	6-4	<4		≥ 4	3-2	<2	5	-	≥2	<2	
# Chironomid Taxa	7	≥9	8-5	<5		≥7	6-4	<4	5	≥7	6-4	<4	
% Contribution of Dominant Taxon	66.0	≤22	23-61	>61		≤29	30-64	>64	1	≤31	32-66	>66	
% Diptera	7.4	-	≤50	>50		-	≤37	>37	3	-	≤47	> 47	
Florida Index	7	≥ 16	15-8	<8		≥7	6-4	<4	5	≥ 8	7-4	<5	
% Suspension feeders/Filterers	4.7	≥ 12	11-6	<6		-	≥7	<7	1	-	≥7	<7	
Total Score		**Panhandle**				**Peninsula**			25	**Northeast**			
Interpretation of Score		**Excellent**			27-33	**Excellent**			26-32	**Excellent**			25-29
		Good			21-26	**Good**			20-25	**Good**			19-24
		Poor			14-20	**Poor**			13-19	**Poor**			13-18
		Severely Degraded			7-13	**Severely Degraded**			7-12	**Severely Degraded**			7-12

Summer Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	**Panhandle**				**Peninsula**				**Northeast**			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa		≥ 31	30-16	<16		≥ 26	25-14	<14		≥ 22	21-12	<12	
EPT Index		≥ 7	6-4	<4		≥ 4	3-2	<2		-	≥2	<2	
# Chironomid Taxa		≥9	8-5	<5		≥7	6-4	<4		≥7	6-4	<4	
% Contribution of Dominant Taxon		≤22	23-61	>61		≤29	30-64	>64		≤31	32-66	>66	
% Diptera		-	≤50	>50		-	≤37	>37		-	≤47	> 47	
Florida Index		≥ 16	15-8	<8		≥7	6-4	<4		≥ 8	7-4	<5	
% Suspension feeders/Filterers		≥ 12	11-6	<6		-	≥7	<7		-	≥7	<7	
Total Score		**Panhandle**				**Peninsula**				**Northeast**			
Interpretation of Score		**Excellent**			27-33	**Excellent**			26-32	**Excellent**			25-29
		Good			21-26	**Good**			20-25	**Good**			19-24
		Poor			14-20	**Poor**			13-19	**Poor**			13-18
		Severely Degraded			7-13	**Severely Degraded**			7-12	**Severely Degraded**			7-12

Benthic macroinvertebrate taxa list for Florida Cities South Gate WWTP, collected via 20 discrete dip net sweeps in Phillippi Creek, on 01 August, 1996.

	Reference Site	Test Site 1	Test Site 2
Acarina			
Arrenurus sp.	2	–	–
Limnesia sp.	2	–	–
Amphipoda			
Hyalella azteca	20	1	9
Coleoptera			
Agasicles hygrophila	1	–	–
Agasicles sp.	–	–	1
Chrysomelidae	10	–	–
Dubiraphia sp.	1	4	5
Hydrovatus sp.	–	–	1
Microcylloepus pusillus	–	2	–
Paracymus sp.	3	–	–
Peltodytes dietrichi	–	1	–
Peltodytes sp.	7	1	6
Stenelmis sp.	12	1	1
Diptera			
Atrichopogon sp.	1	–	–
Chironomidae	16	–	2
Cladotanytarsus sp.	–	1	–
Clinotanypus sp.	2	–	–
Coelotanypus sp.	–	8	–
Cryptochironomus sp.	2	–	–
Cryptotendipes sp.	–	–	1
Dicrotendipes modestus	104	2	2
Dicrotendipes neomodestus	4	–	–
Dicrotendipes sp.	2	–	1
Dolichopodidae	–	1	–
Glyptotendipes sp.	2	–	–
Larsia berneri	6	–	–
Larsia decolorata	35	–	–
Odontomyia sp.	21	–	1
Palpomyia/bezzia grp.	29	–	2
Parachironomus carinatus	2	–	–
Polypedilum halterale grp.	–	–	2
Polypedilum illinoense grp.	39	–	–
Polypedilum scalaenum grp.	8	2	10
Polypedilum sp.	–	–	2
Procladius sp.	4	7	1
Tanytarsus sp.	2	1	–
Tanytarsus sp. C Epler	–	–	1
Tanytarsus sp. G Epler	2	–	–
Tanytarsus sp. R Epler	–	–	1

Xenochironomus xenolabis	2	–	–
Ephemeroptera			
Caenis sp.	158	4	10
Callibaetis sp.	–	–	1
Procloeon sp.	1	–	–
Gastropoda			
Ferrissia sp.	–	–	4
Gyraulus parvus	30	–	–
Hebetancylus excentricus	23	–	–
Melanoides sp.	–	–	1
Melanoides tuberculata	6	–	–
Physella sp.	17	–	5
Planorbidae	–	–	1
Pseudosuccinea columella	2	–	–
Pyrogophorus platyrachis	263	100	233
Hemiptera			
Belostoma sp.	1	–	–
Belostomatidae	–	1	–
Hemiptera	–	2	–
Merragata sp.	2	–	–
Mesovelia sp.	6	–	–
Pelocoris sp.	1	–	–
Hirudinea			
Gloiobdella elongata	1	–	–
Helobdella fusca	–	–	1
Helobdella triserialis	2	–	–
Lepidoptera			
Parapoynx sp.	1	–	–
Odonata			
Argia sp.	29	–	1
Enallagma sp.	11	–	–
Epitheca sp.	–	1	–
Gomphus minutus	1	–	–
Ischnura sp.	12	–	–
Oligochaeta			
Aulodrilus pigueti	–	4	6
Eclipidrilus sp.	–	–	3
Enchytraeidae	–	–	4
Haber speciosus	–	–	1
Limnodrilus hoffmeisteri	–	12	16
Oligochaeta	1	–	–
Pelecypoda			
Corbicula fluminea	10	18	13
Pisidiidae	–	5	1
Trichoptera			
Cheumatopsyche sp.	2	–	–
Hydroptila sp.	14	–	–
Oecetis sp.	5	–	1
Oxyethira sp.	2	–	2

Benthic macroinvertebrate taxa list for Florida Cities South Gate WWTP, collected via Hester-Dendy artificial substrates in Phillippi Creek. Samples were collected from test sites on 29 July, 1996 and from the reference site on 29 August, 1996. Densities, in number/m^2, represent the sum of four replicates.

	Reference Site	Test Site 1	Test Site 2
Amphipoda			
Hyalella azteca	7	11	1
Coleoptera			
Dubiraphia sp.	–	4	2
Dubiraphia vittata	–	–	4
Microcylloepus pusillus	4	–	–
Microcylloepus sp.	–	–	1
Peltodytes sp.	–	1	1
Stenelmis hungerfordi	25	–	1
Stenelmis sp.	67	7	9
Decapoda			
Cambaridae	–	–	1
Diptera			
Ablabesmyia rhamphe grp.	–	2	–
Asheum beckae	–	14	44
Beardius truncatus	–	1	–
Chironomidae	33	36	35
Cladotanytarsus sp.	–	1	–
Cricotopus bicinctus	1	–	–
Dicrotendipes modestus	72	211	491
Dicrotendipes neomodestus	11	28	61
Dicrotendipes simpsoni	3	22	–
Dicrotendipes sp.	2	4	10
Glyptotendipes sp.	–	7	10
Goeldichironomus carus	–	2	–
Goeldichironomus sp.	–	3	–
Labrundinia neopilosella	–	5	2
Labrundinia pilosella	–	–	1
Larsia decolorata	–	2	–
Palpomyia/bezzia grp.	–	41	11
Parachironomus directus	–	–	1
Parachironomus hirtalatus	–	1	2
Pentaneura inconspicua	44	1	3
Polypedilum halterale grp.	–	3	–
Polypedilum illinoense grp.	7	–	4
Polypedilum scalaenum grp.	–	67	54
Polypedilum sp.	–	–	1
Procladius sp.	–	3	–
Rheotanytarsus exiguus	2	–	–
Stenochironomus sp.	96	92	76

Tanytarsus sp.	–	5	–
Tanytarsus sp. A Epler	–	1	2
Tanytarsus sp. C Epler	2	–	–
Tanytarsus sp. D Epler	–	–	1
Tanytarsus sp. G Epler	–	1	–
Tanytarsus sp. K Epler	–	6	–
Tanytarsus sp. L Epler	–	3	–
Tanytarsus sp. T Epler	1	–	–
Thienemanniella sp.	5	–	–
Tribelos fuscicornis	–	6	4
Xenochironomus xenolabis	2	–	–
Ephemeroptera			
Baetidae	3	1	–
Caenis sp.	463	9	31
Callibaetis floridanus	–	5	1
Callibaetis sp.	–	2	–
Labiobaetis sp.	1	–	–
Procloeon viridocularis	–	–	1
Stenacron sp.	–	–	1
Gastropoda			
Ancylidae	6	–	3
Ferrissia hendersoni	–	–	1
Ferrissia sp.	3	–	–
Hebetancylus excentricus	2	–	–
Melanoides tuberculata	1	–	–
Physella sp.	5	3	–
Pyrogophorus platyrachis	29	63	287
Odonata			
Argia sedula	22	–	3
Argia sp.	1	1	3
Coenagrionidae	1	–	–
Enallagma cardenium	12	–	1
Enallagma sp.	–	–	1
Ischnura sp.	8	–	–
Zygoptera	–	1	–
Trichoptera			
Cheumatopsyche sp.	208	–	–
Cyrnellus fraternus	60	159	56
Hydropsyche sp.	9	–	–
Hydropsychidae	36	–	–
Hydroptila sp.	87	–	4
Hydroptilidae	94	–	–
Ochrotrichia sp.	4	–	–
Oxyethira sp.	7	–	–
Polycentropodidae	3	–	1
Trichoptera	–	–	3

Phytoplankton taxa list and densities (#/mL) for Florida Cities South Gate WWTP, collected via subsurface grabs in Phillippi Creek, on 01 August, 1996.

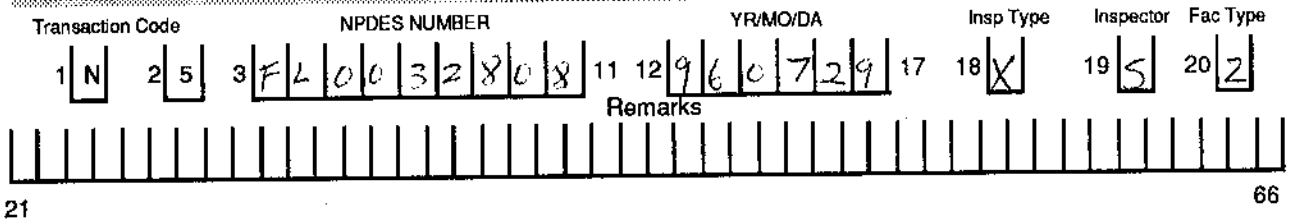
	Reference Site	Test Site 1	Test Site 2
Bacillariophyceae			
Cyclotella sp.	–	10	10
Eunotia sp.	–	10	–
Gomphonema sp.	–	–	10
Navicula sp.	42	123	121
Nitzschia sp.	63	62	40
Pennales	–	–	50
Chlorophyceae			
Carteria sp.	21	–	–
Chlamydomonas sp.	168	10	–
Chodatella sp.	11	–	–
Crucigenia sp.	11	–	–
Pandorina sp.	–	21	10
Scenedesmus sp.	21	21	30
Spermatozoopsis sp.	95	21	10
Tetraedron sp.	11	–	–
Tetrastrum sp.	11	–	–
Chrysophyceae			
Mallomonas sp.	11	–	–
Cyanophyceae			
Oscillatoria sp.	11	–	–
Dinophyceae			
Peridinium sp.	–	–	10
Euglenophyceae			
Euglena sp.	42	–	30
Lepocinclis sp.	–	–	10
Trachelomonas sp.	231	–	–

Periphyton taxa list and densities (#/mm^2) for Florida Cities South Gate WWTP, collected via glass microscope slides in Phillippi Creek, on 29 July, 1996.

	Test Site 1	Test Site 2
Bacillariophyceae		
Achnanthes curvirostrum	–	400
Achnanthes exigua	21747	62045
Achnanthes flexella	–	1201
Achnanthes lanceolata	4272	10007
Achnanthes pinnata	–	400
Bacillaria paxillifer	15922	17212
Capartogramma crucicula	–	1201
Cocconeis placentula	10874	16812
Cyclotella meneghiniana	1165	400
Eunotia sp.	777	–
Gomphonema parvulum	4272	–
Gyrosigma sp.	3107	4803
Hantzschia amphioxys	1165	400
Navicula capitata	–	400
Navicula confervacea	29902	10408
Navicula decussis	3883	4803
Navicula minima	48931	17613
Navicula placenta	777	–
Navicula radiosa	1165	801
Navicula viridula	3883	6805
Nitzschia amphibia	1942	400
Nitzschia constricta	–	400
Nitzschia fonticola	5048	1201
Nitzschia longissima	777	–
Nitzschia microcephala	10874	1601
Nitzschia palea	17864	4003
Nitzschia sp.	777	–
Opephora sp.	2718	801
Pennales	56309	6805
Rhopalodia sp.	1165	–
Surirella ovata	–	400
Synedra ulna	4272	1201
Chlorophyceae		
Actinastrum sp.	388	400
Characium sp.	16310	42431
Oedogonium sp.	22912	–
Scenedesmus sp.	777	2402
Stigeoclonium sp.	1942	2001
Tetraedron sp.	–	400

Cyanophyceae		
Anabaena sp.	4272	–
Chamaesiphon sp.	–	2402
Chroococcus sp.	–	1601
Lyngbya sp.	777	–
Merismopedia sp.	–	1601
Oscillatoria sp.	9709	10408

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



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

