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Biological Assessment of

City of Naples WWTP

Collier County

NPDES #FL0026271

June 1998

March 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 Naples WWTP
County:	Collier
NPDES Number:	FL0026271
Permit Expiration Date:	30 September 1998

Toxics Sampling Inspection (XSI)

Date Sampled: 23 June 1998

Results: All metals and organic constituents in the effluent complied with Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 23 June 1998

Results: The effluent sample was collected prior to final discharge. As a result, all of the discharge data is written as pre-effluent results. The 100% pre-effluent sample was toxic to the water flea, *Ceriodaphnia dubia*, and to the fish, *Cyprinella leedsi*. Total residual chlorine in the pre-effluent sample (1.15 mg/L) exceeded the Class III water quality standard (Rule 62-302.530(19 FAC), and probably caused the toxicity. Dechlorinated effluent samples indicated no mortality to the fish or to the invertebrate.

Impact Bioassessment Inspection (IBI)

Date Sampled: 23 June 1998

Results: Measures of the macroinvertebrate community health indicated no adverse effects on the receiving water communities as a result of the discharge. Although pollution-sensitive organisms were represented at all three study sites, diversity decreased by 41% at test site 2 compared to the control site, and failed to meet the Class III marine water quality standard (Rule 62-302.530(11) FAC). Algal densities were higher than usual due to the large number of dinoflagellates and diatoms. Other measures of algal community health were typical of marine systems and did not indicate any adverse effects from the discharge.

Water Quality Inspection (WQI)

Date Sampled: 23 June 1998

Results: Pre-effluent nutrient concentrations were elevated but did not seem to affect the test sites. All three sites had elevated TKN values that exceeded those values found in 80% of other Florida estuaries. Algal growth potential did not exceed the 10 mg dry wt/L "problem threshold" level at any of the study sites.

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 Naples Wastewater Treatment Plant is located in Collier County, Florida (see map in the Appendix). This municipal facility handles domestic waste and has a design capacity of 8.5 MGD. The facility functions as an activated-sludge domestic wastewater treatment facility, with reclaimed water going to public access spray irrigation and a surface water discharge into the Class III Gordon River. The facility is currently operating with an influent structure that provides screening and grit removal. The treatment process consists of aeration basins, secondary anoxic basins, clarifiers, filters, chlorine contact basins, and a 5 million gallon reuse storage tank with a cascade aerator. The facility discharges intermittently into the Gordon River. The actual flow during the survey was 3.0 MGD. The facility is currently being upgraded to a 10 MGD Bardenpho advanced waste treatment system with surface water discharge.

The state permit limits for the facility are listed in Table 1. The plant has been undergoing a major renovation and has had several effluent violations and plant upsets due to the construction (see Facility Summary in the Appendix).

According to District personnel, the effluent was sampled before the final discharge point and prior to dechlorination. For this reason, the effluent results are reported as pre-effluent results.

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 approximately 1,000 meters above the POD, within Bembury Canal) and two test sites bracketing the discharge (see map in the Appendix). A habitat assessment was performed *in situ* to establish comparability between sites on June 6, 1998. Supplemental physical/chemical data were collected on the pre-effluent sample and study sites. The pre-effluent sample was 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. Static, screening toxicity bioassays, using the invertebrate, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi*, as test organisms, were performed on a pre-effluent sample.

Benthic macroinvertebrate communities were evaluated at control and test sites. Invertebrates were collected using three replicate petite Ponar grabs. Several different measurements of macroinvertebrate and algal community health have been employed to determine the effects of the discharge. These measurements include: habitat assessment, taxa richness, Shannon-Weaver Diversity Index, community composition, functional feeding groups, and algal biomass. For a discussion of each of these measures see *Explanation of Measurements of Community Health* in the Appendix.

Phytoplankton communities 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 pre-effluent sample, and *Dunaliella tertiolecta* for the marine receiving-water sites. Sediments from control and test sites were analyzed for particle grain size. All biological analyses followed the Biology Section Standard Operating Procedures (SOP's). The latest version of the SOP's can be viewed on our web site at 'www.dep.state.fl.us/labs/sops.htm'.

For graphical purposes, the percent differences between the control and test sites involving the number of taxa, the diversity index, the number of polychaete taxa, and the % pelecypods are measured as the control site minus test site divided by the control site. The percent differences between sites involving the % tubificids, algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus control site divided by the control site.

The following personnel were involved in this investigation: Andrew Barienbrock and A.S. Walton (DEP South District), and Julie Baughman, Ken Espy, Marshall Faircloth, Joy Jackson, Scott Lashbrook, Elizabeth Miller, Urania Quintana, Johnny Richardson, Landon Ross, Lisa Tamburello, David Whiting, and Vicki Whiting (DEP Central Biology Laboratory in Tallahassee). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Chuck Zigmont, and Michael Tanski, as well as District representatives.

Results

The pre-effluent and receiving water results for this facility are presented in Table 1 and Table 2.

Discussion

Habitat quality at the control site was higher than at test site 1 and the same as test site 2 (Table 1). Shorelines at both the control site and test site 1 consisted mostly of vertical seawalls and riprap, while test site 2 was mostly natural shoreline with occasional riprap. Substrates at all three study sites consisted primarily of sand with some mud (see Marine Habitat Assessment Sheets in the Appendix).

Table 1. Effluent limits and summary of chemistry data.

City of Naples WWTP	Effluent Limits	Pre-effluent sample ***	Control Site	Test Site 1	Test Site 2
Organic Constituents (µg/L)					
Atrazine	-	0.62	-	-	-
Metals (µg/L)					
Aluminum	≤ 1500 **	50 U	-	-	-
Arsenic	≤ 50 **	20 U	-	-	-
Cadmium	≤ 9.3 **	0.05 U	-	-	-
Chromium	≤ 50 **	10 U	-	-	-
Copper	≤ 2.9 **	1.4 I	-	-	-
Iron	≤ 300 **	158	-	-	-
Lead	≤ 5.6 **	0.14 I	-	-	-
Mercury	≤ 0.025 **	0.1 U	-	-	-
Nickel	≤ 8.3 **	6 U	-	-	-
Selenium	≤ 71 **	30 U	-	-	-
Silver	≤ 2.3 **	0.17 I	-	-	-
Zinc	≤ 86 **	23 I	-	-	-
Nutrients (mg/L)					
Ortho-phosphate	-	0.62	0.027	0.072	0.083
Total phosphorus	1.0 b*	0.67 A	0.14	0.16 A	0.16
Ammonia	-	8.1	0.014 U	0.017 I	0.015 I
Nitrate+Nitrite	30 b *	2.7	0.004 U	0.004 U	0.004 U
TKN	5 b *	9.9 A	1	1.2 A	0.86
Organic Nitrogen	-	1.8	0.986	1.183	0.845
Total Nitrogen	-	12.6	1.004	1.204	0.864
General Phys-Chem Parameters					
Habitat Assessment	-	-	60	52	60
D.O. (mg/L)	> 4.0 *	-	7.2	7.9	8.02
pH (SU)	6.5-8.5 *	-	7.3	7.4	7.6
Salinity (ppt)	-	-	21	24	25
Conductivity (µmhos/cm)	-	-	34,500	38,200	40,300
Total Residual Chlorine (mg/L)	0.01 * *	1.15	-	-	-
Temperature (°C)	-	-	31.4	31.4	31.7
Flow (MGD)	8.5 MGD *	3.0 MGD	-	-	-
AGP (mg dry wt/L)	-	381.5	3.9	7.1	2.6
Toxicity (48-hour static, screening bioassay)					
C. leedsi - fish chlorinated	-	100% Mortality	-	-	-
C. dubia - invertebrate chlorinated	-	100% Mortality	-	-	-
C. leedsi - fish dechlorinated	-	Not Toxic	-	-	-
C. dubia - invertebrate dechlorinated	-	Not Toxic	-	-	-

* Permit Limit

* * Class III water quality limit

* ** Sample was taken prior to final discharge point

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

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

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

a - Single sample

b - Monthly average

Table 2. Community structure of control and test sites.

City of Naples WWTP	Control Site	Test Site 1	Test Site 2
Macroinvertebrate Quantitative			
Number of Taxa	15	19	19
Shannon-Weaver Diversity	2.9	2.9	1.7
Number of Polychaete Taxa	3	4	6
Community Composition			
% Amphipoda	62	37	75
% Cumacea	0.3	6	16
% Gastropoda	1	16	0.4
% Isopoda	2	5	1
% Nemertea	2	1	0
% Pelecypoda	7	0	1
% Polychaeta	22	34	6
% Tubificidae	0	1	0
% Others	3.7	0	0.6
Functional Feeding Groups			
% Browsers-grazers	26	21	38
% Burrowing Deposit Feeders	0	19	3
% Predators/Carnivores	8	3	0
% Scavengers	26	21	38
% Scrapers	1	16	0
% Surface Deposit Feeders	13	8	2
% Suspension Feeders	24	13	19
% Shredders	2	0	0
Phytoplankton Algae			
Number of Taxa	8	7	6
Shannon-Weaver Diversity	1.6	1.4	1.2
Chlorophyll *a* (µg/L)	43.1	56.7	39.8
Algal Density (#/ml)	11,991	9,653	9,896
% Cyanophyceae (blue-green)	2	0	0
% Cryptophyceae	5	1	0
% Bacillariophycea (diatoms)	66	41	29
% Dinophycea (dinoflagellates)	20	54	67
% Euglenophycea	4	3	1
% Chlorophyceae (green)	4	0	0
AGP (mg dry wt/L)	3.9	7.1	2.6

Physical/chemical measurements were similar among the three study sites with the exception of salinity, which was highest at test site 2, lowest at the control site, and intermediate at test site 1.

According to District personnel, the effluent was sampled before the final discharge point and prior to dechlorination.

Copper, iron, lead, silver, and zinc were detected in the pre-effluent sample at levels that complied with Class III water quality standards. Atrazine was detected in the pre-effluent sample at a non-problem level (AQUIRE 1991).

The pre-effluent sample was toxic to both the fish, *Cyprinella leedsi*, and to the invertebrate, *Ceriodaphnia dubia*, during the 48-hour static, screening bioassay (Appendix). The 100% pre-effluent sample resulted in 100% mortality of the fish and the invertebrate within 1 hour of contact. No mortality occurred in the dechlorinated sample. Total residual chlorine in the pre-effluent was measured in the field at 1.15 mg/L. The total residual chlorine appears to be the cause of the mortality.

The pre-effluent total nitrogen concentration was 12.6 mg/L (Table 1). Pre-effluent total phosphorus (0.67 mg/L), ortho-phosphate (0.62 mg/L), and nitrate+nitrite concentrations (2.7 mg/L) appeared typical for this type of treatment system. TKN values at the control site, test site 1, and test site 2 were greater than those found in over 70% of other Florida estuaries. AGP's at the control site, test site 1, and test site 2 were below the 10 mg dry wt/L "problem threshold" (Ron Raschke, USEPA, pers. comm.) for marine waters. All other nutrients were fairly low and typical of a marine system.

Phytoplankton data were used to assess algal community health (Figure 1). Taxa richness was low at all three study sites (Table 2). Shannon-Weaver diversity was somewhat lower at the two test sites than the control site. Algal densities were relatively high for a marine system and similar among the three sites. Chlorophyll *a* at the control site, test site 1, and test site 2 exceeded those levels normally found in over 95% of other Florida estuaries. Dinoflagellates were dominant at the test sites and diatoms dominated the control site. Examining the phytoplankton com-

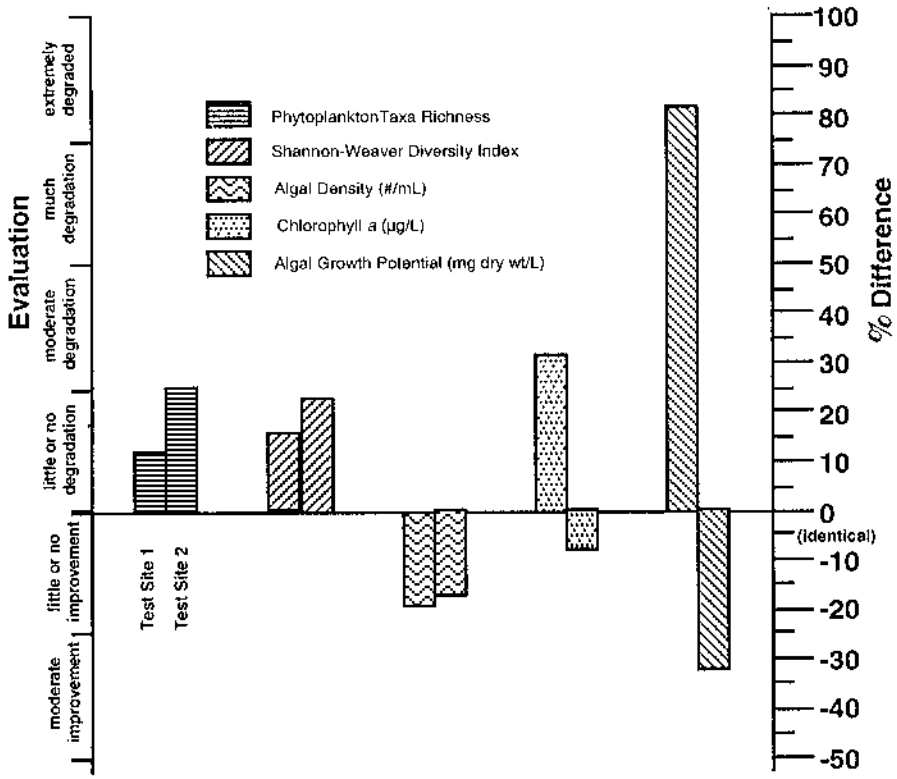


Figure 1. Effect of discharge on the phytoplankton community.

munity data in conjunction with the AGP values, it does not appear that the pre-effluent was adversely affecting the algal communities.

Quantitative measures of macroinvertebrate community health showed little or no degradation at the test sites (Figure 2). Taxa richness was the same at both test sites, and slightly lower at the control site (Table 2). Shannon-Weaver diversity was the same at the control site and test site 1, but decreased by 41% at test site 2. This decrease in diversity did not comply with Class III water quality standards (Rule 62-302.530(11) FAC). A somewhat pollution-sensitive amphipod, *Cerapus* sp., made up 62% of the community at test site 2, resulting in the lower diversity at this site (see the Macroinvertebrate Taxa Lists in the Appendix). Test site 1 was dominated by the somewhat pollution-sensitive amphipod, *Ampelisca sp*, (31% contribution), and the pollution-tolerant amphipod, *Grandidierella bonnieroides,* made up 32% of the control site. Polychaete taxa richness was relatively low at all three study sites.

Literature Cited

Aquatic Toxicity Information Retrieval Data Base (AQUIRE). 1991. U.S. EPA Environmental Research Laboratory, Duluth, Mn.

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.

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. 216 pp.

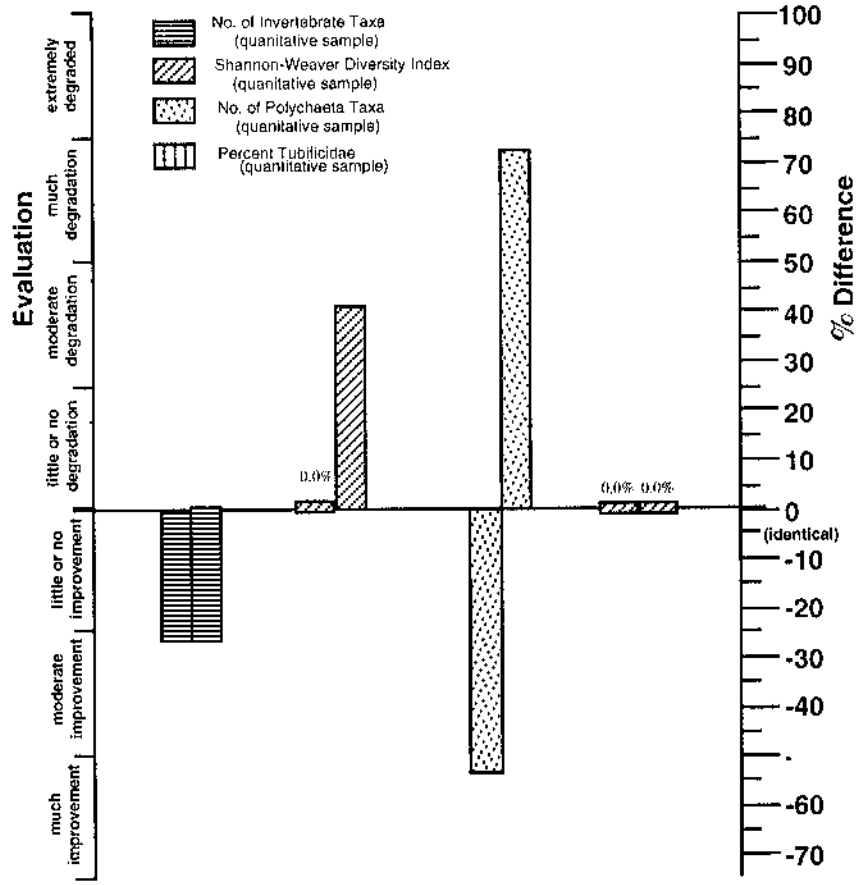


Figure 2. Effect of discharge on the macroinvertebrate community.

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.

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. 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. Species sensitivity data from other sources, such as Chang *et al.* (1992), Farrell (1992), Hudson *et al.* (1990), Hulbert (1990), Lenat (1993), and Whitmore (1989), are used as appropriate.

Community structure: Substantial shifts in proportions of major groups of organisms, compared to control conditions, may indicate degradation. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered indicators of disturbance (Engel *et al.* 1994).

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).

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

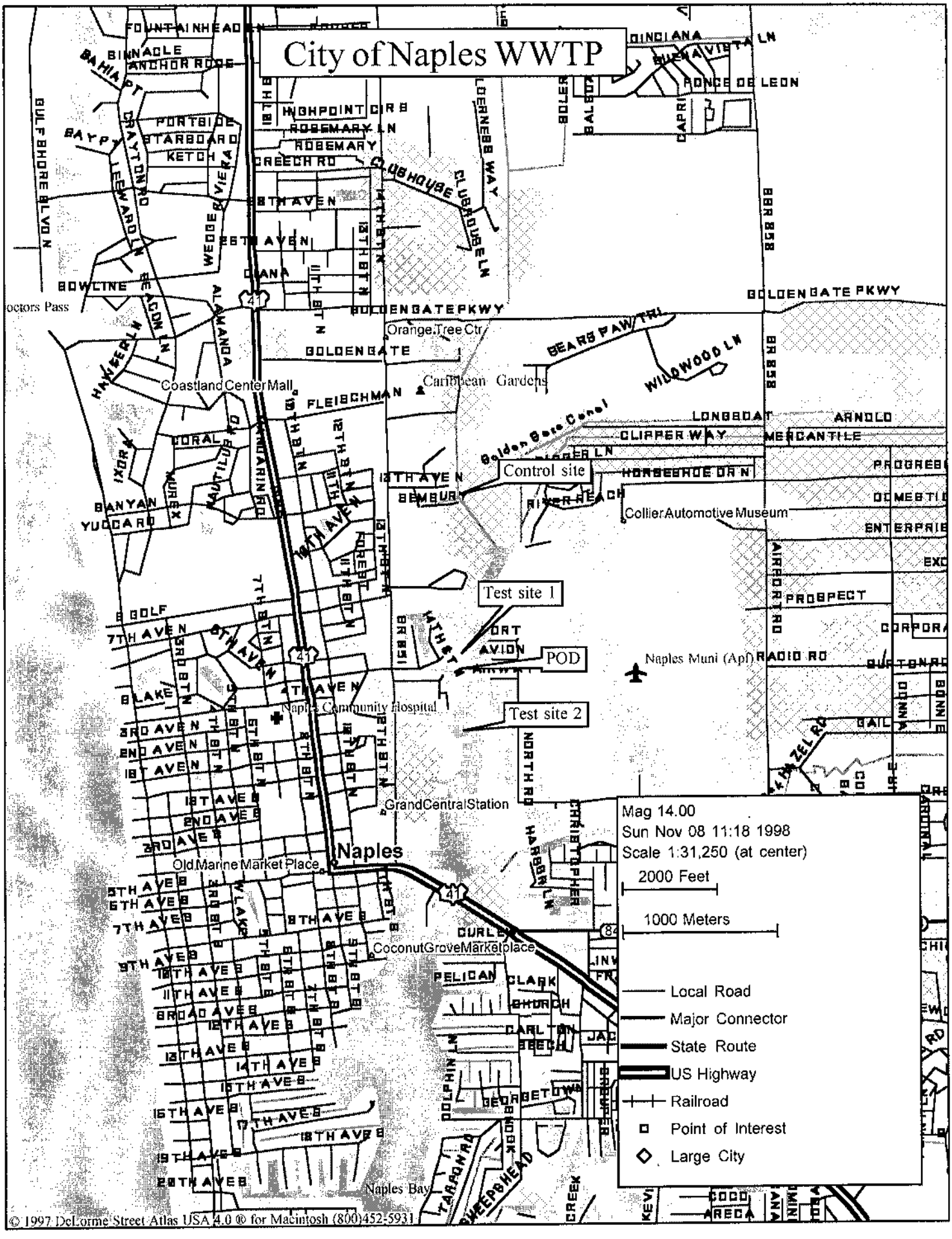
Typical Values for Selected Parameters in Florida Waters

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


City of Naples WWTP
Control site
Test site 1
Test site 2
POD
Naples Muni (Apt)
Naples
Naples Community Hospital
Old Marine Market Place
GrandCentralStation
CoconutGroveMarketplace
Coastland Center Mall
Caribbean Gardens
Orange Tree Ctr
Collier Automotive Museum
Naples Bay
Mag 14.00
Sun Nov 08 11:18 1998
Scale 1:31,250 (at center)
2000 Feet
1000 Meters
Local Road
Major Connector
State Route
US Highway
Railroad
Point of Interest
Large City
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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: City of Naples WWTP		**Date Summary Prepared:** 6-22-98
Location (attach detailed map): 1400 3rd Avenue North	**County** Collier FLA#	**District** South
Federal Permit # and **expiration date:** FL0026271	**State GMS # and State expiration date:** FL0026271	**Facility Type:** Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: Activated sludge domestic wastewater treatment facility with reclaimed water to public access spray irrigation and a surface water discharge. Facility is currently being upgraded to Advanced Waste Treatment and surface water discharge removed

Description of treatment process: Facility is currently operating with an influent structure which provides screening and grit removal, 3 aeration basins, 3 second anoxic basins, 4 clarifiers, 2 filters, 2 Chlorine contact basins, 1 5-MG reuse storage tank and a cascade aerator.

Receiving waters: Gordon River	**Classification:** I II (III)	
Design Flow: 8.5	**Mean Flow:**	**Flow during survey:** ≈ 3.0 MGD

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

therefore, the best time to sample is: Winter season during peak flows or rainy season during low reclaimed water usage

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

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

Parameter	Limit (units)
See attached permit	

Describe special permit conditions and permit modifications:
Facility is being upgraded to a 10 MGD Bardenpho Advanced Waste treatment facility.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

(Facility)

Description of permitted outfall(s): Facility discharges directly through a pipe to the Gordon River (Discharge pt D002).

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: Plant has been undergoing a major renovation and has seen several effluent violations and plant upsets due to the construction.

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

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

Additional information:

Staff contributing to this review (signature):

(Biologist)

Andrew Brinkerk (Inspector)

(Engineer)

( )

( )

( )

I. Reclaimed Water and Effluent Limitations and Monitoring Requirements

A. Surface Water Discharges (existing facility)

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge effluent from Outfall D002 to the Gordon River at the Naples WWTRF outfall, (See Part VI). Such discharge shall be limited and monitored by the permittee as specified below: *[62-600, 6-8-93] [62-601, 5-31-93] [62-650, 11-27-89] [62-302, 1-5-93] [62-610.860, 4-2-90]*

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location No.	Notes
Flow	mgd	Maximum	-	8.5	-	-	Continuous	Recording flowmeter & totalizer	20308	
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	Maximum	-	10.0	15.0	20.0	Daily, (5 per week)	24-hour flow proportioned composite	24922	
Total Suspended Solids	mg/L	Maximum	-	-	-	5.0	Daily, (7 per week)	Grab	24921	
Fecal Coliform Bacteria	See Permit Condition I. C. 4.						Daily (7 per week)	Grab	24922	
pH	std. units	Range	-	-	-	6.5-8.5	Continuous	Grab/On-line monitor & recorder	24922	I. C.
Total Residual Chlorine (For Disinfection)	mg/L	Minimum	-	-	-	1.0	Continuous	Grab/On-line monitor & recorder	24922	
Total Residual Chlorine (For Dechlorination)	mg/L	Maximum	-	-	-	0.01	Daily, (7 per week)	Grab	20308	
Total Kjeldahl Nitrogen (TKN)	mg/L	Maximum	-	5.0	7.5	-	Daily, (5 per week)	24-hour flow proportioned composite	24922	
Total Phosphorus (as P)	mg/L	Maximum	-	1.0	1.5	-	Daily, (5 per week)	24-hour flow proportioned composite	24922	
Nitrate-Nitrogen (as N)	mg/L	Maximum	-	30.0	45.0	-	Daily, (5 per week)	24-hour flow proportioned composite	24922	
Dissolved Oxygen	mg/L	Maximum	See Permit Condition I. C. 9.				Daily, (7 per week)	Grab	20308	
Whole Effluent Toxicity	See Permit Condition I. C. 7.									

Test site #1

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-06)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	28-03-0030	6-23-98	1410	NAPLES BAY

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	COLLIER	GORDON RIVER AFFECTED UPSTREAM CITY OF NAPLES WTP	DW 062398-4

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)
10				90			

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

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

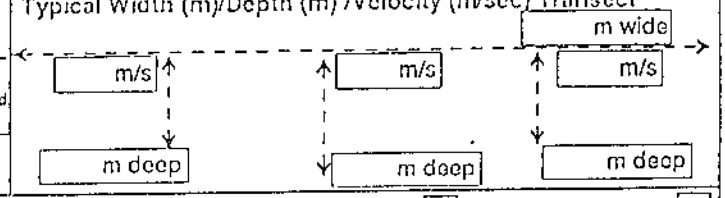
Width of riparian vegetation (m) on least buffered side: 0 | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes (more sinuous)

High Water Mark: ____ (m above present water level) + ____ (present depth in m) = ____ (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	80		
Leaf Packs or Mats				Mud/Muck/Silt	20		
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								1.0
Mid-depth	0.8	31.4	7.42	7.93	38200			
Bottom								

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
KLEINMANN / WALTON	ASWalton	6-23-98

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/DY):	RECEIVING BODY OF WATER:
	28-03-0030	6-23-98	NAPLES BAY

REMARKS:	LOCATION: GORDON RIVER AFFECTED UPSTREAM	FIELD ID/NAME:
		DW062398-H

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

TOTAL SCORE 52

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
6-23-98	WALTON	asw walton

Test site #2

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:
	28-03-0031	6-23-98	1445	NAPLES BAY

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		GORDON RIVER AFFECTED DOWN STRM	DW 062398-5

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)
40				20		40	

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: 4 m

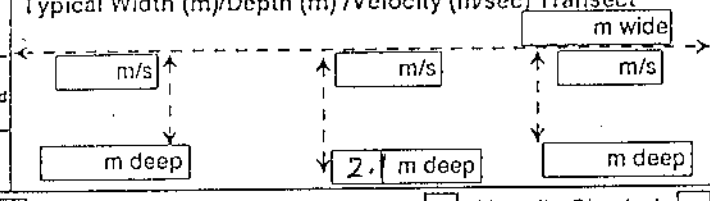
List & map dominant vegetation on back

Artificially Channelized [ ] no [ ] recent, severe [ ] some recovery [✓] mostly recovered, more sinuous

Artificially Impounded [ ] yes

High Water Mark: [ ] (m above present water level) + [ ] (present depth in m) = [ ] (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								
Mid-depth	1.0	31.68	7.60	8.02	40,300			1.0
Bottom								

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: HIGH, EBBING TIDE

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

SAMPLING TEAM:	SIGNATURE:	DATE:
KLEINMANN / WALTON	Abe Walton	6-23-98

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-90)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	28-03-0048	6-23-98	1330	NAPLES BAY

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	COLLIER	GORDON RIVER UPSTR. REFERENCE	DW-062398-3

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)
10				90			

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: _____ (m above present water level) + _____ (present depth in m) = _____ (m above bed)

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

m wide

m/s	m/s	m/s
m deep	m deep	m deep

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	100		
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								1.0
Mid-depth	1.0	31.4	7.29	7.2	34 500			
Bottom								

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
KLEINMANN / WALTON	A S Walton	

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/DD/Y):	RECEIVING BODY OF WATER:
	29-030048	6-2398	NAPLES BAY

REMARKS:	LOCATION: GORDON R. UPSTR. REFERENCE	FIELD ID/NAME:
		DW-062398-3

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 30	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. 38-50 points	Two or three communities observed from those listed. 26-37 points	One community observed from those listed. 13-25 points	No communities observed from those listed. 0-12 points
Tidal Fluctuation 4	>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 1	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 10	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type 10	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

9 — 41 - 60 — 24 40

TOTAL SCORE 60

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
6-23-98	WALTON	ASWalton

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 28-03-0031	DATE (M/D/Y): 6-23-98	RECEIVING BODY OF WATER: NAPLES BAY
REMARKS:	LOCATION: GORDON RIVER AFFECTED DOWNSTRM.		FIELD ID/NAME: DW 062988-5

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 8	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: 30	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. 38-50 points	Two or three communities observed from those listed. 26-37 points	One community observed from those listed. 13-25 points	No communities observed from those listed. 0-12 points
Tidal Fluctuation: 3	>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: 1	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: 10	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type: 8	Combination of sand, gravel, and shell. 12-15 points	Primarily sand, with small areas of mud. 8-11 points	Mixture of sand and mud, or well-aerated mud only. 4-7 points	Anaerobic mud. 0-3 points

TOTAL SCORE: 60

COMMENTS:

ANALYSIS DATE: 6-23-98	ANALYST: WATSON	SIGNATURE: ASWalton

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Naples WWTP
County: Collier
Contact / District: Thomas Jackson / South
NPDES Permit #: FL0026271
LIMS Sample #: 332205 LIMS Job #: TLH-1998-06-23-08
sample log 7/2/98 DW

Sample Collection: Date 6/22/98 Time 15:15
Test Beginning: Date 6/23/98 Time 1430
Test Ending: Date 6/25/98 Time 14:30
Organism Batch #: 28 Diluent Batch #: 29
Organism Age: <24hours SRT toxicant batch #: NA

Test organism: Ceriodaphnia dubia

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

Remarks: Sample dechlorinated by the addition of 3.38 mL/L of 0.025N Sodium Thiosulfate per Liter of sample for the dechlorinated test. Dechlorinated Sample TRC = <0.03 mg/L

Temperature Range
Room: 24.5-25.5°C
Incubator #1: 23.9-25.0°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	UNCORRECTED Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (µmhos/cm) 48 h
CTL A	A	5	5	5	8.0		8.0	24.7		24.8	7.4		7.5	165		180
CTL B	B	5	5	5			8.3			24.8			7.3			180
CTL C	C	5	5	5			8.3			24.8			7.3			180
CTL D	D	5	5	5			8.4			24.8			7.4			190
100% Dech A	A	5	5	5	7.0		8.3	24.6		24.8	7.5		7.4	1900		1980
100% Dech B	B	5	5	5			8.3			24.8			7.3			1920
100% Dech C	C	5	5	5			8.3			24.8			7.2			1955
100% Dech D	D	5	5	5			8.4			24.8			7.2			1895
100% A	A	5	0 @ 5D	—	6.8		—	24.6		—	7.4		—	1950		—
100% B	B	5	0 @ 5D	—			—			—			—			—
100% C	C	5	0 @ 5D	—			—			—			—			—
100% D	D	5	0 @ 5D	—			—			—			—			—
			@ 100% mortality observed at 0 hour plus 55 minutes mf 6/24/98													
measured by:		FW	FW	FW	FW		CH	FW		CH	FW		CH	FW		CH
recorded by:		MF	FW	FW	MF		FW	MF		FW	MF		FW	MF		FW

Investigators' Signatures

Marshall Fairbrath
Courtney Head

reviewer form updated 5/22/98

Water Quality Parameters	Salt Water (Well Water)	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			1.15	—	Thomas Jackson	MF
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	2.9	DR-100	CH	MF
Alkalinity (mg/L as $CaCO_3$):	130	75	110	Hach	CH	MF
Hardness (mg/L as $CaCO_3$):	133	90	310	Hach	CH	MF
Total ammonia (mg/L as N):	<0.017	<0.017	~~2.9~~ 2.74	Orion	MF	CH
Salinity:	0	D	≈1	YSI	CH	MF

A waste Chlorine value in ammonia above MF 6-23-98

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Naples WWTP
County: Collier
Contact / District: Thomas Jackson / South
NPDES Permit #: FL00 26271
LIMS Sample #: 332205 LIMS Job #: TLH1998-06-23-08
sample log 7/24/98 DW
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 2 of 2

Sample Collection: Date 6/22/98 Time 15:15
Test Beginning: Date 6/23/98 Time 1450
Test Ending: Date 6/25/98 Time 14:15
Organism Batch #: 46 Diluent Batch #: Well
Organism Age: 11 days SRT toxicant batch #: NA
Test organism: Cyprinella leedsi

Remarks: Sample dechlorinated by the addition of 3.38 ml of 0.025N Sodium thiosulfate per liter of sample for the dechlorinated test. Dechlorinated Sample TRC = <0.03 mg/L

Temperature Range
Room: 24.5-25.5°C
Incubator #3: 25.0-26.5°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	24 h	48 h
Ctl A	F1	5	5	5	7.8	8.3	8.5	26.0	25.5	25.5	7.4	7.1	7.3	260	260	275
Ctl B	F2	5	5	5	7.8	8.3	8.5	26.0	25.6	25.5	7.4	7.3	7.4	260	260	265
Ctl C	F3	5	5	5	7.8	8.3	8.5	26.0	25.6	25.5	7.5	7.3	7.5	260	260	260
Ctl D	F4	5	5	5	7.9	8.3	8.5	26.0	25.5	25.5	7.5	7.4	7.4	260	260	260
100% DCl A	F5	5	5	5	7.0	7.8	8.1	25.3	25.4	25.6	7.5	7.5	7.1	2010	1975	1990
100% DCl B	F6	5	5	5	7.0	7.8	8.1	25.2	25.4	25.6	7.5	7.5	7.0	2020	2040	2060
100% DCl C	F7	5	5	5	7.0	7.8	8.1	25.2	25.4	25.7	7.5	7.3	7.1	2020	2040	2070
100% DCl D	F8	5	5	5	7.0	7.8	8.1	25.3	25.4	25.5	7.5	7.4	7.1	2020	2030	2060
100% A	F9	5 B→0	0	—	6.8	—	—	25.2	—	—	7.5	—	—	2010	—	—
100% B	F10	5	0	—	6.8	—	—	25.3	—	—	7.4	—	—	2010	—	—
100% C	F11	5	0	—	6.8	—	—	25.2	—	—	7.4	—	—	2010	—	—
100% D	F12	5	0	—	6.8	—	—	25.3	—	—	7.4	—	—	2010	—	—
			B 100% mortality within 15 minutes of test initiation. mf 6/23/98													
measured by:		FW	FW	CH	FW	DAW	CH	FW	DAW	AH	FW	DAW	CH	KW	DAW	CH
recorded by:		MF	FW	FW	MF	FW	FW	MF	FW	FW	MF	FW	FW	MF	FW	FW

Investigators' Signatures

Marshall Faircloth
Laurence Gamble
Consulting Head
Dan Dillon Jr

reviewer

form updated 5/22/98

Water Quality Parameters	Salt Water (Well Water)	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			1.15	—	Thomas Jackson	MF
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	2.9	DR-100	CH	MF
Alkalinity (mg/L as $CaCO_3$):	130	75	110	Hach	CH	MF
Hardness (mg/L as $CaCO_3$):	133	90	310 mf	Hach	CH	MF
Total ammonia (mg/L as N):	<0.017	<0.017	~~2.4~~ 2.74 A	Orion	MF	CH
Salinity:	0	0	≈1	YSI	CH	MF

A Waste chlorine value in ammonia spoon MF 6-23-98

Phytoplankton taxa list and densities (#/mL) for the City of Naples WWTP, collected via subsurface grabs in Gordon River on 23 June, 1998.

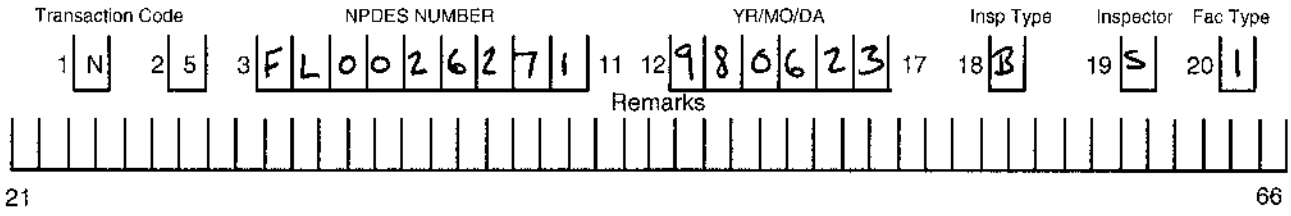
	Control Site	Test Site 1	Test Site 2
Bacillariophyceae			
Coscinodiscus sp.	–	–	58
Cyclotella sp.	7798	3940	2662
Cylindrotheca sp.	74	49	116
Chlorophyceae			
Tetraselmis sp.	–	148	289
Undetermined Chlorophyceae	515	–	–
Cryptophyceae			
Chroomonas sp.	589	49	–
Cyanophyceae			
Dactylococcopsis sp.	221	–	–
Dinophyceae			
Prorocentrum sp.	221	246	58
Undetermined Dinophyceae	2133	4925	6597
Euglenophyceae			
Eutreptia sp.	368	197	116
Trachelomonas sp.	74	99	–

Benthic macroinvertebrate taxa list for the City of Naples WWTP, collected via Ponar grab samples in Gordon River, on 23 June 1998. Densities, in number/m^2, represent the mean of three replicates.

	Control Site	Test Site 1	Test Site 2
Amphipoda			
Ampelisca sp.	3359	9845	5039
Cerapus sp.	–	93	30422
Corophiidae	–	–	1726
Corophium simile	–	–	93
Corophium sp.	2240	–	–
Grandidierella bonnieroides	6019	1493	–
Cumacea			
Cyclaspis pustulata	47	–	–
Cyclaspis varians	–	1633	7745
Oxyurostylis sp.	–	140	–
Diptera			
Polypedilum scalaenum grp.	747	–	–
Echinodermata			
Undetermined Actiniaria	93	–	–
Gastropoda			
Hydrobiidae	–	–	140
Littoridinops sp.	187	4899	–
Undetermined Gastropoda	–	–	47
Isopoda			
Anthuridae	–	–	47
Cyathura sp.	233	140	–
Edotea montosa	187	1353	373
Mysidacea			
Mysidopsis almyra	–	–	47
Mysidopsis bigelowi	–	93	–
Nemertea			
Undetermined Nemertea	280	327	–
Oligochaeta			
Tubificidae	–	373	–
Pelecypoda			
Abra aequalis	–	47	–
Corbula sp.	–	47	–
Corbula swiftiana	–	–	187
Dreissenidae	793	–	93
Tagelus plebeius	–	–	140
Tellina sp.	420	–	140
Tellina versicolor	–	47	–
Polychaeta			
Capitella sp.	–	5459	1633
Cirratulidae	–	–	47
Eteone heteropoda	–	–	47

Laeonereis culveri	2193	1073	93
Megalomma sp.	–	–	280
Sabellidae	47	47	47
Streblospio benedicti	1913	4153	980
Tanaidacea			
Hargeria rapax	–	47	–
Kalliapseudes sp.	–	–	47

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)

