#202

Biological Assessment of

Port St. Joe Wastewater Treatment Plant

Gulf County

NPDES #FL0020206

March 1997

August 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: Port St. Joe WWTP
County: Gulf County
NPDES Number: Fl0020206
NPDES Permit Expiration Date: 1-1-98

Toxics Sampling Inspection (XSI)

Date Sampled: 31 March 1997

Results: The concentration of nickel (23.4 µg/L) exceeded the Class III marine water quality standard of 8.3 µg/L, a violation of Rule 62-302.530(45) FAC. No organic pollutants were detected in the effluent.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 31 March 1997

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

Impact Bioassessment Inspection (IBI)

Date Sampled: 31 March 1997

Results: Variations in benthic macroinvertebrate community characteristics between stations appeared to be more related to salinity fluctuations and recruitment potential from Gulf County Canal, than to the influence of the discharge. Pollution sensitive taxa, such as *Haustorius* sp., *Cyclaspis varians,* and *Leucon americanus,* were found at all three sites. In summary, the discharge did not appear to adversely affect the invertebrate communities in the Gulf County Canal. There were longitudinal changes in the phytoplankton communities along Gulf County Canal, including increases in algal density, and a shift from diatom dominance to cyanophyte dominance (*i.e.*, the stress tolerant *Oscillatoria* sp.) Due to the dynamic nature of this portion of Gulf County Canal, there are currently insufficient data to determine whether the discharge contributed to these observed changes.

Water Quality Inspection (WQI)

Date Sampled: 31 March 1997

Results: Effluent fecal and total coliforms (10 organisms/100 mL each) complied with Class III water quality standards. The effluent appeared to contribute to the moderately enriched ammonia levels at the test sites, which were higher than those found in approximately 70% of other Florida estuaries. The elevated receiving water nitrate-nitrite levels (exceeding the 95th percentile) appeared to be from upstream sources other than the discharge. Algal growth potential (AGP) values at the reference site (2.25 mg dry wt/L), test site 1 (1.45 mg dry wt/L), and test site 2 (6.63 mg dry wt/L) were all below the "problem threshold" of 10 mg dry wt/L for marine waters. The effluent AGP was 41.81 mg dry wt/L.

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

Introduction

The Port St. Joe Wastewater Treatment Facility is located in Gulf County, Florida (see maps in Appendix). This 34.75 MGD, publicly-owned industrial wastewater treatment facility receives influent from St. Joe Forest Products (96% of the total flow), Arizona Chemical (1.5%), and domestic service areas (2.5%). The treatment process includes primary clarification followed by discharge to a 70 acre, 20 foot deep, aerated biological treatment lagoon. Effluent is discharged into the Gulf County Canal, at a point approximately 800 meters upstream from St. Joe Bay. The effluent flow during this survey was 29.22 MGD.

Permit limits include: flow (34.75 MGD), pH (6.5 SU to 8.5 SU), and TSS (21,710 lbs/day as a monthly average, maximum of 28,950 lbs/day). Static bioassay tests are performed once per quarter.

The facility has been granted an 800 meter mixing zone in the Gulf County Canal (400 meters above and 400 meters below the point of discharge). If the following concentrations are exceeded at the Parshall flume, grab samples collected from both edges of the mixing zone shall be analyzed for the parameter(s) exceeding the limit: aluminum (2,300 µg/L), copper (13 µg/L), iron (700 µg/L), mercury (0. 5 µg/L) and silver (2 µg/L).

According to monthly operating report data, no violations were noted within the past twelve months. Bioassays performed in January, 1997, indicated no acute or chronic effects. St. Joe Forest Products (paper mill) was not in operation between April 1, 1997, and August 1, 1997, and therefore, flow into the treatment plant was substantially reduced during that time. Note that sampling for this survey occurred on March 31, 1997, just prior the mill shut down.

Major characteristics of community structure of study sites.

	Reference Site	Test Site 1	Test Site 2
Macroinvertebrate Ponar			
Number of Taxa	17	44	24
Shannon-Weaver Diversity	3.1	3.5	2.9
# Polycheate taxa	6	21	10
% Polychaeta	20.3	59.8	50.4
% Diptera	18.2	0.0	0.0
% Pelecypoda	0.0	2.7	1.4
% Tubificidae	0.68	2.9	23.7
% Isopoda	6.1	2.6	5.6
% Cumacea	3.4	25.8	14.8
% Amphipoda	50.7	5.3	2.8
% Predator/Carnivores	0.7	6.8	3.3
% Above-Surface Deposit Feeders	11.5	4.4	4.2
% Below Surface Deposit Feeders	0.68	48.6	64.3
% Scavengers	5.7	2.2	3.2
% Suspension Feeders	58.1	33.3	20.9
% Browser-grazer	5.7	2.1	3.2
% Other	17.6	2.6	0.9
Phytoplankton Algae			
Number of Taxa	10	13	9
Shannon-Weaver Diversity	2.8	2.1	1.5
Chlorophyll a (µg/L)	1.0 U	1.0 U	1.0 U
Algal Density (#/mL)	719	3086	4735
% Blue-green	20	74.9	94.3
% Green	28.6	2.1	0.0
% Diatoms	42.7	21.5	2.7
Algal Growth Potential (mg dry wt/l)	2.248	1.452	6.634

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in the Gulf County Canal approximately 2000 m northeast of the discharge), and two test sites (test site 1 was located at the point of discharge, and test site 2 was situated in the Gulf County Canal approximately 500 m southwest of the discharge at the US Highway 98 bridge) (see maps in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening

toxicity bioassays, using *Ceriodaphnia dubia* and *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 three replicate petite Ponar grabs. Phytoplankton was sampled at both reference and test sites. Chlorophyll *a* was also determined for phytoplankton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* for the freshwater effluent, and *Dunaliella tertiolecta* for the marine receiving water sites, followed Miller *et al.* (1978) and EPA (1974). Other parameters, such as fecal and total coliforms, TSS, and total residual chlorine, were also sampled.

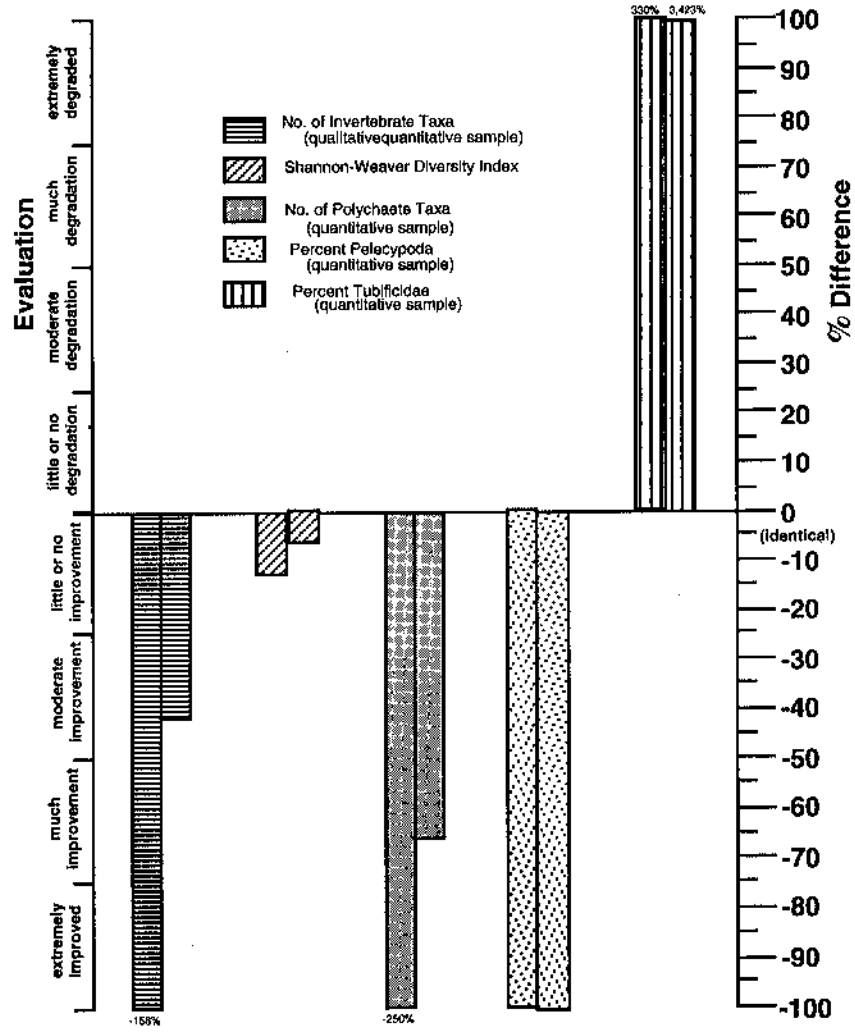
Explanation of Measurements of Community Health

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 freshwater stream biota were evaluated and scored, with 20 points possible for each factor. 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). For marine systems, overall habitat quality is also assigned to one of four categories: Optimal (75-100 points); Suboptimal (50-75 points); Marginal (25-49 points); and Poor (0-24 points) (see habitat assessment field sheets in Appendix B).

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,



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.

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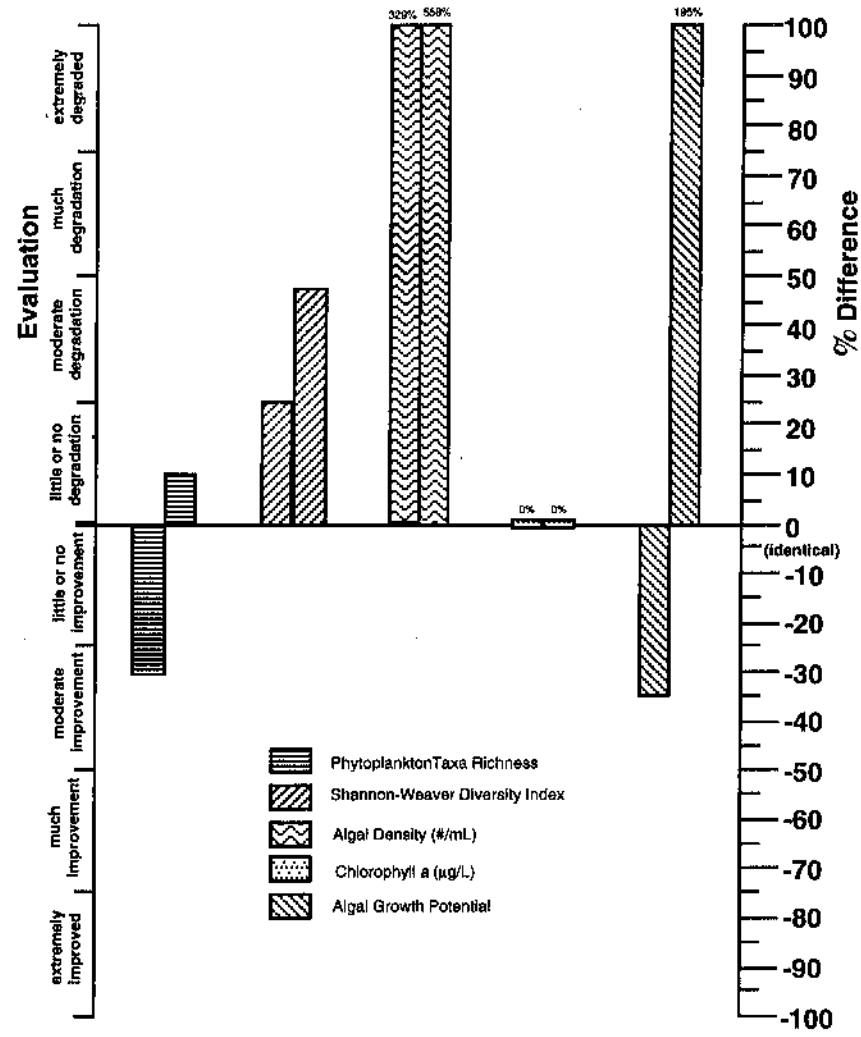
to the exclusion of other taxa. Excessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is a related measure which is also associated with disturbance.

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 Hulbert (1990), Hudson *et al.* (1990), Lenat (1993), Farrell (1992), Chang *et al.* (1992), and Whitmore (1989), 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 the proportions of major groups of organisms, compared to reference 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).

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.



Effect of discharge on the algal 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.

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.

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the number of polychaete taxa, and the % pelecypods are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the % tubificids, 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: Glenn Butts, Charles Goddard, Laurence Donelan, and Nicole Kilburn (DEP Northwest District) and Lyn Burton, Jennifer Eichelberger, Ken Espy, Marshall Faircloth, Russel Frydenborg, Maosen Hua, Joy Jackson, Elizabeth Miller, Urania Quintana, Landon Ross, Lisa Tamburello , David Whiting, and Vicki Whiting (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Bioassessment Review Committee, consisting of Jan Mandrup-Poulsen, Wayne Magley, and Mike Tanski, as well as District representatives.

Results and Discussion

The Gulf County Canal is a tidally influenced, man-made channel, connecting St. Joe Bay with the Intracoastal Waterway system. A reference site and two test sites were situated in this highly altered environment to determine the potential effects of the Port St. Joe discharge. It should be noted that Premier Service Corporation, a magnesium hydroxide recovery plant, also discharges into the Gulf County Canal, approximately 1000 m northeast of the Port St. Joe discharge. Habitat quality was at the lower range of the "fair" category at all three sites (with 31 points at the reference site, 28 points at test site 1, and 37 points at test site 2). All three sites scored poorly in terms of the natural community types present in the Gulf County Canal.

There was significant salinity stratification in portions of the Gulf County Canal. Surface salinity was 1.0 ppt at the reference site, 15.6 ppt at test site 1, and 23.4 ppt at test site 2. In contrast, the bottom salinity was 27.5 ppt at the reference site, 29.1 ppt at test site 1, and 30.1 ppt at test site 2. Test site 2, with a depth of 4.9 m, was deeper than the reference site (2.8 m) or test site 1 (1.9 m). Sediments at all three sites consisted mainly of sand, with some mud, muck, or silt. Turbidity ranged from 9 NTU at test site 1 to 20 NTU at the reference site: these values being greater than those found in 80% of other Florida estuaries (see Table of Typical Water Quality Values in Appendix). Dissolved oxygen levels complied with Class III marine water quality criteria at all three canal sites, ranging from 4.8 mg/L to 5.1 mg/L at the bottom, and from 6.2 mg/L to 7.8 mg/L at the surface. Temperatures at the canal sites ranged between 21.1 °C and 23.2 °C. The pH was lowest at the surface of the reference site (6.4 SU) and highest at test site 2 (7.6 SU).

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

Metals detected in the effluent included iron (500 µg/L), nickel (23.4 µg/L), zinc (74 µg/L) and silver (0.09 µg/L). The concentration of nickel exceeded the Class III marine water quality standard of 8.3 µg/L, a violation of Rule 62-302.530(45) FAC.

Effluent total coliforms (10 organisms/100 mL) and fecal coliforms (10 organisms/100 mL) complied with Class III water quality standards (see Chemistry Summary Table).

The effluent contained 0.54 mg/L of total phosphorus and 0.81 mg/L of ammonia, but nitrate-nitrite was undetected. Ammonia levels at test site 1 (0.17 mg/L) and test site 2 (0.099 mg/L) were higher than those found in approximately 70% of other Florida estuaries. Since the reference site ammonia (0.066 mg/L) was average for an estuary, the increases at the test sites appeared to be attributable to the effluent. Nitrate-nitrite levels at the three canal sites were higher than those found in approximately 80% of Florida estuaries, with the reference site having the highest level (0.36 mg/L). Since nitrate-nitrite was undetected in the effluent, this suggests sources other than the discharge.

Algal growth potential (AGP) values at the reference site (2.25 mg dry wt/L), test site 1 (1.45 mg dry wt/L) and test site 2 (6.63 mg dry wt/L) were below the "problem threshold" of 10 mg dry wt/L for marine waters (Ron Raschke, US EPA, personal communication). The effluent AGP was 41.81 mg dry wt/L.

Variations in benthic macroinvertebrate community characteristics between stations appeared to be more related to salinity fluctuations and recruitment potential from Gulf County Canal, than to the influence of the discharge. The figure on p. 2 indicates the degree of difference between the invertebrate populations of 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.

In the Gulf County Canal, macroinvertebrate taxa richness was lowest at the reference site (with 17 taxa), highest at test site 1 (with 44 taxa), and intermediate at test site 2 (with 24 taxa). Shannon-Weaver diversity was lowest at test site 2 (2.9), increasing to 3.1 at the reference site, and 3.5 at test site

1. The lower diversity at test site 2 can be attributed to the dominance of the polychaete *Capitella* sp., which accounted for 32% of the total population. The number of polychaete taxa was similar between test site 2, with 10 polychaete taxa, and the reference site (with 6 taxa), while test site 1 had double that number (with 21 polychaete taxa). Pelecypods (considered sensitive to stress) were present in low numbers at all three sites, accounting for 2.7% of the test site 1 population and 1.4% at test site 2, while none where found at the reference site.

While polychaetes (between 20.3% to 59.8% of the total population) were abundant all three sites, amphipods (50.7%), cumaceans (25.8%), and tubificids (23.7%) were also common or co-dominant at the reference site, test site 1, and test site 2, respectively. Stress-tolerant freshwater chironomids made up 18.2% of the reference site population, but were absent at the other sites. The occurrence of these freshwater taxa at the reference site is probably related to their dispersal from upstream freshwater portions of Gulf County Canal. In contrast, more marine tubificids were found at the test sites (ranging from 2.9% at test site 1 to 23.7% at test site 2) than the reference site (0.7%). These differences may have been related to the fluctuating salinity regimes between sites.

Pollution sensitive amphipods, such as *Haustorius* sp., and *Corophium* sp., were present at all three sites. Pollution sensitive cumaceans, such as *Cyclaspis varians* and *Leucon americanus,* were also found at all three sites, but they were more abundant at test sites 1 and 2. In summary, the discharge did not appear to be adversely affecting the invertebrate communities in the Gulf County Canal.

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. Phytoplankton taxa richness at test site 1 (with 13 taxa) was slightly higher than that found at test site 2 and the reference site (with 9 and 10 taxa, respectively). Diversity ranged from 1.5 at test site 2 to 2.8 at the reference site. There were longitudinal increases in algal density, with 719 cells/mL at the reference site, 3,086 cells/mL at test site 1, and 4,735 cells/mL at test site 2. Note, however, that chlorophyll *a* was less than 1.0 µg/L at all three sites. While the reference site was dominated by the diatom, *Cyclotella* sp. (making up 34% of the total population), test sites 1 and 2 were dominated by the stress tolerant blue-green, *Oscillatoria* sp. (making up 60% and 71% of the total population, respectively). Due to the dynamic nature of this portion of Gulf County Canal, there are currently insufficient data to determine whether the discharge contributed to these observed changes.

Conclusions

The raw, undiluted effluent was not toxic to the invertebrate, *Ceriodaphnia dubia*, or the fish, *Cyprinella leedsi.*

The concentration of nickel exceeded the Class III marine water quality standard of 8.3 µg/L, a violation of Rule 62-302.530(45) FAC. No organic pollutants were detected in the effluent.

Effluent fecal and total coliforms (10 organisms/100 mL each) complied with Class III water quality standards.

The effluent appeared to contribute to the moderately enriched ammonia levels at the test sites, which were higher than those found in approximately 70% of other Florida estuaries. The elevated receiving water nitrate-nitrite levels (exceeding the 80th percentile) appeared to be from upstream sources other than the discharge.

Algal growth potential (AGP) values at the reference site (2.25 mg dry wt/L), test site 1 (1.45 mg dry wt/L), and test site 2 (6.63 mg dry wt/L) were all below the "problem threshold" of 10 mg dry wt/L for marine waters. The effluent AGP was 41.81 mg dry wt/L.

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There were longitudinal changes in the phytoplankton communities along Gulf County Canal, including increases in algal density, and a shift from diatom dominance to cyanophyte dominance (*i.e.*, the stress tolerant *Oscillatoria* sp.) Due to the dynamic nature of this portion of Gulf County Canal, there are currently insufficient data to determine whether the discharge contributed to these observed changes.

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Chemistry summary table for Port St. Joe WWTP

	Effluent	Reference Site	Test Site 1	Test Site 2
Organic Constituents (ug/L)				
None Detected	None Detected			
Metals (ug/L)				
Aluminum	933			
Arsenic	40 U			
Cadmium	0.6			
Copper	10 U			
Chromium	10 U			
Iron	500			
Lead	20 U			
Mercury	0.1 U			
Nickel	23.4			
Selenium	50 U			
Silver	0.09 I			
Zinc	74			
Nutrients (mg/L)				
Ortho-phosphate	0.16 A	0.006 I	0.01	0.01
Total phosphorus	0.54	0.038 I	0.043	0.059 A
Ammonia	0.81 A	0.066	0.17	0.099 A
Nitrate+Nitrite	0.02 U	0.36	0.33	0.16
TKN	3.5	0.48	0.62	0.62 A
General Phys-Chem Parameters				
Habitat Assessment	-	31	28	37
D. O. (mg/L)surface	0.27	7.8	6.2	6.7
D. O. (mg/L)bottom	-	5.1	5	4.8
pH (SU)surface	7.78	6.4	7.3	7.6
pH (SU)bottom	-	7.3	7.5	7.5
Specific Conductance(µmhos/cm)surface	1,749	1,886	24,520	36,940
Specific Conductance(µmhos/cm)bottom	-	42,875	44,830	46,330
Salinity (ppt) top	0.9	1.0	15.6	23.4
Salinity (ppt) bottom	-	27.5	29.1	30.1
Temperature (°C)surface	29.7	22.4	23.2	22.5
Temperature (°C)bottom	-	21.7	21.5	21.1
Total Suspended Solids (mg/L)	-	12	7	15
Biological Oxygen Demand, 5 day (mg/L)	11.5	0.8	0.9	0.8
Turbidity (NTU's)	17 A	20	9	10
Color (PCU's)	475	60	45	50
Hardness (mg CaCO3)	110	220	650	2050
Algal Growth Potential (mg dry wt/L)	41.81	2.25	1.45	6.63
Toxicity				
Bioassay Fish	non-toxic			
Bioassay Invertebrate	non-toxic			
Microbiological Communities (org/100 mL)				
Fecal Coliform	10 U			
Total Coliform	10 U			

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

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

Typical Values for Selected Parameters in Florida Waters

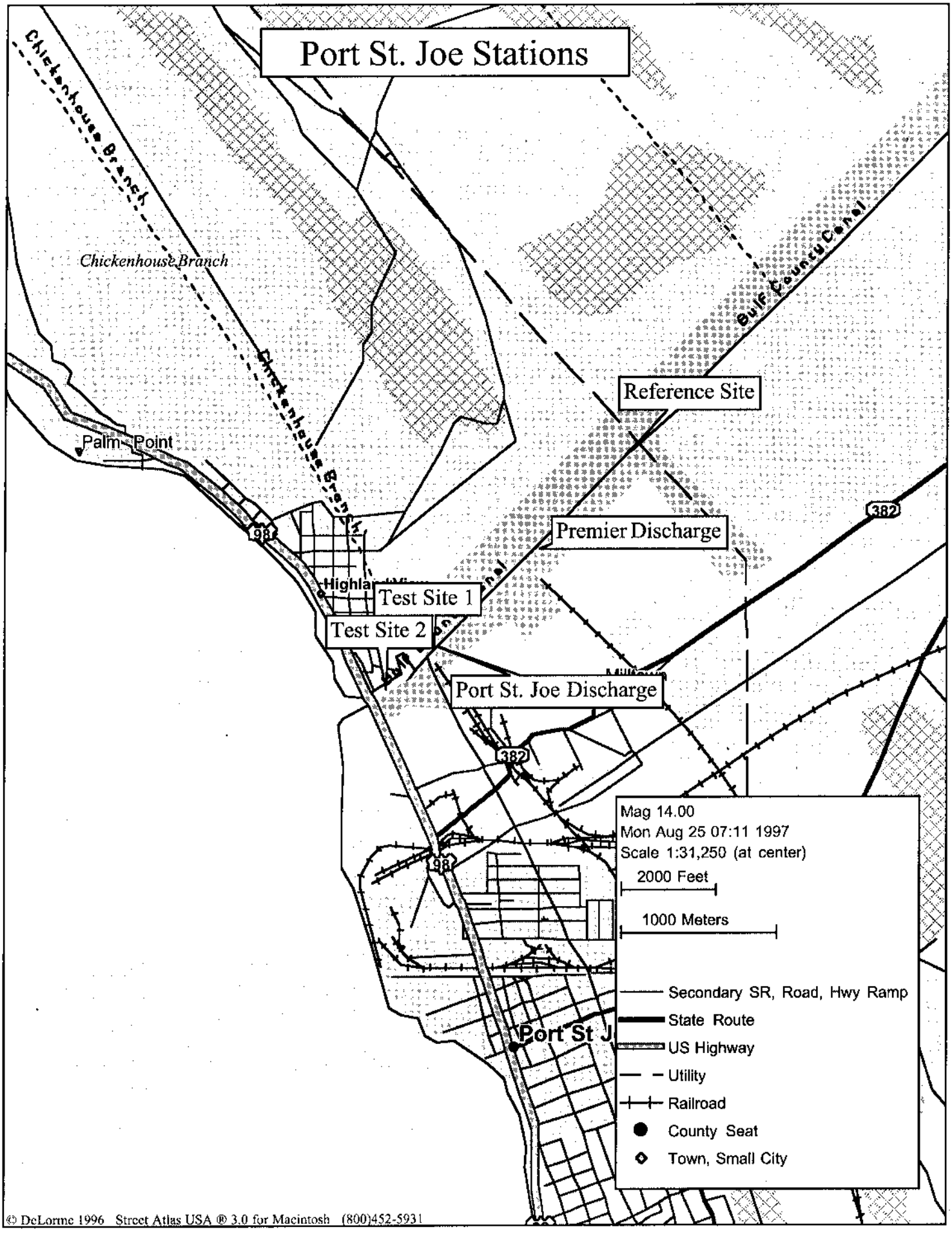
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

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


Port St. Joe Stations
Chickenhouse Branch
Chickenhouse Branch
Gulf County Canal
Reference Site
Palm Point
Premier Discharge
382
Test Site 1
Test Site 2
Port St. Joe Discharge
382
98
98
Port St J
Mag 14.00
Mon Aug 25 07:11 1997
Scale 1:31,250 (at center)
2000 Feet
1000 Meters
Secondary SR, Road, Hwy Ramp
State Route
US Highway
Utility
Railroad
County Seat
Town, Small City
© DeLorme 1996 Street Atlas USA ® 3.0 for Macintosh (800)452-5931

Facility Summary

Facility Name: Port St. Joe
P. O. Box 278
Port St. Joe, Florida 32456

Date Summary Prepared: 3/18/97

Location map: N/A | County: Gulf County | District: Northwest\10

NPDES Permit # FL0020206 expiration date: 08/31/99 | State Permit # IO23-218971 expiration date: 01/01/98 | Facility Type: **Ind.** Dom. Fed. Agric.

Function of facility:

To operate a publicly-owned Industrial Wastewater Treatment Plant with a design annual average daily flow of 34.75 MGD. Contributors to the plant include St. Joe Forest Products Co. (96%), Arizona Chemical Co. (1.5%), and CPSJ domestic waste flow (2.5%).

Description of treatment process:

Plant unit processes include primary clarification in two, 225-foot diameter clarifiers followed by secondary treatment in a 70-acre facultative lagoon with a design detention time of 12 to 14 days. Final effluent is discharged continuously through a Parshall flume to the Gulf County Canal, which flows into St. Joseph Bay. (Info attained from PSJ's Construction Status Report No. 4.)

Receiving waters: Gulf County Canal >> St. Joseph Bay | Classification: I II **III (Outside Mixing Zone)**

Design Flow: 34.75 MGD | Mean Flow: 26.93 MGD | Flow during survey: 29.22 MGD (DEC 96 MOR)

Discharge is: **Continuous** Intermittent Seasonal Rainfall dependent
Other (describe)
best time to sample is: N/A

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

Mixing zones shall include a total length of 800 meters in the Gulf County Canal (400 meters above and 400 meters below Point of Discharge) of the effluent. If the concentration described below is exceeded at the Parshall Flume, grab samples collected from both edges of the mixing zone shall be analyzed for the parameter(s) exceeding the limit.

Parameter	**Concentration**
Aluminum	2.3 mg/L
Copper	.013 mg/L
Iron	.7 mg/L
Mercury	.0005 mg/L
Silver	.002 mg/L

At no time shall the discharge be acutely toxic in the mixing zone or chronically toxic outside the mixing zone.

List effluent requirements (attach relevant paperwork):

Parameter	Frequency	Sample Type
BOD5	Daily	24 Hr. Comp.
TSS	Daily	24 Hr. Comp.
*TKN	Once/week	24 Hr. Comp.
pH	Daily	Grab
*Total phosphorus	Once/week	24 Hr. Comp.
Flow	Continuous	Recorder
*Ammonia (Un-Ion)	Once/week	24 Hr. Comp.
*NO2 + NO3 as N	Once/week	24 Hr. Comp.
Fecal Coliform	Once/week	Grab
Color	Daily	Grab
Aluminum	Once/month	24 Hr. Comp.
*Arsenic	Once/month	24 Hr. Comp.
*Cadmium	Once/month	24 Hr. Comp.
*Chromium	Once/month	24 Hr. Comp.
Copper	Once/month	24 Hr. Comp.
Iron	Once/month	24 Hr. Comp.
*Lead	Once/month	24 Hr. Comp.
Mercury	Once/month	24 Hr. Comp.
*Nickel	Once/month	24 Hr. Comp.
*Selenium	Once/month	24 Hr. Comp.
Silver	Once/month	24 Hr. Comp.
*Zinc	Once/month	24 Hr. Comp.
Static Bioassay	Once/quarter	Grab

Parameters listed above with (*) are to be monitored during the lagoon dredging and for 3 months after completion of the dredging.

Discharge effluent limits at the Parshall Flume shall be:

	Monthly Average	Maximum
BOD5	10,130 lbs/day	14,470 lbs/day
TSS	21,710 lbs/day	28,950 lbs/day
pH	-----	6.5 to 8.5 S.U.

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

No violations were noted within the past twelve months.

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

The latest bioassay reviewed occurred January 1997. The results indicate both tests species, Mysidopsis bahia (mysid shrimp) and Menidia beryllina (silverside minnow) passed both the chronic and acute toxicity tests for this month.

Facility is currently under Administrative Order # 90-024* with EPA.

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

FDEP results taken in August 1996 are comparable to the MOR results taken for the same month.

Additional information:

*EPA has taken back delegation for Port St. Joe's federal permit.

A letter was received by the Department on March 17, 1997 stating that the paper company will be shutdown around April 1st and will remain closed for an unknown period of time.

Staff contributing to this review (signature):

Glenn Butts_____ Biologist
_____ Inspector
_____ Engineer
Nikki Kilburn, ESI/Co-op_____ Other
_____ Other

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.03.0050	DATE (M/D/Y): 03-31-97	TIME: 1316	RECEIVING BODY OF WATER: GULF COUNTY CANAL

REMARKS:	LOCATION: HWY 98 BELOW	FIELD ID/NAME:
TEST SITE 2	PSJ WWTP	# 2 TST2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
				70	30	

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

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

Point-Source Pollution (list location and describe): PORT ST JOE WWTP

Estimated System Width (range, m):	Estimated System Depth (range, m):	yes
High Water Mark (m above bed):	Velocity (range, m/s):	Impounded ☐ Channelized ☐

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: ☐ Paper Fiber: ☒ Mud: ☐ Sand: ☒ Shell: ☐ Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs				Sand	50		
Aquatic Vegetation				Mud/Muck/Silt	30		
Rock or Shell Rubble	10			Benthic leaf mats			
Undercut Banks/Roots				Other: WOOD DEBRIS	10		

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	SAL		Secchi (m):
Top	0.5	22.47	7.61	6.71	36940	23.4		1.2
Mid-depth	2.4	21.46	7.57	5.60	45650	29.6		
Bottom	4.9	21.10	7.53	4.84	46330	30.1		

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

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
G. BUTTS / L. DONELAN	Glenn Butts	

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

SUBMITTING AGENCY CODE: 8010 SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.03.0050	DATE (M/D/Y):	RECEIVING BODY OF WATER: GULF COUNTY CANAL

REMARKS:	LOCATION: HWY 98 BELOW	FIELD ID/NAME:
TEST SITE 2	PSJ WWTP	# 2

Habitat Parameter score	Excellent	Good	Fair	Poor
Littoral Alterations 7	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 10	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 5	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 4	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 37

COMMENTS: GOOD FLUSHING FROM ST. JOE BAY, WOOD DEBRIS IN CHANNEL

ANALYSIS DATE:	ANALYST: G. BUTTS	SIGNATURE: Glenn Butts

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.03.0052	DATE (M/D/Y): 03-31-97	TIME: 1235	RECEIVING BODY OF WATER: GULF COUNTY CANAL

REMARKS:	LOCATION: AT PSJ OUTFALL	FIELD ID/NAME:
TEST SITE 1		# 3

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
				30	70	

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

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

Point-Source Pollution (list location and describe): PORT ST JOE WWTP OUTFALL

Estimated System Width (range, m):	Estimated System Depth (range, m):	yes
High Water Mark (m above bed):	Velocity (range, m/s):	Impounded ☐ Channelized ☐

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: ☐ Paper Fiber: ☒ Mud: ☒ Sand: ☐ Shell: ☐ Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs				Sand	10		PONAR
Aquatic Vegetation				Mud/Muck/Silt	30		
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other: WOOD DEBRIS	60		

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	SAL		Secchi (m):
Top	0.5	23.23	7.27	6.18	29520	15.6		0.4
Mid-depth	0.9	21.99	7.56	5.32	37930	24.8		
Bottom	1.9	22.46	7.52	4.96	44830	29.1		

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

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

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

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

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

Weather Conditions:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
G. BUTTS / L. DONELAN	Glenn Butts	

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

SUBMITTING AGENCY CODE: 8010 SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.03.0052	DATE (M/DY): 03-31-97	RECEIVING BODY OF WATER: GULF COUNTY CANAL

REMARKS:	LOCATION: AT PSJ OUTFALL	FIELD ID/NAME:
TEST SITE 1		# 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 7	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 5	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 5	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 3	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 29

COMMENTS: URBAN DRAINAGE DITCH EMPTIES NEAR OUTFALL, LARGE SEAFOOD PROCESSOR ACROSS CANAL FROM OUTFALL, SHIP REPAIR

ANALYSIS DATE:	ANALYST: G. BUTTS	SIGNATURE: Glenn Butts

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.03.0053	DATE (M/D/Y): 03-31-97	TIME: 1200	RECEIVING BODY OF WATER: GULF COUNTY CANAL

REMARKS: MAN MADE CANAL	LOCATION: AT POWERLINES	FIELD ID/NAME: REFERENCE #4 SITE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
50	50					

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

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

Point-Source Pollution (list location and describe):

Estimated System Width (range, m):	Estimated System Depth (range, m):	yes
High Water Mark (m above bed):	Velocity (range, m/s):	Impounded ☐ Channelized ☐

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☒ Shell: ☐ Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs				Sand	95		PONAR
Aquatic Vegetation				Mud/Muck/Silt	5		
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	SAL		Secchi (m):
Top	0.5	22.45	6.41	7.33	1886	1.0		0.6
Mid-depth	2.4	21.94	7.55	8.81	32950	20.9		
Bottom	2.8	21.67	7.32	5.09	42875	27.5		

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

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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
G. BUTTS / L. DONEGAN	Glenn Butts	

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

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.03.0053	DATE (M/D/Y): 03-31-97	RECEIVING BODY OF WATER: GULF COUNTY CANAL

REMARKS: MAN MADE CANAL	LOCATION: AT POWER LINES	FIELD ID/NAME: REFERENCE SITE #4

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 6	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: 8	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: 5	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: 5	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: 4	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 31

COMMENTS: MOSTLY UNDEVELOPED SHORELINE, STEEP BANKS

ANALYSIS DATE:	ANALYST: G. Butts	SIGNATURE: Glenn Butts

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Port St Joe WWTP
County: Gulf
Contact / District: Glenn Butts / NWD
NPDES Permit #: FL00 20206
LIMS Sample #: 174089 **LIMS Job #:** 97-APR-02-13
sample log: 4-10-97 mf

Sample Collection: Date 4/1/97 Time 10:30
Test Beginning: Date 4/2/97 Time 1330
Test Ending: Date 4/4/97 Time 1300
Organism Batch #: 22 **Diluent Batch #:** well
Organism Age: 13 days
Test Organism: Cyprinella leedsi

Test Type: ~~Screening~~ | Definitive
~~Static~~ | Static Renewal | Flow-through
Temperature range: room ~~24°C - 25°C~~ 24.0-25.0°C mf 4/1/97 corrected
incubator 24.9°C - 25.6°C
Test Number: 2 of 2
Remarks: D = dead, M = missing

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	23.6 @ 23.5	8.2 @ 25.2 °C	103.2 @ 101.8 984 @ 1001 @ 24.6 °C 9880 @ 9885
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.2 @ 24.3	8.4 @ 23.8 °C	104.3 @ 101.8 995 @ 1001 @ 24.5 °C 10050 @ 9885
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.1 @ 23.1	8.2 @ 25.3 °C	102.4 @ 101.8 975 @ 1001 @ 24.4 °C 9870 @ 9885

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
Ctr A	E1	5	5	5	8.3	8.4	8.4	24.3	24.5	24.0	7.8	7.4	7.8	250	250	250
Ctr B	E2	5	5	5	8.3	8.5	8.4	24.2	24.3	24.0	7.8	7.4	7.8	250	250	250
Ctr C	E3	5	5	5	8.3	8.5	8.4	24.2	24.0	24.0	7.9	7.5	7.9	250	250	255
Ctr D	E4	5	5	5	8.3	8.5	8.5	24.0	23.8	24.0	8.0	7.8	7.9	250	250	255
100% A	E5	5	5	5	8.1	8.3	8.5	25.0	24.5	24.0	5.6	5.5	6.6	1810	1810	1800
100% B	E6	5	5	5	8.1	8.4	8.5	25.0	24.3	23.9	5.4	5.7	6.7	1820	1810	1810
100% C	E7	5	4 TM	4	8.1	8.4	8.5	25.0	24.1	23.9	5.3	5.9	6.7	1820	1805	1815
100% D	E8	5	5	5	8.1	8.4	8.5	24.9	23.9	24.0	5.3	6.1	6.8	1820	1800	1820
Measured/Loaded by:		DW	ND	ND	DW	ND	ND	DW	ND	ND	DW	ND	ND	DW	ND	ND
Recorded by:		KR	ND	ND	DW	KR	KR	DW	KR	KR	DW	KR	KR	DW	KR	KR

Investigators' Signatures

Kellie Ralston
Julie Sharpe
Mark Smith
AH Wolfe

Water Quality Parameters	Salt Water (Well Water)	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):					
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DR-100	JS
Alkalinity (mg/L as $CaCO_3$):	120	65	305	Hach	KR
Hardness (mg/L as $CaCO_3$):	130	85	90	Hach	KR
Total ammonia (mg/L as N):	<0.017	<0.017	0.569/0.574	Orion	ND
	Ammonia	Ammonia	Ammonia	Control	Sample

FDEP Biology Section — Acute Bioassay Bench Sheet

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County: Gulf
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Test Ending: Date 4/4/97 Time 1300
Organism Batch #: 13 **Diluent Batch #:** 12
Organism Age: <24 hr
Test Organism: Ceriodaphnia dubia

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Temperature range: room ~~24.0°C-25.0°C~~ 24.0°C-25.0°C
incubator 24.4°C-25.6°C
Test Number: 1 of 2
Remarks: D = dead, M = missing

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	23.6 @ 23.5	8.2 @ 25.2 °C	103.2 @ 101.8 984 @ 1001 @ 24.6 °C 9880 @ 9885
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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. (mmhos/cm) (Cond. (µmhos/cm)) 24 h	UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm)) 48 h
Ctr	A	5	5	5	8.3		8.4	24.0		24.5	7.7		7.5	170		176
Ctr	B	5	5	5			8.4			24.4			7.6			175
Ctr	C	5	5	5			8.4			24.4			7.6			180
Ctr	D	5	5	5			8.4			24.2			7.7			185
100%	A	5	5	5	8.2		8.9	24.5		24.5	7.6		7.6	1705		1740
100%	B	5	5	5			8.9			24.4			7.6			1785
100%	C	5	5	5			8.9			24.4			7.6			1845
100%	D	5	5	5			8.9			24.5			7.5			1870
Measured/Loaded by:		DW	ND	ND	DW		KR	DW			DW			DW		KR
Recorded by:		DR	ND	ND	DW		ND	DW			DW			DW		ND

Investigators' Signatures

Kellie Kalstar

Julie Thaspa

Mike Knight

A. Wolfe
reviewer

form updated 4/01/96

Salt Water / (Well Water)

Water Quality Parameters	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):				
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	DR-100	JS
Alkalinity (mg/L as $CaCO_3$):	120	65	305 Hach	KR
Hardness (mg/L as $CaCO_3$):	130	85	90 Hach	KR
Total ammonia (mg/L as N):	<0.017	<0.017	0.569/0.579 Orion	ND

Ammonia Meter #98136 Meter Slope: -59.0
Ammonia Blank: 0.169
Control Salinity: 0 ppt
Sample Salinity: 1 ppt

Benthic macroinvertebrate taxa list for Port St. Joe WWTP, collected via Ponar grab samples in Gulf County Canal, on 31 March, 1997. Densities, in number/m^2, represent the mean of three replicates.

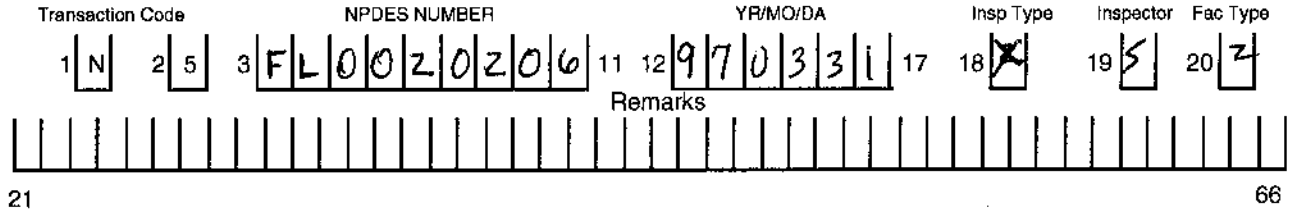
	Reference Site	Test Site 1	Test Site 2
Anthozoa			
Actiniaria sp.	-	-	1
Turbellaria			
Dugesia sp.	1	-	-
Planarian	-	-	2
Nemertea			
Nemertea	-	4	1
Polychaeta			
Phyllodoce sp.	-	1	1
Polynoidae	-	1	-
Sigalionidae	-	1	-
Sthenelais sp.	-	19	-
Eteone heteropoda	-	2	-
Phyllodoce arenae	-	11	-
Sigambra tentaculata	-	7	2
Loandalia americana	22	1	3
Neanthes succinea	-	-	8
Laeonereis culveri	-	5	-
Glycera sp.	-	2	-
Glycera americana	-	3	1
Lumbrineris sp.	-	4	-
Paraonidae	-	1	-
Spionidae	-	9	3
Polydora sp.	1	-	-
Prionospio steenstrupi	-	1	-
Apoprionospio pygmaea	-	18	2
Boccardia sp.	2	-	-
Spiophanes bombyx	1	16	-
Paraprionospio pinnata	-	6	-
Streblospio benedicti	1	7	15
Apoprionospio sp.	-	4	-
Minuspio cirrifera	-	2	-
Opheliidae	-	2	-
Armandia maculata	-	2	-
Capitella sp.	-	301	75
Capitella capitata	-	11	41
Mediomastus californiensis	-	73	29
Ampharetidae	-	-	1
Hobsonia florida	3	-	-
Sabellidae	-	1	-
Oligochaeta			
Tubificidae	1	25	86
Gastropoda			
Nassarius vibex	-	1	-
Haminoea sp.	-	1	-
Gastropoda			
Brachidontes sp.	-	2	-

Brachidontes exustus	-	-	1
Mactra fragilis	-	3	4
Tellina sp.	-	2	-
Tellina versicolor	-	8	-
Semelidae	-	3	-
Mercenaria campechiensis	-	3	-
Petricola pholadiformis	-	1	-
Rupellaria typica	-	1	-
Cumacea			
Cumacea	-	2	-
Leucon americanus	-	51	2
Oxyurostylis sp.	1	11	2
Cyclaspis varians	4	137	49
Spilocuma watlingi	-	19	-
Isopoda			
Edotea montosa	9	22	20
Ampelisca			
Ampelisca abdita	-	1	-
Corophium sp.	2	-	-
Corophium acherusicum	-	3	1
Corophium lacustre	41	-	-
Ericthonius rubricornis	-	5	-
Grandidierella bonnieroides	8	-	2
Haustorius sp.	24	28	6
Liljeborgiidae	-	7	1
Listriella barnardi	-	1	-
Diptera			
Chironomidae	4	-	-
Dicrotendipes	2	-	-
Dicrotendipes modestus	4	-	-
Cladotanytarsus sp.	17	-	-
Sipunculidae			
Sipunculidae	-	1	-
Ophiuridae			
Ophiuridae	-	1	-

Phytoplankton taxa list and densities (#/mL) for Port St. Joe WWTP, collected via subsurface grabs in Gulf County canal, on 31 March, 1997.

	Refernce Site	Test Site 1	Test Site 2
Cyanophyceae			
Merismopedia sp.	-	17	18
Dactylococcopsis sp.	7	7	13
Lyngbya sp.	-	1	1
Oscillatoria sp.	-	115	100
Anabaena sp.	-	3	-
Bacillariophyceae			
Centrales sp.	2	-	-
Cyclotella sp.	10	7	2
Thalassiosira fluviatilus	-	7	-
Chaetoceros sp.	-	1	-
Rhizosolenia sp.	1	-	-
Pinnularia sp.	-	-	1
Gomphonema sp.	-	-	1
Nitzschia sp.	2	24	-
Nitzschia longissima	-	2	-
Chlorophyceae			
Chlorophyceae	-	1	-
Chlamydomonas sp.	1	1	-
Chlorococcum sp.	4	2	-
Chlorella sp.	4	-	-
Scenedesmus sp.	1	-	-
Spermatozoopsis sp.	-	1	3
Dinophyceae			
Dinophyceae	1	-	-
Cryptophyceae			
Cryptophyceae	1	-	-
Chroomonas sp.	-	2	1
Cryptomonas sp.	1	-	-

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



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