

Biological Assessment of

Port St. Joe Wastewater Treatment Plant

Gulf County

NPDES #FL0020206

Sampled December 2000

October 2001

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 Wastewater Treatment Plant
County:	Gulf
NPDES Number:	FL0020206
NPDES Permit Expiration Date:	August 31, 1999

Toxics Sampling Inspection (**XSI**)

Date Sampled: 18 December 2000

Results: Nickel in the effluent sample (12.1 µg/L) exceeded the Class III water quality standard (8.3 µg/L). Chromium, cadmium, copper, iron, silver and zinc were detected at levels that complied with Class III marine water quality standards. The organic compound, 2,4,6-Trichlorophenol was detected at a level equal to or less than the minimum detection limit.

Compliance Biomonitoring Inspection (**CBI**)

Date Sampled: 18 December 2000

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

Impact Bioassessment Inspection (**IBI**)

Date Sampled: 20 December 2000

Results: The macroinvertebrate and phytoplankton communities indicated degraded conditions at both study sites. Community health measures were somewhat better at the test site compared to the control site, indicating sources of impairment other than the Port St. Joe WWTP.

Water Quality Inspection (**WQI**)

Date Sampled: 18, 20 December 2000

Results: Physical/chemical parameters were similar between the study sites. The test site nutrients were elevated compared to the control site and appear to have been increased by the addition of the effluent nutrients. AGP was well below the "problem threshold" of 10.0 mg dry wt/L for marine waters at the control (1.7 mg dry wt/L) and test sites (2.9 mg dry wt/L). The effluent AGP value was 37.0 mg/dry wt/L.

Biological assessments are prepared by FDEP staff to provide information for review of NPDES permit renewal applications. Biological assessments, in conjunction with other information concerning the subject facility and its receiving-water body, are used to determine appropriate permit conditions.

Introduction

The City of Port St. Joe Wastewater Treatment Plant is located in Gulf County, Florida (see maps in the Appendix). This 34.75 MGD publicly-owned wastewater treatment facility was primarily designed to handle the effluent produced by Florida Coast Paper Company, Apalachicola Northern Railroad, and Arizona Chemical, as well as the domestic waste produced by the City of Port St. Joe. The treatment process originally included primary clarification followed by discharge to a 28 hectare, 6 meter deep, aerated biological treatment lagoon. However, with the closing of Florida Coast Paper and Arizona Chemical, the treatment process has been altered to reflect the smaller volume of influent being treated. Presently, the facility is bypassing the primary clarifier units and only running the aerators in the lagoon during periods of discharge. The current treatment train provides 200–300 days of retention time in the lagoon. Effluent is discharged into the Gulf County Canal two to three times per month at a point approximately 800 meters upstream of St. Joe Bay. The actual mean flow preceding the survey was 1.95 MGD and 2.86 MGD during the survey. This is compared to a flow of 29.22 MGD during the last bioassessement survey conducted just prior to the closing of the Florida Coast Paper Mill in 1997 (FDEP 1997).

State permit limits for the St. Joe Wastewater Treatment Plant are listed in Table 1 and include: flow, pH (6.5 SU to 8.5 SU), BOD 5-day (10,130 lbs/day as a monthly average), and TSS (27,710 lbs/day as a monthly average, maximum of 28,950 lbs/day). Static acute bioassay tests are performed once per quarter (see Facility Summary in Appendix).

The facility has been granted an 800 meter mixing zone in the Gulf County Canal (400 meters above and 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 the facility's monthly operating reports, the plant exceeded the BOD permit limit for a single sample on June 6, 2000 and June 20, 2000. No other violations occurred within the past twelve months and bioassays performed indicated no acute or chronic effects. Florida Coast Paper and Arizona Chemical, the two largest contributors to the waste stream, are no longer in production and made only minor contributions to effluent during the survey period.

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 in the Gulf County Canal approximately 2,000 meters northeast of the discharge) and one test site (located in the Gulf County Canal approximately 500 meters southwest of the discharge, at the US Highway 98 Bridge) (see map in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites, and supplemental physical/chemical data were also collected at the study sites on December 20, 2000 during an outgoing tide. Effluent samples were collected on December 18, 2000, and analyzed for toxicity, nutrients, metals, and organic constituents (base neutral and acid extractables, and pesticide extractables).

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

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

Benthic macroinvertebrate communities were evaluated at control and test sites using one composite sample, composed of ten petite Ponar grabs. It should be noted that the number of Ponar grabs typically taken in a Bioassessment survey is three. However, preliminary marine method trials suggest that three grabs is inadequate to characterize a site due to the high variability of marine sediments. A review of the preliminary data indicated that ten Ponar grabs may be a reasonable compromise between cost and the ability to detect impacts.

Several different measures of macroinvertebrate and algal community health have been employed to determine the effects of the discharge. These measurements include: taxa richness, Shannon-Weaver Diversity Index, community composition, functional feeding groups, and algal biomass. For a discussion of each of these measures see the *Explanation of Measurements of Community Health* in the Appendix. All field and laboratory methods followed the Bureau of Laboratories Standard Operating Procedures and may be viewed at: http://www8.myflorida. com and navigating through environment/search/science/laboratories/index.html.

The following personnel were involved in this investigation: Glenn Butts and Kenny Ferguson of the DEP Northwest District and DEP Central Biology and Chemistry Laboratory Staff in Tallahassee. The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Chuck Ziegmont, and Michael Tanski, as well as District representatives.

Table 1. Effluent limits and summary of chemistry data.

Port St. Joe WWTP	Effluent Limits	Effluent Samples	Control Site	Test Site
Organic Constituents (µg/L)				
2,4,6,-Trichlorophenol	-	1.9 I	-	-
Metals (µg/L)				
Aluminum	2300 *	210 I	-	-
Arsenic	50.0 **	4.0 U	-	-
Cadmium	9.3 **	1.2	-	-
Chromium	-	2.3 I	-	-
Copper	13.0 *	5.4	-	-
Iron	700 *	689	-	-
Lead	5.6 **	4.8 I	-	-
Mercury	0.5 *	-	-	-
Nickel	8.3 **	12.1	-	-
Selenium	71.0 **	0.50 U	-	-
Silver	2.00	0.16	-	-
Zinc	86.0 **	14.2	-	-
Nutrients (mg/L)				
Ortho-phosphate	-	0.16 J	0.020 U	0.020 U
Total phosphorus	-	0.57	0.021 I	0.032 I
Ammonia	-	1.0	0.044	0.36
Un-ionized Ammonia	-	0.0030	0.0004	0.0013
Nitrate+Nitrite	-	0.004 U	0.037	0.098
TKN	-	3.4	0.56	0.91
Organic Nitrogen	-	2.4	0.52	0.55
Total Nitrogen	-	3.404	0.60	1.27
General Phys-Chem Parameters				
Habitat Assessment	-	-	39	40
DO (mg/L)	5.0 **	1.8	8.9	8.9
pH (SU)	6.5 - 8.5	6.9	7.7	7.2
Conductivity (µmhos/cm)	**	1,237	41,000	36,800
Salinity (ppt)	-	0.8	35.1	31.1
Temperature (C)	100	15.6	13.0	12.9
BOD, 5 day (lbs/day)	14470 *	2,499	1.0 Aa	1.1 a
Flow (MGD)	34.75 *	-	-	-
Hardness (mg $CaCO_3$)	-	162		
Color (Pt-Co)	-	500 A	20	30
Turbidity (NTU)	-	3 A	1	2
TSS (lbs/day)	28,950 *	2352	26 a	-
AGP (mg dry wt/L)	-	37.0	1.7	2.9
Toxicity				
Bioassay - Fish	-	Not Toxic	-	-
Bioassay - Invertebrate	-	Not Toxic	-	-
Microbiology (# counts/100ml)				
Fecal Coliforms	≤ 800	90 BQ	10 BQ	20 BQ
Total Coliforms	≤ 2400	530 Q	10 BQ	110 BQ

A - Value is the mean of two or more determinations
B - Colony counts outside the acceptable range
I - Value is < the MQL, and ≥ the MDL
J - Estimated value
Q - Sample held beyond normal holding time
U - Analyzed, but not detected; value is the MDL
V - Analyte detected in sample & method blank
* Permit Limit
** Class III water quality standard
a - Reported as mg/L

Results and Discussion

The Gulf County Canal is a tidally influenced man-made channel, connecting St. Joe Bay with the Intracoastal Waterway system. The control and test sites were situated in this highly altered environment to determine the potential effects of the Port St. Joe WWTP discharge. It should also 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.

Aluminum, copper, iron, and silver all complied with permit limits, although iron was detected at a level that approached the limit (Table 1). Chromium, cadmium, lead, and zinc were detected at levels that complied with Class III marine water quality standards (Table 1). Nickel was detected in the effluent sample (12.1 µg/L) at a level that exceeded the Class III water quality standard (≤ 8.3 µg/L) a violation of Rule 62-302.530 (45) FAC. The organic compound 2,4,6-Trichlorophenol was detected in the effluent at a level equal to or less than the minimum quantitation limit, and greater than the minimum detection limit.

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

Table 2. Community structure of control and test sites.

Port St. Joe WWTP	Control Site	Test Site
Macroinvertebrate Quantitative		
Number of Taxa	9	16
Shannon-Weaver diversity	1.55	3.43
No. Polychaete Taxa	2	6
Community Composition		
% Amphipoda	76.6	13.3
% Cumacea	2.1	0.0
% Decapoda	2.1	0.0
% Mysidacea	2.1	1.7
% Gastropoda	0.0	1.7
% Pelecypoda	10.6	50.0
% Polychaeta	6.4	30.0
% Tanaidacea	0.0	3.3
Functional Feeding Groups		
% Browsers-grazers	3.2	16.7
% Predators/Carnivores	1.1	0.8
% Scavengers	1.1	0.0
% Scrapers	0.0	1.7
% Suspension Feeders	92.6	72.5
% Unknown	2.1	8.3
Phytoplankton Algae		
Number of Taxa	7	6
Shannon-Weaver diversity	0.45	0.42
Chlorophyll *a* (µg/L)	*	8.9
Algal Density (#/mL)	25,102	30,934
% Blue-green	95.1	95.1
% Chrysophyceae	0.3	0.2
% Diatoms	3.5	3.2
% Dinoflagellates	0.0	0.5
% Green	1.1	0.9
AGP (mg dry wt/L)	1.7	2.9

* Not sampled or analysis not performed

Several of the nutrients were significantly higher at the test site compared to the control site (Table 1). For example, TKN was 63% higher, nitrate+nitrite was 165% higher, and ammonia was nearly an order of magnitude higher at the test site compared to the control site. In addition, test site levels of TKN, nitrate+nitrite, and ammonia were higher than 70%, 80%, and 95%, respectively of other typical Florida estuaries (see *Typical Values for Selected Parameters in Florida Waters* in Appendix). The effluent nutrients appear to have contributed to the elevated nutrients at the test site in combination with other sources in the watershed.

AGP, which measures bioavailable nutrients via algal response, was 1.7 mg dry wt/L at the control site and 2.9 mg dry wt/L at the test site, well below the 10 mg dry wt/L "problem threshold" (Ron Raschke, USEPA, pers. comm.). Effluent AGP was 37.0 mg dry wt/L.

Even though the nutrient levels were found to be relatively high at both the control and test sites, the phytoplankton communities were very depressed at both sites. Although algal densities were 25,102 #/ml at the control site and 30,934 #/ml at the test site, the communities were dominated by pollution-tolerant blue-green algae, which represented 95% of the sample (Table 2). Chlorophyll *a* was inadvertently not mea-

sured at the control site. Chlorophyll *a* was found to be elevated at the test site (8.9 µg/L) and was greater than 60% of other typical Florida estuaries.

Habitat quality was at the lower range of the "fair" category at both study sites with 39 points at the control site and 40 points at the test site (see Habitat Assessment Field Data Sheets in Appendix). From observations made in the field, both the control and test sites scored poorly in terms of natural community types present, with sand and mud/silt being the predominate substrate types present. Sediment particle sizes were analyzed in the laboratory and both sites consisted mainly of particles between 0.25 - 0.50 mm in diameter, making up 56% of the control site and 53% of the test site substrate (Table 3).

Macroinvertebrate and phytoplankton communities appeared to be severely stressed at both the control and test sites (Table 2). Macroinvertebrate taxa richness was 9 at the control site and 16 at the test site, an increase of 77%. Shannon-Weaver diversity was 1.55 at the control site and 3.43 at the test site, an increase of 122%. Both sites had low densities of macroinvertebrates, the control site had 196 organisms/m^2 and the test site had 250 organisms/m^2 (see Macroinvertebrate Taxa Lists in the Appendix). These numbers represent extremely low densities and compared to the last bioassessment survey conducted at this facility (FDEP 1997), represent a 153% decline in density at the control site and a 378% decline at the test site. It is not clear what caused this reduction. With the removal of the Florida Coast Paper and Arizona Chemical discharges from the Port St Joe WWTP's process, it would be expected that number of organisms would increase or at least not decrease further. The severely degraded biological communities may have been more a function of the highly altered nature of the Gulf County Canal or the effect of other point or non-point source effects in the canal rather than a direct effect of the Port St. Joe WWTP effluent.

Literature Cited

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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.

Table 3. Summary of sediment physical data.

Port St Joe WWTP	Control Site	Test Site
Particle Size (%)		
<0.063 mm	0.98	1.66
0.063-0.125 mm	0.58	0.98
0.125-0.25 mm	21.30	41.80
0.25-0.5 mm	56.00	53.20
0.5-2.0 mm	21.20	2.31
>2.0 mm	0.00	0.22
% Organic	0.35	0.38

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

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.

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

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.

City of Port St. Joe WWTP





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FDEP - Bureau of Laboratories
Fifth Year Inspection
Created on: October 8, 2001
Created by: Julie Riley

Facility Summary

Facility Name: The City of Port St. Joe WWTP **Date Summary Prepared:** 12/13/00

Location map: Port St. Joe Industrial WWTP Port St. Joe, FL. 32456 **County:** Gulf **District:** Northwest/10

Permit # FL0020206 **Expiration Date:** January 1,1998 **Facility Type:** IND.

Function of facility:

To provide treatment for domestic and industrial wastewater from the following sources:

Florida Coast Paper Company: This facility has suspended operations permanently, however, the facility contributes non-contact cooling water to the WWTF. Runoff from the contact areas of the plant is also sent to the WWTF for treatment during periods of rainfall.

Arizona Chemical: Industrial wastewater

City of Port St. Joe: Domestic wastewater. The facility also accepts loads from septic tank haulers.

Apalachicola Northern Railroad: This facility discharges the first 49,500 gallons of industrial wastewater form a train washing operation to the WWTF for treatment. The discharge is not continuous and may exceed or be significantly lower than the rate listed.

Description of treatment process:

The facility is permitted for the operation of a 34.75 MGD industrial wastewater treatment facility with effluent discharge to the Gulf County Canal. The treatment process consists of domestic wastewater pretreatment, influent screening, grit removal, dual clarifiers, with final treatment from a 70-acre facultative lagoon.

Closure of the Florida Coast Paper Company has forced the facility to alter their treatment process. The facility is bypassing the primary clarifier units and only running the aerators in the lagoon during periods of discharge. The current treatment train provides 200 - 300 days of retention time in the lagoon. Domestic flows are still chlorinated at a level of 8 – 12 mg/L prior to discharging into the lagoon. The facility discharges approximately one to three times a month.

Receiving waters: St. Andrews Bay **Classification:** III

Design Flow: 34.75 MGD **Mean Flow:** 1.95 MGD **Flow during survey:** 2.86 MGD

Discharge is: Continuous **Best time to sample is:** N/A

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

Mixing zones for aluminum, copper, iron, mercury and silver include a total length of 800 meters, including upstream and downstream, in the Gulf County Canal (400 meters above and 400 meters below the point of discharge of the effluent). If the concentration described below is exceeded

Staff contributing to this review (signature)

Glenn Butts	Biologist
	Inspector
	Engineer
Kenny Ferguson	Other
Kim Allen	Other

at the parshall flume, grab samples collected from both edges of the mixing zone (collected on the same day as the 24 – hour composite sample at the parshall flume) shall be analyzed for the parameter (s) exceeding the limit. Holding times must be reported for these subsequent analyses.

Parameter	Concentration
Aluminum	2.3 mg/L
Copper	0.013 mg/L
Iron	0.7 mg/L
Mercury	0.0005 mg/L
Silver	0.002 mg/L

Water quality standards for Class III marine waters shall not be exceeded outside the mixing zone.

List effluent limits (attach relevant paperwork:

Permit Effluent Limits							
Parameters	**Max. /Min.**	**Annual Average**	**Monthly Average**	**Weekly Average**	**Single Sample**	**Monitoring frequency**	**Sample Type**
Flow, MGD	Max.		Report		Report	Continuous	Recorder
BOD 5day, lbs/day	Max.		10,130		14,470	Daily	24-Hr. Comp.
TSS, lbs/day	Max.		27,710		28,950	Daily	24-Hr. Comp.
pH, std. units	Range		Report		6.5-8.5	Daily	Grab
Fecal Coliform Bacteria, #/100 ml	Max.		Report		Report	Weekly	Grab
TKN total as N, ppm	Max.		Report		Report	Weekly	24-Hr. Comp
Color, PCU	Max.		Report		Report	Daily	Grab
Total Phosphorus, ppm	Max.		Report		Report	Weekly	24-Hr. Comp.
NO_2-NO_3 as N, ppm	Max.		Report		Report	Weekly	24-Hr. Comp.
Aluminum, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Ammonia (Un-ionized), ppm	Max.		Report		Report	Weekly	24-Hr. Comp.

Permit Effluent Limits Continued							
Parameters	**Max. /Min.**	**Annual Average**	**Monthly Average**	**Weekly Average**	**Single Sample**	**Monitoring frequency**	**Sample Type**
Arsenic, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Cadmium, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Chromium, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Copper, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Iron, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Lead, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Mercury, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Nickel, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Selenium, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Silver, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.
Zinc, mg/L	Max.		Report		Report	Monthly	24-Hr. Comp.

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

The following violation(s) occurred between September 1999 and August 2000.

The facility exceeded the State Permit limits of 14,470-lbs/day single sample maximum on 06/07/2000 and 06/20/2000.

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

The City of Port St. Joe is required to perform acute WET testing on the species *Menidia beryllina* and *Mysidopsis bahia* quarterly and chronic WET testing semi-annually. WET testing performed on the species *Menidia beryllina* and *Mysidopsis bahia* has indicated acute toxicity for one or both of the species every quarter since the fourth quarter of 1998. This seems to coincide with the shutdown of the paper mill. Formal enforcement has been initiated.

The last toxicity testing conducted November 16-23, 2000, indicated no acute or chronic toxicity to either the mysid shrimp or the silverside.

Previous Impact Bioassessment

Toxics Sampling Inspection (XSI)

Date Sampled:	31 March 97
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 97
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 97
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 97
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.

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

The facility has improved it's effluent in regards to fecal coliforms since the last facility summary prepared in January of 2000.

Additional information:

The frequency of discharge from the facility has been reduced to only one to three times/month due to the permanent shutdown of the facility's major influent contributor, Florida Coast Paper Company. As a result, the facility may be converted into a domestic WWTF. The paper mill is currently discharging wastewater associated with maintaining the facility but is only a fraction of its former contribution to the WWTF.

A consent order is currently being devised for the unknown effluent toxicity from the facility. It is believed that the toxicity may be linked to malfunctioning of the treatment process due to the facility's high capacity design and drastically diminished influent. The facility is estimated to remove its effluent from surface water discharge to upland application in less than a year. Negotiations for the purchase of land for the upland application are currently underway and most of the discharge pipe is already in place.

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: 32.03.0059	DATE (M/D/Y): 12-2-10	TIME: 1300	RECEIVING BODY OF WATER: ST JOE BAY

REMARKS: REFERENCE TEST SITE	LOCATION: GULF COUNTY CANAL ~~BELOW PSJ~~ AT POWERLINES ~~OUTFALL~~	FIELD ID/NAME: # 02

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	90	10 TOTAL	PONAR
Aquatic Vegetation				Mud/Muck/Silt	10	GRABS	
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):			Secchi (m):
Top	0.6	13.04	7.66	8.88	41000			2.6
Mid-depth	1.6	12.78	7.57	8.99	42600			
Bottom	3.4	12.77	7.24	9.02	42700			

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: COLD, CLEAR HIGH 38 F LOW PREVIOUS NIGHT 22 F

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

SAMPLING TEAM: G. BUTTS / ~~L. DOUGLAS~~ / Kenny Ferguson	SIGNATURE: Glenn Butts	DATE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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):	RECEIVING BODY OF WATER: ST JOE BAY

REMARKS:	LOCATION: GULF COUNTY CANAL	FIELD ID/NAME:
REFERENCE SITE	AT POWERLINES	# 2

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 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 6	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 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**

TOTAL SCORE 39

COMMENTS: MOSTLY UNDEVELOPED AREA, STEEP ERODING BANKS — OBSERVED TWO BALD EAGLES

ANALYSIS DATE:	ANALYST: G. BUTTS / K. Ferguson ~~[illegible]~~	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: 32.03.0050	DATE (M/D/Y): 12-20-00	TIME: 1200	RECEIVING BODY OF WATER: ST JOE BAY

REMARKS: TEST ~~REFERENCE~~ SITE	LOCATION: GULF COUNTY CANAL ~~AT~~ BELOW PORT ST JOE WWTP ~~DISCHARGE~~	FIELD ID/NAME: # ~~B~~ # 3

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 + PREMIER SERVICES

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: ☐ SOME ORGANICS

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs				Sand	85		
Aquatic Vegetation				Mud/Muck/Silt	10		
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other: DEBRIS	5		

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top	0.6	12.90	7.2	8.85	36,800			2.3
Mid-depth	2.3	12.86	7.57	8.65	42,900			
Bottom	4.5	12.83	7.37	8.93	42,800			

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: G. BUTTS / ~~L. POWELL~~ Kenny Ferguson	SIGNATURE: Glenn Butts	DATE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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: ST JOE BAY

REMARKS:	LOCATION: GULF COUNTY CANAL BELOW PSJ WWTP OUTFALL	FIELD ID/NAME:
TEST SITE		# 3

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 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 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 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**

TOTAL SCORE 40

COMMENTS:

ANALYSIS DATE:	ANALYST: G. BUTTS / ~~L. DOMEAN~~ K. Ferguson	SIGNATURE: Glenn Butts

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Port St. Joe WWTP
County: Gulf
Contact / District: Glenn Butts / NW-DIST
NPDES Permit #: FL0020206
LIMS Sample #: 500930 LIMS Job #: RH2000-12-19-02-01
sample log 12-27-00 mF
Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Test Number: 1 of 2

Remarks:

Sample Collection: Date 12/18/00 Time 10:45 12/19/00 10:30 (grab) (comp)
Test Beginning: Date 12/19/00 Time 14:45
Test Ending: Date 12/21/00 Time 13:00
Organism Batch #: 99 Diluent Batch #: Well
Organism Age: 10 days SRT toxicant batch #: —
Test organism: C. dubia

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. (µmhos/cm) 0 hr	UNCORRECTED Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (µmhos/cm) 48 h
CTRL A	B9	5	5	5	7.6	8.1	8.2	24.5	23.4	24.1	7.9	7.7	7.7	215	165	260
B	B10	5	5	5	7.7	8.2	8.4	24.5	23.3	24.2	8.0	7.7	7.7	245	260	265
C	B11	5	5	5	7.7	8.2	8.4	24.5	23.4	24.3	8.0	7.7	7.7	250	260	270
D	B12	5	5	5	7.7	8.2	8.3	24.4	23.4	24.1	8.0	7.5	7.6	250	RC	260
100% A	B13	5	5	5	7.9	8.3	8.4	24.6	23.2	24..	7.6	7.3	7.6	1255	1215	1240
B	B14	5	5	5	7.9	8.3	8.6	24.7	23.2	24.6	7.4	7.3	7.4	1235	1220	1295
C	B15	5	5	5	7.9	8.4	8.6	24.7	23.3	24.3	7.4	7.3	7.4	1245	1240	1290
D	B16	5	5	5	7.9	8.4	8.6	24.7	23.3	24.3	7.6	7.3	7.4	1260	1230	1275
measured by:		SG	SG	SG	DPH	SG	SG	DPH	SG	SG	DPH	SG	SG	DPH	SG	SG
recorded by:		DPH	SG	SG	SG	JA	JA	SG	JA	JA	SG	JA	JA	SG	JA	JA

Investigators' Signatures
Shannon Gerard
Della Hutchinson
Joshua Ayers
Art Wolfe
reviewer

Temperature Range °C
Incubator # 3 23.0 - 25.0°C
Room B246 23.0 - 25.5°C

Salt Water (Well Water) | 20% Min Water

Water Quality Parameters	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	NA	NA	NA	SG
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	DRICL	SG DPH
Alkalinity (mg/L as $CaCO_3$):	137	300	HACH	JA DPH
Hardness (mg/L as $CaCO_3$):	130	165	HACH	JA DPH
Total ammonia (mg/L as N):	<0.017	0.61C	[illegible]	DPH DPH
Salinity:	<1	<1	LISI	JA DPH

form updated 3/3/99

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Port St Joe WWTP
County: Gulf
Contact / District: Glenn Butts | NW-DIST
NPDES Permit #: FL0020206
LIMS Sample #: 500930 LIMS Job #: TLH2000-12-19-08-01
sample log 12-27-00 mf
Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Test Number: 2 of 2

Remarks: DMR 10/10/00 Transcription error 10:45 ~~14:30~~

Sample Collection: Date 12/18/00 Time ~~14:30~~
Test Beginning: Date 12/19/00 Time 14:45
Test Ending: Date 12/21/00 Time 13:00
Organism Batch #: 64 Diluent Batch #: DMW #41
Organism Age: 24 hrs. SRT toxicant batch #: —
Test organism: C. dubia

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) 0 hr	UNCORRECTED Cond. (mmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) 48 h
CTRL A	A	5	5	5	8.0	—	8.0	24.1	—	23.7	8.4	—	8.1	160	—	210
B	AB*	5	5	5	—	—	8.2	"	"	23.6	—	—	8.2	—	—	210
C	AC	5	5	5	—	—	8.2	—	"	23.6	—	—	8.1	—	—	205
D	AD	5	5	4D	—	—	8.2	—	"	23.6	—	—	8.1	—	—	195
100% A	A	5	5	4D	8.0	—	8.9	24.1	"	23.5	7.9	—	8.2	1230	—	1315
B	B	5	5	5	—	—	8.9	—	"	23.5	—	—	8.3	—	—	1420
C	C	5	5	3D	—	—	8.9	—	"	23.5	—	—	8.2	—	—	1350
D	D	5	5	5	—	—	8.9	—	"	23.5	—	—	8.1	—	—	1365
measured by:		DH	DH	SG	DH	—	SG	DH	—	DH	DH	—	SG	DH	—	SG
recorded by:		UMC	DH	DH	JA	—	JA	JA	—	JA	JA	—	JA	JA	—	JA

Investigators' Signatures
Chris Hutchinson
Dixie Tindall
Shannon Everard
Jim Kittaka

Temperature Range °C
Incubator # 2 24.5 - 25.5°C
Room B246 23.0 - 25.5°C

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			NA	NA	NA	SG
Lab Total Residual Cl2 (mg/L):	/	<0.03	<0.03	DR/CC	SG	DH
Alkalinity (mg/L as $CaCO_3$):	/	79	300	HACH	JA	DH
Hardness (mg/L as $CaCO_3$):	/	20	163	HACH	JA	DH
Total ammonia (mg/L as N):	/	<0.03	<0.03	Orion	DH	DH
Salinity:	/	<1	<1	451	JA	DH

JH GH
reviewer

form updated 3/3/99

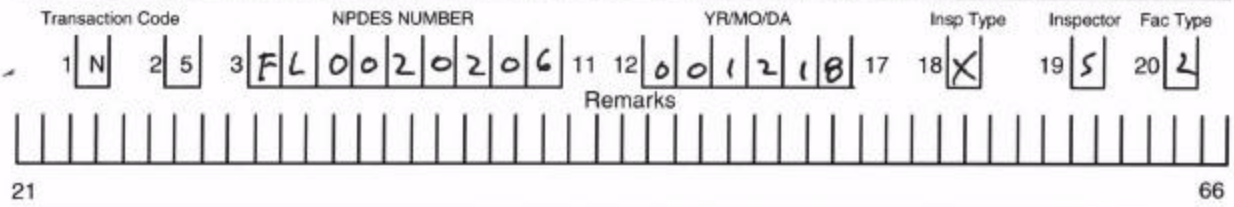
Benthic macroinvertebrate taxa list for Port St. Joe WWTP, collected via a composite sample of ten Ponar grabs per sampling site in the Gulf County Canal, on 20 December 2000. Densities, in #/m2.

	Control Site	Test Site
Polychaeta		
Leitoscoloplos robustus	-	4
Nereis succinea	-	4
Paraonidae	-	13
Paraprionospio pinnata	4	-
Prionospio sp.	-	13
Spio pettiboneae	-	21
Spiophanes bombyx	8	21
Mollusca		
Acteocina sp.	-	4
Crassinella lunulata	-	13
Mactra fragilis	4	42
Mactridae	-	4
Parvilucina multilineata	4	-
Pelecypoda	13	-
Tagelus plebeius	-	4
Tellinidae	-	63
Cumacea		
Oxyurostylis smithi	4	-
Mysidacea		
Bowmaniella floridana	4	4
Tanaidacea		
Kalliapseudes sp.	-	8
Amphipoda		
Acanthohaustorius shoemakeri	-	13
Americhelidium americanum	-	4
Lepidactylus sp.	146	17
Monocorophium sp.	4	-
Decapoda		
Callinectes sp.	4	-

Phytoplankton taxa and densities (#/mL) for Port St. Joe WWTP, collected via subsurface grabs in the Gulf County Canal on 20 December 2000.

	Control Site	Test Site
Cyanophyceae		
Chroococcaceae	23605	29001
Merismopedia minima	-	143
Lyngbya sp.	68	-
Oscillatoria sp.	204	286
Chrysophyceae		
Dictyocha staurodon	68	72
Bacillariophyceae		
Cyclotella sp.	204	-
Pennales sp.	143	143
Nitzschia sp.	859	859
Chlorophyceae		
Chlorophyceae	72	72
Chlorella sp.	215	215
Dinophyceae		
Peridinium sp.	-	143

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)

