

Biological Assessment of

Millennium Specialty Chemicals

Duval County

NPDES #FL0000884

Sampled September 1999

January 2001

Biology Section
Bureau of Laboratories
Division of Resource Assessment and Management

Comprehensive Quality Assurance Plan No. 870346G

Florida Department of Environmental Protection
Fifth Year Inspection Summary

Discharger:	Millennium Specialty Chemicals Plant
County:	Duval
NPDES Number:	FL0000884
Permit Expiration:	July 07, 2003

Toxics Sampling Inspection **(XSI)**	
Date Sampled:	September 13, 1999
Results:	Aluminum, cadmium, chromium, copper, iron, lead, nickel, and zinc were detected in the effluent at levels that complied with Class III marine water quality standards.

Compliance Biomonitoring Inspection **(CBI)**	
Date Sampled:	September 13, 1999
Results:	The effluent sample was not toxic to the vertebrate, *Cyprinella leedsi,* or to the invertebrate, *Ceriodaphnia dubia,* during the 48-hour acute bioassay.

Impact Bioassessment Inspection **(IBI)**	
Date Sampled:	September 13, 1999
Results:	The macroinvertebrate communities were severely degraded at the control and test sites. The effluent appears to have contributed in part to this degradation as seen from the fact that no invertebrates were recovered from test site 2 and only two taxa were recovered from test site 1. Eight taxa were identified in the control site samples. The algal communities did not appear to be significantly different among the study sites.

Water Quality Inspection **(WQI)**	
Date Sampled:	September 13, 1999
Results:	The effluent dissolved oxygen value (3.4 mg/L) did not comply with the facility's permit limit of 4.0 mg/L or Class III water quality standards (Rule 62-302.530 (31) FAC). Dissolved oxygen levels at all study sites were above Class III marine water quality standards. The effluent fecal (10,000 #counts/100ml) and total coliform counts (29,000 #counts/100ml) were significantly above permit levels and Class III water quality standards (Rules 62-302.530 (6) and (7) FAC, respectively). However, due to hurricane evacuation activities, microbiological plate counts were read after 15-18 hours of incubation time, which does not comply with Laboratory SOP's.

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 Millennium Speciality Chemicals facility is located in the City of Jacksonville in Duval County, Florida (see locus map in the Appendix). Millennium Chemicals is an industrial manufacturer of specialty organic chemicals. Industrial wastewater at the Millennium Chemicals facility is comprised of: boiler blowdown, cooling tower blowdown, water softener blowdown, steam condensate wastewater, non-contact cooling water, and storm water.

Treatment of the wastewater involves pH control, cooling sprays, and oil skimming before the effluent is discharged. The effluent is continuously discharged into Moncrief Creek by way of a submerged concrete pipe discharging approximately five feet from the shoreline. Moncrief Creek is a tidally influenced Class III (marine) tributary to the Trout River that subsequently flows to the St. Johns River. The design flow of the wastewater treatment system for Millennium Chemicals is 5 MGD; flow during this survey was 0.57 MGD.

State permit limits for the effluent are listed in Table 1. Florida Department of Environmental Protection (FDEP) review of the monthly operating reports from Millennium Chemicals indicate that they experienced numerous permit violations and plant upsets since September 1998 resulting in a warning letter, issued April 26, 1999. Millennium Chemicals is presently operating under a Consent Order (#97-1188) and an Administrative Order (#041-NE) that collectively establish interim limits for copper, iron, fecal coliform, and total coliforms.

Methods

The purpose of this investigation was to determine the effects of the Millennium Chemicals wastewater discharge on the Moncrief Creek receiving water. To establish discharge effects, a comparison of biological community health was made between three field designated sites: the control site, located in Ribault River approximately 367 meters below Lem Turner Bridge; test site 1 (east), in Moncrief Creek 50 meters east of the Millennium Point of Discharge (POD), and test site 2 (west), also in Moncrief Creek 50 meters west of Millennium POD. A Habitat Assessment was performed in situ, establishing comparability between sites. Supplemental physical and chemical data were also collected from the effluent site and field sites. Effluent from Millennium Chemicals was analyzed for metals, nutrients, semi-volatile organics, and organonitrogen and phosphorus pesticides. Data for this report was collected on September 13, 1999 during a flood tide and 24 hours before Hurricane Floyd.

Using the invertebrate, *Ceriodaphnia dubia*, and the fish, *Cyprinella leedsi*, as test organisms, acute screening toxicity bioassays were conducted on an effluent sample. Also, bacterial populations were analyzed for total and fecal coliforms.

Benthic macroinvertebrate communities from all field sites were evaluated. Qualitative invertebrate collections were done using a Petite ponar dredge.

Sampling for periphyton was conducted at the three sites by incubating glass microscope slides in a standard periphytometer for 28 days. Phytoplankton were sampled by subsurface grabs into nalgene bottles. Chlorophyll a was determined using laboratory spectrophotometer analyses for phytoplankton communities. The test organism *Selenastrum capricornutum* was used for algal growth potential. All field and laboratory methods for FDEP investigations are carried out following the Bureau of Laboratory's Standard Operating Procedures (SOP's). Connect to the FDEP web site at www.floridadep.org/labs/sops.htm to read the Bureau's SOP's.

Different measurements of macroinvertebrate and algal community health have been used to determine the effects of the discharge on those community assemblages in the receiving water. These measurements are: habitat assessment; taxa richness; Shannon-Weaver Diversity Index; Florida Index; community composition; functional feeding groups; and algal biomass. For a discussion of each of these measures, see *Explanation of Measurements of Community Health* in the Appendix.

For graphical purposes, the percent difference for: number of taxa, diversity index, Florida Index, diatom to blue-green algae ratio and % filter-feeders is calculated as the control site minus the test site di-

Table 1. Effluent limits and summary of chemistry data.

Millennium Speciality Chemicals	Effluent Limits	Effluent Samples	Control Site	Test Site 1 (east)	Test Site 2 (west)
Organic Constituents (mg/L)					
None Detected	-	-	-	-	-
Metals (µg/L)					
Aluminum	≤ 1500 **	50	500 U	500 U	500 U
Arsenic (total)	≤ 50 **	4 U	85U	85 U	85 U
Bromine (free molecular)	≤ 100 *b	-	-	-	-
Cadmium	≤9.3 **	.045 I	0.8 U	0.4 U	0.40 U
Chromium VI	≤ 500 *b	3.9	8.6 I	7.0 I	7.2 I
Copper	≤ 15.5 *b	3.5	1.10 J	1.95 J	2.03 J
Iron	≤ 1600 *b	11.1	230 I	420 I	360 I
Lead	≤ 5.6 *b	.78	5.0 U	3.02 I	3.02 I
Nickel	≤ 8.3 **	7.8	14 I	16 I	13 U
Selenium	≤ 71 **	1.2 U	81.5 I	73.1	95.9
Silver	≤ 2.3 **	.03 U	0.6 U	0.30 U	0.30 U
Zinc	≤ 86 *b	72	60 U	67 I	60 U
Nutrients (mg/L)					
Ortho-phosphate	-	0.47	0.12	0.10	0.12
Total phosphorus	-	0.55 A	0.16	0.17	0.16 A
Ammonia	-	0.01	0.16 J	0.19 J	0.22 J
Nitrate+Nitrite	-	0.06	0.059	0.095	0.093
TKN	-	0.24 A	0.91 J	0.90 J	0.95 J
Organic Nitrogen	-	0.23	0.75	0.71	0.73
Total Nitrogen	-	-	-	-	-
General Phys-Chem Parameters					
Habitat Assessment	-	na	75	68	68
D.O. (mg/L)	> 4.0 **	3.35	5.1	4.6	4.12
pH (SU)	6.5 ≤ 8.5*	7.4	7.3	7.3	7.2
Conductivity (µmhos/cm)	-	621	31,250	28,200	28,500
Temperature (°C)	< 38 *b	29.3	28.2	27.3	26.7
C.B.O.D., 5 day (mg/L)	-	-	-	-	-
Flow (MGD)	5.0 *b	0.6	na	na	na
Hardness (mg $CaCO_3$)	-	149	3654	3208	3304
Toxicity (48-hour static, screening bioassay)					
Bioassay - Fish	>100 *	100 L	na	na	na
Bioassay - Invertebrate	>100 *	100 L	na	na	na
Microbiology (# counts/100mL)					
Fecal Coliforms	4500 *	10,000 JB	900 JB	23,000 J	22,000 J
Total Coliforms	5000 *	29,000 J	6300 J	56,000 J	53,000 J
AGP (mg dry wt/L)	-	2.7	9.8	11.5	11.4

* Permit Limit
** Class III water quality standard
b - Daily Maximum
na - Not Appliable
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range
I - Value reported is < the minimum quantitation limit, and ≥ the minimum detection limit
J - Estimated value
L - Actual value is known to be greater than value given
U - Material analyzed for but not detected; value reported is the minimum detection limit

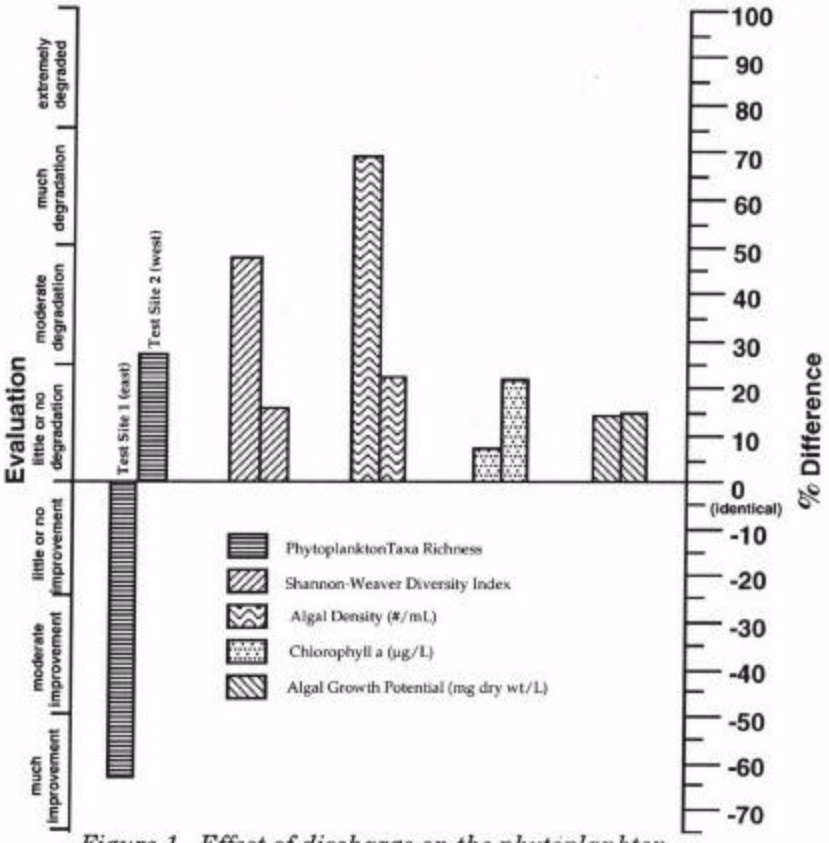


Figure 1. Effect of discharge on the phytoplankton community.

vided by the control site. The percent difference for algal density, chlorophyll *a*, and algal growth potential is calculated as the test site minus the control site divided by the control site.

The Florida Department of Environmental Protection personnel involved in this investigation were, from the Northeast District, Patrick O'Connor, RJ Perez and Heather Whery. From the Central Biology Laboratory in Tallahassee, Ken Espy, Marshall Faircloth, Russell Frydenborg, Michael Heyn, Joy Jackson, Edwin Loschi, Elizabeth Miller, Urania Quintana, Johnny Richardson, Julie Riley, Dr. Landon Ross and Steve Wolfe. The Point Source Studies Review Committee reviewed this report: Dr. Wayne Magley, Michael Tanski, and Chuck Ziegmont, and district representatives.

Results

Chemical and biological results for this report are presented in Tables 1 and 2.

Shorelines in the study area were typical of estuarine salt marsh systems (see Habitat Assessment Field Data Sheets in Appendix). Salt marsh grasses such as *Spartina* sp. and *Juncus* sp. dominated the community types surrounding the test sites at Moncrief Creek and the control site at Ribault River. The sediment substrate at Moncrief Creek consisted of sand (70%) with mud and some detritus. At the control site the sediment substrate was sand (75%) and some mud.

The Ribault River at the control site was 20-25 meters wide, approximately 1.3 meters deep and flowed about 0.3 meters/second. Moncrief Creek at test site 1 (east) was 10-15 meters wide, 1.3 meters deep and flowed about 0.3 meters/second. At test site 2 (west), these parameters were similar to test site 1 except that the water depth was 3.0 meters. Predominant land use surrounding the study area was residential (80%); field observations also noted moderate sediment odors at the test sites (see Field Data Sheets in Appendix).

Discussion

The metals aluminum, cadmium, chromium, copper, iron, lead, nickel, and zinc were all detected in the effluent at levels that complied with class III marine water quality standards and with facility permit limits (Table 1). There were no organic constituents found in the effluent sample.

The effluent dissolved oxygen value (3.4 mg/L) did not comply with Class III standards or with the facility's permit limit of 4.0 mg/L. The effluent conductivity was 621 µmhos/cm. The test site 1 (east) conductivity value (28,200 µmhos/cm) was similar to the test site 2 (west) conductivity value (28,500 µmhos/cm) and the control site conductivity (31,250 µmhos/cm).

The effluent sample was not toxic either to the fish *Cyprinella leedsi* or to the invertebrate *Ceri-*

Table 2. Community structure of control and test sites.

Millennium Speciality Chemicals	Control Site	Test Site 1 (east)	Test Site 2 (west)
Macroinvertebrate Quantitative			
Number of Taxa	8	2	0
Shannon-Weaver diversity	0.8	0.86	0
No. Polychaete Taxa	27	20	0
Community Composition			
% Amphipoda	0.6	0.0	0.0
% Decapoda	2.2	0.0	0.0
% Gastropoda	0.0	0.0	0.0
% Nemertea	0.9	0.0	0.0
% Pelecypoda	0.9	0.0	0.0
% Polychaeta	86.3	71.4	0.0
% Tubificidae	9.0	28.6	0.0
Functional Feeding Groups			
% Browsers-grazers	0.3	0.0	0.0
% Burrowing Deposit Feeders	9.0	28.6	0.0
% Predators/Carnivores	0.9	0.0	0.0
% Scavengers	0.3	0.0	0.0
% Surface Deposit Feeders	43.2	35.7	0.0
% Suspension Feeders	46.3	35.7	0.0
Phytoplankton Algae			
Number of Taxa	11	18	8
Shannon-Weaver diversity	1.96	2.91	1.66
Chlorophyll *a* (µg/L)	10.7	11.7	13.7
Algal Density (#/mL)	577	1911.23	758
% Blue-green	13.2	2.0	1.7
% Cryptophytes	0.9	0.0	0.0
% Diatoms	83.0	81.1	97.8
% Dinoflagellates	0.0	12.5	0.6
% Green	2.8	3.9	0.0
AGP (mg dry wt/L)	9.8	11.5	11.4

odaphnia dubia, using the 48-hour acute toxicity-screening test (see Bench Sheets in Appendix).

Bacteriological analyses of the effluent sample show that both the fecal coliform counts (10,000 # count/100ml) and the total coliform counts (29,000 # count/100ml) are significantly above permit levels and Class III water quality standards (Rules 62-302.530 (6) and 62-302.530 (7) FAC, respectively), however, due to hurricane evacuation activities at the lab, microbiological plate counts had to be read after 15 to 18 hours of incubation time. This incubation time does not comply with Laboratory SOP's. Consequently, the bacteriological results can only be used for informational purposes and not for permit compliance.

Nutrient concentrations at the test sites were similar to those at the control site (Table 1). Most of the values were between the 65-90th percentile of other typical estuaries in Florida, indicating nutrient enrichment in both Moncrief Creek and Ribault River (*Typical Values for Selected Parameters in Florida Waters*).

AGP measures bioavailable nutrients via algal response. AGP was below the 10 mg dry wt/L "problem threshold" (Ron Raschke, pers. comm.) at the control site (9.8 mg dry wt/L). Test site 1 (east) AGP value (11.5 mg dry wt/L) and test site 2 (west) AGP value (11.4 mg dry wt/L) both slightly exceeded the 10 mg dry wt/L "problem threshold". These results suggest some nutrient enrichment from the effluent in this portion of Moncrief Creek.

Diatoms dominated the phytoplankton assemblages at the control site and at both test sites. Diatoms accounted for 83% of the total number of individuals sampled at the control site, 81.1% at test site 1, and 97.8 % at test site 2. (See Table 2 and Phytoplankton Taxa List in Appendix). Taxa richness and diversity were highest at test site 2 (west), intermediate at the control site, and lowest at test site 1 (east) (Figure 1).

Habitat Assessment scores for both test sites were 68 points each, placing them in the "marginal" category. The habitat score for the control site was 75 points placing it in the "sub-optimal" category (see the Field Data Sheets in the Appendix). The test sites lost points because of diminished shorelines, a result of seawalls and riprap placement.

Sampling of invertebrates, using a Petite ponar dredge, showed significant differences between the test sites and the control site. Various measures of macroinvertebrate communi-

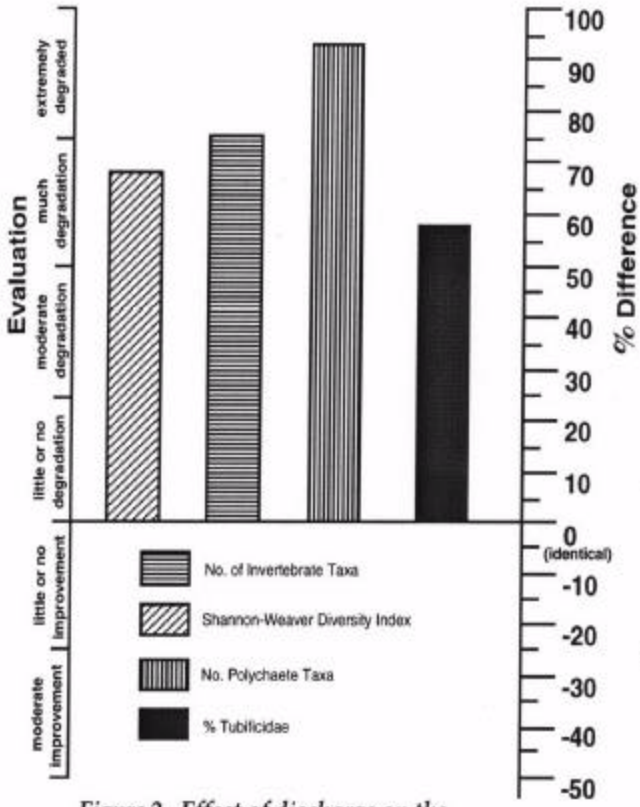


Figure 2. Effect of discharge on the macroinvertebrate community.

ty health showed water quality degradation at both test sites compared to the control site.

There were no organisms recovered from the samples collected at test site 2. Between the control site and test site 1, there were significant shifts among the macroinvertebrate assemblages, for example, taxa richness declined by 75% at test site 1 compared to the control site. The diversity, however, was very similar due to the fact that there were significantly more organisms recovered from the control site (with 321 total individuals) compared to the test site 1 samples (28 individuals). The polychaete *Streblospio benedicti* was the dominant invertebrate at both the control site (86.3%) and test site 1 (71.4%). Pollution-tolerant tubificids were represented at the control site (9.0%) but showed a substantial increase at test site 1 (28.6%). The pelecypods, normally indicators of "good water quality" were collected at the control site but were absent from both test sites.

The decreased number of invertebrate taxa, polychaete taxa, and the percentage of pelecypods indicate a degraded invertebrate community at the test sites compared to the control site (Figure 1). Taxa richness decreased from 8 taxa at the control site, to 2 taxa at test site 1 and no organisms were recovered in the test site 2 samples. The composition of the phytoplankton algae assemblages at all study sites were homogeneous and indicate higher nutrient loading at all study sites. The composition of the macroinvertebrate communities at the two test sites in Moncrief Creek may have been altered as a result of Millennium Speciality Chemicals effluent. Of special concern is the complete absence of invertebrate species at test site 2.

References

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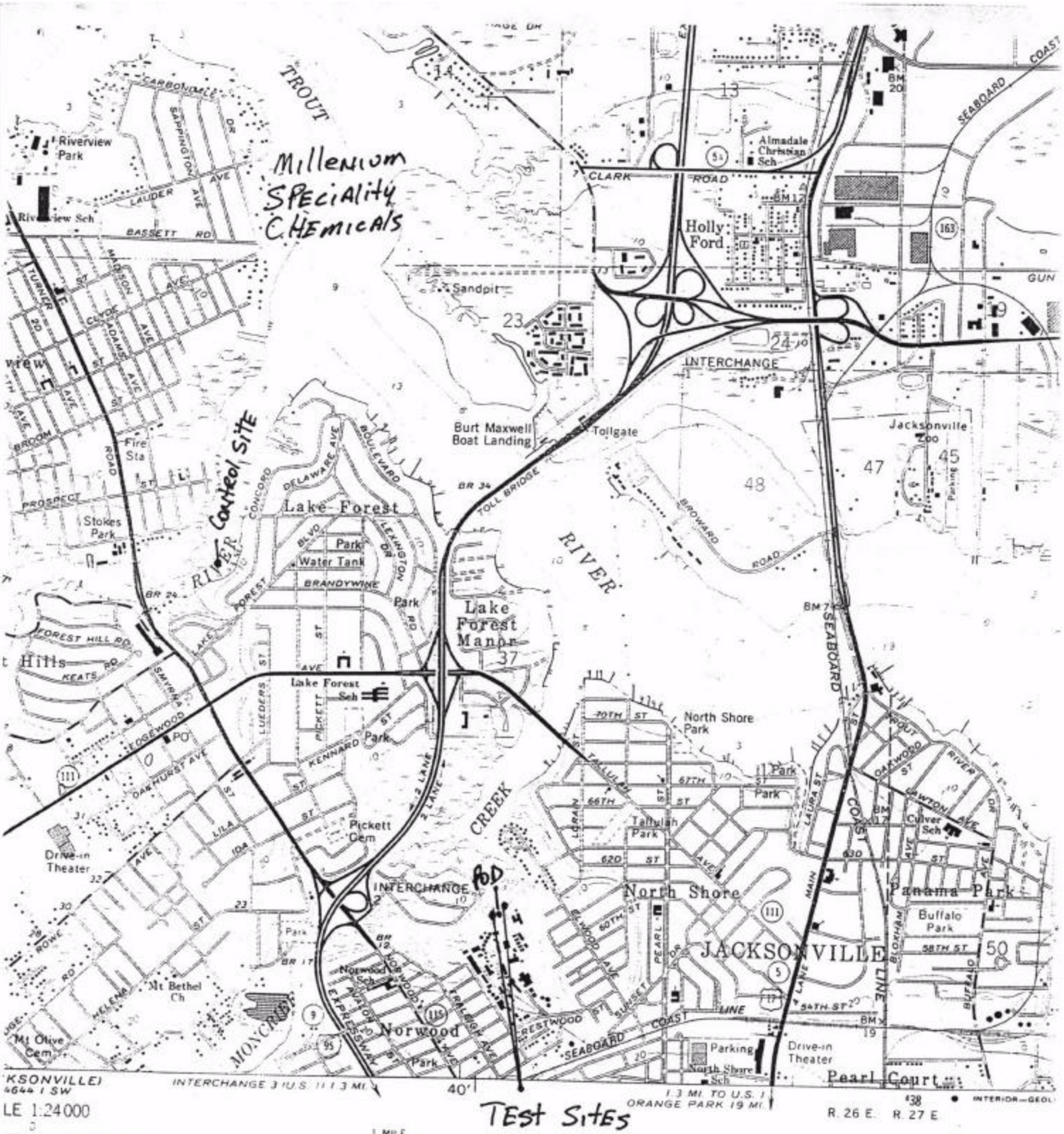
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LE 1:24000

NTERVAL 10 FEET
VERTICAL DATUM OF 1929
IN FEET—DATUM IS MEAN LOW WATER
EN THE TWO DATUMS IS VARIABLE
E APPROXIMATE LINE OF MEAN HIGH WATER
IDE IS APPROXIMATELY 1 FOOT

ATIONAL MAP ACCURACY STANDARDS
L SURVEY, DENVER, COLORADO 80225
N, VIRGINIA 22092
APS AND SYMBOLS IS AVAILABLE ON REQUEST

RC
Heavy-duty
Medium-duty
Interstate Route

Map photoinspected 1983
No major culture or drainage changes observed

Explanation of Measurements of Community Health

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

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

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

Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. Species sensitivity data from other sources, such as Chang *et al.* (1992), Farrell (1992), Hudson *et al.* (1990), Hulbert (1990), Lenat (1993), and Whitmore (1989), are used as appropriate.

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

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

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

Typical Values for Selected Parameters in Florida Estuaries

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

Percentile Distribution (690 stations)

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
Phytoplankton Chlorophyll *a*	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphate	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

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

State of Florida
Department of Environmental Protection
Facility Summary

Facility Name: Millennium Specialty Chemicals		**Prepared By:** Heather Wehry **Date:** 9/13/99
Location: (See Attached Map)	**County:** 16 - Duval	**District:** Northeast
Federal Permit No.: FL0000884 **Expiration Date:** 7/7/2003	**State GMS #:** N/A **State Expiration Date:** N/A	**Facility Type:** Industrial
Function of Facility: Organic specialty chemical manufacturing plant		
Description of treatment process: The wastewater is comprised of boiler blowdown, cooling tower blowdown, water softener blowdown, steam condensate wastewater, non-contact cooling water, and storm water. Treatment of the wastewater consists of pH control, cooling sprays, and oil skimming with effluent discharge to Moncrief Creek to the Trout River and onto the St. Johns River.		
Receiving Waters: Moncrief Creek		**Classification:** Class III – Marine
Design Flow: 5.0 MGD (average)	**Mean Flow:** 0.6 MGD (7/98 – 6/99)	**Flow during survey:**
Discharge is: *Continuous* Intermittent Seasonal Rainfall Dependent Other		
Facility Mixing Zone Details: There are no mixing zones for this facility.		
List effluent limits:		

Parameter	Limit	Describe special permit conditions and permit modifications:
Flow (MGD)	5.0 Daily Maximum	
COD (mg/l)	Report Daily Maximum	
Temperature (°C)	38 Daily Maximum	
Oil and Grease (mg/l)	5.0 Daily Maximum	
Phenolic Compounds (mg/l)	0.3 Daily Maximum	
pH (s.u.)	>6.5 & <8.5	
Total Organic Carbon (mg/l)	Report Daily Maximum	
Total Recoverable Chromium VI (µg/l)	50 Daily Maximum	
Total Recoverable Zinc (µg/l)	86 Daily Maximum	
Total Recoverable Lead (µg/l)	5.6 Daily Maximum	
Total Residual Chlorine (mg/l)	0.01 Daily Maximum	

Bromine (free molcular, mg/l)	0.1 Daily Maximum	
Total Recoverable Copper (µg/l)	15.5 Daily Maximum	Interim limit in effect until 12/99. Marine standard = 2.9 (µg/l)
Total Recoverable Iron (mg/l)	1.6 Daily Maximum	Interim limit in effect until 12/99. Marine standard = 0.3 (mg/l)
Fecal Coliform (#/100ml)	4500	Interim limit in effect until 12/99. Marine standard = 800 (col/100 ml)
Total Coliform (#/10ml)	5000	Interim limit in effect until 12/99. Marine standard = 2400 (col/100 ml)
Acute Toxicity	>100	96-hour definitive static acute toxicity test on test species Ceriodaphnia dubia and Cyprinella leedsi.

Description of permitted outfall: Wastewater discharges through a 36 inch rectangular weir into a 28 inch diameter submerged concrete pipe, which discharges approximately 5 feet from the shore line of Moncrief Creek.

List permit violations (MOR data) and plant upsets that occurred at the plant within the past year:

The facility has experienced 2 plant upsets since September 1998. Abnormal events 269 and 270 resulted in pH exceedances on September 8th and 10th. The pH was elevated because the acid feed system was not operating properly.

The facility is currently operating under a consent order and an administrative order, that collectively establish interim limits for copper, fecal coliform, total coliform, and iron. Several effluent violations have occurred over the past year, and they have been summarized in the table below. Warning letter WL-99-0004-IW-16 was issued April 26, 1999 and negotiations are currently underway to resolve the effluent violations.

Date	Parameter	Violations
September 1998	Total Coliform	Invalid sample analysis (9/28/98)
December 1998	Oil and Grease	Effluent concentration = 9 mg/l
December 1998	Total Coliform	Effluent concentration > 8000 col/100 ml
January 1999	Oil and Grease	Effluent concentration = 81 mg/l
January 1999	Total Coliform	Effluent concentration > 8000 col/100 ml
February 1999	Total Coliform	Invalid sample analysis (2/16/99)
February 1999	Bromine	No testing between 2/14 and 3/18/99.
February 1999	pH	Effluent exceeded limit of 8.5 on 2/8 and 2/10. pH max for month = 8.96.
March 1999	Oil and Grease	Effluent concentration = 7.0 mg/l
March 1999	Total Coliform	Effluent concentration > 6000 col/100ml
April 1999	Total Coliform	Effluent concentration > 6000 col/100 ml
May 1999	Total Phenolic Compounds	Effluent concentration = 0.76 mg/L

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

The facility is under an active Consent Order (OGC No. 97-1188) to propose treatment for copper, total coliform, and fecal coliform. A treatment proposal has been submitted and an application to modify the existing permit to incorporate the proposed treatment is currently being reviewed by the DEP permitting staff.

Discuss MOR trends to prior data; is the trend improving or declining: No trend appears to be

developing.
Additional Information: N/A

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5/21/98)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE:	TIME:	RECEIVING BODY OF WATER:
	20030 622	9/13/99	1440	TROUT CREEK

REMARKS:	COUNTY:	LOCATION:	FIELD NAME:
	DUVAL	RIBAULT RIVER APPROX 400YDS BELOW LEM TURNER BRIDGE	CONTROL SITE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commericial	Industrial	Other (specify
5	1	1		85	8		

Local Watershed Erosion: None: ☐ Slight: ☐ Moderate: ☒ Heavy: ☐

Local Watershed NPS Pollution: No evidence: ☐ Slight: ☐ Moderate potential: ☒ Obvious sources: ☐

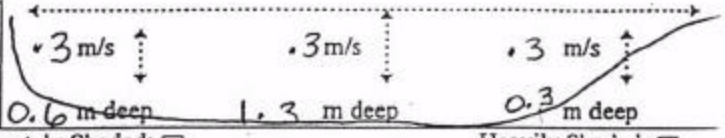
Width of riparian vegetation (m) on least buffered side: >18

List & map dominant vegetation SPARTINA / on back JUNCUS MARSH

Artificially Channelized ☒ NO none
Artificially Impounded ☐ YES

High Water Mark: 0.3 + 1.3 = 1.6
(m above present water level) (present depth in m) (m above bed)

Typical Width (m)/Depth (m)/Velocity (m/sec) Transect
20-25 m wide TIDAL



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

SEDIMENT SUBSTRATE

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

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

Sediment Deposition: Sludge: ☐ Sand smothering: none Silt smothering: none Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand	75	1	P PONAR
Leaf Packs or Mats				Mud/Muck/Silt	20	1	P PONAR
Aquatic Vegetation				Other:			
Rock or Shell Rubble	5	1	P PONAR	Other:			
Undercut banks/Roots				Draw aerial view sketch of habitats found in 100 m section.			

Water Quality	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Time		Secchi (m)
Top								
Mid-depth	0.6	28.2	7.25	5.1	31,250	1440		1.1
Bottom								

System Type: Stream: ☐ 1st - 2nd order Lake: ☐ Wetland: ☐ Estuary: ☒ Other: ☐

Water Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils: None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity: Clear: ☐ Slightly Turbid: ☒ Turbid: ☐ Opaque: ☐

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

Weather Conditions/Notes: IN COMING TIDE 1 DAY BEFORE HURRICANE FLOYD P/C 80's BREEZY 15-20 out of NE

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

Sampling Team: PEREZ, O'CONNOR

Signature: [signature]

Date: 9/13/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5/21/98)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE:	TIME:	RECEIVING BODY OF WATER:
	20030 622	9/13/99	1440	TROUT CREEK

REMARKS:	COUNTY:	LOCATION:	FIELD NAME:
	DUVAL	RIBAULT RIVER APPROX 400YDS BELOW LEM TURNER BRIDGE	CONTROL SITE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commericial	Industrial	Other (specif
5	1	1		85	8		

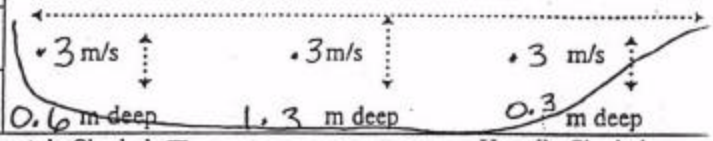
Local Watershed Erosion: None: ☐ Slight: ☐ Moderate: ☒ Heavy:

Local Watershed NPS Pollution: No evidence: ☐ Slight: ☐ Moderate potential: ☒ Obvious sources:

Width of riparian vegetation (m) on least buffered side: >18

List & map dominant vegetation SPARTINA / on back JUNCUS MARSH

Typical Width (m)/Depth (m)/Velocity (m/sec) Transect: 20-25 m wide TIDAL



Artificially Channelized ☒ NO Artificially Impounded ☐ YES none

High Water Mark: 0.3 + 1.3 = 1.6 (m above present water level) (present depth in m) (m above bed)

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

SEDIMENT SUBSTRATE

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

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

Sediment Deposition: Sludge: ☐ Sand smothering: none Silt smothering: none Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand	75	1	PPONAR
Leaf Packs or Mats				Mud/Muck/Silt	20	1	PPONAR
Aquatic Vegetation				Other:			
Rock or Shell Rubble	5	1	PPONAR	Other:			
Undercut banks/Roots				Draw aerial view sketch of habitats found in 100 m section.			

Water Quality	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Time		Secchi (m
Top								
Mid-depth	0.6	28.2	7.25	5.1	31,250	1440		1.1
Bottom								

System Type: Stream: ☐ 1st - 2nd order Lake: ☐ Wetland: ☐ Estuary: ☒ Other: ☐

Water Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils: None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity: Clear: ☐ Slightly Turbid: ☒ Turbid: ☐ Opaque: ☐

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

Weather Conditions/Notes: IN COMING TIDE 1 DAY BEFORE HURRICANE FLOYD PIC 80'S BREEZY 15-20 out of NE

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

Sampling Team: PEREZ, O'CONNOR

Signature: [signature]

Date: 9/13/

DEPARTMENT OF ENVIRONMENTAL REGULATION

MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		9/13/99	TROUT CREEK

REMARKS:	LOCATION:	FIELD ID/NAME:
	RIBAULT RIVER 400 YDS BELOW LEM TURNER BRIDGE	Control Site

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 8	None—Unaltered shoreline. 9-10 points	Mostly natural shoreline, but with occasional riprap. 6-8 points	Shoreline consisting mostly of riprap and vertical seawalls. 3-5 points	Shoreline consisting almost entirely of vertical seawalls. 0-2 points
Community Types Observed: 37	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: 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: 10	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points			Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type: 11	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: 75

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
9/13/99	O'CONNOR	Patrick O'Connor

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5/21/98)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE:	TIME:	RECEIVING BODY OF WATER:
	20030421	9/13/99	1310	TROUT CREEK

TEST SITE EAST

REMARKS:	COUNTY:	LOCATION:	FIELD NAME:
	DUVAL	50 m (EAST) of MONCRIEF CREEK MILLENIUM POD	TEST SITE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commericial	Industrial	Other (specif
2	2	1		80	10	5	

Local Watershed Erosion: None: ☐ Slight: ☐ Moderate: ☒ Heavy:

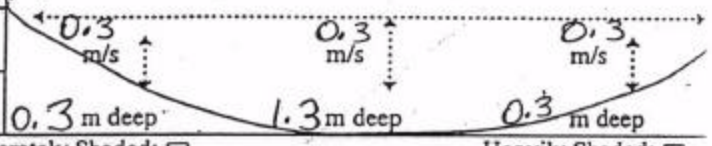
Local Watershed NPS Pollution: No evidence: ☐ Slight: ☐ Moderate potential: ☐ Obvious sources:

Width of riparian vegetation (m) on least buffered side: 5-6

List & map dominant vegetation SPARTINA on back JUNCUS MARSH

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

10-15 m wide



Artificially Channelized ☒ NO ☐ YES none

Artificially Impounded

High Water Mark: 0.3 + 1.3 = 1.6
(m above present water level) (present depth in m) (m above bed)

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

SEDIMENT SUBSTRATE

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

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

Sediment Deposition: Sludge: ☐ Sand smothering: none Silt smothering: none Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand	70	1	P. Pona
Leaf Packs or Mats				Mud/Muck/Silt	20	1	P. Pona
Aquatic Vegetation				Other: DETRITUS	10	1	P. Pona
Rock or Shell Rubble				Other:			
Undercut banks/Roots				Draw aerial view sketch of habitats found in 100 m section.			

Water Quality	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Time		Secchi (m
Top								
Mid-depth	0.6	27.3	7.25	4.6	28,200	1310		0.7
Bottom								

System Type: Stream: ☐ 1st - 2nd order Lake: ☐ Wetland: ☐ Estuary: ☒ Other: ☐

Water Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils: None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity: Clear: ☐ Slightly Turbid: ☒ Turbid: ☐ Opaque: ☐

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

Weather Conditions/Notes:

P/C 80's BREEZE, INCOMING TIDE, 1 DAY PRIOR TO HURRICANE FLOYD

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

Sampling Team: PEREZ O'CONNOR

Signature:

Date: 9/13/9

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	21003077	9/13/99	TROUT CREEK

REMARKS:	LOCATION: MONCRIEF CREEK 50 m. EAST of Millenium P.O.	FIELD ID/NAME: TEST SITE EAST

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: 37	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: 3	Only natural runoff.. 9-10 points	Mostly natural runoff, but with a few, small stormwater sources. 6-8 points	Considerable stormwater discharge from local roads, parking lots, etc. 3-5 points	Extensive manmade discharges, especially from canals draining large tracts of land. 0-2 points
Flow and Wave Action: 9	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type: 11	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: 68

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
9/13/99	O'CONNOR	Robert A. O'Connor

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5/21/98)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 21030472	DATE: 9/13/99	TIME: 1150	RECEIVING BODY OF WATER: TROUT CREEK TEST SITE WBI

REMARKS:	COUNTY: DUVAL	LOCATION: MONCRIEF CREEK 50 m WEST of MILLENIUM POD	FIELD NAME: TEST SITE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commericial	Industrial	Other (specif
2	2	1	80 Po	80	10	5	

Local Watershed Erosion: None: ☐ Slight: ☐ Moderate: ☒ Heavy:

Local Watershed NPS Pollution: No evidence: ☐ Slight: ☐ Moderate potential: ☐ Obvious sources:

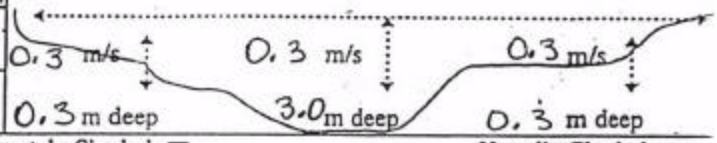
Width of riparian vegetation (m) on least buffered side: 6 M

List & map dominant vegetation SPARTINA on back JUNCUS MARSH

Artificially Channelized ☒ NO none
Artificially Impounded ☐ YES

High Water Mark: 0.3 + 3.0 = 3.3
(m above present water level) (present depth in m) (m above bed)

Typical Width (m)/Depth (m)/Velocity (m/sec) Transect
10-15 m wide



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

SEDIMENT SUBSTRATE

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

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

Sediment Deposition: Sludge: ☐ Sand smothering: none Silt smothering: none Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand	70	1	P BOTTLE
Leaf Packs or Mats				Mud/Muck/Silt	20	1	P BOTTLE
Aquatic Vegetation				Other: Detritus	10	1	P BOTTLE
Rock or Shell Rubble				Other:			
Undercut banks/Roots				Draw aerial view sketch of habitats found in 100 m section.			

Water Quality	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Time		Secchi (m)
Top								
Mid-depth	1.5	26.7	7.16	4.12	28.500 28,500	1150		0.65
Bottom								

System Type: Stream: ☐ 1st - 2nd order Lake: ☐ Wetland: ☐ Estuary: ☒ Other: ☐

Water Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils: None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity: Clear: ☐ Slightly Turbid: ☒ Turbid: ☐ Opaque: ☐

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

Weather Conditions/Notes:
P/C 80s Breeze
1 DAY PRIOR to HURRICANE FLOYD INCOMING TIDE

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

Sampling Team: PEREZ O'CONNOR

Signature: Patrick W Conn

Date: 9/13/99

DEPARTMENT OF ENVIRONMENTAL REGULATION
MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	20036472	9/13/99	TROUT CREEK

REMARKS:	LOCATION: MONCRIEF CREEK 50 m. WEST of MILLENIUM P.O.D.	FIELD ID/NAME: TEST SITE WEST

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 37	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 3	Only natural runoff. 9-10 points	Mostly natural runoff, but with a few, small stormwater sources. 6-8 points	Considerable stormwater discharge from local roads, parking lots, etc. 3-5 points	Extensive manmade discharges, especially from canals draining large tracts of land. 0-2 points
Flow and Wave Action 9	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type 11	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 68

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
9/13/99	O'CONNOR	Patrick W Conn

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Millennium effluent
County: Duval
Contact / District: Heather Lehay / NORTHEAST
NPDES Permit #: FL0000884
LIMS Sample #: 407324 LIMS Job #: TLH-FFM-09-14-10
sample log 10/14/99 mf
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 1 of 2

Remarks:

Sample Collection: Date 9-13-99 Time 1115
Test Beginning: Date 9/14/99 Time 14:50
Test Ending: Date 9/16/99 Time 14:00
Organism Batch #: 45 Diluent Batch #: 38
Organism Age: 24 hrs. SRT toxicant batch #: NA
Test organism: C. dubia

Conc.	Chamber #	Number Live 0 hr	24 h	48 h	pH 0 hr	24 h	48 h	Temperature (°C) 0 hr	24 h	48 h	D.O. (mg/L) 0 hr	24 h	48 h	UNCORRECTED Cond. (mmhos/cm) 0 hr	24 h	48 h
CTRL A	A	5	5	5	8.3	—	8.5	24.6	—	23.8	7.6	—	7.7	0.175	—	.248
B	B	5	5	5	—	—	8.5	~~24.5~~	—	24.6	—	—	7.9	—	—	.187
C	C	5	5	5	—	—	8.5	~~24.1~~	—	24.1	—	—	7.9	—	—	.222
D	D	5	5	5	—	—	8.6	—	—	23.4	—	—	8.0	—	—	.240
100% A	A	5	5	5	7.8	—	8.6	25.1	—	23.8	6.7	—	7.8	0.495	—	.718
B	B	5	5	5	—	—	8.6	~~24.~~	—	24.1	—	—	7.8	—	—	.664
C	C	5	5	5	—	—	8.5	—	—	24.1	—	—	7.7	—	—	.613
D	D	5	5	5	—	—	8.5	—	—	24.0	—	—	7.8	—	—	.584
measured by: Loaded By		DPH	DPH	MF	SG		DPH	SG		DPH	SG		DPH	SG		DPH
recorded by:		MF	DPH	DPH	DPH		SG	DPH		DPH	DPH		DPH	DPH		SG

reverse Initial MF 9/14/99

Investigators' Signatures
Della Parker Hayes
Marshall Faircloth
Shannon Gerardi

Temperature Range °C
Incubator # 2 25.0-26.8°C
Room 23.5-25.5°C

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			N/A	N/A		
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	PR100	CH	DPH
Alkalinity (mg/L as $CaCO_3$):		80	95	HACH	SG	DPH
Hardness (mg/L as $CaCO_3$):		82	151	HACH	SG	DPH
Total ammonia (mg/L as N):		<0.017	<0.017	Denver	MF	DPH
Salinity:		0	0	YSI	MF SG	MF

LH Wolfe
reviewer

form updated 3/3/99

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Millennium effluent
County: Duval
Contact / District: Heather Mahny / Northeast
NPDES Permit #: FL0000884
LIMS Sample #: 407324 LIMS Job #: TCH-1999-09-14-10
sample log 10/8/99 MF

Sample Collection: Date 9/13/99 Time 1115
Test Beginning: Date 9/14/99 Time 1445
Test Ending: Date 9/16/99 Time 1400
Organism Batch #: 109 Diluent Batch #: Well H_2O
Organism Age: 11 Days SRT toxicant batch #: NA
Test organism: C. ludai

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

Remarks:

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	D1	5	5	5	7.9	7.9	8.4	24.7	25.8	24.7	7.3	7.3	7.5	0.280	0.285	.285
B	D2	5	5	5	8.0	8.0	8.5	24.6	25.2	25.6	7.0	7.4	7.6	0.250	0.265	.284
C	D3	5	5	5	8.0	8.3	8.5	24.5	25.6	24.4	7.0	7.5	7.4	0.250	0.265	.273
D	D4	5	5	5	8.0	8.3	8.5	24.6	25.2	24.1	6.9	7.5	7.7	0.250	0.273	.274
1:100 A	D6	5	5	5	7.7	8.5	8.7	25.3	25.1	24.3	6.2	7.5	7.2	0.520	0.558	.562
B	D6	5	5	5	7.7	8.6	8.7	25.3	25.1	24.1	6.2	6.6	7.3	0.530	0.567	.555
C	D7	5	5	5	7.7	8.8	8.7	25.3	25.1	24.2	6.2	6.8	7.1	0.530	0.573	.546
D	D8	5	5	5	7.7	8.6	8.7	25.4	24.9	24.3	6.2	6.6	7.2	0.540	0.548	.555
measured by: Randy		DPH	DPH	DPH	CH	DPH	DPH	SG	DPH	DPH	SG	DPH	DPH	CH	DPH	DPH
recorded by:		MF	DPH	DPH	DPH	DPH	SG	DPH	DPH	SG	DPH	DPH	SG	DPH	DPH	SG

Investigators' Signatures
Stella Parker Hayes
Marshall Faircloth
Shannon Girardi

Temperature Range °C
Incubator # #3 24.5-26.0°C
Room 23.5°C - 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):			N/A	N/A		
Lab Total Residual Cl2 (mg/L):	9/14 <0.03	<	<0.03	DR100	CH	DPH
Alkalinity (mg/L as $CaCO_3$):	132		95	HACH	SG	DPH
Hardness (mg/L as $CaCO_3$):	132		151	HACH	SG	DPH
Total ammonia (mg/L as N):	<0.017		<0.017	Nessler	MF	DPH
Salinity:	0		0	YSI	MF	MF

AHW 9/15/99
reviewer

form updated 3/3/99

Recvd 05/05/00

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STATE OF FLORIDA
DEPT. OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT

Division of Water Facilities
Surface Water Section

Edwin,
Here's the Micro data...
Unfortunately, that was the day of a hurricane evacuation. This forced the plates to be read earlier than 24 +/- 2 hours. Thus, they do not comply with the established SOP. While these results can be used for informational purposes with the proper qualifying code, they should not be used to quantitatively measure permit compliance.
Thanks,
Mike H.

MICROBIOLOGICAL ANALYSIS REPORT

NAME OF SURVEY			COLLECTOR
Millennium Specialty Chemical Inc.			Perez O'Connor
DATE: COLLECTED	RECEIVED	PROCESS START	COMPLETED
09/13/99	1700 09/13/99	1700 09/13/99	09/14/99
SURVEY TYPE	SAMPLE TYPE	COUNTY	ANALYTICAL METHOD
Industrial Waste Fifth Year Inspection	Final Effluent	Duval	Membrane Filter
ANALYST	COMMENTS		
Niedbalski, Kalmbacher, Hollingsworth	Due to hurricane evacuation, plates were read at 15.0 hours incubation time. Results are provisional information only; not valid for permit requirements.		

NAME OF SURVEY			COLLECTOR
Millennium Specialty Chemical Inc.			Wehry
DATE: COLLECTED	RECEIVED	PROCESS START	COMPLETED
09/13/99	1400 09/13/99	1500 09/13/99	09/14/99
SURVEY TYPE	SAMPLE TYPE	COUNTY	ANALYTICAL METHOD
Industrial Waste Fifth Year Inspection	Final Effluent	Duval	Membrane Filter
ANALYST	COMMENTS		
Neidbalski, Kalmbacher, Hollingsworth	Due to hurricane evacuation, plates were read at 17.5 hours incubation time. Results are provisional information only; not valid for permit requirements.		

NOTE: counts next page.
It is interesting that control is one order of magnitude less than the Test Sites or the effluent. counts

Total colis: control < test, eff. by one order
Fecal colis: control < test, eff. by two orders

Pg 2/2

LAB NO.	STORET NO.	SITE LOCATION	COLL TIME	SET UP TIME	TOTAL COLIFORM #/100ML	TOTAL COLIFORM CODE	FECAL COLIFORM #/100ML	FECAL COLIFORM CODE
99507	— 472	Moncrief Creek ~ 50 m west of Millenium POD	1150	1815	53,000	J	22,000	J
99508	— 471	Moncrief Creek ~ 50 m east of Millenium POD	1310	1815	56,000	J	23,000	J
99509	· 623	Ribault River ~400 yds. below Lem Turner Rd.	1440	1815	6300	J	900	J, B
99506		Final Effluent	1115	1545	29,000	J	10,000	J, B

RESULTS APPROVED BY:	DATE

STATE OF FLORIDA
DEPT. OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
MICROBIOLOGICAL ANALYSIS REPORT
STORET CODES

A - Value reported is the mean of two or more determinations.
B - Results based on colony counts outside the acceptable range.
I - Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit.
J - Estimated Value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected; the value reported is the minimum detection limit.
V - Analyte was detected in both sample and method blank.
Z - Colonies were too numerous to count (TNTC).

Examples: 20 colonies from 1ml of sample would be reported as 2000 / 100ml.
2 colonies from 1ml of sample would be reported as 200B / 100ml.
30 colonies from 1ml of sample that exceeded holding time would be reported as 100Q / 100ml.

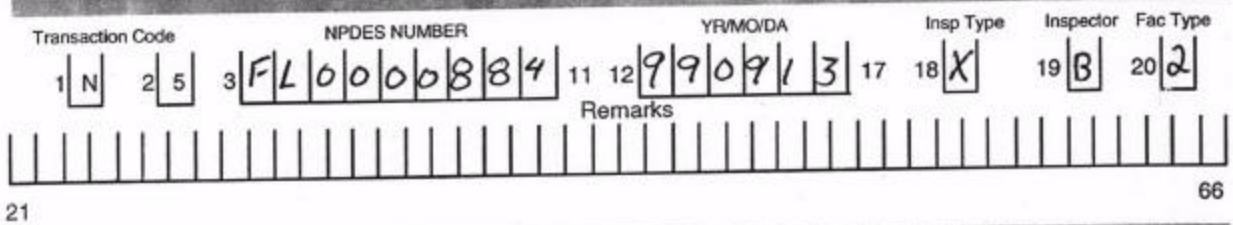
Benthic macroinvertebrate taxa list for Millennium Specialty Chemicals, collected via Ponar grab samples in Moncrief Creek, on 13 September 1999. Densities, in number/m^2, represent the mean of three replicates.

	Control Site	Test Site east	Test Site west
Amphipoda			
Gammarus mucronatus	1	–	–
Grandidierella bonnieroides	1	–	–
Mysidacea			
Americamysis bahia	3	–	–
Undetermined *Americamysis* sp.	4	–	–
Nemertea			
Undetermined Nemertea sp.	3	–	–
Oligochaeta			
Undetermined Tubificidae sp.	29	8	–
Pelecypoda			
Tellina versicolor	3	–	–
Polychaeta			
Streblospio benedicti	277	20	–

Phytoplankton taxa list and densities (#/mL) for Millennium Specialty Chemicals, collected via subsurface grabs in Moncrief Creek on 13 September 1999.

	Control Site	Test Site east	Test Site west
Bacillariophyceae			
Chaetoceros sp.	3	—	—
Cyclotella sp.	3	57	12
Entomoneis sp.	—	1	1
Gyrosigma sp.	—	71	27
Leptocylindrus sp.	—	6	—
Melosira sp.	6	15	1
Nitzschia sp.	9	29	16
Skeletonema sp.	67	44	115
Thalassiosira sp.	—	3	—
Undetermined Bacillariophyceae sp.	—	15	—
Undetermined Centrales sp.	—	5	—
Undetermined Pennales sp.	—	45	6
Chlorophyceae			
Chlamydomonas sp.	—	10	—
Dictyosphaerium sp.	—	1	—
Franceia sp.	—	1	—
Oocystis sp.	—	1	—
Scenedesmus sp.	1	1	—
Tetrastrum sp.	2	—	—
Cryptophyceae			
Undetermined Cryptophyceae sp.	1	—	—
Cyanophyceae			
Anabaena sp.	1	—	—
Chroococcus sp.	—	3	—
Dactylococcopsis sp.	—	1	—
Gloeocapsa sp.	12	—	1
Microcystis sp.	1	—	—
Synechococcus sp.	—	3	—
Undetermined Chroococcaceae sp.	—	—	2
Euglenophyceae			
Euglena sp.	—	2	—
Dinophyceae			
Undetermined Dinophyceae sp.	—	45	1

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)

