

Biological Assessment of

City Industries Ground Water Remediation

Orange County

NPDES #FL0043265

Sampled March 17, 2003

August 2003

Biology Section

Bureau of Laboratories

Division of Resource Assessment and Management

Quality Manual No. 870346G

NELAC Certification No. E31780

Florida Department of Environmental Protection
Fifth Year Inspection Summary

Discharger:	City Industries Ground Water Remediation
County:	Orange
NPDES Number:	FL0043265
Permit Expiration:	12/28/2004

Toxics Sampling Inspection **(XSI)**

Date Sampled: March 17, 2003

Results: The organic constituent Bromacil was detected in the effluent. Aluminum, copper, iron and lead were detected in the effluent at levels that complied with Class III Water Quality Criteria. Copper and lead were present in the effluent at a concentration above the minimum detection limit but below the practical quantitation limit.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: March 17, 2003

Results: The effluent sample was not toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during the 48-hour acute bioassays.

Water Quality Inspection **(WQI)**

Date Sampled: March 17, 2003

Results: Fecal coliform bacteria were not detected in the effluent. Fecal coliform bacteria were detected in water samples from both the Control (3,300/100 ml) and Test (3,133/100 ml) Sites at levels that exceeded Class III Water Quality Criteria (800/100 ml, single sample, F.A.C. 62-302.530 (6)).

Impact Bioassessment Inspection **(IBI)**

Date Sampled: March 17, 2003

Results: There was no nutrient enrichment attributable to the facility at the Test Site compared to the Control Site. Algal growth potential results from the effluent sample were lower than expected based upon nutrient concentrations, suggesting possible growth inhibition. Benthic macroinvertebrate communities were degraded at both the Test and Control Sites, but this did not appear attributable to the facility's effluent.

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 Industries Ground Water Remediation Plant is located in Orange County, Florida (Appendix 1). This facility is a ground water remediation plant for hazardous waste contamination. The facility was a hazardous waste reclamation plant that improperly disposed of waste by dumping on site. Ground water is pumped by 13 wells and combined before being treated in an air-stripping tower (see Facility Summary in Appendix 2). No additional treatment is provided before discharge of the effluent. The effluent is discharged into the Class III fresh waters of Crane Strand Canal, to the Union Park Canal, and then into the Little Econlockhatchee River. The design flow of the wastewater system is 0.15 million gallons per day (MGD) as a monthly average. The actual mean flow during this survey was 0.125 MGD (Philip Kane, FDEP Central District).

Surface Water Quality Criteria and facility permit limits are listed in Table 1. According to the facility's discharge monitoring reports, the plant has had no permit violations from January to December 2002 (Appendix 2).

Methods

The purpose of this investigation was to determine the discharger's effects on the biota of the receiving waters. Chemical and biological comparisons were made between a control site (located in the Crane Strand Canal 10-110 m upstream of the discharge) and a test site (located in the Crane Strand Canal 10-110 m downstream of the discharge). Detailed methods are given in Appendix 3.

All field and laboratory biological methods followed Biology Section Standard Operating Procedures (SOPs, see http://www.floridadep.org/labs/qa/2002sops.htm for details) and met DEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm).

The following were involved in this investigation: Michael Eckoff, Philip Kane and Steven Kent (FDEP Central District), and FDEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Wayne Magley, Chuck Ziegmont and Michael Tanski).

Results and Discussion

- Specific chemical results are reported in Table 1 and a complete list of chemical analytes can be reviewed in Appendix 4. The metals aluminum, copper, iron and lead were detected in the effluent at levels that complied with Class III Water Quality Criteria (Chapter 62-302 F.A.C.) and facility permit limits. Copper and lead were present in the effluent at a concentration above the minimum detection limit but below the practical quantitation limit. The organic constituent Bromacil was detected in the effluent at a level above the minimum detection limit but below the practical quantitation level. Effluent pH (Standard Units) and dissolved oxygen (mg/L) complied with Class III Water Quality Criteria (Chapter 62-302 F.A.C.) and facility permit limits.
- Habitat assessment scores were 78 at the Control Site and 76 at the Test Site, indicating marginal habitat quality (Table 1, data sheets in Appendix 8). The Control and Test Sites were both highly channelized, with poor bank stability and poor riparian habitat quality.
- Dissolved oxygen (DO as mg/L), water temperature (degrees Celsius), pH (Standard Units), and conductivity (µmhos/cm) at the Test and Control Sites complied with Class III Water Quality Criteria (Table 1, 62-302.530 F.A.C.).
- The effluent samples were not toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during four 48-hour acute screening bioassays (See Table 1 for percent mortality and Appendix 7 for bioassay bench sheets).
- Fecal coliform bacteria were not detected in the facility's effluent. Water samples from both the Control and Test Sites had fecal coliform levels >3,000 colonies/100 ml, an exceedance of Class III Water Quality Criteria (800 colonies/100 ml, single sample, 62-302.530 (6) F.A.C., see Table 1 for results and Appendix 7 for laboratory work-sheets). These high fecal coliform levels do not appear to be related to the facility's effluent.
- The effluent total nitrogen concentration was 0.527 mg/L and total phosphorus concentration was 0.77 mg/L (Table 1). Nutrient levels in water samples from the Test and Control Sites were similar and did not indicate enrichment from the facility's effluent. Nutrient levels were typical of 50-70% of Florida streams for total ammonia, total phosphorus, orthophosphate and nitrate + nitrite while total Kjeldahl nitrogen levels were similar to those in the lowest 20% when compared with levels typical of Florida streams (Appendix 6).
- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller *et al.* 1978). Raschke and Shultz (1987) found that AGP above 5.0 mg dry weight/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The AGP values at both the upstream Control Site (11.3 mg dry weight/L, Table 2) and

Table 1. Effluent limits, Class III Criteria and chemical, microbiological and toxicological data.

City Industries	Class III Criteria	Effluent Limits	Effluent Samples	Control Site	Test Site
Organic Constituents (µg/L)					
Bromacil	-	-	0.32 I	-	-
Metals (µg/L unless otherwise noted, Class III Criteria are less than or equal to the value given)					
Aluminum	-	-	452 A	-	-
Arsenic	50	50	4.0 U	-	-
Cadmium	b	0.72 b	0.025 U	-	-
Calcium (mg/L)	-	-	18.5 A	-	-
Chromium	b	53.66 b	2.0 U	-	-
Copper	b	5.69 b	4.6 I	-	-
Iron	1000	1000	460 A	-	-
Lead	b	1.52 b	0.1 I	-	-
Magnesium (mg/L)	-	-	2.4 A	-	-
Nickel	b	31.98 b	2.0 U	-	-
Selenium	5.0	5.0	1.0 U	-	-
Silver	0.07	0.07	0.02 U	-	-
Zinc	b	73.40 b	4.0 U	-	-
Nutrients (mg/L)					
Ortho-phosphate	-	-	0.54	0.061	0.069
Total Phosphorus	-	1.6 s	0.77	0.11	0.17
Total Ammonia	-	1.6 s	0.23	0.082	0.078
Un-ionized Ammonia	≤ 0.02 s	-	<0.02	<0.02	<0.02
Nitrate and Nitrite	-	-	0.087	0.19	0.19
Total Kjeldahl Nitrogen	-	-	0.44	0.45 J	0.46 JA
Organic Nitrogen	-	-	0.21	0.368	0.382
Total Nitrogen	-	4.8 s	0.527	0.64	0.65
General Physical and Chemical Parameters					
Habitat Assessment	-	-	-	78	76
Dissolved Oxygen (mg/L)	≥ 5.0 s	6.0-8.0 s	8.5	5.9	6.0
pH (SU)	6.0-8.5 s	6.0-8.5 s	6.3	6.8	7.0
Conductivity (µmhos/cm)	1275 s	-	170	154	154
Temperature (°C)	-	Report	24.6	22.3	22.3
COD (mg/L)	-	Report	20 U	-	-
Total Suspended Solids (mg/L)	-	-	1 U	6.3	7.8 A
CBOD, 5 day (mg/L)	-	8 s	2 U	4 I	2.2 I
Chlorophyll *a* (µg/L)	-	-	-	0.85 U	0.85 U
Phaeophytin (µg/L)	-	-	-	0.85 U	0.85 U
Flow (MGD)	-	0.17	0.125	-	-
Hardness (mg $CaCO_3$)	-	Report	56.078	-	-
Toxicity (48-hour static, screening bioassay, percent mortality in 100% effluent)					
Bioassay - Water flea	-	**	0% c	-	-
Bioassay - Fish	-	**	0% c	-	-
Microbiology (Number of counts/100ml)					
Fecal Coliforms	800 s	-	1 U	3300 B	3133 AB
Total Coliforms	2400 s	-	-	-	-

Value exceeds the Class III Water Quality Criteria

b - Value is calculated based on hardness

c - Four samples of effluent were tested in separate bioassays. No toxicity was detected.

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

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

s - Single sample

** NOEC - A no observed effect concentration less than 100% effluent will constitute a violation of this permit

Table 2. Measured and predicted algal growth potential (AGP) for total soluble inorganic nitrogen (TSIN) limitation

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Inorganic N:P ratio
Control (mg dry wt/L)	11.3	10.3 ± 2.1	4.5
Test (mg dry wt/L)	13.0	10.2 ± 2.0	3.9
Effluent (mg dry wt/L)	4.0	12.0 ± 2.4	0.6

the downstream Test Site (13.0 mg dry weight/L) exceeded the suggested "problem" threshold. Although the AGP value of the effluent (4.0 mg dry weight/L) was not above this threshold, there was evidence of growth inhibition in AGP data for the effluent sample, with two thirds less dry weight produced than expected (Table 2). The expected AGP value of the effluent (12.0 ± 2.4 mg dry weight/L) was approximately the same as the actual Control and Test Site AGP values. This indicates there is not nutrient enrichment related to the discharge in this portion of the Crane Strand Canal.

- Qualitative measures of benthic macroinvertebrate assemblages from dipnet samples are summarized in Tables 3 and 4 and in Appendix 9. The Control Site SCI score of 19 and the Test Site SCI score of 17 placed them both in the "poor" category. The habitat assessment indicated a severely altered, channelized receiving water; in such habitats the Stream Condition Index may have less ability to discriminate between impacted locations.
- Hester Dendy samplers were not deployed in this inspection.

Summary

The organic constituent Bromacil was detected in the effluent. The metals aluminum, copper, iron and lead were detected in the effluent at levels that complied with Class III Water Quality Criteria and facility permit limits. Fecal coliform bacteria exceeded Class III Water Quality Criteria in the Crane Strand Canal, but were not attributable to the facility's effluent. The effluent sample was not toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during 48-hour acute screening bioassays.

There was no nutrient enrichment attributable to the facility at the Test Site compared to the Control Site. Algal growth potential results from the effluent sample were lower than expected, suggesting possible growth inhibition. Benthic macroinvertebrate communities were degraded at both the Test and Control Sites, but this did not appear attributable to the facility's effluent.

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Table 3. Macroinvertebrate Dipnet Samples - Qualitative

City Industries	Control Site	Test Site
Stream Condition Index (value)	19	17
Stream Condition Index (word)	Poor	Poor
Stream Condition Index Metrics		
Florida Index	9	8
Number of EPT Taxa	2	1
Number of Taxa	22	24
Number of Chironomid Taxa	7	7
Percent Dominant Taxon	48.3	38.3
Percent Dipterans	24.2	26.1
Percent Suspension Feeders and Filterers	6.3	5.2
Total Number of Individuals	120	115
Community Composition: Percent of total		
Dominant Taxon (name)	Ancylidae	Ancylidae
Dominant Taxon (group)	Gastropoda	Gastropoda
Amphipoda	5.8	8.7
Bivalvia	3.3	3.5
Diptera	24.2	26.1
Gastropoda	48.3	39.1
Hirudinea	0.0	2.6
Lepidoptera	2.5	3.5
Odonata	1.7	1.7
Oligochaeta	10.8	13.0
Other	3.3	1.7
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	10.8	13.0
Predators	7.5	6.1
Surface Deposit Feeders	15.0	17.8
Suspension Feeders and Filterers	6.3	5.2
Scrapers	48.8	38.3
Shredders	11.7	17.0
Other	0.0	2.6

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City Industries Control Site

Table 4a. Stream Condition Index Metrics: Peninsula, Winter Index					
Metric:	Value	5	3	1	Score
Total Number of Taxa	22	≥27	26-14	<14	3
Number of EPT Taxa	2	≥4	3-2	<2	3
Number of Chironomid Taxa	7	≥9	8-5	<5	3
Percent Contribution of Dominant Taxon	48.3	≤30	31-65	>65	3
Percent Diptera	24.2	-	≤52	>52	3
Florida Index	9	≥10	9-5	<5	3
Percent Suspension Feeders and Filterers	6.25	≥15	14-8	<8	1
Total Score		City Industries Control Site			19
Interpretation of Scores		Excellent			27-33
		Good			21-26
		Poor			14-20
		Very Poor			7-13

City Industries Test Site

Table 4b. Stream Condition Index Metrics: Peninsula, Winter Index					
Metric:	Value	5	3	1	Score
Total Number of Taxa	24	≥27	26-14	<14	3
Number of EPT Taxa	1	≥4	3-2	<2	1
Number of Chironomid Taxa	7	≥9	8-5	<5	3
Percent Contribution of Dominant Taxon	38.3	≤30	31-65	>65	3
Percent Diptera	26.1	-	≤52	>52	3
Florida Index	8	≥10	9-5	<5	3
Percent Suspension Feeders and Filterers	5.2	≥15	14-8	<8	1
Total Score		City Industries Test Site			17
Interpretation of Scores		Excellent			27-33
		Good			21-26
		Poor			14-20
		Very Poor			7-13

Appendices

- Appendix 1. Map of facility
- Appendix 2. Facility summary
- Appendix 3. Methods
- Appendix 4. Chemical analyses of effluent and receiving water.
- Appendix 5. Explanation of biological measurements
- Appendix 6. Typical values for selected parameters in Florida waters
- Appendix 7. Additional physical, chemical, toxicological and microbiological results
- Appendix 8. Habitat Assessment field sheets
- Appendix 9a. Dipnet samples: Taxa list and number of macroinvertebrates counted (collapsed)
- Appendix 9b. Dipnet samples: Taxa list and number of macroinvertebrates counted

Appendix 1

City Industries Ground Water Remediation Superfund Site

3825 Forsyth Avenue

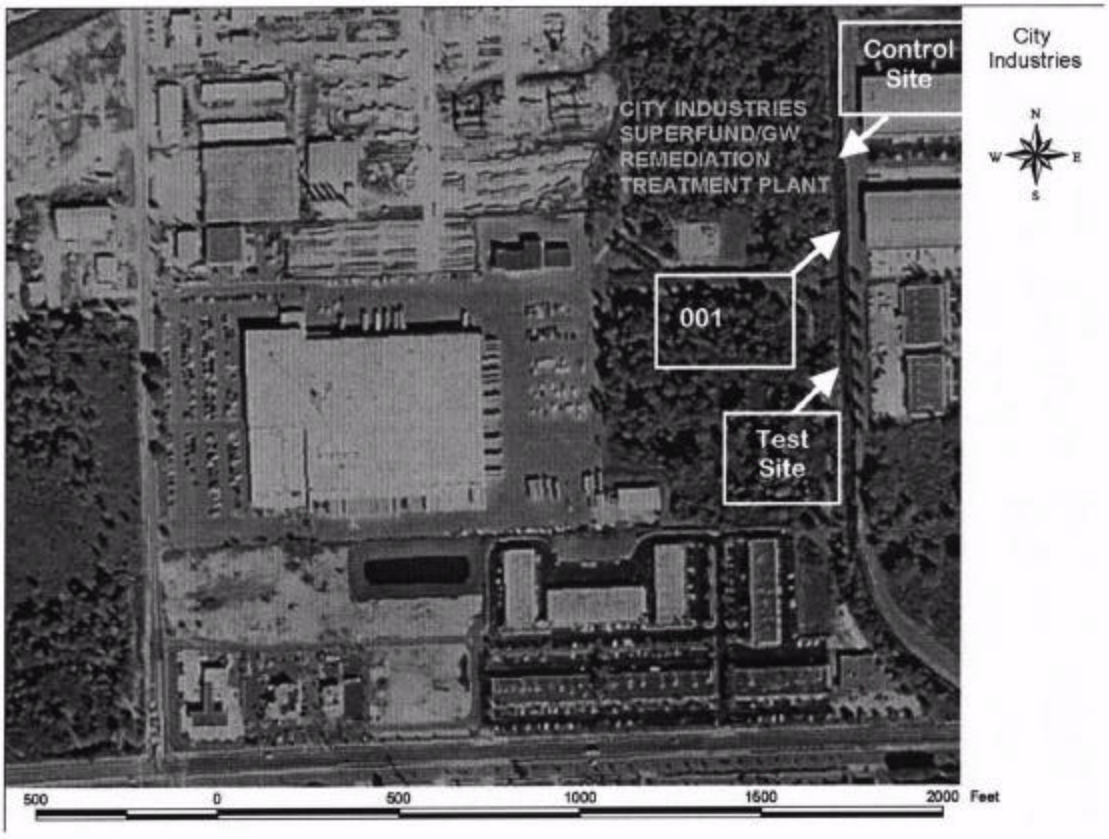
Orange County

Winter Park, Florida

NPDES Permit Number FL0043265

Expiration Date: December 28, 2004

Latitude 28°36'05" N, Longitude 81°17'34" W



Appendix 2

Facility Summary

Facility Name (as it appears on permit): City Industries Ground Water Remediation Minor NonPOTW NPDES Discharge		**Former Names:**
Physical Address: 3825 Forsyth Road (behind Sears) Winter Park, Orange County, Florida	**NPDES Permit No.:** 48-FL0043265-IW7B **Expiration Date:** December 28, 2004	**Prepared By:** Michael Eckoff
County: Orange **District:** Central	**State Permit No.:** 48-FL0043265-IW7B **Expiration Date:** December 28, 2004	**Facility Type:** Minor NonPOTW NPDES Discharge
Function of Facility: Ground Water Remediation		
Sampling Location (specify lat/longs of NPDES point): 28° 36' 05" N, 81° 17' 34" W		
Description of treatment process: The ground water is pumped out of the ground through 13 wells at an average rate of 0.15 MGD monthly average (100 ± 20 gpm). The influent from the wells is combined in a distribution header and treated in an air stripping tower. This treatment is a part of a remediation plan approved by the Federal EPA and it is not a part of this permit. The water from each well is pumped to the treatment facility in a 1.5 inch plastic forcemain. Flow is recorded at each well. No additional treatment is provided prior to the surface water discharge authorized by this permit. Treated effluent from the remediation treatment system shall also meet the requirements of this permit.		
Receiving Waters: Crane Strand Canal, which flows south to the Union Park Canal and east to the Little Econlockhatchee River.		**Classification:** Class III fresh surface water bodies of the State
Temperature (C):	**Design Flow:**	
pH (SU):	**Mean Flow:**	
Conductivity (umhos/cm):	**Flow During Survey:**	
Dissolved Oxygen (mg/L):	**Total Residual Chlorine (mg/L):**	
Discharge is: (Continuous) **Intermittent** **Seasonal** **Rainfall Dependent** **Other**		
Facility Mixing Zone Details: No mixing zone.		

List Effluent Limits:

Parameter and Units	Limit	Describe special permit conditions and permit modifications:
Flow (MGD)	0.15 Monthly Avg. 0.17 Daily Max.	Daily Metered Daily Metered
Dissolved Oxygen (mg/l)	6.0 Min.	Weekly In Situ
$CBOD_5$ (mg/l)	5.0 Monthly Avg. 8.0 Daily Max.	Weekly Eight Hour Composite Weekly Eight Hour Composite
COD	Report Daily Max.	Weekly Eight Hour Composite
Total Nitrogen as N (mg/l)	3.0 Monthly Avg. 4.8 Daily Max.	Weekly Eight Hour Composite Weekly Eight Hour Composite
Total Phosphorus as P (mg/l)	1.0 Monthly Avg. 1.60 Daily Max.	Weekly Eight Hour Composite Weekly Eight Hour Composite

Ammonia as N (mg/l)	1.0 Monthly Avg. 1.60 Daily Max.	Weekly Eight Hour Composite Weekly Eight Hour Composite
Temperature (°F)	Report Daily Max.	Monthly In Situ
Total Hardness as $CaCO_3$ (mg/l)	Report Daily Max.	Quarterly Grab
Total Recoverable Copper (µg/l)	Calculated using equation - $Cu \leq e^{(0.8545[\ln H]-1.465)}$. Total hardness shall be measured at the time of the effluent sample. The "ln H" means the natural logarithm of total hardness expressed as milligrams/L of CaCO3. For metals criteria involving equations with hardness, the hardness shall be set at 25 mg/L if actual hardness is <25 mg/L and set at 400 mg/L if actual hardness is >400 mg/L.	Quarterly Grab-The measured effluent value shall be recorded on the DMR in the parameter row for "Total Recoverable Copper (effluent)." The calculated effluent limit shall be recorded on the DMR in the parameter row for "Total Recoverable Copper (calculated limit)." Compliance with the effluent limitation is determined by calculating the difference between the measured effluent value and the calculated. The compliance value shall be recorded on the DMR in the parameter row for "Total Recoverable Copper (effluent minus calculated limit)." If the compliance value is greater than 0.00, the permittee will be considered in violation of the limitation.
Total Recoverable Iron (mg/l)	1.0 Daily Max.	Quarterly Grab
pH	The pH shall not be less than 6.0 standard units, nor greater than 8.5 standard units. The pH shall not vary more than one unit above or below natural background of predominantly fresh waters, provided that the pH is lowered to less than six units in predominantly fresh waters or raised above 8.5 units. If natural background is less than six units, in predominantly fresh waters; the pH shall not vary below natural background or vary more than one unit above natural background of predominantly fresh waters. If natural background is higher than 8.5 units, the pH shall not vary above natural background or vary more than one unit below natural background of predominantly fresh waters.	Monthly Grab
Chronic Toxicity (Annual)	>100%	24 hour composite

daphnid, Ceriodaphnia dubia fathead minnow, Pimephales promelas		
Description of permitted outfall: The effluent is discharged via a six inch diameter gravity flow pipe.		
List permit violations (DMR data) and plant upsets that occurred at the plant within the last year: No permit violations were noted during the review period of January through December 2002.		
Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions: There is currently no enforcement action with the facility.		
Discuss MOR trends to prior data; is trend improving or declining: N/A		
Additional Information:		

Appendix 3

Methods

The purpose of this investigation was to determine the discharger's effects on the biota of the receiving waters. Chemical and biological comparisons were made between a control site and a test site. A habitat assessment was performed *in situ* to compare biological conditions at the control and test sites. The resulting scores were based upon the examinations of the physical structure and extent of disturbance at the study sites and aid in the interpretation of biological community data. Supplemental physical and chemical data were collected on the effluent and at both study sites.

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides. The results from these analyses were compared with Water Quality Limits (62-302 F.A.C.) and facility permit limits (Table 1, Appendix 2). A list of the analytes tested for, the minimum detection limit and the practical quantitation limit are given in Appendix 4. Methods used for all chemical analyses are on file at the FDEP Central Chemistry Laboratory in Tallahassee and may be viewed on the web at http://www.floridadep.org/labs/sop/index.htm.

Acute screening toxicity bioassays were performed on the effluent samples using the water flea, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi* (Weber 1993). The effluent and water from control and test sites were analyzed for the presence and concentration of total and fecal coliform bacteria (APHA 1992, methods 9222 B, 9222 D).

An effluent sample and water samples from the control and test sites were autoclaved, filtered (0.45 µm), inoculated with the unicellular green alga, *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, USEPA 2002), and incubated for 14 days (Miller et al. 1978). The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L (Miller et al. 1978). To measure possible inhibition of algal growth based on possible toxicants in effluent or site water, AGP results were compared to expected levels of dry weight production based on the nutrient content of the water (Miller et al. 1978, Appendix 5).

Benthic macroinvertebrates were collected from multiple substrates (*e.g.* snags, leaf packs, vegetation) using discrete dipnet sweeps (qualitative samples, method modified from Plafkin *et al.* 1989). Benthic macroinvertebrates were sorted and identified to the lowest practical taxonomic level, usually species. Seven measures were calculated from benthic macroinvertebrate data to determine the effects of the discharge on receiving waters. These measures included: (1) taxa richness, (2) community composition, (3) functional feeding groups, (4) percent dominant taxon, (5) the Florida Index, (6) the number of Ephemeroptera, Plecoptera and Trichoptera (EPT) taxa, and (7) the Stream Condition Index (SCI). For a discussion of each biological measure and its potential relationship to Florida Administrative Code, see Appendix 5.

Statistical comparisons of the proportions of taxa, major groups or feeding groups were made using 95% confidence intervals on proportions. A 95% confidence interval is the range of values above and below a given proportion that has a 95% chance of containing the true proportion (Sokal and Rohlf 1995). If the 95% confidence intervals for two proportions do not overlap, then the proportion of X in sample 1 is significantly different from the proportion of X in sample 2 at $p<0.05$. A "$p<0.05$" level of significance means that there is less than a 5% chance that the true proportions in the two samples are the same. All comparisons that are labeled as significant in the text have a probability <0.05 that the proportions are the same.

Appendix 4

Chemical analysis of effluent and receiving water

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
3/17/2003 8:30	CITY BLANK	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
3/17/2003 8:30	CITY BLANK	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	1,4-Naphthoquinone	19	ug/L	UJ	19	76
3/17/2003 8:30	CITY BLANK	BNA-Water	1-Naphthylamine	9.5	ug/L	U	9.5	38
3/17/2003 8:30	CITY BLANK	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	2,4,5-Trichlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
3/17/2003 8:30	CITY BLANK	BNA-Water	2,4-Dinitrophenol	14	ug/L	UJ	14	57
3/17/2003 8:30	CITY BLANK	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2,6-Dichlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Acetylaminofluorene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Methylnaphthalene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Naphthylamine	9.5	ug/L	U	9.5	38
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Nitroaniline	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	2-Picoline	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
3/17/2003 8:30	CITY BLANK	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	UJ	19	76
3/17/2003 8:30	CITY BLANK	BNA-Water	3-Methylcholanthrene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	3-Nitroaniline	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	4-Aminobiphenyl	3.8	ug/L	U	3.8	15
3/17/2003 8:30	CITY BLANK	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	4-Chloroaniline	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	4-Nitroaniline	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
3/17/2003 8:30	CITY BLANK	BNA-Water	5-Nitro-o-toluidine	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Acetophenone	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	Aniline	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Benzidine	95	ug/L	U	95	380
3/17/2003 8:30	CITY BLANK	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Benzyl alcohol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
3/17/2003 8:30	CITY BLANK	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
3/17/2003 8:30	CITY BLANK	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
3/17/2003 8:30	CITY BLANK	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
3/17/2003 8:30	CITY BLANK	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Dibenzofuran	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
3/17/2003 8:30	CITY BLANK	BNA-Water	Dimethylaminoazobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Dinoseb	3.8	ug/L	U	3.8	15
3/17/2003 8:30	CITY BLANK	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	11
3/17/2003 8:30	CITY BLANK	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
3/17/2003 8:30	CITY BLANK	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
3/17/2003 8:30	CITY BLANK	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
3/17/2003 8:30	CITY BLANK	BNA-Water	Ethyl methanesulfonate	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
3/17/2003 8:30	CITY BLANK	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
3/17/2003 8:30	CITY BLANK	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
3/17/2003 8:30	CITY BLANK	BNA-Water	Hexachloropropene	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Isophorone	0.95	ug/L	UJ	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Isosafrole	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Methapyrilene	3.8	ug/L	UJ	3.8	15
3/17/2003 8:30	CITY BLANK	BNA-Water	Methyl methanesulfonate	0.95	ug/L	UJ	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosodi-n-butylamine	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosodiethylamine	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosomorpholine	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosopiperidine	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	UJ	19	76
3/17/2003 8:30	CITY BLANK	BNA-Water	Pentachlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
3/17/2003 8:30	CITY BLANK	BNA-Water	Pentachloronitrobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
3/17/2003 8:30	CITY BLANK	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	11
3/17/2003 8:30	CITY BLANK	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
3/17/2003 8:30	CITY BLANK	BNA-Water	Safrole	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
3/17/2003 8:30	CITY BLANK	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.6
3/17/2003 8:30	CITY BLANK	BNA-Water	o-Toluidine	0.95	ug/L	U	0.95	3.8
3/17/2003 8:30	CITY BLANK	GC-Water	Alachlor	0.57	ug/L	U	0.57	2.28
3/17/2003 8:30	CITY BLANK	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
3/17/2003 8:30	CITY BLANK	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
3/17/2003 8:30	CITY BLANK	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
3/17/2003 8:30	CITY BLANK	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
3/17/2003 8:30	CITY BLANK	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
3/17/2003 8:30	CITY BLANK	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
3/17/2003 8:30	CITY BLANK	GC-Water	Chlorpyrifos Methyl	0.095	ug/L	U	0.095	0.38
3/17/2003 8:30	CITY BLANK	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
3/17/2003 8:30	CITY BLANK	GC-Water	Ethion	0.048	ug/L	UJ	0.048	0.192
3/17/2003 8:30	CITY BLANK	GC-Water	Ethoprop	0.095	ug/L	U	0.095	0.38
3/17/2003 8:30	CITY BLANK	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
3/17/2003 8:30	CITY BLANK	GC-Water	Fonofos	0.095	ug/L	UJ	0.095	0.38
3/17/2003 8:30	CITY BLANK	GC-Water	Hexazinone	0.095	ug/L	U	0.095	0.38
3/17/2003 8:30	CITY BLANK	GC-Water	Malathion	0.14	ug/L	UJ	0.14	0.56
3/17/2003 8:30	CITY BLANK	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
3/17/2003 8:30	CITY BLANK	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
3/17/2003 8:30	CITY BLANK	GC-Water	Metribuzin	0.095	ug/L	U	0.095	0.38

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
3/17/2003 8:30	CITY BLANK	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
3/17/2003 8:30	CITY BLANK	GC-Water	Naled	0.76	ug/L	U	0.76	3.04
3/17/2003 8:30	CITY BLANK	GC-Water	Norflurazon	0.095	ug/L	U	0.095	0.38
3/17/2003 8:30	CITY BLANK	GC-Water	Parathion Ethyl	0.14	ug/L	UJ	0.14	0.56
3/17/2003 8:30	CITY BLANK	GC-Water	Parathion Methyl	0.095	ug/L	U	0.095	0.38
3/17/2003 8:30	CITY BLANK	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
3/17/2003 8:30	CITY BLANK	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
3/17/2003 8:30	CITY BLANK	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
3/17/2003 8:30	CITY BLANK	Metals-Water	Aluminum	10	ug/L	U	10	40
3/17/2003 8:30	CITY BLANK	Metals-Water	Arsenic	4	ug/L	U	4	16
3/17/2003 8:30	CITY BLANK	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
3/17/2003 8:30	CITY BLANK	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
3/17/2003 8:30	CITY BLANK	Metals-Water	Chromium	2	ug/L	U	2	8
3/17/2003 8:30	CITY BLANK	Metals-Water	Copper	0.75	ug/L	U	0.75	3
3/17/2003 8:30	CITY BLANK	Metals-Water	Iron	7	ug/L	U	7	28
3/17/2003 8:30	CITY BLANK	Metals-Water	Lead	0.1	ug/L	U	0.1	0.4
3/17/2003 8:30	CITY BLANK	Metals-Water	Magnesium	0.01	mg/L	U	0.01	0.04
3/17/2003 8:30	CITY BLANK	Metals-Water	Nickel	2	ug/L	U	2	8
3/17/2003 8:30	CITY BLANK	Metals-Water	Selenium	1	ug/L	U	1	4
3/17/2003 8:30	CITY BLANK	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
3/17/2003 8:30	CITY BLANK	Metals-Water	Zinc	4	ug/L	U	4	16
3/17/2003 8:30	CITY BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
3/17/2003 8:30	CITY BLANK	Nutrients-Liquid	NO2NO3-N	0.01	mg N/L	I	0.004	0.01
3/17/2003 8:30	CITY BLANK	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
3/17/2003 8:30	CITY BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
3/17/2003 8:30	CITY BLANK	Nutrients-Liquid	Total-P	0.015	mg P/L	U	0.015	0.04
3/17/2003 8:30	CITY BLANK	Overflow	COD	20	mg/L	U		
3/17/2003 9:40	CITY DOWNSTREAM	Bio-AGP/LimNut	Algal Growth Potential	13	mg DryWt/L		0.1	0.3
3/17/2003 9:40	CITY DOWNSTREAM	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
3/17/2003 9:40	CITY DOWNSTREAM	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
3/17/2003 9:40	CITY DOWNSTREAM	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	25	# Taxa			
3/17/2003 9:40	CITY DOWNSTREAM	Nutrients-Liquid	Ammonia-N	0.078	mg N/L		0.01	0.02
3/17/2003 9:40	CITY DOWNSTREAM	Nutrients-Liquid	NO2NO3-N	0.19	mg N/L		0.004	0.01
3/17/2003 9:40	CITY DOWNSTREAM	Nutrients-Liquid	N_KJEL_TOT	0.46	mg N/L	JA	0.06	0.2
3/17/2003 9:40	CITY DOWNSTREAM	Nutrients-Liquid	O-Phosphate-P	0.069	mg P/L		0.004	0.01
3/17/2003 9:40	CITY DOWNSTREAM	Nutrients-Liquid	Total-P	0.17	mg P/L	A	0.015	0.04
3/17/2003 9:40	CITY DOWNSTREAM	Overflow	COD		mg/L			
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1,4-Naphthoquinone	19	ug/L	UJ	19	76
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	1-Naphthylamine	9.5	ug/L	U	9.5	38
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,4,5-Trichlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,4-Dinitrophenol	14	ug/L	UJ	14	57
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,6-Dichlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Acetylaminofluorene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Methylnaphthalene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Naphthylamine	9.5	ug/L	U	9.5	38
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Nitroaniline	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	2-Picoline	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	UJ	19	76
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	3-Methylcholanthrene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	3-Nitroaniline	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4-Aminobiphenyl	3.8	ug/L	U	3.8	15
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4-Chloroaniline	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4-Nitroaniline	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	5-Nitro-o-toluidine	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Acetophenone	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Aniline	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Benzidine	95	ug/L	U	95	380
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Benzyl alcohol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Dibenzofuran	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Dimethylaminoazobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Dinoseb	3.8	ug/L	U	3.8	15
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Ethyl methanesulfonate	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Hexachloropropene	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Isophorone	0.95	ug/L	UJ	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Isosafrole	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Methapyrilene	3.8	ug/L	UJ	3.8	15
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Methyl methanesulfonate	0.95	ug/L	UJ	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosodi-n-butylamine	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosodiethylamine	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosomorpholine	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosopiperidine	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	UJ	19	76
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Pentachlorobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Pentachloronitrobenzene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	11
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	Safrole	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.6
3/17/2003 7:55	CITY EFFLUENT	BNA-Water	o-Toluidine	0.95	ug/L	U	0.95	3.8
3/17/2003 7:55	CITY EFFLUENT	Bio-AGP/LimNut	Algal Growth Potential	3.99	mg DryWt/L		0.1	0.3
3/17/2003 7:55	CITY EFFLUENT	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
3/17/2003 7:55	CITY EFFLUENT	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
3/17/2003 7:55	CITY EFFLUENT	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	LC50	L		
3/17/2003 7:55	CITY EFFLUENT	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	LC50	L		
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.32
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Bromacil	0.32	ug/L	I	0.19	0.76
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096	0.384
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Ethion	0.048	ug/L	UJ	0.048	0.192
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Ethoprop	0.096	ug/L	U	0.096	0.384
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Fonofos	0.096	ug/L	UJ	0.096	0.384
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Hexazinone	0.096	ug/L	U	0.096	0.384
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Malathion	0.14	ug/L	UJ	0.14	0.56
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Metribuzin	0.096	ug/L	U	0.096	0.384
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Naled	0.77	ug/L	U	0.77	3.08
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Norflurazon	0.096	ug/L	U	0.096	0.384
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Parathion Ethyl	0.14	ug/L	UJ	0.14	0.56
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096	0.384
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
3/17/2003 7:55	CITY EFFLUENT	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Aluminum	452	ug/L	A	10	40
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Arsenic	4	ug/L	U	4	16
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Calcium	18.5	mg/L	A	0.05	0.2
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Chromium	2	ug/L	U	2	8
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Copper	4.6	ug/L	I	0.75	3
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Iron	460	ug/L	A	7	28
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Lead	0.1	ug/L	I	0.1	0.4
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Magnesium	2.4	mg/L	A	0.01	0.04
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Nickel	2	ug/L	U	2	8
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Selenium	1	ug/L	U	1	4
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
3/17/2003 7:55	CITY EFFLUENT	Metals-Water	Zinc	4	ug/L	U	4	16
3/17/2003 7:55	CITY EFFLUENT	Nutrients-Liquid	Ammonia-N	0.23	mg N/L		0.01	0.02
3/17/2003 7:55	CITY EFFLUENT	Nutrients-Liquid	NO2NO3-N	0.087	mg N/L		0.004	0.01
3/17/2003 7:55	CITY EFFLUENT	Nutrients-Liquid	N_KJEL_TOT	0.44	mg N/L		0.06	0.2
3/17/2003 7:55	CITY EFFLUENT	Nutrients-Liquid	O-Phosphate-P	0.54	mg P/L		0.04	0.1
3/17/2003 7:55	CITY EFFLUENT	Nutrients-Liquid	Total-P	0.77	mg P/L		0.015	0.04
3/17/2003 7:55	CITY EFFLUENT	Overflow	COD	20	mg/L	U		

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
3/17/2003 10:05	CITY UPSTREAM	Bio-AGP/LimNut	Algal Growth Potential	11.3	mg DryWt/L		0.1	0.3
3/17/2003 10:05	CITY UPSTREAM	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
3/17/2003 10:05	CITY UPSTREAM	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
3/17/2003 10:05	CITY UPSTREAM	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	24	# Taxa			
3/17/2003 10:05	CITY UPSTREAM	Nutrients-Liquid	Ammonia-N	0.082	mg N/L		0.01	0.02
3/17/2003 10:05	CITY UPSTREAM	Nutrients-Liquid	NO2NO3-N	0.19	mg N/L		0.004	0.01
3/17/2003 10:05	CITY UPSTREAM	Nutrients-Liquid	N_KJEL_TOT	0.45	mg N/L	J	0.06	0.2
3/17/2003 10:05	CITY UPSTREAM	Nutrients-Liquid	O-Phosphate-P	0.061	mg P/L		0.004	0.01
3/17/2003 10:05	CITY UPSTREAM	Nutrients-Liquid	Total-P	0.11	mg P/L		0.015	0.04
3/17/2003 10:05	CITY UPSTREAM	Overflow	COD		mg/L			

Appendix 5

Explanation of Biological Measures

(1) Habitat Assessment:

Eight aspects of the physical structure and extent of disturbance are ranked, with 20 possible points for each factor (FDEP SOP FT 3100, based on Plafkin *et al.*, 1989 and Barbour and Stribling, 1994). The Habitat Assessment score includes types and amounts of benthic substrates, water velocity, amount of sand or silt accumulation, extent of artificial channelization, bank stability, and riparian zone width and vegetation type. All scores are summed to yield an overall Habitat Assessment score. Habitat Assessment score ranges from 11-160 and overall habitat quality is assigned to one of four categories: Optimal (120-160 points), Suboptimal (80-119 points), Marginal (40-79 points), and Poor (11-39 points).

(2) Effluent and Water Samples from Control and Test Sites

Algal Growth Potential (AGP): The effluent and water from control and test sites are autoclaved, filtered (0.45µm), inoculated with the unicellular green alga, *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum,* USEPA 2002*),* and incubated for 14 days. The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L (Miller *et al.* 1978). Raschke and Shultz (1987) found that an AGP above 5.0 mg dry weight/L represents a "problem" threshold for fresh receiving waters, implying nutrient enrichment. High AGP values may constitute one line of evidence for violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al.* 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of ± 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 11:1, nitrogen limitation of algal production is likely. When the N:P ratio is above 11:1, phosphorus limitation is likely. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may be a violation of 62-302.530(62) F.A.C..

(3) Algal Phytoplankton and Periphyton Assemblages

Chlorophyll *a* Content: Chlorophyll *a* content is measured in both phytoplankton and periphyton samples to estimate algal biomass (APHA 1992, modified from *Standard Methods* 10200H). High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may be a violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

Cell Density: Cell density is estimated as number/ml for phytoplankton samples and number/cm^2 for periphyton samples (APHA 1992, modified from *Standard Methods* 10200F and 10900G).

Taxa richness: Taxa richness is the number of distinct algal taxa present in a sample. Stress tends to reduce the number of different types of algae present in a sample, but moderate nutrient enrichment of nutrient poor waters may sometimes be correlated with increased algal taxa richness (Stevenson and Bahls 1999).

Community Composition: Shifts in relative proportions of major groups of algae downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Stevenson and Bahls 1999) and may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present with more equitable abundance among taxa (Magurran 1988). Low diversity scores related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

(4) Benthic Macroinvertebrate Assemblages

Taxa richness: Taxa richness is the number of distinct macroinvertebrate taxa present in a sample. Stress, habitat destruction and pollution tend to reduce the number of different types of organisms present (Karr and Chu 1998).

Decreases in taxa richness related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Percent Contribution of Dominant Taxon: Percent contribution of the dominant taxon is calculated by dividing the number of individuals in the most abundant taxa by the total number of individuals counted. Percent contribution of the dominant taxon tends to increase with increasing perturbation (Plafkin *et al.*, 1989). Increases in the percent contribution of the dominant taxon related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present in equitable abundance among taxa (Magurran 1988). A difference of 25% in Shannon-Weaver diversity between results from Hester-Dendy multiplate samplers incubated for 28 days at test and control sites constitutes a violation of 62-302.530(11) F.A.C..

The Florida Index: Some organisms become rare or absent as the intensity or duration of disturbance increases. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their ranked sensitivity to pollution (Beck 1954). A site with a high Florida Index score is considered healthy (Ross 1990). Decreases in Florida Index points related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Ephemeroptera/Plecoptera/Trichoptera (EPT) Taxa: This value is the number of EPT taxa present. More EPT taxa are usually present in unpolluted waters (Plafkin *et al.*, 1989, Wallace *et al.*, 1996). Decreases in the number of EPT taxa related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Community Composition: Shifts in proportions of major groups of organisms downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Karr and Chu 1998). Shifts in community composition related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Functional Feeding Groups: Environmental degradation may differentially affect groups of invertebrates based on how the group feeds (e.g. predators, deposit feeders, etc.). In Florida, pollution may be responsible for reducing the numbers of filter feeders (FDEP 1994) and shredders (EA Engineering 1994). Changes in the proportions of functional feeding groups related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

The Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric (Barbour *et al.* 1996a, b) developed for Florida. Using data from qualitative dipnet samples, the SCI assigns points to seven parameters, depending on how closely each parameter approaches an expected reference condition (Barbour *et al.* 1996a, b and FDEP SOP FS 7420, LT 7200). Points are summed to yield a final SCI score (range 7-33, depending on region and index period). Included in the calculation of SCI are taxa richness, number of EPT taxa, number of Chironomid taxa, percent contribution of the dominant taxon, the Florida Index, percent contribution of Diptera, and the percent contribution of suspension and filter feeders. Scores are broken into four ordinal groups: Excellent, Good, Poor and Very Poor. A decrease in ordinal SCI score from the Control to the Test site may be evidence of degradation related to a facility's effluent. An SCI score of "Poor" or "Very Poor" related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Appendix 6

Typical Values for Selected Parameters in Florida Waters

Percentile Distribution (1617 stations)

CONTROL SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Periphyton Chlorophyll *a* (mg/m^2)	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85	**ND**
Hester-Dendy Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90	**ND**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**ND**
Dipnet Taxa Richness	9	12	17	20	**22**	24.5	26	28	31	37	53	**22**
Total Kjeldahl Nitrogen	0.30	0.39	**0.56**	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.45**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	**0.11**	0.14	0.20	0.34	0.60	**0.082**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	**0.20**	0.32	0.64	1.05	**0.19**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	**0.13**	0.18	0.25	0.39	0.74	1.51	**0.11**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	**0.08**	0.11	0.17	0.27	0.59	1.37	**0.061**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**ND**

TEST SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Periphyton Chlorophyll *a* (mg/m^2)	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85	**ND**
Hester-Dendy Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90	**ND**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**ND**
Dipnet Taxa Richness	9	12	17	20	22	**24.5**	26	28	31	37	53	**24**
Total Kjeldahl Nitrogen	0.30	0.39	**0.56**	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.46**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	**0.08**	0.11	0.14	0.20	0.34	0.60	**0.078**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	**0.20**	0.32	0.64	1.05	**0.19**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	**0.18**	0.25	0.39	0.74	1.51	**0.17**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	**0.08**	0.11	0.17	0.27	0.59	1.37	**0.069**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**ND**

Taxa richness and diversity values are for benthic macroinvertebrates. Hester-Dendy sample= benthic macroinvertebrates collected from a standardized multi-plate sampler. Dipnet taxa richness = number of taxa collected in standardized dipnet sweep samples. Diversity = Shannon-Weaver H'. NTU = Nephelometric turbidity units. Adapted from Joe Hand, FDER, personal communication, 1991 (data collected 1980-1989). ND = No data.

Appendix 7

Additional physical, chemical, toxicological and microbiological results

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City Industries Ground Water Remediation (Sample #1), 3825 Forsyth Road, Winter Park, Orange County, Florida, NPDES# FL0043265, performed from 18 to 20 March 2003.

Facility:	**City Industries Ground Water Remediation (Sample #1)**	**NPDES #:**	**FL0043265**	Facility Type:	**Ground Water Remediation**	**Analysts:**	Jacquelyn Brynda
Location:	3825 Forsyth Road, Winter Park	Contact/District:	Kane/ Central				Joshua Ayres
County:	Orange	Test type:	static acute screen				James Daniels
Sample Collection Date:	3/17/2003 Time: 0755	# tests:	8	Receiving Waters:	Crane Strand Canal		Marshall Faircloth
Test Beginning Date:	3/18/2003 Time: 1500	Chlorination Type:	non-chlorinated		Union Park Canal		Christa Pierini
Test Ending Date:	3/20/2003 Time: 1400	FDEP SOP#:	TA07_01 / 02		Little Econlockhatchee River		
			Page 1 of 4			**Reviewer:**	Rob Buda

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours [A]Feeding: YCT/Algae
Chamber size: 30mL Food Batch #: 1 / 11

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[B] 0 hour	24 hour	48 hour	Dissolved Oxygen[E] 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/20	5	5	5	8.3	-	7.8	24.4	-	24.6	7.9	-	7.4	185	180
Control B	0/20	5	5	5	-	-	7.8	-	-	24.5	-	-	7.4	-	195
Control C	0/20	5	5	5	-	-	7.8	-	-	24.6	-	-	7.3	-	190
Control D	0/20	5	5	5	-	-	7.8	-	-	24.4	-	-	7.3	-	200
100% A	20/0	5	5	5	7.7	-	7.7	24.0	-	24.5	7.9	-	7.4	165	175
100% B	20/0	5	5	5	-	-	7.7	-	-	24.4	-	-	7.3	-	180
100% C	20/0	5	5	5	-	-	7.7	-	-	24.3	-	-	7.1	-	180
100% D	20/0	5	5	5	-	-	7.7	-	-	24.2	-	-	7.1	-	185

[A] Organisms fed prior to testing.

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 25.0-27.5°C.

LIMS	
Job number:	TLH-2003-03-18-05-01
sample number:	660271

Data Transcription Verification	
date:	6/19/2003
by:	Cathy Oaks
	Travis Hill

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (fish):	<0.017	<0.017
Control water (water flea):	<0.017	<0.017
100% Sample:	0.084	0.003

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	142	135
Control water (water flea):	80	80
100% Sample:	50	55

Organism: ***Cyprinella leedsi*** Life stage: 5 days [C]Feeding: artemia
Chamber size: 1L

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[D] 0 hour	24 hour	48 hour	Dissolved Oxygen[E] 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/500	5	5	5	7.8	8.1	8.4	25.5	24.2	24.9	6.9	7.5	7.6	270	280
Control B	0/500	5	5	5	7.8	8.2	8.4	25.4	24.0	25.2	7.1	7.6	7.6	275	290
Control C	0/500	5	5	5	7.8	8.2	8.4	25.5	23.8	25.2	7.1	7.6	7.6	280	290
Control D	0/500	5	5	5	7.8	8.2	8.4	25.4	23.7	24.5	7.0	7.7	7.7	280	290
100% A	500/0	5	5	5	7.6	8.2	8.0	24.8	23.9	25.5	7.4	7.7	7.2	175	190
100% B	500/0	5	5	5	7.6	8.1	8.0	24.7	23.6	24.4	7.6	7.7	7.4	165	180
100 % C	500/0	5	5	5	7.5	8.0	7.9	24.6	23.6	24.9	7.9	7.8	7.2	165	190
100% D	500/0	5	5	5	7.5	7.9	7.9	24.6	23.8	24.4	8.0	7.8	7.7	170	190

[C] Organisms fed prior to testing.

[D] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 25.0-27.5°C.

[E] Sampe was aerated before test initiation to decrease the dissolved oxygen below 9.0mg/L.

Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

Continued

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City Industries Ground Water Remediation (Sample #2), 3825 Forsyth Road, Winter Park, Orange County, Florida, NPDES# FL0043265, performed from 18 to 20 March 2003.

Facility:	**City Industries Ground Water Remediation (Sample #2)**	**NPDES #:**	**FL0043265**	Facility Type:	**Ground Water Remediation**	**Analysts:**	Jacquelyn Brynda
		Contact/District:	Kane/ Central				Joshua Ayres
Location:	3825 Forsyth Road, Winter Park	Test type:	static acute screen				James Daniels
County:	Orange	# tests:	8	Receiving Waters:	Crane Strand Canal		Marshall Faircloth
Sample Collection Date:	3/17/2003 Time: 0755	Chlorination Type:	non-chlorinated		Union Park Canal		Christa Pierini
Test Beginning Date:	3/18/2003 Time: 1500	FDEP SOP#:	TA07_01 / 02		Little Econlockhatchee River		
Test Ending Date:	3/20/2003 Time: 1400				**Page 2 of 4**	**Reviewer:**	Rob Buda

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours [A]Feeding: YCT/Algae Chamber size: 30mL Food Batch #: 1 / 11

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen[E]			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/20	5	5	5	8.3	-	7.9	23.7	-	24.5	8.0	-	7.2	175	195
Control B	0/20	5	5	5	-	-	7.9	-	-	24.4	-	-	7.2	-	200
Control C	0/20	5	5	5	-	-	7.9	-	-	24.4	-	-	7.2	-	200
Control D	0/20	5	5	5	-	-	7.9	-	-	24.4	-	-	7.1	-	195
100% A	20/0	5	5	5	7.7	-	7.6	23.9	-	24.5	8.0	-	6.9	165	185
100% B	20/0	5	5	5	-	-	7.6	-	-	24.5	-	-	6.9	-	190
100% C	20/0	5	5	5	-	-	7.6	-	-	24.5	-	-	6.8	-	190
100% D	20/0	5	5	5	-	-	7.6	-	-	24.2	-	-	6.9	-	195

[A] Organisms fed prior to testing.

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 25.0-27.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 5 days [C]Feeding: artemia Chamber size: 1L

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[D]			Dissolved Oxygen[E]			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	7.9	8.2	8.4	25.1	24.1	24.3	7.9	7.6	7.7	260	275
Control B	0/500	5	5	5	7.9	8.3	8.4	25.1	23.8	24.7	7.5	7.8	7.8	270	280
Control C	0/500	5	5	5	7.9	8.3	8.4	25.1	23.8	25.1	7.5	7.7	7.6	270	295
Control D	0/500	5	5	5	7.9	8.3	8.5	25.3	23.7	26.1	7.4	7.7	7.6	270	310
100% A	500/0	5	5	5	7.8	7.9	7.9	24.6	23.9	25.1	7.5	7.7	7.8	175	190
100% B	500/0	5	5	5	7.8	7.8	7.9	24.5	23.8	25.5	7.7	7.8	7.5	170	195
100 % C	500/0	5	5	5	7.8	7.8	7.9	24.6	23.6	25.2	7.8	7.7	7.4	180	190
100% D	500/0	5	5	5	7.8	7.8	7.9	24.6	23.7	24.5	7.8	7.7	7.5	175	190

[C] Organisms fed prior to testing.

[D] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 25.0-27.5°C.

[E] Sampe was aerated before test initiation to decrease the dissolved oxygen below 9.0mg/L.

Continued

LIMS	
Job number:	TLH-2003-03-18-05-02
sample number:	660433

Data Transcription Verification	
date:	6/19/2003
by:	Cathy Oaks
	Travis Hill

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (fish):	<0.017	<0.017
Control water (water flea):	<0.017	<0.017
100% Sample:	0.066	0.002

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	142	135
Control water (water flea):	80	80
100% Sample:	49	55

Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City Industries Ground Water Remediation (Sample #3), 3825 Forsyth Road, Winter Park, Orange County, Florida, NPDES# FL0043265, performed from 18 to 20 March 2003.

Facility:	**City Industries Ground Water Remediation (Sample #3)**	**NPDES #:**	**FL0043265**	Facility Type:	**Ground Water Remediation**	**Analysts:**	Jacquelyn Brynda
		Contact/District:	Kane/ Central				Joshua Ayres
Location:	3825 Forsyth Road, Winter Park	Test type:	static acute screen				James Daniels
County:	Orange	# tests:	8	Receiving Waters:	Crane Strand Canal		Marshall Faircloth
Sample Collection Date:	3/17/2003 Time: 0755	Chlorination Type:	non-chlorinated		Union Park Canal		Christa Pierini
Test Beginning Date:	3/18/2003 Time: 1500	FDEP SOP#:	TA07_01 / 02		Little Econlockhatchee River		
Test Ending Date:	3/20/2003 Time: 1400				**Page 3 of 4**	**Reviewer:**	Rob Buda

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours [A]Feeding: YCT/Algae
Chamber size: 30mL Food Batch #: 1 / 11

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[B] 0 hour	24 hour	48 hour	Dissolved Oxygen[B] 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/20	5	5	5	8.3	-	8.0	23.8	-	24.8	8.0	-	7.4	175	190
Control B	0/20	5	5	5	-	-	8.0	-	-	24.6	-	-	7.3	-	195
Control C	0/20	5	5	5	-	-	8.0	-	-	24.5	-	-	7.3	-	200
Control D	0/20	5	5	5	-	-	8.0	-	-	24.3	-	-	7.4	-	205
100% A	20/0	5	5	5	7.4	-	7.7	24.0	-	24.6	8.1	-	7.4	170	180
100% B	20/0	5	5	5	-	-	7.7	-	-	24.5	-	-	7.2	-	180
100% C	20/0	5	5	5	-	-	7.7	-	-	24.5	-	-	7.0	-	190
100% D	20/0	5	5	5	-	-	7.7	-	-	24.4	-	-	7.1	-	195

[A] Organisms fed prior to testing.

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 25.0-27.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 5 days [C]Feeding: artemia
Chamber size: 1L

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[D] 0 hour	24 hour	48 hour	Dissolved Oxygen[E] 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/500	5	5	5	7.9	8.2	8.4	25.1	24.4	24.5	7.6	7.7	7.5	265	280
Control B	0/500	5	5	5	7.9	8.2	8.4	25.4	24.2	24.7	6.8	7.6	7.7	270	290
Control C	0/500	5	5	5	7.9	8.2	8.4	25.2	24.3	25.5	7.1	7.6	7.5	270	295
Control D	0/500	5	5	5	7.9	8.1	8.4	25.2	24.2	25.3	7.3	7.5	7.4	275	290
100% A	500/0	5	5	5	7.3	7.6	7.9	24.9	24.0	24.5	7.5	7.4	7.4	175	190
100% B	500/0	5	5	5	7.2	7.6	7.9	24.9	24.1	26.1	8.3	7.8	7.4	170	190
100 % C	500/0	5	5	5	7.2	7.6	7.9	24.9	24.0	24.7	8.4	7.8	7.3	170	190
100% D	500/0	5	5	5	7.2	7.6	7.9	24.9	24.5	25.1	8.5	7.9	7.4	170	190

[C] Organisms fed prior to testing.

[D] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 25.0-27.5°C.

[E] Sampe was aerated before test initiation to decrease the dissolved oxygen below 9.0mg/L.

Continued

LIMS	
Job number:	TLH-2003-03-18-05-03
sample number:	660434

Data Transcription Verification	
date:	6/19/2003
by:	Cathy Oaks
	Travis Hill

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (fish):	<0.017	<0.017
Control water (water flea):	<0.017	<0.017
100% Sample:	0.056	0.001

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	142	135
Control water (water flea):	80	80
100% Sample:	48	56

Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

Table 1. Concluded — Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City Industries Ground Water Remediation (Sample #4), 3825 Forsyth Road, Winter Park, Orange County, Florida, NPDES# FL0043265, performed from 18 to 20 March 2003.

Facility:	**City Industries Ground Water Remediation (Sample #4)**	**NPDES #:**	**FL0043265**	Facility Type:	**Ground Water Remediation**	**Analysts:**	Jacquelyn Brynda
		Contact/District:	Kane/ Central				Joshua Ayres
Location:	3825 Forsyth Road, Winter Park	Test type:	static acute screen				James Daniels
County:	Orange	# tests:	8	Receiving Waters:	Crane Strand Canal		Marshall Faircloth
Sample Collection Date:	3/17/2003 Time: 0755	Chlorination Type:	non-chlorinated		Union Park Canal		Christa Pierini
Test Beginning Date:	3/18/2003 Time: 1500	FDEP SOP#:	TA07_01 / 02		Little Econlockhatchee River		
Test Ending Date:	3/20/2003 Time: 1400				**Page 4 of 4**	**Reviewer:**	Rob Buda

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours [A]Feeding: YCT/Algae Conductivity Uncorrected

Chamber size: 30mL Food Batch #: 1 / 11

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen[E]			µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/20	5	5	5	8.4	-	8.1	24.1	-	24.6	8.2	-	7.5	175	205
Control B	0/20	5	5	5	-	-	8.1	-	-	24.6	-	-	7.6	-	250
Control C	0/20	5	5	5	-	-	8.1	-	-	24.6	-	-	7.6	-	220
Control D	0/20	5	5	5	-	-	8.1	-	-	24.6	-	-	7.6	-	210
100% A	20/0	5	5	5	7.6	-	7.7	24.3	-	24.7	8.1	-	7.4	170	210
100% B	20/0	5	5	5	-	-	7.7	-	-	24.8	-	-	7.2	-	200
100% C	20/0	5	5	5	-	-	7.7	-	-	24.7	-	-	6.9	-	200
100% D	20/0	5	5	5	-	-	7.7	-	-	24.6	-	-	6.9	-	195

[A] Organisms fed prior to testing.

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 25.0-27.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 5 days [C]Feeding: artemia Conductivity Uncorrected

Chamber size: 1L

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[D]			Dissolved Oxygen[E]			µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	7.9	8.2	8.4	25.2	24.7	24.3	8.5	7.8	7.6	260	280
Control B	0/500	5	5	5	7.9	8.2	8.4	25.1	24.4	24.8	7.8	7.7	7.7	270	300
Control C	0/500	5	5	5	7.9	8.2	8.4	25.1	24.0	25.3	7.6	7.6	7.4	270	290
Control D	0/500	5	5	5	7.9	8.2	8.4	25.0	24.3	25.0	7.7	7.6	7.2	270	295
100% A	500/0	5	5	5	7.8	7.9	7.9	25.1	24.1	24.3	7.6	7.6	7.5	175	190
100% B	500/0	5	5	5	7.8	7.9	7.9	25.0	24.2	24.6	7.7	7.7	7.6	170	185
100 % C	500/0	5	5	5	7.8	7.8	7.9	25.0	24.2	24.9	7.7	7.6	7.4	170	185
100% D	500/0	5	5	5	7.7	7.8	7.9	25.1	24.1	25.9	7.8	7.7	7.2	170	190

[C] Organisms fed prior to testing.

[D] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 25.0-27.5°C.

[E] Sampe was aerated before test initiation to decrease the dissolved oxygen below 9.0mg/L.

LIMS	
Job number:	TLH-2003-03-18-05-04
sample number:	660435

Data Transcription Verification	
date:	6/19/2003
by:	Cathy Oaks
	Travis Hill

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (fish):	<0.017	<0.017
Control water (water flea):	<0.017	<0.017
100% Sample:	0.055	0.001

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	142	135
Control water (water flea):	80	80
100% Sample:	48	56

Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
CENTRAL DISTRICT

Date: June 11, 2003
To: P. Kane
From: Donald P. Smith
Subject: City Industries

LABORATORY ANALYSIS REPORT

Sample Date: March 17, 2003
Collected by: P. Kane, S. Kent

Parameter	Analytical Method	Laboratory Number	Site	Field ID	Analysis Result	Unit	Code
CBOD	SM5210B	17806cod	City Industries Groundwatrer remedation Discharge Point		2	mg/L	U
TSS	160.2	17806tss	City Industries Groundwatrer remedation Discharge Point		1	mg/L	U
FC	SM 9222d	17806fc	City Industries Groundwatrer remedation Discharge Point		1	Colonies/100ml	U
CBOD	SM5210B	17807cod	City Industries Groundwatrer remedation Discharge Point	10 m downstream	2.2	mg/L	I
TSS	160.2	17807tss	City Industries Groundwatrer remedation Discharge Point	10 m downstream	7.8	mg/L	A
FC	SM 9222d	17807fc	City Industries Groundwatrer remedation Discharge Point	10 m downstream	3133	Colonies/100ml	A B
CBOD	SM5210B	17808cod	City Industries Groundwatrer remedation Discharge Point	10 m upstream	4	mg/L	I
TSS	160.2	17808tss	City Industries Groundwatrer remedation Discharge Point	10 m upstream	6.3	mg/L	
FC	SM 9222d	17808fc	City Industries Groundwatrer remedation Discharge Point	10 m upstream	3300	Colonies/100ml	B

Codes
A - Value reported is the mean of two or more determinations.
B - Results based on colony counts outside of the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practcal quantitation limit.
J - Estimated value.
L - Actual value is known to be greater than the value given.
Q - Sample held beyond normal holding time.
U - Material was analyzed for but not detected. The value reported is the minimum detection limit.
Z - Colonies were too numerous to count (TNTC).

Appendix 8

Habitat Assessment Field Sheets.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-90)

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDEP	STORET STATION NUMBER:	DATE (M/D/Y): 03/17/03	TIME: 1100	RECEIVING BODY OF WATER: ECONLOCKATHACHEE R IV

REMARKS:	COUNTY: ORANGE	LOCATION: UPSTREAM CITY CRANE STRAND @ INDUSTRIES	FIELD ID NAME: CITY UPSTREAM

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
10				~~50~~ PK	50	40	

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

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

Width of riparian vegetation (m) on least buffered side: 0

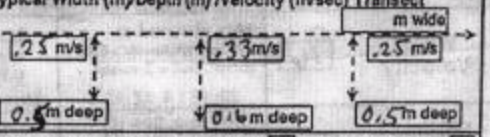
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposition: Sludge: ☐ Sand smothering: none slight moderate severe Silt smothering: none slight moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand	60		
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation	40	15	NET	Other:			
Rock or Shell Rubble				Other:		5	NET
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.5	21.25	6.84	5.86	154			TO BOTTOM
Bottom								

System Type: Stream: ☒ (1st, 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

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

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

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

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

Weather Conditions/Notes: CLOUDY AFTER RAIN NIGHT BEFORE

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

SAMPLING TEAM: KANE, KENT	SIGNATURE: Phil Kane	DATE: 03/17/03

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (5-27-98)

SUBMITTING AGENCY CODE: 36	STORET STATION NUMBER:	DATE SAMPLED: 03/17/03	RECEIVING BODY OF WATER: ECON RIVER
SUBMITTING AGENCY NAME: FDEP			

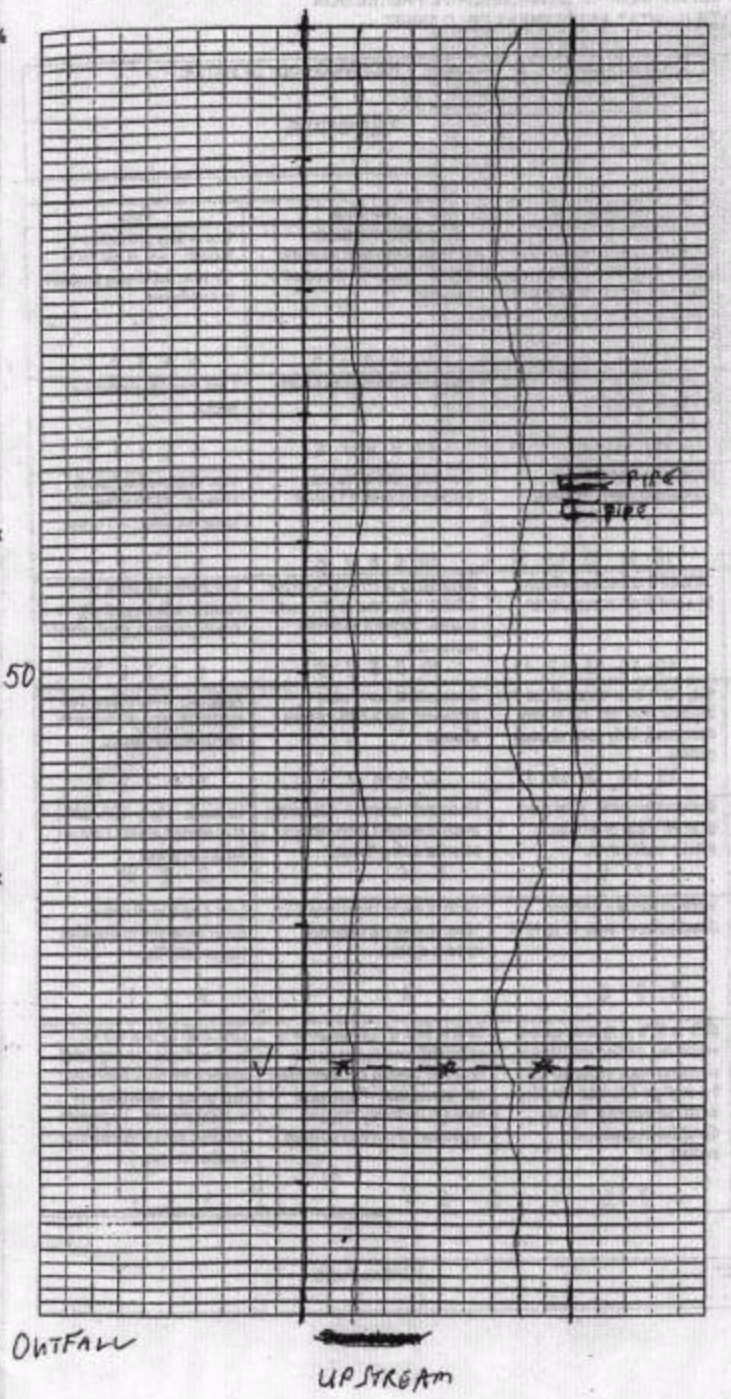
REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
EPA REMEDIATION	ORANGE	CRANE STRAN @ CITY INDU	

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components				
Substrate Diversity [5]	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability [15]	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15 % productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity [16]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Habitat Smothering [15]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Primary Score [51]				
Secondary Habitat Components				
Artificial Channelization [3]	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability				
Right Bank [1]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Left Bank [6]				
Riparian Buffer Zone Width				
Right Bank [1]	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12 m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Left Bank [9]				
Riparian Zone Vegetation Quality				
Right Bank [1]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1
Left Bank [6]				
Secondary Score 21 ~~78~~ PK				

[78] TOTAL SCORE

ANALYSIS DATE: 03/17/03	ANALYST: KANE, KENT	SIGNATURE: Phil Kane

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (December 11, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

- [ ] Snags
- [ ] Roots/undercut banks
- [ ] Leaf Packs (or mats)
- [x] Macrophytes
- [ ] _____
- [ ] _____
- [ ] _____

Velocity:
Note where velocity measures were taken.

Habitat Smothering:
Note areas (on map) where sand or silt is smothering substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed/other notes:

TERRESTRIAL
PIGWEED
NETTLES
LANTANA
ELDERBERRY
CAMPHOR TREE
CHINA BERRY TREE
CAROLINA LAUREL CHERRY
POND CYPRESS
FERNS
PALMETTOS
GRAPE VINE
VIRGINIA CREEPER
MAPLE
CHINESE TALLOW

AQUATIC
ALLIGATOR WEED
ALLEGENDIUM
PICKEREL WEED
GRASS SPECIES
TYPHA

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-90)

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDEP	STORET STATION NUMBER:	DATE (M/D/Y): 03/17/03	TIME: 1010	RECEIVING BODY OF WATER: ECONLOCKHATCHEE R.

REMARKS:	COUNTY: ORANGE	LOCATION: DOWNSTREAM CITY CRANE STRAND @ INDUSTRIES	FIELD NAME: CITY DOWNSTREAM

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
10				~~50~~ FR	50	40	

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

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

Width of riparian vegetation (m) on least buffered side: 0

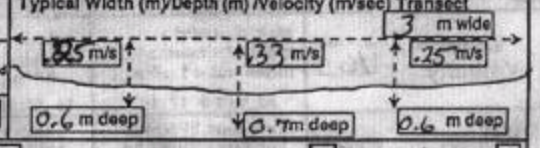
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark: 0.5 (m above present water level) + 0.6 (present depth in m) = 1.1 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposition: Sludge: ☐ Sand smothering: none slight moderate severe Silt smothering: none slight moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand	60		
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation	40	5	NET	Other:			
Rock or Shell Rubble				Other:		5	NET
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.5	22.27	7.01	6.02	154			TO BOTTOM
Bottom								

System Type: Stream: ☒ (1st, 2nd order; 3rd - 4th order; 5th - 6th order; 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

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

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

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

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

Weather Conditions/Notes: CLOUDY AFTER RAIN NIGHT BEFORE

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

SAMPLING TEAM: KANE, KENT SIGNATURE: Phil Kane DATE: 03/17/03

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (5-27-98)

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDEP	STORET STATION NUMBER:	DATE (M/D/Y): 03/17/03	RECEIVING BODY OF WATER: ECON RIVER

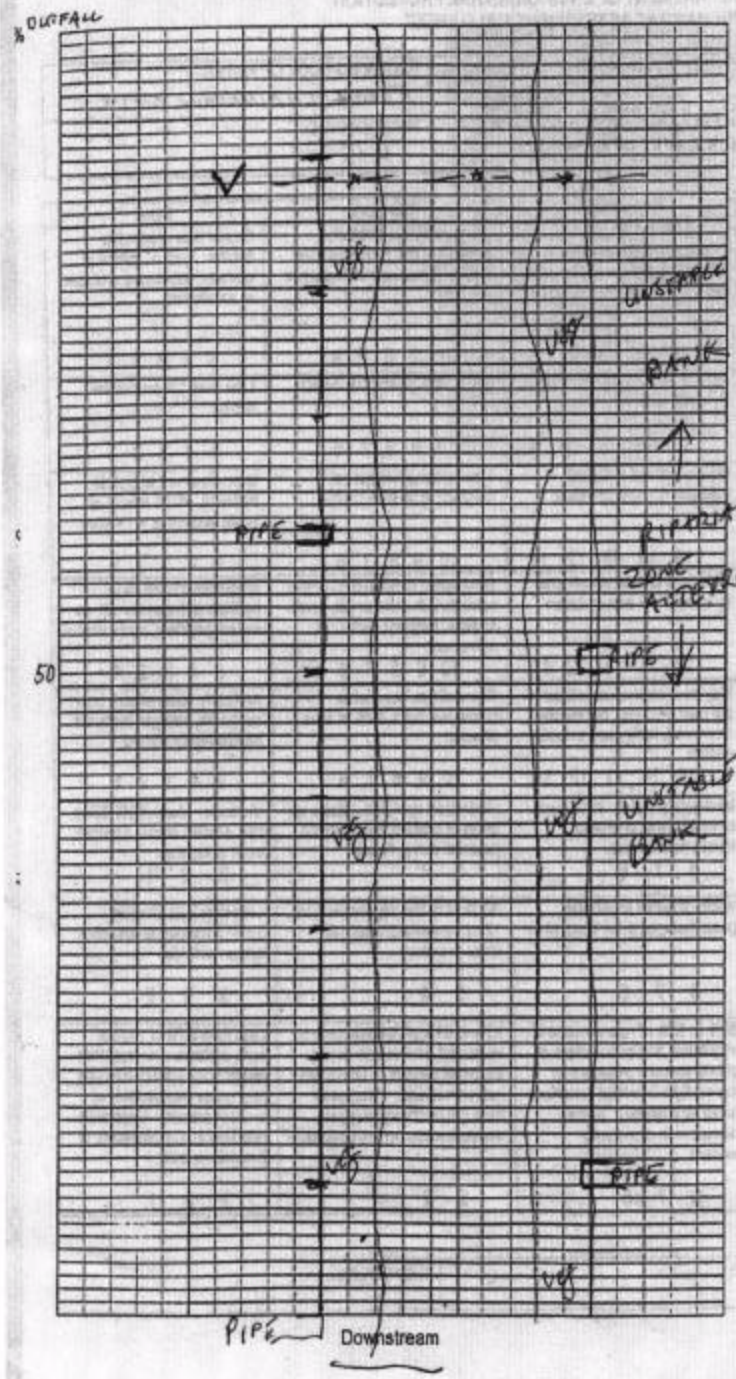
REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
EPA REMEDIATION	ORANGE	CRANE STRAN @ CITY IND	

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity [5]	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. (5) 4 3 2 1
Substrate Availability [15]	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15 % productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity [16]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Habitat Smothering [15]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Primary Score [51]				
Secondary Habitat Components Artificial Channelization [3]	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank [1] Left Bank [6]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 (6)	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank [1] Left Bank [8]	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12 m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank [1] Left Bank [5]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1
Secondary Score [25]				

TOTAL SCORE [76]

ANALYSIS DATE:	ANALYST:	SIGNATURE:
03/17/03	RANE, KENT	Kent Rane

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (December 11, 2001)
Length of grid represents 100 m of stream (not linear-meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

- ☐ Snags
- ☐ Roots/undercut banks
- ☐ Leaf Packs (or mats)
- ☑ Macrophytes
- ☐ _____
- ☐ _____
- ☐ _____

Velocity:
Note where velocity measures were taken.

Habitat Smothering:
Note areas (on map) where sand or silt is smothering substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed/other notes:

TERRESTRIAL
PIGWEED
NETTLES
LANTANA
ELDERBERRY
CAMPHOR TREE
CHINA BERRY TREE
CAROLINA LAUREL CHERRY
POND CYPRESS
FERNS
PALMETTOS

AQUATIC
ALLIGATOR WEED
AUREN PIUM
PICKEREL WEED
GRASS SPECIES

Appendix 9a

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of City Industries (March 17, 2003). Taxa list and number of individuals counted (collapsed). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

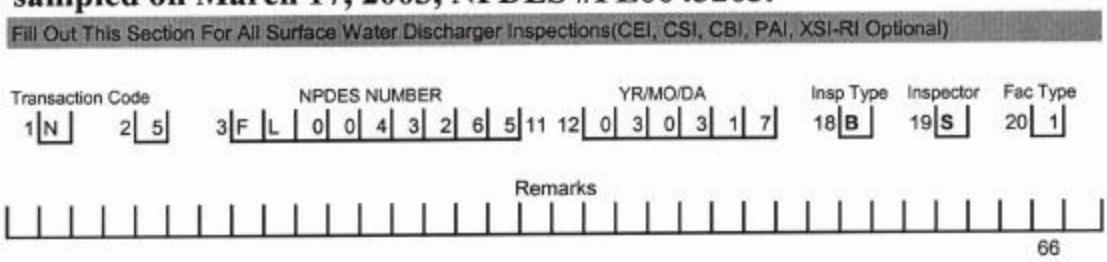
	Control Site	Test Site
Annelida		
Hirudinea		
Helobdella triserialis	-	3
Oligochaeta		
Enchytraeidae	-	1
Limnodrilus sp.	-	3
Limnodrilus hoffmeisteri	4	-
Nais communis complex	5	3
Pristinella jenkinae	-	1
Slavina appendiculata	-	2
Stylaria lacustris	4	5
Arthropoda		
Arachnida		
Hygrobates sp.	1	-
Oribatei sp.	1	-
Crustacea		
Hyalella azteca	7	10
Insecta		
Diptera		
Ablabesmyia mallochi	4	4
Ablabesmyia rhamphe grp.	2	-
Ceratopogonidae	1	-
Chironomus sp.	-	1
Cryptochironomus sp.	-	1
Hemerodromia sp.	1	-
Labrundinia pilosella	2	-
Paratanytarsus sp.	3	-
Polypedilum illinoense grp.	12	17
Polypedilum scalaenum grp.	3	4
Rheotanytarsus exiguus	1	1
Sciomyzidae	-	1
Thienemanniella sp.	-	1
Ephemeroptera		
Baetis intercalaris	1	-
Lepidoptera		
Parapoynx sp.	3	-
Pyralidae	-	4
Trichoptera		
Cheumatopsyche sp.	1	1
Zygoptera		
Enallagma sp.	2	2
Mollusca		
Bivalvia		
Corbicula fluminea	1	3
Sphaeriidae	3	1
Gastropoda		
Ancylidae	58	44
Hydrobiidae	-	1
Nemertea		
Prostoma sp.	-	1

Appendix 9b

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of City Industries (March 17, 2003). Taxa list and number of individuals counted.

	Control Site	Test Site
Annelida		
Hirudinea		
Glossiphoniidae	-	2
Helobdella triserialis	-	1
Oligochaeta		
Enchytraeidae	-	1
Limnodrilus sp.	-	3
Limnodrilus hoffmeisteri	4	-
Nais communis complex	5	3
Pristinella jenkinae	-	1
Slavina appendiculata	-	2
Stylaria lacustris	4	5
Arthropoda		
Arachnida		
Hygrobates sp.	1	-
Oribatei sp.	1	-
Crustacea		
Amphipoda	1	-
Hyalella azteca	6	10
Insecta		
Diptera		
Ablabesmyia mallochi	2	1
Ablabesmyia rhamphe grp.	1	-
Ceratopogonidae	1	-
Chironomidae	4	3
Chironomus sp.	-	1
Cryptochironomus sp.	-	1
Diptera	-	1
Hemerodromia sp.	1	-
Labrundinia pilosella	1	-
Paratanytarsus sp.	3	-
Polypedilum illinoense grp.	12	16
Polypedilum scalaenum grp.	3	4
Rheotanytarsus exiguus	1	1
Sciomyzidae	-	1
Thienemanniella sp.	-	1
Ephemeroptera		
Baetis intercalaris	1	-
Lepidoptera		
Parapoynx sp.	3	-
Pyralidae	-	4
Trichoptera		
Cheumatopsyche sp.	1	1
Zygoptera		
Coenagrionidae	1	-
Enallagma sp.	1	2
Mollusca		
Bivalvia		
Corbicula fluminea	1	3
Sphaeriidae	3	1
Gastropoda		
Ancylidae	57	43
Gastropoda	1	1
Hydrobiidae	-	1
Nemertea		
Prostoma sp.	-	1

The Bioassay of City Industries Ground Water Remediation effluent sampled on March 17, 2003, NPDES #FL0043265.



The Priority Pollutants Analysis for Bioassay of City Industries Ground Water Remediation effluent sampled on March 17, 2003, NPDES #FL0043265.

