

Biological Assessment of

U.S. Agri-Chemicals Corporation
Fort Meade Chemical Complex

Polk County

NPDES #FL0001902

January 13, 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:	US Agri-Chemcials Corporation Fort Meade Chemical Complex
County:	Polk
NPDES Number:	FL0001902
Permit Expiration:	9/15/03

Toxics Sampling Inspection **(XSI)**

Date Sampled: January 13, 2003

Results: No organic pollutants were detected in the effluent. Aluminum and iron were detected in the effluent at levels that did not exceed the Class III Water Quality Criteria (FAC 62-302). Cadmium was detected in the effluent at a level (0.027 µg/L) below the minimum quantitation limit, and at or above the minimum detection limit.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: January 13, 2003

Results: To perform a 7-day chronic bioassay analysis, samples must be collected on alternating days. This requirement was not sufficiently met; therefore the 7-day chronic toxicity bioassays were invalidated. However, for informational purposes, the effluent did not show toxicity for the fish species, *Pimephales promelas*; and there was no mortality for the invertebrate species, *Ceriodaphnia dubia*, for a 120-hour exposure period to 100% effluent.

Water Quality Inspection **(WQI)**

Date Sampled: January 13, 2003

Results: Fecal and total coliform bacteria samples were not collected in this inspection. Total phosphorus concentration was 8.5 times greater and orthophosphate concentration was 12 times greater at the Test Site compared to Control Site concentrations. These levels are greater than 95% of typical Florida streams. Test Site levels of these nutrients were almost identical to effluent levels, indicating that the effluent is responsible for the extremely elevated levels of phosphorus below the discharge. In contrast, ammonia and TKN concentrations at the Test Site were below 10% of typical Florida streams. The difference in available nitrogen and phosphorus in this system indicates that it is nitrogen limited. Any addition of nitrogen could cause the algal community to plunge into imbalance. The Control Site AGP value was 9.33 mg dry wt/L, above the "problem" threshold, while the Test Site AGP value was 3.0 mg dry wt/L and the effluent value was 1.9 mg dry wt/L. Chlorophyll-*a* concentrations in the effluent (23 µg/L) and Test Site (30 µg/L) water samples were much higher than that of the Control Site sample (4.8 µg/L).

Impact Bioassessment Inspection **(IBI)**

Date Sampled: January 13, 2003

Results: Quantitative macroinvertebrate samples indicated impairment at the Test Site compared to the Control Site. The Control Site Shannon-Weaver diversity score was 2.71 and the Test Site score was 1.92. The Test Site score is 29% lower than the Control Site score or a change to less than 75% of background (71%), which is an exceedance of the Biological Integrity Criterion (62-302.530(11) F.A.C.).

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 U.S. Agri-Chemicals Corporation Fort Meade Chemical Complex is located in Polk County, Florida (Appendix 1). It is a phosphate fertilizer and chemical manufacturing plant. Activities at this facility include the manufacturing of sulfuric acid, phosphoric acid, monoammonium phosphate and fluosilic acid, the storing of phosphogypsum process material, and the handling and shipping of the plant's products. Treatment of non-process (non-contact) wastewater and stormwater is achieved by routing the water to an inactive mine pit located east of the plant site where the wastewater settles and is filtered and polished in the mine cut prior to discharge. Process (contact) wastewater is double lime treated and settled in a two-treatment pond system located at the plant site. This treatment is typically used on an emergency only basis. There has been no contact process wastewater treated or discharged at this facility for the previous 10-year period (see Facility Summary in Appendix 2). This facility has four permitted discharges, three treated (Outfall 002, Outfall 003, Outfall 004) and one stormwater (Outfall 007). This investigation only includes data from Outfall 004, because it was the only outfall discharging at the time of inspection. The treated effluent from Outfall 004 is continuously discharged into a tributary of McCullough Creek. The mean flow of the wastewater system is 5.26 million gallons per day (MGD), while the actual flow during this survey was 4.5 MGD (see Facility Summary in Appendix 2).

Surface Water Quality Criteria and facility permit limits are listed in Table 1. According to the facility's monthly discharge monitoring reports, the plant has had no permit limit violations in the last year (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 (an upstream monitoring station the facility uses located in McCullough Creek) and a test site (located in a tributary leading to McCullough Creek approximately 15 meters downstream of Outfall 004's discharge). The effluent dominated the water sampled at the Test Site. 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: Bonnie Hall (FDEP Phosphate Management) and Brian Irsch (FDEP Southwest 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. Aluminum and iron were detected in the effluent at levels that complied with Class III Water Quality Criteria (FAC 62-302). No organic pollutants were detected in the effluent. Effluent conductivity (µmhos/cm), pH (Standard Units) and dissolved oxygen (mg/L) complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits.
- Habitat assessment scores were 103 at the Control Site and 112 at the Test Site (Table 1, data sheets in Appendix 7). The Test Site scored higher for having less habitat smothering, greater water velocity, and less stream channelization. The addition of the facility's effluent to McCullough Creek was associated with a five-fold increase in stream flow.
- Dissolved oxygen (DO as mg/L), 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.). However, the Test Site (795 µmhos/cm) conductivity was more than twice that measured at the Control Site (306 µmhos/cm). This increase in conductivity was attributable to the facility's effluent (796 µmhos/cm).
- To perform a 7-day chronic bioassay analysis, samples must be collected on alternating days to allow for proper renewal. Due to the lack of a valid third sample being received, this requirement was not sufficiently met; therefore the 7-day chronic toxicity bioassays were invalidated. For informational purposes, the effluent did not show toxicity for the fish species, *Pimephales promelas*, during a seven-day exposure period done without sample renewal. The toxicity test for the invertebrate species, *Ceriodaphnia dubia*, was ended on day five after mortality occurred in the laboratory control sample. However, there was no mortality in the *C. dubia* test organisms exposed to 100% effluent during a period of 120 hours.
- Effluent total phosphorus (6.3 mg/L) and ortho-phosphate (6.4 mg/L) concentrations contributed to

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

US Agri-Chemicals-Ft. Meade	Class III Criteria	Effluent Limits (Outfall 004)	Effluent (Outfall 004)	Control Site	Test Site
Organic Constituents (µg/L)					
none detected				-	-
Metals (µg/L unless otherwise noted, Class III Criteria are less than or equal to the value given)					
Aluminum	-	-	44	-	-
Arsenic	50	-	8 U	-	-
Cadmium	b	2.98	0.027 I	-	-
Calcium (mg/L)	-	-	95	-	-
Chromium	b	236	2 U	-	-
Copper	b	26.6	2.4 U	-	-
Iron	1000	-	166	-	-
Lead	b	15.2	0.1 U	-	-
Magnesium (mg/L)	-	-	25.3	-	-
Nickel	b	147	2 U	-	-
Selenium	5.0	-	1 U	-	-
Silver	0.07	-	0.02 U	-	-
Zinc	b	339	4 U	-	-
Nutrients (mg/L)					
Ortho-phosphate	-	report	6.4	0.52	6.2
Total Phosphorus	-	≤ 35s	6.3	0.75	6.4
Ammonia	-	report	0.017 I	0.047	0.019 I
Un-ionized Ammonia	≤ 0.02 s	≤ 0.02 s	< 0.02	< 0.02	< 0.02
Nitrate and Nitrite	-	-	0.08	0.06	0.079
Total Kjeldahl Nitrogen	-	-	0.39	0.85	0.36
Organic Nitrogen	-	-	0.37	0.80	0.34
Total Nitrogen	-	report	0.47	0.91	0.44
General Physical and Chemical Parameters					
Habitat Assessment	-	-	-	103	112
Dissolved Oxygen (mg/L)	≥ 5.0 s	≥ 5.0 s	7.2	8.62	8.35
pH (SU)	6.0-8.5 s	6.0-8.5 s	7.28	7.23	7.35
Conductivity (µmhos/cm)	1275 s	1275 s	796	306	795
Temperature (°C)	-	report	16.8	14.5	16.7
Color (Pt-Co)	-	-	15	60	20
Total Suspended Solids (mg/L)	-	-	4 U	6 I	11 I
Turbidity (NTU)	36	-	2.1	6.9	6.5
Chlorophyll *a* (µg/L)	-	-	23	4.8	30 A
Phaeophytin (µg/L)	-	-	0	0	0 A
Fluoride (mg/L)	10	≤ 10s	3.2	1.4	3.2
Sulfate (mg/L)	-	report	250	13	250
Flow (MGD)	-	report	4.5	-	-
Hardness (mg $CaCO_3$)	-	-	341.4	-	-

b - Value is calculated based on hardness

s - Single sample

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

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

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

report - facility is required to report value

elevated levels at the Test Site. Total phosphorus concentration was 8.5 times greater at the Test Site compared to the Control Site, and orthophosphate concentration was 12 times greater at the Test Site. These values are greater than 95% of those typical of Florida streams (Appendix 6). In contrast, effluent total nitrogen concentration was 0.47 mg/L. Test Site ammonia (0.019 mg/L) and total nitrogen (0.44 mg/L) concentrations were similar to those of the effluent (Table 1) and lower than those measured at the Control Site. Nitrate+nitrite concentrations were 0.06 mg/L at the Control Site, 0.079 mg/l at the Test Site, and 0.08 mg/L in the effluent.

- Fecal and total coliform bacteria were not collected during this inspection.
- 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 value at the upstream Control Site was 9.33 mg dry weight/L (Table 2), exceeding the "problem" threshold. The AGP values of the downstream Test Site (3.0 mg dry weight/L) and the effluent (1.87) were not above this threshold. There was no evidence of growth inhibition in water samples from either the Test Site or the Control Site (Table 2). However, the effluent sample produced half as much dry weight/L as expected in relation to the amount of nutrients present, suggesting that algal growth may have been inhibited in the effluent. Freshwater systems in Florida are usually limited by the availability of nitrogen. The nitrogen to phosphorus ratios in water samples from the Control and Test Sites are less than 10 and indicate that algae at the Control and Test Sites are nitrogen-limited (Table 2). In this stream, especially downstream from the addition of the phosphorus-rich effluent, the difference in available nitrogen and phosphorus means that any addition of nitrogen would fuel higher levels of algal production and increase chlorophyll-*a* concentrations.

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)	9.33 A	4.1 ± 0.8	0.21
Test (mg dry wt/L)	3.0	3.7 ± 0.7	0.016
Effluent (mg dry wt/L)	1.87	3.7 ± 0.7	0.015

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

- Chlorophyll *a* concentration in the water samples was 4.8 mg/L at the Control Site and averaged 30 mg/L at the Test Site. The effluent water sample had 23 mg/L chlorophyll *a*. These chlorophyll *a* levels are a cause for concern. If this trend were to continue throughout the year, they would exceed the 20 mg/L annual average threshold that is one of the criteria for listing waterbodies under the Impaired Waters Rule (IWR). The low nitrogen availability relative to the elevated phosphorus loading attributable to the facility suggests chlorophyll *a* levels would rise with any addition of available nitrogen. Although AGP data collected for this survey did not support this, an AGP sample demonstrates response under the exposure of a single dose of nutrients. While the algae in McCullough Creek were continuously exposed to nutrient concentrations sufficient to support more algal production.
- Periphyton samples were compromised at both study sites.
- Qualitative macroinvertebrate samples were not collected.
- Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed a 29% reduction of the Shannon-Weaver diversity score at the Test Site compared to the Control Site (Table 3, Appendix 8). This represents a violation of the Biological Integrity Criterion (62-302.530(11) F.A.C.) or a change to less than 75% of background for Shannon-Weaver diversity.

Summary

The effluent from the U.S. Agri-Chemicals Ft. Meade complex is contributing to elevated levels of total phosphorus and orthophosphate in McCullough Creek downstream from the point of discharge. Levels measured from the Test Site greatly exceeded levels typical of Florida streams. In contrast, concentrations of ammonia, nitrate+nitrite, and total Kjeldahl nitrogen measured at the Test Site were relatively low. This contrast in available phosphorus and nitrogen suggests any additional nitrogen inputs would cause increases in algal abundance.

Table 3. Macroinvertebrate Hester-Dendy Samples - Quantitative

US Agri-Chemicals-Ft. Meade	Control Site	Test Site
Summary Statistics		
Shannon-Weaver Diversity	2.71	1.92
Number of Taxa	22	22
Florida Index	11	14
Number of EPT Taxa	4	7
Percent Dominant Taxon	36.3	63
Dominant Taxon (name)	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.
Total Number of Individuals	625	727
Community Composition: Percent of total		
Amphipoda	1.8	0.7
Coleoptera	1.4	1.2
Diptera	41.3	28.9
Ephemeroptera	1.4	4.8
Gastropoda	16.8	0.4
Trichoptera	36.5	63.8
Other	0.8	0.1
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	0.6	0.0
Predators	4.6	1.7
Surface Deposit Feeders	14.2	19.0
Suspension Feeders	44.7	65.2
Scrapers	18.4	4.0
Shredders	11.9	9.5
Unknown	5.5	0.6

Result is a violation of the Biological Integrity Criterion.

Chlorophyll *a* concentration was 4.8 µg/L at the Control Site, increasing to 30 µg/L at the Test Site. This indicates that the facility's effluent could be responsible for increasing chlorophyll *a* levels in McCullough Creek to above the annual average threshold for listing under the Impaired Waters Rule (IWR) if this trend continues. This is cause for concern and further monitoring is suggested to determine the stream's status under the IWR. The probable increase in algal production from any additional nitrogen inputs downstream of the facility suggests that the facility's effluent may contribute to the creation of imbalanced or nuisance conditions downstream.

In this system, especially downstream, these data indicate that any addition of nitrogen could cause the algal community to plunge into imbalance.

Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers indicated a violation of the Biological Integrity Criterion attributable to the facility's effluent. Although some of the macroinvertebrate community measures were similar at both sites, the Test Site community was dominated by one organism causing Shannon-Weaver diversity to be reduced more than 25%.

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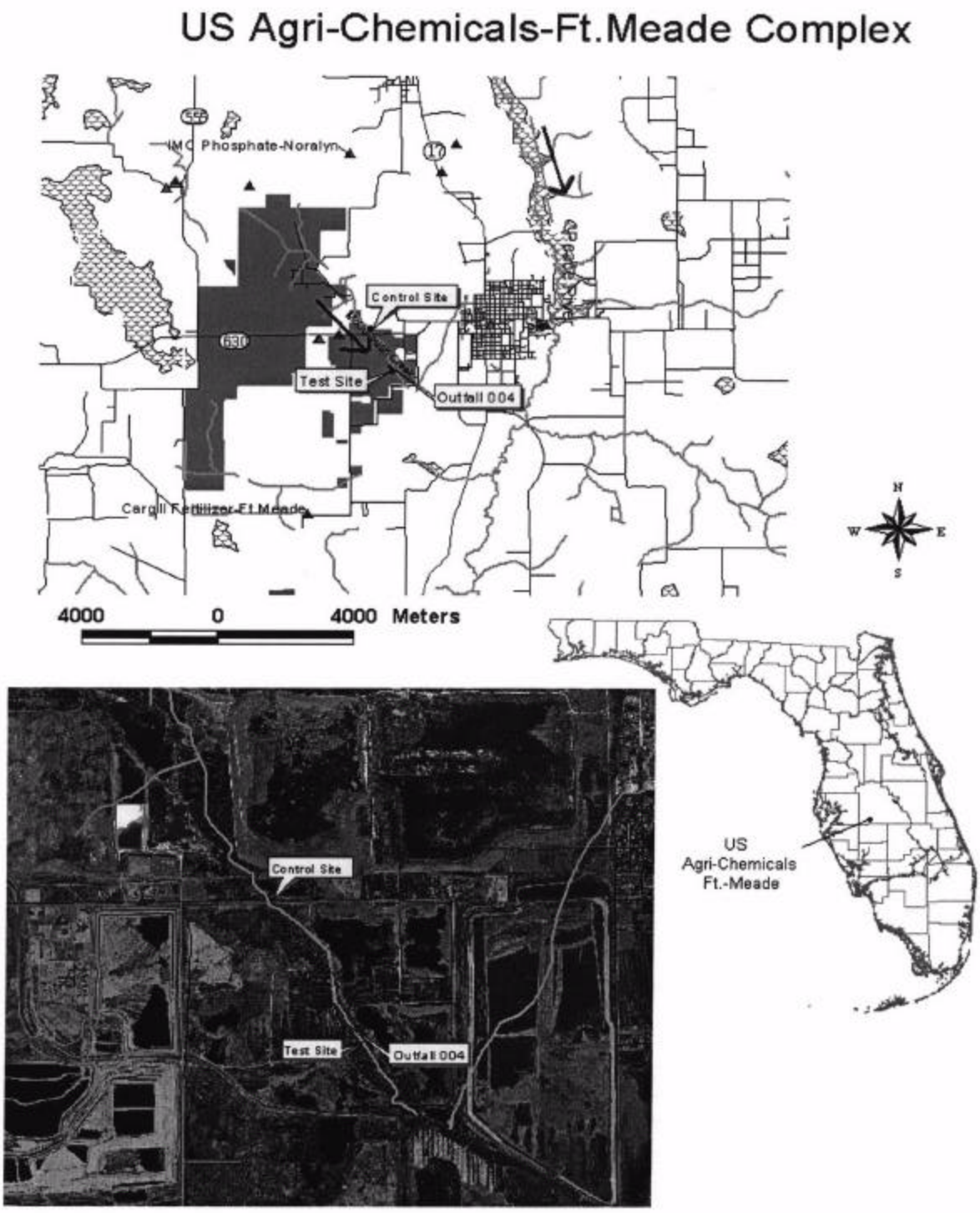
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Appendices

- 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. Habitat Assessment field sheets
- Appendix 8a. Hester-Dendy multi-plate samplers: Taxa list and macroinvertebrate density (average number of individuals per m^2)
- Appendix 8b. Hester-Dendy multi-plate samplers: Taxa list and total number of macroinvertebrates counted

Appendix 1

Map of Facility



State of Florida
Department of Environmental Protection
Facility Summary

Facility Name: US Agri-Chemicals Corporation		**Prepared By: G. Sharrock**
Location: Ft. Meade	**County: Polk**	**District: SWD**
Federal Permit No.: FL0001902 **Expiration Date: 9/15/2003**	**State Permit No.:FL0001902** **Expiration Date: 9/15/2003**	**Facility Type: Industrial**
Function of Facility: Phosphate Fertilizer & Chemical Manufacturing Plant		
Description of treatment process: Non-contact wastewater and stormwater is routed to an inactive mine pit located east of the plant site where the wastewater settles and is filtered and polished in the mine cut prior to discharge. Contact process wastewater is double lime treated and settled in a two treatment pond system located at the plant site. This treatment is typically an emergency only basis and there has been no contact process wastewater treated or discharged at this facility for the previous 10 year period.		
Receiving Waters: McCullough Creek		**Classification: III Fresh**
Design Flow: N/A	**Mean Flow: 5.26 MGD**	**Flow During Survey: 4.5**
Discharge is: Continuous Intermittent Seasonal Rainfall Dependent Other		
Facility Mixing Zone Details: N/A		
List Effluent Limits:		

Effluent Limits:

	Monthly Minimum	Monthly Average	Daily Maximum	Frequency	Sample Type
Flow (MGD)	**N/A**	**Report**	**Report**	**Continuous**	**Recorder**
Gross Alpha Particle Activity pCi/l	**N/A**	**N/A**	**15.0 See I.A.6.**	**	**24hr/Comp**
Combined Radium 226 & 228 (pCi/l)	**N/A**	**N/A**	**5.0 See I.A.5.**	**	**24 hr/Comp**
Ortho-Phosphate (mg/l) as P	**N/A**	**Report**	**Report**	*	**Grab**
pH (standard units)	**6.0**	**Report**	**8.5 See I.A.7.**	**Continuous**	**Recorder**
Total Ammonia as N (mg/l)	**N/A**	**Report**	**Report See I.A.7.**	**1/Week**	**Grab**
Ammonia (un-ionized) (mg/l)	**N/A**	**N/A**	**0.02 See I.A.7.**	**1/Week**	**Calculation**
Specific Conductance (µmhos/centimeter)	**N/A**	**N/A**	**See I.A.13**	**1/Week**	**Grab**
Dissolved Oxygen (mg/l)	**5.0**	**N/A**	**N/A**	**1/Week**	**Grab**
Total Fluoride as F (mg/l)	**N/A**	**Report**	**10.0**	**1/Week**	**24 hr/Comp**
Temperature (°C)	**N/A**	**N/A**	**Report See I.A.7.**	**1/Week**	**Grab-In-Situ**
Total Sulfates (mg/l)	**N/A**	**N/A**	**Report**	**1/Week**	**24hr/Comp**
Total Phosphorus as P (mg/l)	**N/A**	**15.0**	**35.0**	**1/Week**	**24hr/Comp**
Total Phosphorus as P (lb/day)	**N/A**	**Report**	**Report**	**1/Week**	**24 hr/Comp**

Total Nitrogen as N (mg/l)	N/A	Report	Report	1/Week	24/hr/Comp
Total Nitrogen as N (lb/day)	N/A	Report	Report	1/Week	24 hr/Comp
Toxicity	See I.A.11 & 12 below				

* Ortho-Phosphate should be analyzed for only if Total P exceeds 35.0 mg/l for the purpose of Determining the source of any excess nutrient.

** Gross Alpha and total Radium will be sampled monthly at Outfall 002 and quarterly at Outfalls 003 & 004.

3. There shall be no discharge of floating solids or visible foam in other than trace amounts. [62-302.500, F.A.C.]

4. The discharge shall not cause a visible sheen on the receiving water. [62-302.500, F.A.C.]

5. During any sampling event performed in accordance with the monitoring requirements of I.A.1. above, a properly preserved sample must be taken for the determination of gross alpha activity as well as combined radium (Ra 226 & 228). The sample must be first analyzed for gross alpha activity. If the total value of gross alpha activity exceeds the MCL of 15 pCi/l, the same sample shall be analyzed for total radium.

6. This parameter represents the Gross alpha particle activity including radium 226, but excluding radon and uranium. [62-302.530(58)(b) F.A.C.]

7. Effluent samples for pH and temperature shall be taken simultaneously with each total ammonia grab sample. Un-ionized ammonia shall be calculated in accordance with Table I (attached). All measured values for pH, temperature, and total ammonia used to calculate an un-ionized ammonia value shall be reported as an attachment to the Discharge Monitoring Report (DMR). All calculated un-ionized ammonia values shall also be reported on the attachment. The daily maximum value for un-ionized ammonia for each reporting period shall be reported on the DMR.

8. The discharge of nutrients shall be limited in accordance with Rule 62.302.530(48) a. and b, F.A.C. The limitation for total phosphorus is based upon reported discharge quality, ambient conditions.

9. Unless specified elsewhere in the permit, samples taken in compliance with the monitoring requirements specified in I.A.1. and I.A.2. shall be taken at the nearest accessible point after final treatment but prior to actual mixing with the receiving water body.

10. If no discharge occurs on the day of a specified monitoring requirement, a sample shall be collected on the day of the next discharge.

11. In order to provide the Department with reasonable assurance that the discharges from Outfalls 002, 003 and 004 does not violate the chronic toxicity requirements of Section 62-302.500, F.A.C., the permittee shall perform the toxicity tests as specified below and submit the results to the Department.

As required by Part I.A. of this permit, the permittee shall initiate the series of tests described below beginning with the first discharge event from the date of this permit to evaluate whole effluent toxicity of the discharge from Outfalls 002, 003, and 004. All test species, procedures and quality assurance criteria used shall be in accordance with Short-term methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002, or the most current edition. The control and dilution water will be moderately hard water as described in EPA/600/4-91/002, Table 3. A standard reference toxicant quality assurance chronic toxicity test shall be conducted concurrently with each species used in the toxicity tests and the results submitted with the bioassay report. Alternatively, if monthly QA/QC reference toxicant tests are conducted, these results

must be submitted. Any deviation from the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.

a. (1.) The permittee shall conduct a daphnid, Ceriodaphnia dubia, Survival and Reproduction test and a fathead minnow, Pimephales promales, Larval Survival and Growth Test. These tests shall be conducted using a control (0% effluent) and one test concentration of 100% effluent. A no observed effect concentration (NOEC) less than 100% effluent will constitute a violation of this permit and Chapter 62-302.530(62), F.A.C. All test results shall be statistically analyzed according Appendix H in EPA/600/4-91/002, or the most current edition.

(2.) For each set of tests conducted, a *24-hour* composite sample of final effluent shall be collected and used per the sampling schedule discussed in EPA/600/4-90/002, Section 8. Two additional composite samples shall be collected according to the protocol on day two and day four of the test and used as renewal solutions on Day 3 and Day 5 of the test.

(3.) If control mortality exceeds 20% for either species in any test, the test(s) for that species (including the control) shall be repeated. A test will be considered valid only if control mortality does not exceed 20% for either species. If, in any separate grab sample test, 100% mortality occurs prior to the end of the test, and control mortality is less than 20% at that time, that test (including the control) shall be terminated with the conclusion that the sample demonstrates unacceptable chronic toxicity. Additionally, the test must meet the acceptability criteria for each species as defined in EPA/600/4-91/002 Section 13.11 and Section 11.11, respectively.

b. (1.) The toxicity tests specified above shall be conducted on the first discharge (for intermittant discharges) or within 60 days (for continuous discharges) following the issuance of this permit. Upon the completion of this test which demonstrates that no unacceptable toxicity (as defined in C.(1) has been identified, the permittee will not be required to undergo chronic toxicity testing for the remainder of this permit.

Description of permitted outfall: Outfall 004 is the primary Outfall for the facility. The structure is a rectangular wier at a drop inlet culvert system. Outfall 002 is an internal outfall via pump and pipe from the (emergency only) lime treatment system. Outfall 003 is an auxiliary outfall that is not in use.
List permit violations (DMR data) and plant upsets that occurred at the plant within the last year: N/A
Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions: FDEP reclaimed stream study April 1999
Discuss MOR trends to prior data; is trend improving or declining:
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.

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 Hester-Dendy multi-plate samplers incubated for 28 days (quantitative samples, method modified from APHA 1992, method 10500.5). 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) Shannon-Weaver Diversity Index, (6) the Florida Index, and (7) the number of Ephemeroptera, Plecoptera and Trichoptera (EPT) taxa. For a discussion of each biological measure and its potential relationship to Florida Administrative Code, see Appendix 5.

Appendix 4
Chemical analyses of effluent and receiving waters

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/13/2003 13:15	(FS 01) BACKGROUND SITE REP 2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	14	# Taxa			
1/13/2003 13:15	(FS 01) BACKGROUND SITE REP 3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	15	# Taxa			
1/13/2003 13:15	(FS01) BACKGROUND SITE	Bio-AGP/LimNut	Algal Growth Potential	9.33	mg DryWt/L	A	0.1	0.3
1/13/2003 13:15	(FS01) BACKGROUND SITE	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	4.8	ug/L		0.85	2.6
1/13/2003 13:15	(FS01) BACKGROUND SITE	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0	ug/L		0.85	2.6
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	Ammonia-N	0.047	mg N/L		0.01	0.02
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	Color	60	PCU		5	5
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	Fluoride	1.4	mg F/L		0.1	0.2
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	NO2NO3-N	0.06	mg N/L		0.004	0.01
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	N_KJEL_TOT	0.85	mg N/L		0.06	0.2
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	O-Phosphate-P	0.52	mg P/L		0.04	0.1
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	Sulfate	13	mg SO4/L		0.2	0.5
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	TSS	6	mg/L	I	4	16
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	Total-P	0.75	mg P/L		0.015	0.04
1/13/2003 13:15	(FS01) BACKGROUND SITE	Nutrients-Liquid	Turbidity	6.9	NTU		0.05	0.05
1/13/2003 13:15	(FS01) BACKGROUND SITE REP 1	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	4.4	mg/m2		0.15	0.46
1/13/2003 13:15	(FS01) BACKGROUND SITE REP 1	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	1.5	mg/m2		0.15	0.46
1/13/2003 13:15	(FS01) BACKGROUND SITE REP 1	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa		# Taxa			
1/13/2003 13:15	(FS01) BACKGROUND SITE REP 1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	15	# Taxa			
1/13/2003 13:15	(FS01) BACKGROUND SITE REP 1	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	10	#Taxa			
1/13/2003 13:15	(FS01) BACKGROUND SITE REP 1	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	7	#Taxa			
1/13/2003 13:30	BLANK	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
1/13/2003 13:30	BLANK	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	1,4-Naphthoquinone	19	ug/L	UJ	19	76
1/13/2003 13:30	BLANK	BNA-Water	1-Naphthylamine	9.5	ug/L	U	9.5	38
1/13/2003 13:30	BLANK	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	2,4,5-Trichlorophenol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
1/13/2003 13:30	BLANK	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
1/13/2003 13:30	BLANK	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2,6-Dichlorophenol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2-Acetylaminofluorene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
1/13/2003 13:30	BLANK	BNA-Water	2-Methylnaphthalene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2-Naphthylamine	9.5	ug/L	U	9.5	38
1/13/2003 13:30	BLANK	BNA-Water	2-Nitroaniline	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	2-Picoline	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
1/13/2003 13:30	BLANK	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	UJ	19	76
1/13/2003 13:30	BLANK	BNA-Water	3-Methylcholanthrene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	3-Nitroaniline	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	4-Aminobiphenyl	3.8	ug/L	U	3.8	15

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/13/2003 13:30	BLANK	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	4-Chloroaniline	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	4-Nitroaniline	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
1/13/2003 13:30	BLANK	BNA-Water	5-Nitro-o-toluidine	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Acetophenone	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	Aniline	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Benzidine	95	ug/L	U	95	380
1/13/2003 13:30	BLANK	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Benzyl alcohol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	UJ	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
1/13/2003 13:30	BLANK	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
1/13/2003 13:30	BLANK	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
1/13/2003 13:30	BLANK	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
1/13/2003 13:30	BLANK	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Dibenzofuran	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
1/13/2003 13:30	BLANK	BNA-Water	Dimethylaminoazobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Dinoseb	3.8	ug/L	U	3.8	15
1/13/2003 13:30	BLANK	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	11
1/13/2003 13:30	BLANK	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
1/13/2003 13:30	BLANK	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
1/13/2003 13:30	BLANK	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
1/13/2003 13:30	BLANK	BNA-Water	Ethyl methanesulfonate	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
1/13/2003 13:30	BLANK	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
1/13/2003 13:30	BLANK	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
1/13/2003 13:30	BLANK	BNA-Water	Hexachloropropene	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Isophorone	0.95	ug/L	UJ	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Isosafrole	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Methapyrilene	3.8	ug/L	U	3.8	15
1/13/2003 13:30	BLANK	BNA-Water	Methyl methanesulfonate	0.95	ug/L	UJ	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosodi-n-butylamine	0.95	ug/L	U	0.95	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosodiethylamine	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosomorpholine	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosopiperidine	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	U	19	76
1/13/2003 13:30	BLANK	BNA-Water	Pentachlorobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
1/13/2003 13:30	BLANK	BNA-Water	Pentachloronitrobenzene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
1/13/2003 13:30	BLANK	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	11
1/13/2003 13:30	BLANK	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
1/13/2003 13:30	BLANK	BNA-Water	Safrole	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
1/13/2003 13:30	BLANK	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.6
1/13/2003 13:30	BLANK	BNA-Water	o-Toluidine	0.95	ug/L	U	0.95	3.8
1/13/2003 13:30	BLANK	GC-Water	Alachlor	0.57	ug/L	U	0.57	2.28
1/13/2003 13:30	BLANK	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
1/13/2003 13:30	BLANK	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
1/13/2003 13:30	BLANK	GC-Water	Azinphos Methyl	0.048	ug/L	UJ	0.048	0.192
1/13/2003 13:30	BLANK	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
1/13/2003 13:30	BLANK	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
1/13/2003 13:30	BLANK	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
1/13/2003 13:30	BLANK	GC-Water	Chlorpyrifos Methyl	0.095	ug/L	U	0.095	0.38
1/13/2003 13:30	BLANK	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
1/13/2003 13:30	BLANK	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
1/13/2003 13:30	BLANK	GC-Water	Ethoprop	0.095	ug/L	U	0.095	0.38
1/13/2003 13:30	BLANK	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
1/13/2003 13:30	BLANK	GC-Water	Fonofos	0.095	ug/L	U	0.095	0.38
1/13/2003 13:30	BLANK	GC-Water	Hexazinone	0.095	ug/L	U	0.095	0.38
1/13/2003 13:30	BLANK	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
1/13/2003 13:30	BLANK	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
1/13/2003 13:30	BLANK	GC-Water	Metolachlor	0.48	ug/L	UJ	0.48	1.92
1/13/2003 13:30	BLANK	GC-Water	Metribuzin	0.095	ug/L	U	0.095	0.38
1/13/2003 13:30	BLANK	GC-Water	Mevinphos	0.19	ug/L	UJ	0.19	0.76
1/13/2003 13:30	BLANK	GC-Water	Naled	0.76	ug/L	U	0.76	3.04
1/13/2003 13:30	BLANK	GC-Water	Norflurazon	0.095	ug/L	U	0.095	0.38
1/13/2003 13:30	BLANK	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
1/13/2003 13:30	BLANK	GC-Water	Parathion Methyl	0.095	ug/L	U	0.095	0.38
1/13/2003 13:30	BLANK	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
1/13/2003 13:30	BLANK	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
1/13/2003 13:30	BLANK	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
1/13/2003 13:30	BLANK	Metals-Water	Aluminum	10	ug/L	U	10	40
1/13/2003 13:30	BLANK	Metals-Water	Arsenic	3	ug/L	U	3	12
1/13/2003 13:30	BLANK	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
1/13/2003 13:30	BLANK	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
1/13/2003 13:30	BLANK	Metals-Water	Chromium	2	ug/L	U	2	8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/13/2003 13:30	BLANK	Metals-Water	Copper	0.75	ug/L	U	0.75	3
1/13/2003 13:30	BLANK	Metals-Water	Iron	17	ug/L	U	7	28
1/13/2003 13:30	BLANK	Metals-Water	Lead	0.1	ug/L	U	0.1	0.4
1/13/2003 13:30	BLANK	Metals-Water	Magnesium	0.01	mg/L	U	0.01	0.04
1/13/2003 13:30	BLANK	Metals-Water	Nickel	2	ug/L	U	2	8
1/13/2003 13:30	BLANK	Metals-Water	Selenium	1	ug/L	U	1	4
1/13/2003 13:30	BLANK	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
1/13/2003 13:30	BLANK	Metals-Water	Zinc	4	ug/L	U	4	16
1/13/2003 13:30	BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
1/13/2003 13:30	BLANK	Nutrients-Liquid	Color	5	PCU	U	5	5
1/13/2003 13:30	BLANK	Nutrients-Liquid	Fluoride	0.1	mg F/L	U	0.1	0.2
1/13/2003 13:30	BLANK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
1/13/2003 13:30	BLANK	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
1/13/2003 13:30	BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
1/13/2003 13:30	BLANK	Nutrients-Liquid	Sulfate	0.2	mg SO4/L	U	0.2	0.5
1/13/2003 13:30	BLANK	Nutrients-Liquid	TSS	4	mg/L	U	4	16
1/13/2003 13:30	BLANK	Nutrients-Liquid	Total-P	0.015	mg P/L	U	0.015	0.04
1/13/2003 13:30	BLANK	Nutrients-Liquid	Turbidity	0.05	NTU	U	0.05	0.05
1/13/2003 11:20	FYI TEST SITE	Bio-AGP/LimNut	Algal Growth Potential	3	mg DryWt/L	A	0.1	0.3
1/13/2003 11:20	FYI TEST SITE	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	30	ug/L	A	0.85	2.6
1/13/2003 11:20	FYI TEST SITE	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0	ug/L	A	0.85	2.6
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	Ammonia-N	0.019	mg N/L	I	0.01	0.02
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	Color	20	PCU		5	5
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	Fluoride	3.2	mg F/L		0.1	0.2
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	NO2NO3-N	0.079	mg N/L		0.004	0.01
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	N_KJEL_TOT	0.36	mg N/L		0.06	0.2
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	O-Phosphate-P	6.2	mg P/L		0.16	0.4
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	Sulfate	250	mg SO4/L		2	5
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	TSS	11	mg/L	I	4	16
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	Total-P	6.4	mg P/L		0.3	0.8
1/13/2003 11:20	FYI TEST SITE	Nutrients-Liquid	Turbidity	6.5	NTU		0.05	0.05
1/13/2003 11:20	FYI TEST SITE REP 1	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	0.23	mg/m2	U	0.23	0.68
1/13/2003 11:20	FYI TEST SITE REP 1	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0.23	mg/m2	U	0.23	0.68
1/13/2003 11:20	FYI TEST SITE REP 1	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa		# Taxa			
1/13/2003 11:20	FYI TEST SITE REP 1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	15	# Taxa			
1/13/2003 11:20	FYI TEST SITE REP 1	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	25	#Taxa			
1/13/2003 11:20	FYI TEST SITE REP 1	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	10	#Taxa			
1/13/2003 11:20	FYI TEST SITE REP 2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	10	# Taxa			
1/13/2003 11:20	FYI TEST SITE REP 3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	15	# Taxa			
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1,2,4-Trichlorobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1,2-Dichlorobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1,3-Dichlorobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1,4-Dichlorobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1,4-Naphthoquinone	19	ug/L	UJ	19	75
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	1-Naphthylamine	9.4	ug/L	U	9.4	38
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,4,5-Trichlorophenol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,4,6-Trichlorophenol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,4-Dichlorophenol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,4-Dimethylphenol	47	ug/L	U	47	190
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,4-Dinitrotoluene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,6-Dichlorophenol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2,6-Dinitrotoluene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Acetylaminofluorene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Chloronaphthalene	0.94	ug/L	U	0.94	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Chlorophenol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Methyl-4,6-dinitrophenol	2.8	ug/L	U	2.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Methylnaphthalene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Naphthylamine	9.4	ug/L	U	9.4	38
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Nitroaniline	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Nitrophenol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	2-Picoline	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	UJ	19	75
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	3-Methylcholanthrene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	3-Nitroaniline	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4-Aminobiphenyl	3.8	ug/L	U	3.8	15
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4-Bromophenyl phenyl ether	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4-Chloro-3-methylphenol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4-Chloroaniline	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4-Nitroaniline	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	5-Nitro-o-toluidine	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Acenaphthene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Acenaphthylene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Acetophenone	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Aniline	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Anthracene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Benzidine	94	ug/L	U	94	380
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Benzo(a)anthracene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Benzo(a)pyrene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Benzo(b)fluoranthene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Benzo(g,h,i)perylene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Benzo(k)fluoranthene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Benzyl alcohol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Bis(2-chloroethoxy)methane	0.94	ug/L	UJ	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Bis(2-chloroethyl)ether	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Bis(2-chloroisopropyl)ether	2.8	ug/L	U	2.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Butyl benzyl phthalate	4.7	ug/L	U	4.7	19
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Chrysene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Di-n-butyl phthalate	4.7	ug/L	U	4.7	19
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Di-n-octyl phthalate	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Dibenzo(a,h)anthracene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Dibenzofuran	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Diethyl phthalate	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Dimethyl phthalate	47	ug/L	U	47	190
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Dimethylaminoazobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Dinoseb	3.8	ug/L	U	3.8	15
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Diphenylamine	2.8	ug/L	U	2.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Ethyl methanesulfonate	0.94	ug/L	U	0.94	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Fluoranthene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Fluorene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Hexachlorobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Hexachlorobutadiene	2.8	ug/L	U	2.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Hexachlorocyclopentadiene	2.8	ug/L	U	2.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Hexachloroethane	2.8	ug/L	U	2.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Hexachloropropene	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Indeno(1,2,3-cd)pyrene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Isophorone	0.94	ug/L	UJ	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Isosafrole	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Methapyrilene	3.8	ug/L	U	3.8	15
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Methyl methanesulfonate	0.94	ug/L	UJ	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosodi-n-butylamine	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosodiethylamine	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosodiphenylamine	2.8	ug/L	U	2.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosomorpholine	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosopiperidine	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Naphthalene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	U	19	75
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Pentachlorobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Pentachloroethane	47	ug/L	U	47	190
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Pentachloronitrobenzene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Pentachlorophenol	2.8	ug/L	U	2.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	11
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Phenanthrene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Phenol	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Pyrene	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	Safrole	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	BNA-Water	o-Toluidine	0.94	ug/L	U	0.94	3.8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Bio-AGP/LimNut	Algal Growth Potential	1.87	mg DryWt/L		0.1	0.3
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	23	ug/L		0.85	2.6
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0	ug/L		0.85	2.6
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Bio-Toxicology	Bioassay-Chronic-Scrn-FW-C.dubia, NOEC		NOEC			
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Bio-Toxicology	Bioassay-Chronic-Scrn-FW-Fish, NOEC		NOEC			
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.32
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Azinphos Methyl	0.048	ug/L	UJ	0.048	0.192
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Chlorpyrifos Methyl	0.097	ug/L	U	0.097	0.388
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Ethoprop	0.097	ug/L	U	0.097	0.388

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Fonofos	0.097	ug/L	U	0.097	0.388
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Hexazinone	0.097	ug/L	U	0.097	0.388
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Metolachlor	0.48	ug/L	UJ	0.48	1.92
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Metribuzin	0.097	ug/L	U	0.097	0.388
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Mevinphos	0.19	ug/L	UJ	0.19	0.76
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Naled	0.78	ug/L	U	0.78	3.12
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Norflurazon	0.097	ug/L	U	0.097	0.388
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Parathion Methyl	0.097	ug/L	U	0.097	0.388
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Aluminum	44	ug/L		10	40
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Arsenic	8	ug/L	U	3	12
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Cadmium	0.027	ug/L	I	0.025	0.1
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Calcium	95	mg/L		0.05	0.2
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Chromium	2	ug/L	U	2	8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Copper	2.4	ug/L	U	0.75	3
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Iron	166	ug/L		7	28
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Lead	0.1	ug/L	U	0.1	0.4
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Magnesium	25.3	mg/L		0.01	0.04
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Nickel	2	ug/L	U	2	8
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Selenium	1	ug/L	U	1	4
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Metals-Water	Zinc	4	ug/L	U	4	16
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	Ammonia-N	0.017	mg N/L	I	0.01	0.02
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	Color	15	PCU		5	5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	Fluoride	3.2	mg F/L		0.1	0.2
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	NO2NO3-N	0.08	mg N/L		0.004	0.01
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	N_KJEL_TOT	0.39	mg N/L		0.06	0.2
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	O-Phosphate-P	6.4	mg P/L		0.24	0.6
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	Sulfate	250	mg SO4/L		2	5
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	TSS	4	mg/L	U	4	16
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	Total-P	6.3	mg P/L		0.15	0.4
1/13/2003 12:00	USAC FT. MEADE OUTFALL 004	Nutrients-Liquid	Turbidity	2.1	NTU		0.05	0.05

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 10:1, nitrogen limitation of algal production is likely. When the N: P ratio is 20:1 or greater, phosphorus limitation is likely (EPA-822-B-00-002). For ratios in-between it is possible there is co-limitation occurring. 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
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	**2.71**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**22**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	37	53	**ND**
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	**0.85**
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.047**
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	**0.06**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**0.75**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**0.52**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**6.9**

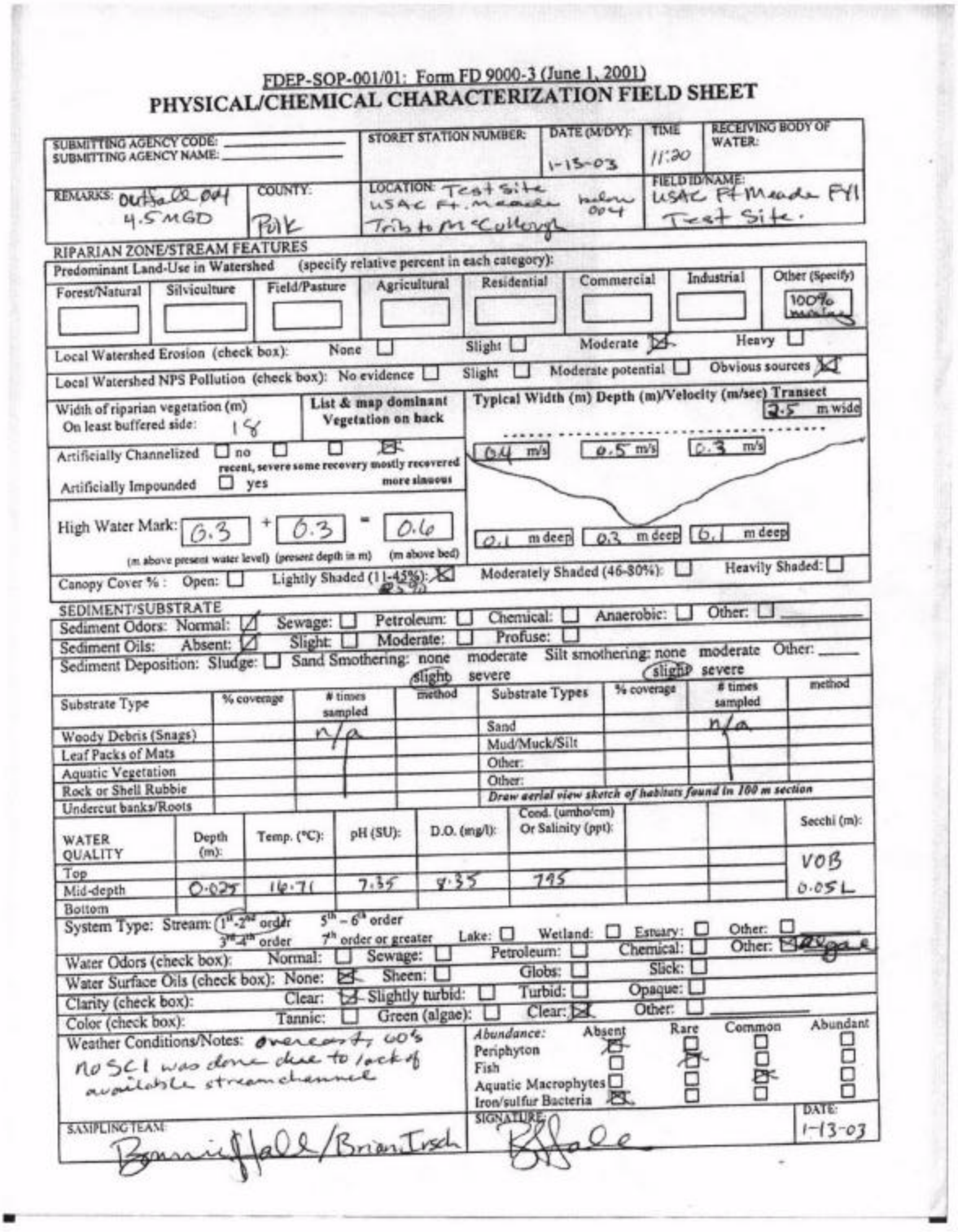
TEST SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
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	**1.92**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**22**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	37	53	**ND**
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	**0.36**
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.019 I**
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	**0.079**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**6.4**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**6.2**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**6.5**

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. I = Value reported is < the minimum quantitation limit, and ≥the minimum detection limit. U = Material analyzed for but not detected; value reported is the minimum detection limit.

Appendix 7

Habitat Assessment Field Sheets.



FDEP-SOP-001/01: Form FD 9000-3 (June 1, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 1-15-03	TIME: 11:20	RECEIVING BODY OF WATER:	
REMARKS: Outfall 004 4.5 MGD	COUNTY: Polk	LOCATION: Test site USAC Ft. Meade below 004 Trib to McCullough		FIELD ID/NAME: USAC Ft Meade FY1 Test Site.	

RIPARIAN ZONE/STREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
							100% mining

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: 18

List & map dominant Vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark: 0.3 (m above present water level) + 0.3 (present depth in m) = 0.6 (m above bed)

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

2.5 m wide

0.4 m/s 0.5 m/s 0.3 m/s

0.1 m deep 0.3 m deep 0.1 m deep

Canopy Cover %: Open: ☐ Lightly Shaded (11-45%): ☒ 25% 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 moderate slight severe Silt smothering: none moderate slight severe Other:

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

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top								VOB
Mid-depth	0.025	16.71	7.35	8.35	795			0.05L
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: ☒ Algae

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

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

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

Weather Conditions/Notes: overcast, 60's
NOSCI was done due to lack of available stream channel

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

SAMPLING TEAM: Bonnie Hall/Brian Irsh

SIGNATURE: B Hall

DATE: 1-13-03

FDEP-SOP-001/01: Form FD 9000-5 (June 1, 2001)

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11/26/02	McCullough Cr

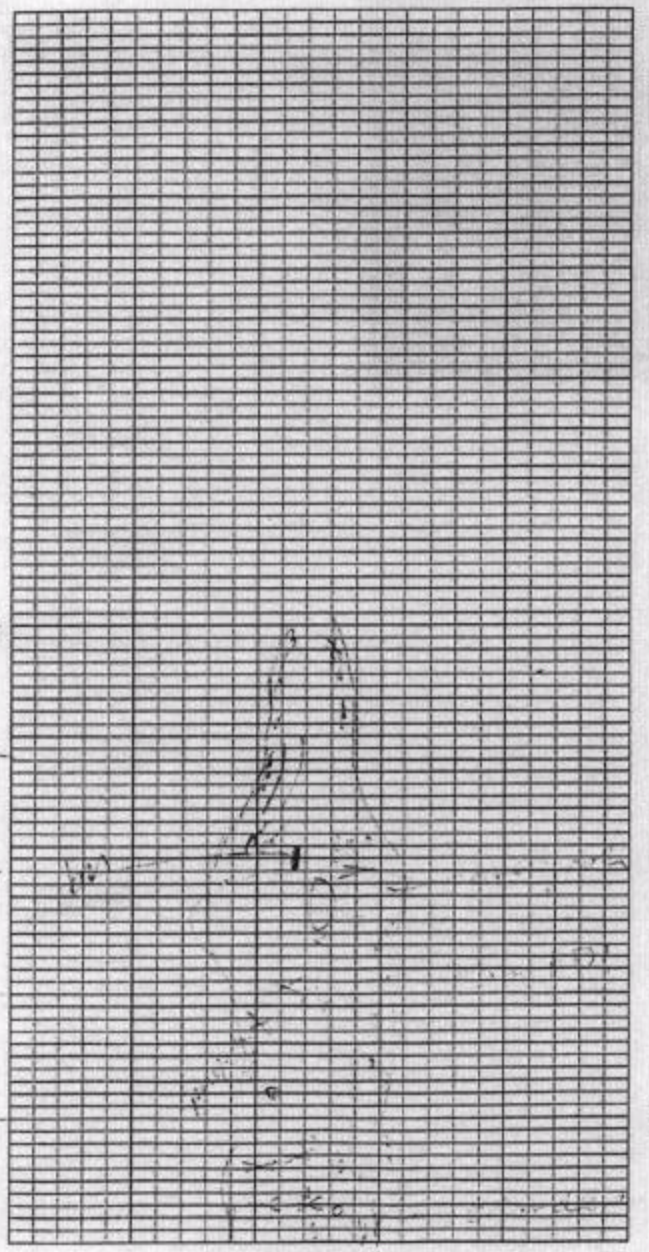
REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	Trib to McCullough below 0004 outfall	USAC Ft. Meade FYI Test Site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 10	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), 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 11	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 17	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 18 Primary Score 56	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 the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, as severe problem, pools absent 5 4 3 2 1
Secondary Habitat Components Artificial Channelization 16	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many 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 9 Left Bank 9	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 8 Left Bank 8	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m 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 3 Left Bank 3 Secondary Score 50	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. 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 ozone 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

112 TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
	Bonnie Hall	BHall

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 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.

- [X] Snags
- [R] Roots/undercut banks
- [A] Leaf Packs (or mats)
- [O] Macrophytes
- [ ] _____
- [ ] _____
- [ ] _____

Velocity: Code
Note where velocity measures were taken.

Habitat Smothering:
Note areas (on map) where sand or silt is something 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:

L. parviflorum
Mikania Acer pil
Salix Sp
Poa sp

Scoured w/dead clams throughout

FDEP-SOP-001/01: Form FD 9000-3 (June 1, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1-13-03	13:15	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	McCullough Cr Background Site	USAC Ft Meade FY1 control site

RIPARIAN ZONE/STREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
							100% mined

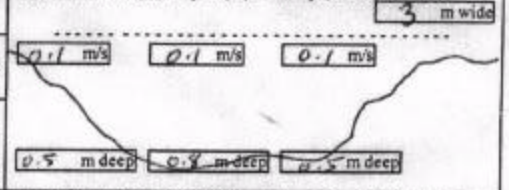
Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☒ Heavy ☐

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

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

List & map dominant Vegetation on back

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



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

Artificially Impounded ☐ yes

High Water Mark: 0.3 (m above present water level) + 0.8 (present depth in m) = 1.1 (m above bed)

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposition: Sludge: ☐ Sand Smothering: none moderate (slight) severe Silt smothering: none moderate slight (severe) Other: clay moderate artifact HD only

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

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.25	14.53	7.23	4.62	306			0.7
Bottom								

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

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

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

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

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

Weather Conditions/Notes: overcast, 60's. no sol

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

SAMPLING TEAM: Bonnie Hall/Brian Irsch

SIGNATURE: B Hall

DATE: 1-13-03

FDEP-SOP-001/01: Form FD 9000-5 (June 1, 2001)

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

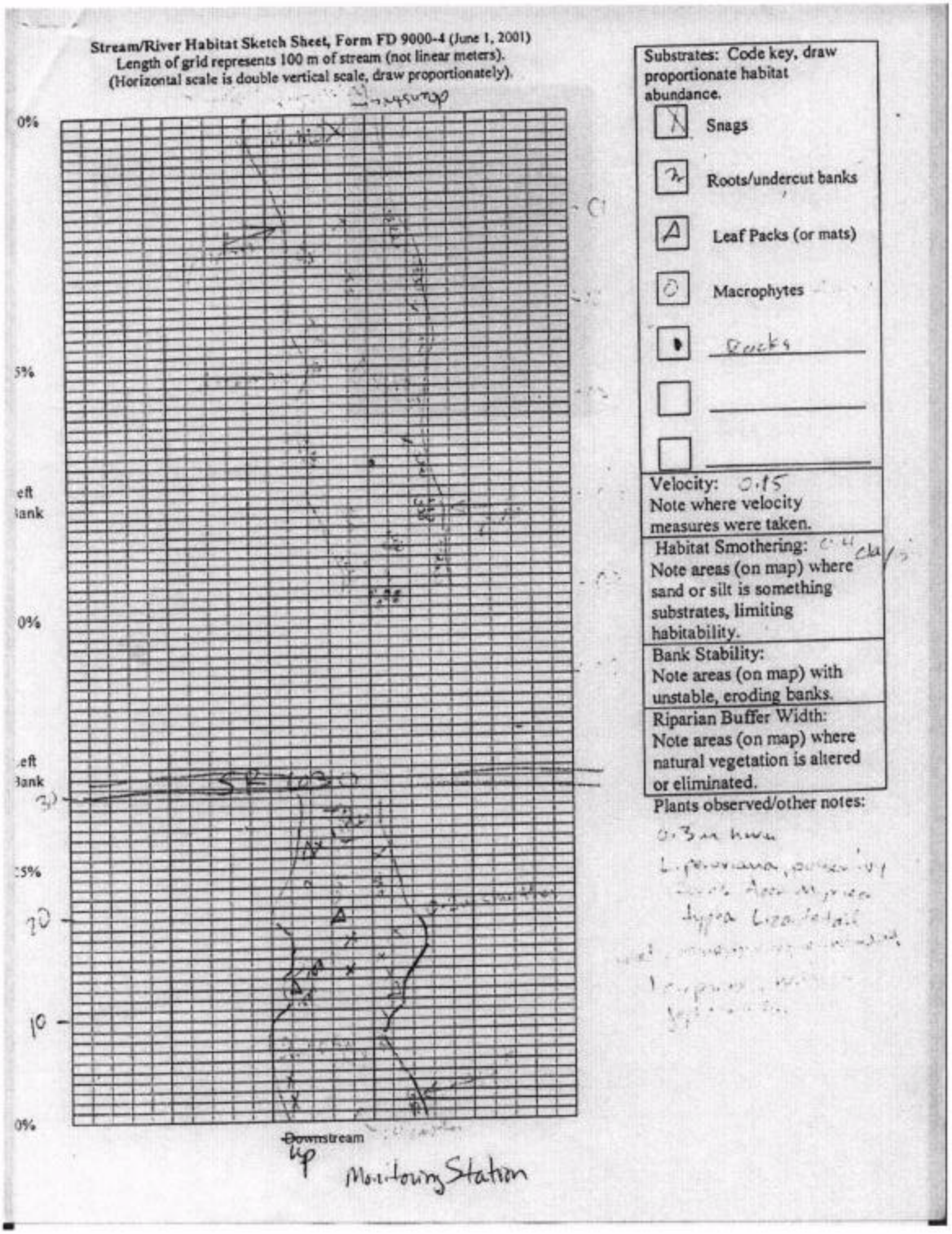
SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 11-26-02	RECEIVING BODY OF WATER:

REMARKS:	COUNTY: Polk	LOCATION: McMullen Cr upstream	FIELD ID/NAME: USAC Ft. Meade FYI Control Site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 16	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), 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 13	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 12	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 7 Primary Score (48)	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 the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, as severe problem, pools absent 5 4 3 2 1
Secondary Habitat Components Artificial Channelization 10	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many 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 9 Left Bank 9	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 5 Left Bank 5	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m 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 6 Left Bank 5 Secondary Score (55)	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 ozone 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 bright of 2 inches or less. 3 2 1

(103) TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:


Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).
0%
5%
eft
ank
0%
eft
ank
5%
0%
Downstream
up
Monitoring Station
Substrates: Code key, draw proportionate habitat abundance.
Snags
Roots/undercut banks
Leaf Packs (or mats)
Macrophytes
Rocks
Velocity: 0.15
Note where velocity measures were taken.
Habitat Smothering:
Note areas (on map) where sand or silt is something 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:

Appendix 9a.

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the US Agri-Chemicals Fort Meade facility for 28 days (1/13/03). Taxa collected and density (average number of individuals/m^2) rounded to the nearest individual (n = 3 samples). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida:		
Oligochaeta		
Limnodrilus sp.	3	-
Lumbriculus variegatus	3	-
Stylaria lacustris	5	-
Arthropoda:		
Arachnida		
Hygrobates sp.	3	3
Crustacea		
Hyalella azteca	29	13
Insecta		
Coleoptera		
Microcylloepus pusillus	3	13
Stenelmis sp.	21	11
Diptera		
Corynoneura lobata	5	-
Endotribelos hesperium	-	5
Glyptotendipes sp.	3	-
Hemerodromia sp.	-	5
Parametriocnemus sp.	-	3
Pentaneura inconspicua	74	26
Polypedilum flavum	362	351
Rheotanytarsus exiguus	11	13
Rheotanytarsus exiguus grp.	128	21
Rheotanytarsus pellucidus	91	11
Simulium sp.	-	5
Thienemanniella xena	8	114
Ephemeroptera		
Baetis intercalaris	19	90
Pseudocloeon sp.	5	3
Trichoptera		
Cheumatopsyche sp.	600	1,211
Hydropsyche sp.	-	3
Mayatrichia ayama	-	5
Neotrichia sp.	3	5
Oecetis persimilis	-	3
Mollusca:		
Gastropoda		
Amnicola sp.	267	-
Ancylidae	-	8
Micromenetus dilatatus	5	-
Physella sp.	5	-

Appendix 9b.

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the US Agri-Chemicals Fort Meade facility for 28 days (1/13/03). Taxa collected and total number of individuals counted (n = 3 samples).

	Control Site	Test Site
Annelida:		
Oligochaeta		
Limnodrilus sp.	1	-
Lumbriculus variegatus	1	-
Stylaria lacustris	2	-
Arthropoda:		
Arachnida		
Hygrobates sp.	1	1
Crustacea		
Hyalella azteca	9	5
Undetermined Amphipoda	2	-
Insecta		
Coleoptera		
Microcylloepus pusillus	1	5
Stenelmis sp.	8	4
Diptera		
Chironomidae	22	8
Corynoneura sp.	1	-
Corynoneura lobata	1	-
Endotribelos hesperium	-	2
Glyptotendipes sp.	1	-
Hemerodromia sp.	-	2
Orthocladiinae	-	1
Parametriocnemus sp.	-	1
Pentaneura inconspicua	6	2
Polypedilum flavum	137	132
Rheotanytarsus sp.	1	-
Rheotanytarsus exiguus	4	5
Rheotanytarsus exiguus grp.	48	8
Rheotanytarsus pellucidus	34	4
Simuliidae	-	1
Simulium sp.	-	1
Thienemanniella xena	3	43
Ephemeroptera		
Baetis intercalaris	7	34
Pseudocloeon sp.	2	1
Trichoptera		
Cheumatopsyche sp.	212	430
Hydropsyche sp.	-	1
Hydropsychidae	4	26
Mayatrichia ayama	-	2
Neotrichia sp.	1	2
Oecetis persimilis	-	1
Undertermined Trichoptera	11	2
Mollusca:		
Gastropoda		
Amnicola sp.	99	-
Ancylidae	-	3
Micromenetus dilatatus	1	-
Micromenetus sp.	1	-
Physella sp.	2	-
Undetermined Gastropoda	2	-

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

