Florida
Department of Environmental Protection

Biological Assessment of

Whiting Field N.A.S. WWTP

Santa Rosa County

NPDES #FL0002569

Sampled October 1993

May 1994

Biology Section
Division of Technical Services

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Whiting Field N.A.S. WWTP
County: Santa Rosa
NPDES Number: FL0002569
State Permit Expiration Date: 7 June 1994

Toxics Sampling Inspection (XSI)

Date Sampled: 29 October 1993

Results: No organic priority pollutants or pesticides were found in the effluent, but cadmium (2.5 µg/L) and copper (22 µg/L) were detected at levels above permit limits and above the Class III water quality standards (Rule 17302.530 (16) and (24) FAC). Silver was detected at a level above the Class III water quality standard but below the practical quantitation limit. This level of silver is not considered a violation, however it does warrant continued monitoring.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 2 November 1993

Results: The sample of effluent was not acutely toxic to the bannerfin shiner, *Cyprinella leedsi*. While the invertebrate, *Ceriodaphnia dubia*, experienced 15% mortality in the 48 hour test, this does not represent a violation.

Impact Bioassessment Inspection (IBI)

Date Sampled: 29 October 1993

Results: Shannon-Weaver diversity decreased by 73% at the test site, compared with the upstream reference site. This is a violation of biological integrity (Rule 17-302.530(11) FAC). Dramatic decreases in taxa richness, the Florida Index, and pollution sensitive taxa were also found between the reference and test sites. The test site macroinvertebrate population was dominated by the pollution tolerant dipteran, *Polypedilum illinoense* (85.5% of the total), interpreted to be a violation of Rule 17-302.530(47) FAC, which prohibits the discharge of substances which result in the dominance of nuisance species.

Water Quality Inspection (WQI)

Date Sampled: 29 October 1993

Results: Although, the nutrient sample for the test site appeared to have been preserved with nitric acid (invalidating the nitrogen results), nutrient enrichment at the test site was still evident from the AGP results. Algal growth potential at the test site (203.4 mg dry wt/L) far exceeded the 5 mg dry wt/L "problem threshold". Total phosphorus at the test site was greater than 95% of representative Florida streams. Fecal coliforms in the effluent were in violation of permit limits. Total coliforms in the effluent were in violation of Class III standards (17-302.530(7) FAC). Total residual chlorine of the effluent was 0.06 mg/L when measured in the field, a violation of permit limits and Class III surface water quality standards (17-302.530(19) FAC).

Introduction

The Whiting Field Naval Air Station WWTP, located in Santa Rosa County, Florida, is a domestic wastewater treatment plant serving a military training base (see maps in Appendix). This 1.05 MGD trickling filter facility discharges into an unnamed tributary of Clear Creek. Clear Creek enters the Blackwater River about 6.4 km above Milton, Florida. The plant's mean flow is 0.4 MGD. Sludge is treated by aerobic digestion, dried, and disposed of in the base sanitary landfill. If needed, wet sludge is to be transported to the Milton WWTP for disposal.

Permit limits for the plant are as follows: flow (0.87 MGD monthly average), pH (6.0-8.5 S.U.), dissolved oxygen (2.0 mg/L minimum), BOD_5 (20 mg/L annual average), TSS (20 mg/L annual average), chlorine residual (0.5 mg/L minimum for disinfection and 0.01 mg/L maximum at discharge), TKN (30 mg/L), and fecal coliform bacteria (200 organisms/100 mL maximum) (see Facility Summary in Appendix).

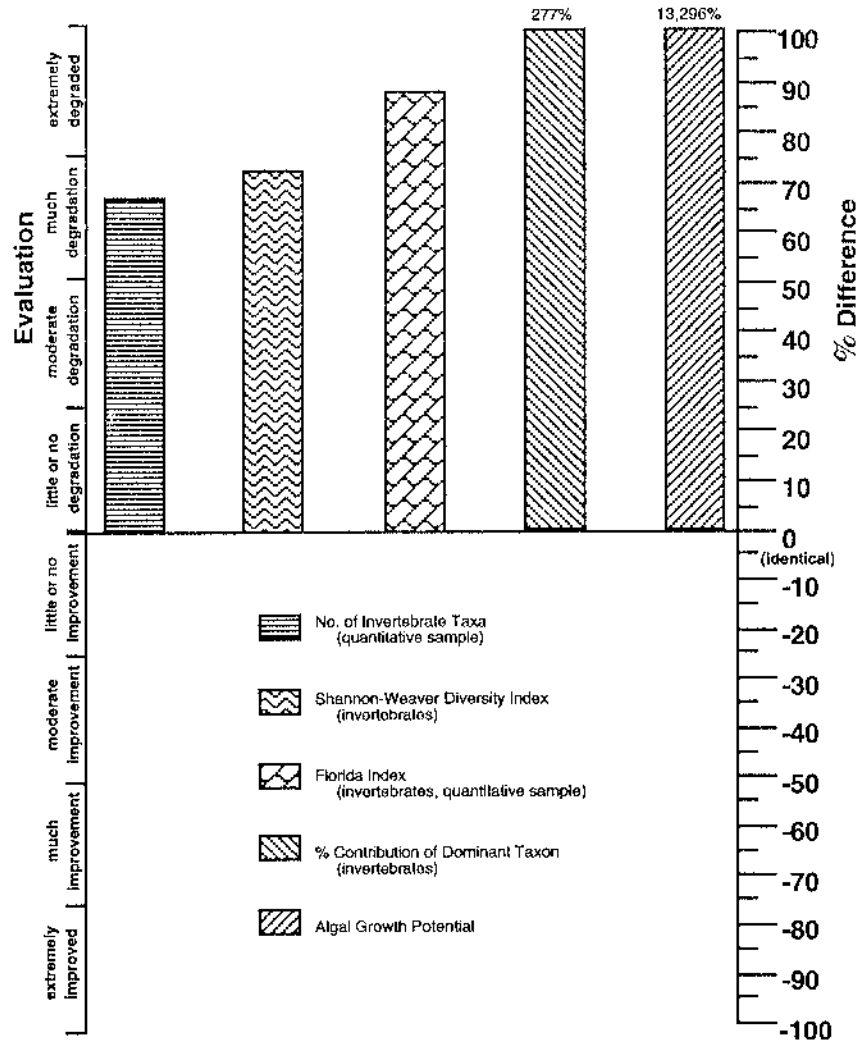
Notes from an inspection on March 31, 1993, indicated numerous problems. The plant has a lengthy list of instances of poor plant maintenance, self-monitoring, and record keeping (see Facility Summary in Appendix). Additionally, effluent samples collected on this date violated water quality standards for cadmium, copper, and silver.

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site	Recovery Site
Macroinvertebrate Qualitative			
Number of Taxa	26	6	38
Florida Index	17	1	29
# EPT Taxa	6	0	11
SIIF	17	9	25
% Contribution of Dominant Taxon	40	78	10
% Oligochaeta	1.4	17.7	0.8
% Diptera	46	81.3	43
% Ephemeroptera	4.7	0	16.5
% Trichoptera	41.2	0	13.5
% Odonata	0.5	0.5	3.0
% Coleoptera	3.3	0	9.7
% Plecoptera	0	0	11.4
% Other	2.9	0.5	2.1
% Predators/ Carnivores	9.2	26.6	19.2
% Deposit feeders (above surface)/ Collector-Gatherers	4.7	29.2	26.2
% Deposit feeders (below surface)	1.4	17.7	0.8
% Suspension feeders/ Collector-Filterers	80.4	0	14.8
% Scavengers	0.7	0	1.7
% Scrapers	3.1	0	17.3
% Shredders	0.6	26	14.8
% Borers	0	0	5.3
% Parasites	0	0.5	0
Macroinvertebrate Hester-Dendy			
Number of Taxa	36	12	34
Florida Index	24	3	23
# EPT Taxa	12	0	7
Shannon-Weaver Diversity	3.3	0.9	4.3
% Contribution of Dominant Taxon	22.7	85.5	15
% Oligochaeta	0	4.8	1.4
% Diptera	75	94.2	81.6
% Trichoptera	22.7	0	2
% Ephemeroptera	1.2	0	9.5
% Plecoptera	0.1	0	2
% Other	0.7	1.0	3.4
% Predators/Carnivores	4.8	31.8	11.3
% Deposit feeders (above surface)/ Collector-Gatherers	9.8	31.4	35.4
% Deposit feeders (below surface)	0	5.2	1.5
% Suspension feeders/Collector-Filterers	73.5	0.2	39.4
% Plant piercers	3.7	0	0
% Scrapers	4.5	0.3	7.3
% Shredders	3.8	31.1	5.1
Algal Growth Potential (mg dry wt/L)	1.5	203.4	1.8

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in Clear Creek approximately 0.5 miles above the discharge) and a test site (100 feet below the plant outfall in the unnamed tributary to Clear Creek). During reconnaissance, it was noted that the upstream reference site was being affected by severe erosion at SR 87. Another site (designated here as the recovery site) was chosen in an area of natural habitat, approximately 2.5 miles downstream from where the WWTP discharge enters Clear Creek. The purpose of this recovery site was to assess the adverse effects of the sedimentation on the upstream reference site. It was thought that the "recovery site" was far enough from the WWTP discharge that it could serve as a "control" for the sediment affected reference site. A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on the effluent/test site, as well as the reference and recovery sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.



Effect of discharge on receiving stream
(measured as difference between control and test sites).

Benthic macroinvertebrate communities were evaluated at the three stream stations (reference, test, and "recovery" sites). Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using 20 discrete dip net sweeps. Additional invertebrate collections were accomplished using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Unfortunately, periphytometers were not deployed, and phytoplankton was not sampled at the test site, so impacts from the WWTP on algal populations could not be determined. Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

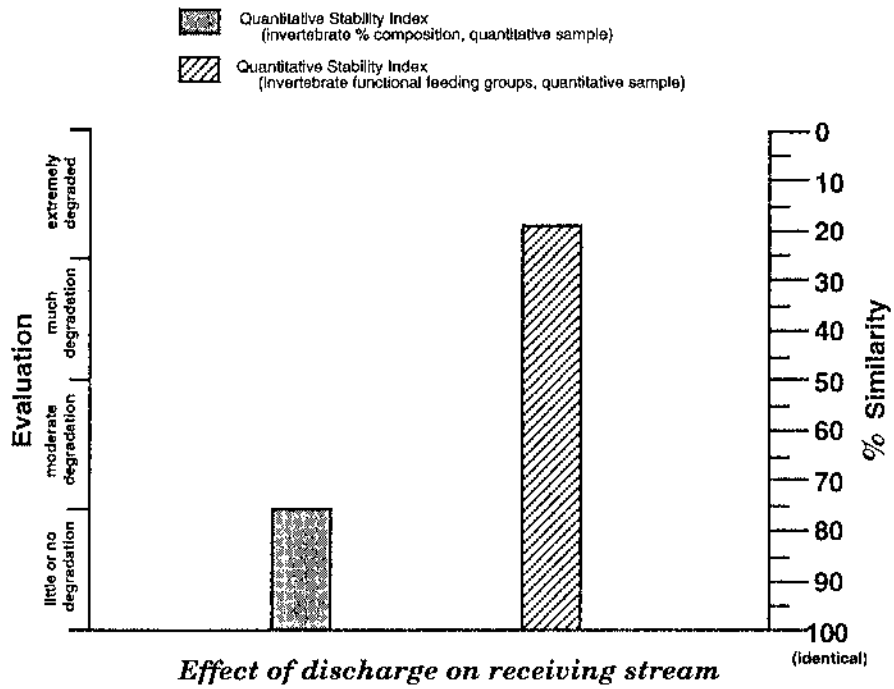
Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed in this report. Many of

these, such as the number of taxa and Shannon-Weaver Diversity Index are well known. Others are briefly explained here. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy (*i.e.*, many clean-water organisms are present). The Ephemeroptera/Plecoptera/Trichoptera (EPT) Index is calculated by summing the number of distinct taxa of EPT's represented in a sample. A higher EPT Index is associated with good water quality. Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually associated with disturbance. The determination of the Quantitative Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for each site. Then, the lesser of the two percentages for each discrete taxonomic group is totaled. A QSI (for % composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (for functional feeding groups). The Stream Invertebrate Index for Florida (SIIF) is a composite metric which is based upon the macroinvertebrate communities found at Florida Eco-regional reference sites sampled with dip net sweeps (EA Engineering 1994). The SIIF assigns 5, 3, or 1 point(s) to a variety of invertebrate parameters, depending on how closely that parameter approaches the expected Eco-regional reference condition (5 being a very close match). The following parameters are used in calculating the SIIF for the Panhandle: taxa richness, EPT Index, % contribution of the dominant taxa, % Diptera, Florida Index, % suspension feeders/filterers, and % shredders (EA Engineering 1994). In the Panhandle, 23-29 SIIF points indicates no impairment, 15-22 points indicates moderate impairment, and 7-14 points is clear evidence of severe degradation. In the Florida Peninsula, these same parameters, along with the # of crustacean and mollusk taxa and the % of crustacean and mollusk taxa, are used to calculate the SIIF. In the Peninsula, 27-33 SIIF points indicates no impairment, 17-26 points indicates moderate impairment, and 9-16 points is clear evidence of severe degradation.

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, and the Florida Index are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the percent contribution of dominant taxon and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Glenn Butts, Ron Rampfel, and Karen McDonald (DEP Northwest District) and Chris Barge, Lyn Burton, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathleen Lurding, Elizabeth Miller, Kim Pearce, Urania Quintana, Greg Wynn and David Young (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.



Effect of discharge on receiving stream
(measured as similarity between control and test sites).

Results and Discussion

The reference and test sites received similar habitat assessment scores (63 and 65 points, respectively). Habitat at the recovery site was

noticeably improved, with a score of 84. Half of the surrounding land at the reference site was used for commercial purposes (associated with the roadways), while the remainder was forested (40%) or residential (10%). The test site was mostly forested (70%), with the rest of the land consisting of the Whiting Field N.A.S. Land at the recovery site was also predominantly forested (70%), with some agricultural (10%), residential (10%) and pasture land (10%). Water velocity at the reference site (0.4 m/s) was higher than that of the test site (0.2 m/sec), although velocity at both areas was sufficient for rheophilic organisms. Water velocity at the recovery site was 0.5 m/sec.

The pH was 6.5 at all three sites. Conductivity was comparable between sites (250 µmhos/cm, 313 µmhos/cm, and 140 µmhos/cm at the reference, test, and recovery sites, respectively). Dissolved oxygen was sufficient for aquatic life, ranging from 8.7 mg/L at the test site to 9.1 mg/L at the recovery site.

As mentioned earlier, the reference site was clearly subject to the effects of sedimentation and siltation. Water at this moderately shaded site was tannic and slightly turbid from the upstream erosion. Water at the heavily shaded test site was tannic, slightly turbid, with a slight green tint. However, chlorophyll *a* was not sampled, so the degree of this green tint could not be quantified. Sedimentation was not a problem at the test site, so adverse effects on the biota may be attributed to the Whiting Field discharge. The heavily shaded recovery site, located about 2.5 miles downstream from the discharge, did not appear to suffer from the sedimentation observed upstream. It was noted that the bulk of the sediment from the SR 87 area was deposited several hundred meters below SR 87A, causing the formation of sediment islands and encouraging the growth of titi thickets. Therefore, the "recovery" site appeared less affected by sedimentation than was the upstream reference site.

The sample of effluent was not acutely toxic to the bannerfin shiner, *Cyprinella leedsi*. While the invertebrate, *Ceriodaphnia dubia*, experienced 15% mortality in the 48 hour test, this does not represent a violation (Appendix). No organic priority pollutants or pesticides were found.

In the effluent, cadmium (2.5 µg/L) and copper (22 µg/L) were detected at levels above permit limits and above the Class III water quality standards (Rules 17-302.530 (16) and (24) FAC). Silver (0.08 µg/L) was detected at a level above the Class III water quality standard, but below the practical quantitation limit. Therefore, while this level of silver is not considered a violation, it does warrant continued monitoring. Iron (70 µg/L) and zinc (20 µg/L) were also detected in the effluent, neither of which violate Class III standards. A subsequent sample was collected on 14 December 1993 by Greg Smith of the DEP Northwest District office in Pensacola. Water quality violations of silver (0.08 µg/L), copper (27 µg/L), and cadmium (1.1 µg/L) were noted in his report.

Nutrient concentrations at the reference site were generally low, except for nitrate-nitrite, which was higher than approximately 85% of typical Florida streams (see Chemistry Summary Table and Table of Typical Water Quality Values in Appendix). Unfortunately, the effluent/test site nutrient sample appeared to have been preserved with nitric acid, invalidating the results (except for the total phosphorus value). Total phosphorus at the effluent/test site was 2.0 mg/L, while ortho-phosphate was 2.2 mg/L. Both values are higher than 95% of other Florida streams. Algal growth potential (AGP) results also indicated that substantial bioavailable nitrogen was present at the effluent/test site. AGP at the test site was an extraordinarily high 203.4 mg dry wt/L, compared with a fairly low AGP (1.5 mg dry wt/L) found at the reference site. The recovery site AGP was 1.8. An AGP above 5 mg dry wt/L is considered troublesome, since it has been correlated with algae blooms, low dissolved oxygen, and fish kills (Raschke and Schultz 1987).

Total and fecal coliforms were within standards at the reference and recovery sites. Fecal coliforms (320 organisms/100 mL) in the effluent/test site sample were in violation of permit limits. Total coliforms (3300 organisms/100 mL) at the test site were in violation of Class III standards (Rule 17-302.530(7) FAC).

Total residual chlorine of the effluent was 0.06 mg/L when measured in the field, a violation of permit limits and Class III surface water quality standards (17-302.530(19) FAC).

Measures of macroinvertebrate community health indicated extreme degradation associated with the discharge. The figure on p. 2 indicates the degree of difference between the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference. The figure on p. 3 summa-

rizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation. The recovery site data are not graphically depicted. Those results are presented in the Table on page 1 and discussed here.

Compared with the sediment affected reference site, taxa richness was severely reduced at the test site, both in the dip net samples (by 77%) and in the Hester-Dendy samples (by 67%). Dramatic decreases in the Florida Index also occurred between the reference site and test site. The Florida Index declined at the test site by 88% in the Hester-Dendy samples and by 94% in the dip net samples. Another indication of extreme degradation caused by the discharge was the 73% decrease in Shannon-Weaver diversity between the reference and the test sites. This is a violation of the biological integrity criterion (Rule 17-302.530(11) FAC).

Quantitative stability indices for community structure in the Hester-Dendy samples indicated a moderate similarity between the reference and test sites. The QSI for functional feeding groups (21%) however, indicated gross changes due to the discharge. The reference site was well represented by clean-water dipterans, (*e.g.*, *Rheotanytarsus* spp. and *Parametriocnemus* sp.), ephemeropterans (*Stenonema smithae*, *Baetis propinquus*, and *Isonychia* sp.), and trichopterans (*Hydropsyche* sp.). In contrast, these sensitive organisms were eliminated at the test site, in both dip net and Hester-Dendy samples, being replaced by the pollution tolerant (Hudson *et al.* 1990) dipteran, *Polypedilum illinoense* (85.5% of the total population). This dramatic community shift between the two study areas, and the dominance of a pollution tolerant organism, indicates a violation of Rule 17-302.530(47) FAC, which prohibits the discharge of substances which result in the dominance of nuisance species. Despite the problems with the nutrient analyses (incorrect preservative), the AGP results, coupled with the biological data, suggests that nutrient induced imbalances of flora and fauna are also occurring due to the discharge.

Another finding of this study was that the Clear Creek reference site biota were impaired due to non-point source runoff (erosion and subsequent sedimentation). This was especially evident in the dip net samples. Since the actual available substrates are sampled, dip net sweeps are considered very sensitive to habitat perturbations, such as sedimentation. In the dip net samples, a total of 38 taxa was recovered from the recovery site, while only 26 taxa were found at the reference site. Similarly, the Florida Index was 29 at the recovery site and only 17 at the reference site. The habitat perturbation was even evident in Hester-Dendy samples, where Shannon-Weaver diversity was 4.3 at the recovery station and 3.3 at the sediment affected reference site.

The Stream Invertebrate Index for Florida was consistent with the above findings. The sediment affected reference site received a SIIF score of 17 (moderate impairment), the WWTP test site received 9 SIIF points (severe degradation), while the recovery site got 25 SIIF points (no impairment). This is evidence that: 1) erosion control measures are needed in this watershed to mitigate damage seen at the reference site, and 2) improvements in effluent quality or alternate disposal methods are needed for the Whiting Field WWTP.

Conclusions

The sample of effluent was not acutely toxic to the bannerfin shiner, *Cyprinella leedsi*. While the invertebrate, *Ceriodaphnia dubia*, experienced 15% mortality in the 48 hour test, this does not represent a violation. No organic priority pollutants or pesticides were found.

In the effluent, cadmium (2.5 µg/L) and copper (22 µg/L) were detected at levels above permit limits and above the Class III water quality standards (Rule 17-302.530 (16) and (24) FAC). Silver was detected at a level above the Class III water quality standard but below the practical quantitation limit. Although this level of silver is not considered a violation, it does warrant continued monitoring. Iron (70 µg/L) and zinc (20 µg/L) were also detected in the effluent, neither of which violate Class III standards.

Although, the nutrient sample for the effluent/test site appeared to have been preserved with nitric acid (invalidating the nitrogen results), nutrient enrichment was still evident from the AGP results. Algal growth potential at the effluent/test site (203.4 mg dry wt/L) far exceeded the 5 mg dry wt/L "problem threshold". Total phosphorus at the effluent/test site was greater than 95% of representative Florida streams.

Total and fecal coliforms were within standards at the reference

site. Fecal coliforms in the effluent were in violation of permit limits. Total coliforms in the effluent were in violation of Class III standards (17-302.530(7) FAC).

Total residual chlorine of the effluent was 0.06 mg/L when measured in the field, a violation of permit limits and Class III surface water quality standards (17-302.530(19) FAC).

Shannon-Weaver diversity decreased by 73% at the test site, compared with the upstream reference site. This is a violation of biological integrity (Rule 17-302.530(11) FAC). Dramatic decreases in taxa richness, the Florida Index, and pollution sensitive taxa were also found between the reference and test sites. The test site macroinvertebrate population was dominated by the pollution tolerant dipteran, *Polypedilum illinoense* (85.5% of the total), interpreted to be a violation of Rule 17-302.530(47) FAC, which prohibits the discharge of substances which result in the dominance of nuisance species. Another finding of this study was that the Clear Creek reference site biota were impaired due to non-point source runoff (erosion and subsequent sedimentation), when compared with a "recovery site".

The Stream Invertebrate Index for Florida was consistent with the above findings. The sediment affected reference site received a SIIF score of 17 (moderate impairment), the WWTP test site received 9 SIIF points (severe degradation), while the recovery site generated a SIIF score of 25 (no impairment). This is evidence that 1) erosion control measures are needed in this watershed to mitigate damage seen at the reference site and 2) improvements in effluent quality or alternate disposal methods are needed for the Whiting Field WWTP.

Literature Cited

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Chemistry summary table for Whiting Field N.A.S. WWTP .

	Effluent/Test Site	Reference Site	Recovery Site
Organic Constituents (ug/L)			
None detected			
Metals (ug/L)			
Aluminum	100 U		
Arsenic	20 U		
Cadmium	2.5		
Copper	22 J		
Chromium	10 U		
Iron	70 J		
Lead	15 U		
Mercury	0.1 U		
Nickel	5 U		
Selenium	30 U		
Silver	0.08 I		
Zinc	20		
Nutrients (mg/L)			
Ortho-phosphate	2.2 A	0.015 U	0.015 U
Total phosphorus	2.0	0.020 U	0.020 U
Ammonia	0.27	0.020 U	0.020 U
Nitrate+Nitrite	690*	0.56 A	0.42
TKN	See comment *	0.11 A	0.090 I
Other Parameters			
Habitat Assessment	65	63	84
D.O. (mg/L)	8.7	8.9	9.1
pH (SU's)	6.5	6.5	6.5
Conductivity (µmhos/cm)	313	250	140
Temperature (°C)	16.3	13.8	13.9
AGP (mg dry wt/L)	203.4	1.5	1.8
Bioassay Fish	Not toxic		
Bioassay Invertebrate	15% mortality		
Fecal coliform (org/100 ml)	320	140	140
Total coliform (org/100 ml)	3300	1500	1500
TSS (mg/L)	4.4	5.2	4.8
Turbidity (NTU's)	15	20	10
BOD5 (mg/L)	3.9	0.5 U	0.5 U
Hardness (mg/L as CaCO3)	30	20 U	20 U

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

I - Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit.

J - Estimated value.

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

*- Sample appeared to be preserved with nitric acid. TKN could not be recovered. Nitrate-nitrite value is equivocal.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: Whiting Field		Date Summary Prepared: 10/28/93
Location (attach detailed map): NAS Whiting Field Building 1443	County: Santa Rosa	District: NW DISTRICT
Federal Permit # and expiration date: FL0002569	State GMS # and State expiration date:	Facility Type: Industrial Municipal Federal Agricultural Other (list):

Function of facility:
1.05 MGD Trickling Filter Wastewater Treatment Facility

Description of treatment process:
A 1.05 MGD Trickling Filter WWTP to operate a maximum Flow of 0.87 MGD. Discharge of effluent to Clear Creek to Blackwater River. Sludge treatment by aerobic digestion and sludge drying beds. Dried sludge to Base Sanitary Landfill. Wet Sludge shall be transported to Milton WWTP for disposal should the need occur.

Receiving waters: Clear Creek / Blackwater River	Classification: I II (III)	
Design Flow: 1.05 MGD	Mean Flow: 0.4 MGD	Flow during survey: 0.4 MGD

Discharge is: (Continuous) Intermittent Seasonal Rainfall dependent
Other (describe)

therefore, the best time to sample is:

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

NO MIXING ZONE

List effluent limits (if necessary, attach relevant paperwork):

Parameter	Limit (units)
Flow	0.87 MGD (max. mo. avg.)
pH - Eff.	6.0 (min.) / 8.5 (max.)
Chlorine Residual	0.5 mg/L (min.) / Decrease 0.01 mg/L (max.)
BOD5	20 mg/L (max. annual avg.)
Total Nonfilt. Residue (SS)	20 mg/L (max. annual avg.)
Fecal Coliform	200/100 mL (max.)
DO	2 mg/L (min.)
TKN	30 mg/L (max.)

Describe special permit conditions and permit modifications: July 25, 1989
Delete specific condition 25 (concerning sampling the supernate from the sludge drying beds) and add:
25. Samples of the supernate from the sludge drying beds shall be taken, analyzed and the results submitted annually to the Northwest District office with the monthly report for August. The parameters to be samples are as follows:

1) Primary standards except radionuclides	Yearly
2) Secondary standards	Yearly
3) Unregulated contaminants	Yearly

Whiting Field
(Facility)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Description of permitted outfall(s):

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: A March 31, 1993 inspection revealed poor monitoring, record keeping and maintenance of the facility. Samples taken indicated that the effluent did not meet water quality standards for several parameters. (A copy of the inspection comments is attached.) Facility Compliance areas evaluated and marked unsatisfactory at the time of the March 31, 1993 inspection are: records and reports, laboratory, sampling, self-monitoring program, flow measurement, and effluent. The following samples taken on March 31, 1993 exceeded their limitations: Copper - result = 38 ug/l (limit of 3.02 ug/l) and Cadmium - result = 1.1 ug/l (limit of 0 ug/l). (Note: Silver was also high with a result of 0.5 mg/l. A limit of ≤ 0.07 ug/l is set for silver; however, silver is not required to be sampled and analyzed in the permit conditions.)

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
PAST BIOASSESSMENTS HAVE NOT SHOWN PROBLEMS IN CLEAR CREEK RELATED TO WHITING WWTP. PAST BIOASSESSMENTS HAVE NOT INCLUDED THE TRIBUTARY WHERE THE DISCHARGE IS LOCATED. THE PRESENT STUDY WILL INCLUDE THIS TRIB.

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

Additional information:

Staff contributing to this review (signature):
Glenn Butts (Biologist)
Greg Smith (Inspector)
(Engineer)
Karen McDonald Co-op (ES I)
( )
( )

LATEST INSPECTION COMMENTS

INSPECTION COMMENTS

1. Records requested for review could not be found and the records which were found were very disorganized. The facility is required to maintain five years worth of monitoring data. Records of monitoring data shall include:
1) Date, time and exact location of sampling;
2) The individual(s) who performed the sampling or measurements;
3) The date(s) analyses were performed;
4) The individual(s) who performed the analyses;
5) The analytical techniques or methods used; and
6) The results of such analyses.

Additional Inspection Comments

Facility: Whiting Field

Inspector: Greg Smith

2. No calibration records could be found for any of the equipment used in the self monitoring program.

3. The dissolved oxygen samples are being sent to ATL Laboratory for analysis. D.O. must be measured immediately upon collection.

4. No records were being maintained for composite or grab samples.

5. The balance used for TSS sample analysis had not been calibrated.

6. There was no records of temperature monitoring for the water bath used for fecal coliform analysis.

. No Quality Controls or Quality Assurances were noted for the analysis being performed at the facility's laboratory.

. Ponding was noted on the trickling Filter.

Additional Inspection Comments

Facility: Whiting Field

Inspector: Greg Smith

9. Very uneven distribution of the filter media was noted in the trickling filter.

10. The stilling well for the flowmeter needs to be cleaned out.

11. The door for the chlorine feed room was sticking shut.

12. Solids build-up in the chlorine contact chamber was indicated by excess gassification.

13. The flowmeter was not working.

14. A review of the facility's monthly operating reports indicated the following:

A. Fecal coliform results were not reported for December 1992 or February 1993.

B. BOD and TSS measurements were not made while the plant was undergoing repair in February. This is a critical period of time and monitoring should be performed more frequently instead of not at all.

Additional Inspection Comments

Facility: _____

Inspector: _____

c. D.O. monitoring was not performed as required in March.

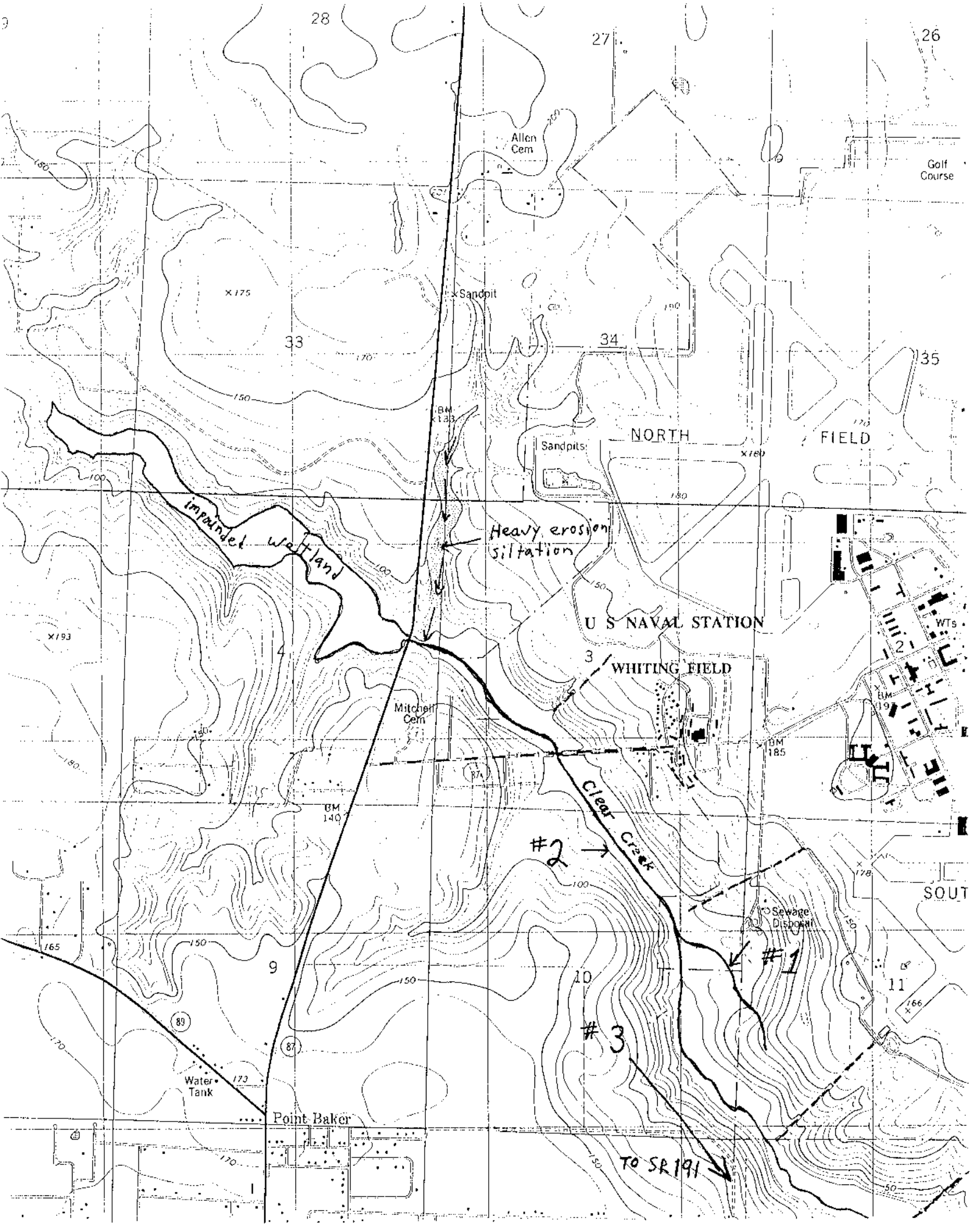
D. Chlorine results are being reported incorrectly.

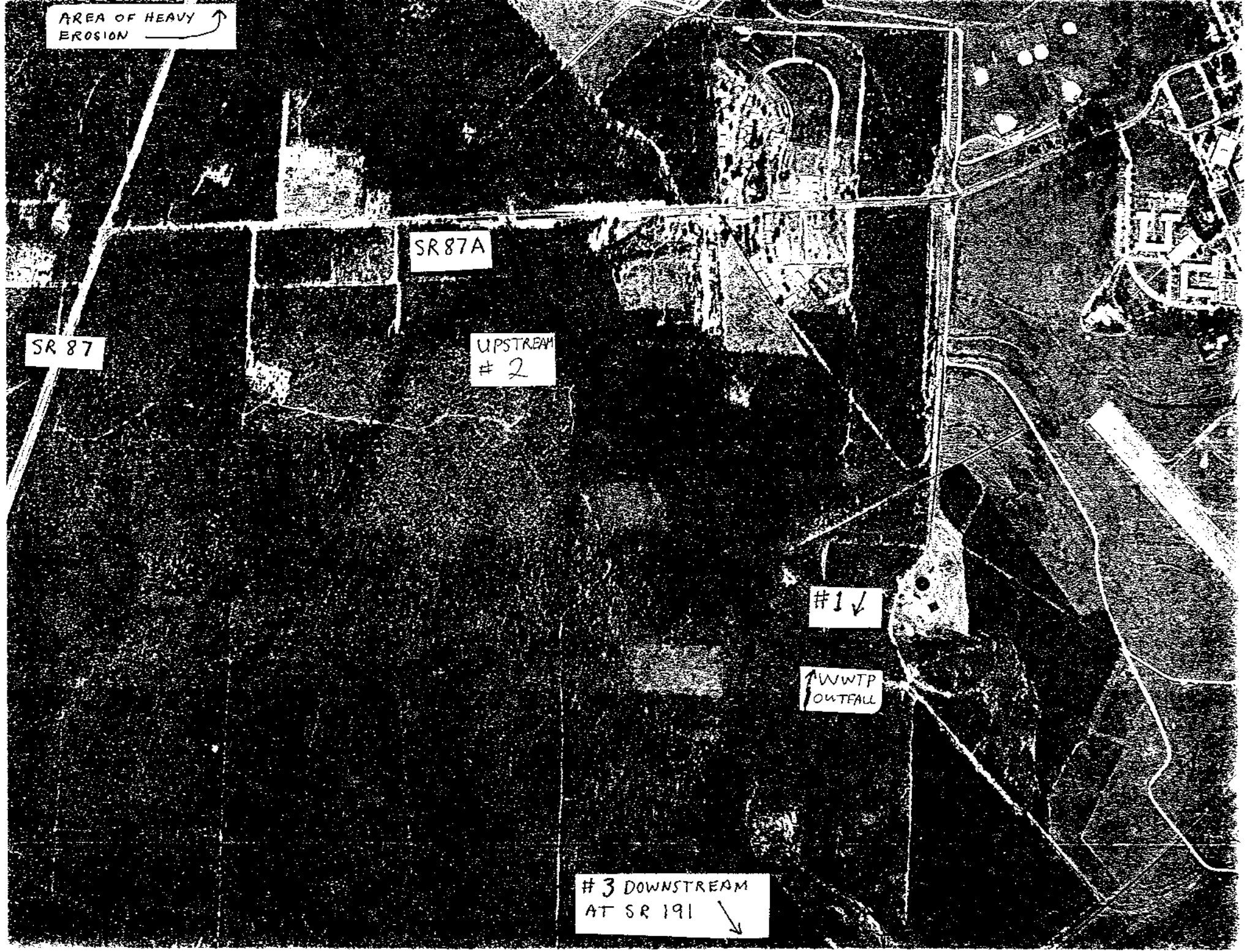
15. During questioning regarding the disposal of rinse water generated during the cleanup of herbicide and pesticide spraying equiptment at the golf course some inconsistencies were noted between Facility personnel and Tumpane personnel. Mr. Dale Boyett (Facility personnel) indicated that there was a problem while Mr. Bob Brembzer (Tumpane personnel) explained that no clean-up was being done.

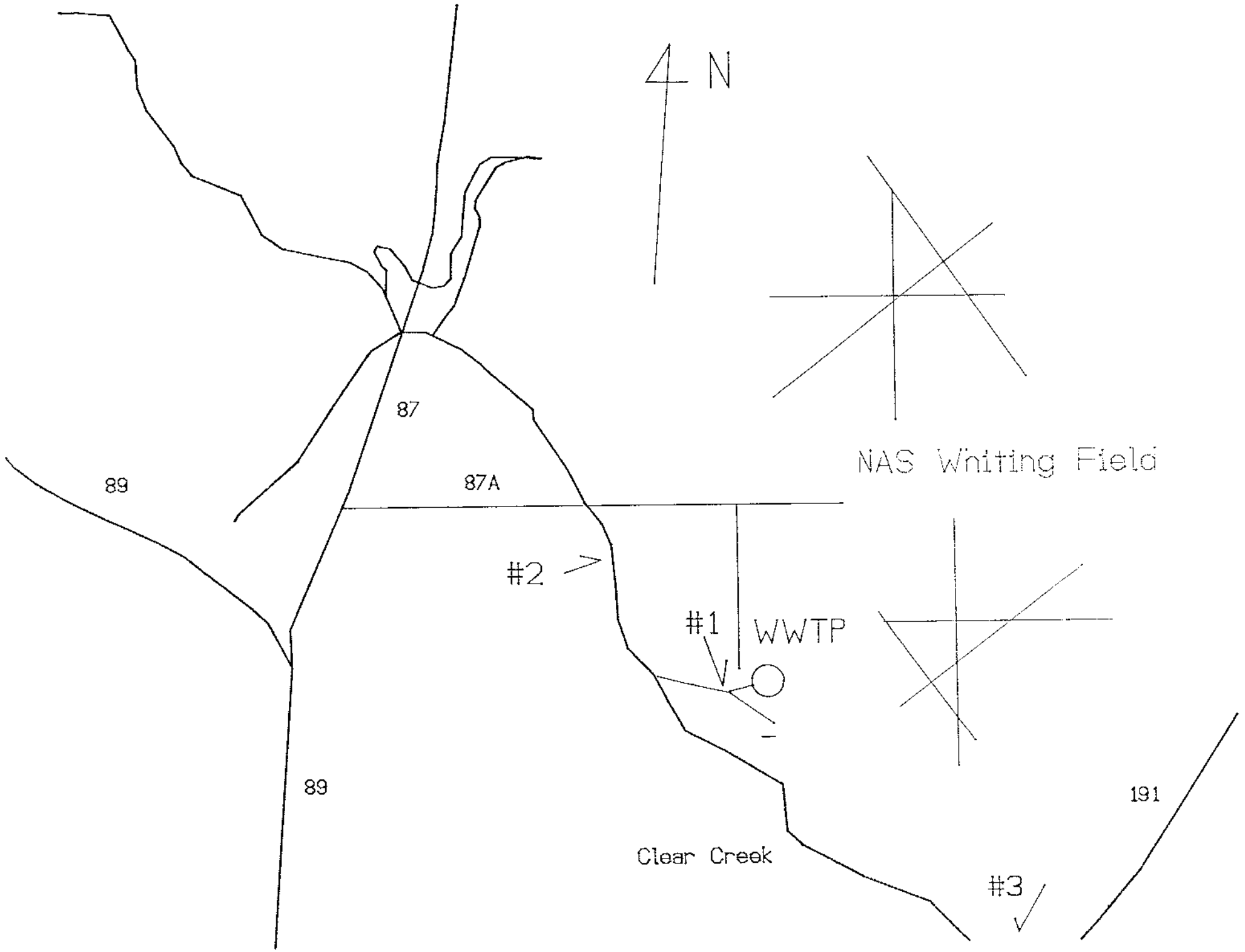
16. Samples taken during the inspection indicate Water Quality violations for the following parameters;

a) copper 38 ug/L
b) silver 0.5 ug/L
c) cadmium 1.1 ug/L

Please note that several of these deficiencies have been noted during previous inspections and should be corrected immediately.


28
27
26
Allen Cem
Golf Course
Sandpit
33
34
35
BM 183
Sandpits
NORTH FIELD
impounded wetland
Heavy erosion
Siltation
U S NAVAL STATION
WHITING FIELD
WTs
BM 19
BM 185
Mitchell Cem
BM 140
Clear Creek
#2
#1
#3
Sewage Disposal
SOUT
9
10
11
Water Tank
Point Baker
TO SR 191


AREA OF HEAVY EROSION
SR 87A
SR 87
UPSTREAM # 2
#1
WWTP OUTFALL
#3 DOWNSTREAM AT SR 191


N
87
89
87A
NAS Whiting Field
#2
#1
WWTP
89
191
Clear Creek
#3

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

GMS

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: NW DISTRICT	~~STORET~~ STATION NUMBER: 1057F07017	DATE (M/D/Y): 10-28-93	RECEIVING BODY OF WATER: TRIB. TO CLEAR CREEK

REMARKS: TEST SITE	LOCATION: 100 feet BELOW WHITING WWTP OUTFALL	FIELD ID/NAME: # 1

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover **20**	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity **17**	Max. observed; >0.3 m/sec. **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec **0-7 points**
Artificial Channel/ Flow Alteration **10**	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability **9**	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality **9**	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments **0**	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE **65**

COMMENTS: THIS SITE HAS ADEQUATE HABITAT AND STEADY FLOW TO SUPPORT A DIVERSE CLEAN WATER FAUNA.

ANALYSIS DATE: 10-28-93.	ANALYST:	SIGNATURE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 6MS 1057F07017	DATE (M/D/Y): 10-28-93	TIME: 0930	RECEIVING BODY OF WATER: TRIB TO CLEAR CREEK

REMARKS: TEST SITE	LOCATION: 100 feet Below WHITING WWTP OUTFALL	FIELD ID/NAME: # 1

RIPARIAN ZONE/INSTREAM FEATURES

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

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

Local Watershed Erosion (check box): None [X] Moderate [ ] Heavy [ ]

Local Watershed NPS Pollution (check box): No evidence [X] Some potential sources [ ] Obvious sources [ ]

Point-Source Pollution (list location and describe): WHITING FIELD WWTP DOMESTIC DISCHARGE

Estimated System Width (range, m): 5	Estimated System Depth (range, m): 0.6	yes
High Water Mark (m above bed): 0.6	Velocity (range, m/s): 0.2	Impounded [ ] Channelized [ ]

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Anaerobic: [ ] Other: [ ] MUSTY

Sediment Oils: Absent: [X] Slight: [ ] Moderate: [ ] Profuse: [ ]

Sediment Deposits: Sludge: [ ] Paper Fiber: [ ] Mud: [ ] Sand: [X] Shell: [ ] Other: [X] ORGANICS

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	2		Riffles			
Leaf Packs	5	2		Sand	20	4	
Aquatic Vegetation	20	3		Mud/Muck/Silt	20	4	
Rock or Shell Rubble				Benthic leaf mats	10	2	
Undercut Banks/Roots	15	3		Other:			

WATER QUALITY

	Depth (m):	Temp. (°C): 10-28-93	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	BOD 11-02-93	TURB	Secchi (m):
Top	0.5	16.3	6.5	8.7	313	3.9	15	>0.5
Mid-depth								
Bottom								

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

Water Odors (check box): Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Other: [ ]

Water Surface Oils (check box): None: [X] Sheen: [ ] Globs: [ ] Slick: [ ]

Clarity (check box): Clear: [ ] Slightly turbid: [X] Turbid: [ ] Opaque: [ ]

Color (check box): Tannic: [X] Green (algae): [ ] Clear: [ ] Other: [ ] Slightly green

Weather Conditions: Cool, Overcast

Abundance:	Absent	Rare	Common	Abundant
Periphyton	[ ]	[ ]	[ ]	[X]
Fish	[ ]	[ ]	[X]	[ ]
Aquatic Macrophytes	[ ]	[ ]	[X]	[ ]
Iron/sulfur Bacteria	[X]	[ ]	[ ]	[ ]

SAMPLING TEAM: Glenn Butts	SIGNATURE: Glenn Butts	DATE: 10-28-93

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

SUBMITTING AGENCY CODE: 8010 SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.0023	DATE (M/DY): 10-29-93	RECEIVING BODY OF WATER: CLEAR CREEK

REMARKS: TEST SITE FOR SILTATION/EROSION AT SR 87	LOCATION: UPSTREAM FROM WHITING WWTP AT SR 87A	FIELD ID/NAME: # 2

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 22	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. 23-30 points	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. 16-22 points	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. 8-15 points	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. 0-7 points
Water Velocity 23	Max. observed: >0.3 m/sec. but < 1 m/sec 23-30 points	Max. observed; 0.1 to 0.3 m/sec 16-22 points	Max. observed; 0.05 to 0.1 m/sec 8-15 points	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 0-7 points
Artificial Channel/ Flow Alteration 3	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. 12-15 points	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. 0-3 points
Bank Stability 3	Stable. No evidence of erosion or bank failure. Little potential for future problems. 9-10 points	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 6-8 points	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 3-5 points	Unstable. Many raw, eroded areas. Obvious bank sloughing. 0-2 points
Riparian Zone Vegetation Quality 7	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. 9-10 points	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. 6-8 points	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. 3-5 points	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. 0-2 points

Adjustments 5	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE 63

COMMENTS: EROSION FROM WASHOUT AT SR 87

ANALYSIS DATE:	ANALYST:	SIGNATURE:
10-29-93	G. Butts	Glenn Butts

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.0023	DATE (M/D/Y): 10-29-93	TIME: 1030	RECEIVING BODY OF WATER: CLEAR CREEK

REMARKS: TEST SITE FOR SILTATION/EROSION AT SR 87	LOCATION: UPSTREAM FROM WHITING WWTP AT SR 87A	FIELD ID/NAME: # 2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
40			10	50		

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

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

Point-Source Pollution (list location and describe): NONE AT THIS SITE, HOWEVER NPS INCLUDES HEAVY EROSION/SILTATION FROM WASHOUT AT SR 87

Estimated System Width (range, m): 9.0	Estimated System Depth (range, m): 0.5-1.0	yes
High Water Mark (m above bed): 0.7	Velocity (range, m/s): 0.4	Impounded ☐ Channelized ☐

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐ Slight H_2S

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	3	DIPNET	Riffles			DIPNET
Leaf Packs	20	4		Sand	30	3	
Aquatic Vegetation	20	4		Mud/Muck/Silt			
Rock or Shell Rubble				Benthic leaf mats	10	3	
Undercut Banks/Roots	10	3		Other:			

WATER QUALITY

	Depth (m):	Temp. (°C): (10-29-93)	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	BOD (11-01-93)	TURB	Secchi (m):
Top	1.0	13.8	6.5	8.9	250	0.5	20	0.6
Mid-depth								
Bottom								

System Type : Stream: ☒ (Sand Bottomed, Swamp & Bog, Alluvial, Sand Bot w/ Spring, Calcareous, Misc.) 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: ☐ Obvious upstream Siltation

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

Weather Conditions: Cool drizzle

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

SAMPLING TEAM: Glenn Butts, Ron Rampfel	SIGNATURE: Glenn Butts	DATE: 10-29-93

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.0020	DATE (M/D/Y): 10-29-93	TIME: 1130	RECEIVING BODY OF WATER: CLEAR CREEK

REMARKS: CONTROL SITE	LOCATION: BELOW WHITING FIELD AT SR 191	FIELD ID/NAME: # 3

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
70	10	10	10			

Local Watershed Erosion (check box): None [X] Moderate [ ] Heavy [ ]

Local Watershed NPS Pollution (check box): No evidence [X] Some potential sources [ ] Obvious sources [ ]

Point-Source Pollution (list location and describe): NOT EVIDENT EVEN THOUGH WHITING WWTP AND HEAVY EROSION IS ABOUT 2 MILES UPSTREAM. AT THIS POINT IN THE CREEK UPSTREAM INFLUENCE APPEARS MINIMAL.

Estimated System Width (range, m): 12.0	Estimated System Depth (range, m): 0.5-1.5	yes
High Water Mark (m above bed): 0.5	Velocity (range, m/s): 0.5	Impounded [ ] Channelized [ ]

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Anaerobic: [ ] Other: [ ]

Sediment Oils: Absent: [X] Slight: [ ] Moderate: [ ] Profuse: [ ]

Sediment Deposits: Sludge: [ ] Paper Fiber: [ ] Mud: [ ] Sand: [X] Shell: [ ] Other: [ ]

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	3	DIPNET	Riffles			DIPNET
Leaf Packs	20	4		Sand	30	3	
Aquatic Vegetation	20	4		Mud/Muck/Silt			
Rock or Shell Rubble				Benthic leaf mats	10	3	
Undercut Banks/Roots	10	3		Other:			

WATER QUALITY

	Depth (m):	Temp. (°C): (10-29-93)	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	BOD (11-01-93)	TURB	Secchi (m):
Top	1.0	13.9	6.5	9.1	140	0.5	10	1.1
Mid-depth								
Bottom								

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

Water Odors (check box): Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Other: [ ]

Water Surface Oils (check box): None: [X] Sheen: [ ] Globs: [ ] Slick: [ ]

Clarity (check box): Clear: [X] Slightly turbid: [ ] Turbid: [ ] Opaque: [ ]

Color (check box): Tannic: [X] Green (algae): [ ] Clear: [ ] Other: [ ]

Weather Conditions: Cool Drizzle

Abundance:	Absent	Rare	Common	Abundant
Periphyton	[ ]	[ ]	[X]	[ ]
Fish	[ ]	[ ]	[X]	[ ]
Aquatic Macrophytes	[ ]	[ ]	[X]	[ ]
Iron/sulfur Bacteria	[X]	[ ]	[ ]	[ ]

SAMPLING TEAM: Glenn Butts Ron Rampfel	SIGNATURE: Glenn Butts	DATE: 10-29-93

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

SUBMITTING AGENCY CODE: 3010 SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.0020	DATE (M/D/Y): 10-29-93	RECEIVING BODY OF WATER: CLEAR CREEK
REMARKS: CONTROL SITE	LOCATION: BELOW WHITING FIELD AT SR 191		FIELD ID/NAME: # 3

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 25	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. 23-30 points	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. 16-22 points	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. 8-15 points	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. 0-7 points
Water Velocity 24	Max. observed; >0.3 m/sec. 23-30 points	Max. observed; 0.1 to 0.3 m/sec 16-22 points	Max. observed; 0.05 to 0.1 m/sec 8-15 points	Max. observed; <0.05 m/sec 0-7 points
Artificial Channel/ Flow Alteration 12	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. 12-15 points	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. 0-3 points
Bank Stability 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. 9-10 points	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 6-8 points	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 3-5 points	Unstable. Many raw, eroded areas. Obvious bank sloughing. 0-2 points
Riparian Zone Vegetation Quality 9	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. 9-10 points	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. 6-8 points	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. 3-5 points	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. 0-2 points

Adjustments 5	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE 84

COMMENTS: THIS IS CONSIDERED THE CONTROL BECAUSE ACCESS CLOSER TO THE DISCHARGE TRIB WAS NOT POSSIBLE, HEAVY EROSION PROBLEM UPSTREAM

ANALYSIS DATE:	ANALYST:	SIGNATURE:
10-29-93	Glenn Butts	Glenn L Butts

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Whiting Effluent
Location: Whiting Field WWTP Effluent
County: SANTA ROSA
Contact/District: G. Butts / NW
NPDES Permit #: FL0021211 93-Nov-03-07 Outfall #: 65365-

Sample Collection: Date 11/02/93 Time 1025
Test Beginning: Date 11/03/93 Time 1330
Test Ending: Date 11/05/93 Time 0830
Organism Batch #: 118 Diluent Batch #: 29
Organism Age: < 24 hrs
Test Organism: Ceriodaphnia dubia

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 1 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0	22.7 @ 22.8	8.5 @ 22.8	980 @ 1,000
	9.0 @ 9.0			9420 @ 10,000 @ 23.4 °C
24 hr	7.0 @ 7.0	23.6 @ 23.7	8.4 @ 23.8	990 @ 1,000
	9.0 @ 9.0			9420 @ 10,000 @ 24.0 °C
48 hr	7.0 @ 7.0	23.3 @ 23.4	8.4 @ 23.7	990 @ 1,000
	9.0 @ 9.0			9650 @ 10,000 @ 24.0 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control	A	5	5	5	7.9		8.2	22.6		24.0	8.0		8.4	155		165
Control	B	5	5	5			8.2			24.0			8.3			170
Control	C	5	5	5			8.2			23.9			8.3			170
Control	D	5	5	5			8.2			23.8			8.4			170
100%	A	5	5	4	6.9		8.1	22.6		24.0	8.0		8.4	315		325
100%	B	5	4	4			8.1			24.0			8.4			335
100%	C	5	4	4			8.1			24.0			8.4			345
100%	D	5	5	5			8.1			23.8			8.4			330
Measured/Loaded by:		MF	TM	TM	MF		TM	MF		TM	MF		TM	MF		TM
Recorded by:		TM	TM	TR	TM		TR	TM		TR	TM		TR	TM		TR

Investigators' Signatures

Tina M. Mikulski
Marshall Faircloth
Tobin G. Rackley

Reviewer

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			0.06	—	GB
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TM
Alkalinity:	125	70	60	Hach	TM
Hardness:	130	80	30	Hach	TM
Total Ammonia:	<0.017	<0.017	0.193	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: 58.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 7/8/93

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Whiting Effluent
Location: whiting Field WWTP Effluent
County: SANTA ROSA
Contact/District: G. Butts / NW
NPDES Permit #: FL0021211 Outfall #:
93 Nov -03 07 65365 -

Sample Collection: Date 11/02/93 Time 1025
Test Beginning: Date 11/03/93 Time 1330
Test Ending: Date 11/05/93 Time 1330
Organism Batch #: 446 Diluent Batch #: well
Organism Age: 10 days old
Test Organism: Cyprinella leedsi

Test Type: (Screening) Definitive
(Static) Static Renewal | Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.7 @ 22.8	8.5 @ 22.8	980 @ 1,000 9420 @ 10,000 @ 23.4 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.6 @ 23.7	8.4 @ 23.8 *	980 @ 1,000 * 990 TM 9420 @ 10,000 @ 24.0 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.4 @ 23.7	990 @ 1,000 9650 @ 10,000 @ 24.0 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
Control A	13	5	5	5	7.4	8.1	8.2	25.3	23.3	23.7	7.5	9.1	8.4	250	245	245
Control B	41	5	5	5	7.4	8.1	8.2		23.3	23.7	7.5	9.1	8.3	250	250	250
100% A	413	5	5	5	6.9	7.6	7.6	24.4	23.3	23.7	8.0	9.0	8.3	340	335	340
100% B	76	5	5	5	6.9	7.5	7.6		23.3	23.6	8.0	8.8	7.8	340	335	340
Measured/Loaded by:		TM	TM	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM
Recorded by:		TM	TM	TM	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR

Investigators' Signatures

Tina McKendry
Maryball Faircloth
Robin C. Keale

Reviewer

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			0.06	—	GB
Lab Total Residual Cl2:	<0.03	<0.03	<0.05	DR-100	TM
Alkalinity:	125	70	60	Hach	TM
Hardness:	120	80	30	Hach	TM
Total Ammonia:	<0.01	<0.017	[illegible]	Orion	MF

* Mr. Hogg mail recorded 0.193 mg/L 11/5/93

Ammonia Meter #98136 Meter Slope: -55.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

Benthic macroinvertebrate taxa list for Whiting Field N.A.S. WWTP, collected via Hester-Dendy artificial substrates in Clear Creek, on 29 October, 1993. Densities, in number/m^2, represent the mean of three replicates.

	Test Site	Reference Site	Recovery Site
Acarina			
Atractides sp.	–	1	–
Hygrobates sp.	–	1	–
Undetermined Oribatidae sp.	2	–	–
Coleoptera			
Ancyronyx variagata	–	4	–
Macronychus glabratus	–	–	1
Stenelmis sp.	–	1	2
Diptera			
Conchapelopia sp.	–	–	3
Corynoneura sp.	–	–	1
Cricotopus/Orthocladius grp. sp.	–	4	–
Goeldichironomus holoprasinus	2	–	–
Helopelopia sp.	–	1	–
Hemerodromia sp.	–	3	6
Microtendipes pedellus grp.	–	–	1
Orthocladius annectens	–	2	–
Orthocladinae genus F (Epler)	–	1	6
Palpomyia grp. sp.	–	–	1
Polypedilum convictum grp.	–	2	–
Polypedilum illinoense	643	–	–
Parametriocnemus sp.	–	33	8
Rheocricotopus robacki	–	92	21
Rheotanytarsus distinctissimus grp.	–	213	22
Rheotanytarsus exiguus grp.	1	222	13
Simulium sp.	–	58	3
Tanytarsus sp. C (Epler	–	–	1
Tanytarsus sp. D (Epler)	–	6	2
Tanytarsus sp.	–	–	1
Tanytarsus sp. G (Epler)	–	–	6
Tanytarsus sp. J (Epler)	–	4	10
Tanytarsus sp. L (Epler)	–	–	1
Tanytarsus sp. M (Epler)	–	1	4
Tanytarsus sp. T (Epler)	–	–	1
Thienemanniella sp.	–	1	–
Tribelos jucundum	–	–	1
Tvetenia discoloripes grp. sp.	–	4	–
Undetermined Chironomidae sp.	–	65	1
Undetermined dipteran pupae	63	18	7

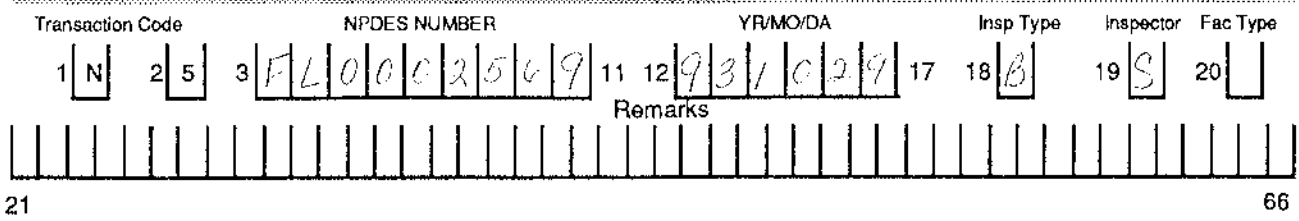
Undetermined Tanypodinae	–	4	–
Ephemeroptera			
Attenella attenuata	–	2	–
Baetis intercalaris	–	1	–
Isonychia arida	–	1	–
Isonychia sp.	–	2	–
Stenonema smithae	–	5	10
Stenonema sp.	–	1	4
Gastropoda			
Hebetancylus excentricus	–	–	1
Micromenetus dilatatus	2	–	–
Megaloptera			
Corydalus cornutus	–	1	1
Oligochaeta			
Aeolosoma headleyi	5	–	–
Eclipidrilus sp.	1	–	–
Nais behningi	–	–	2
Pristina leidyi	24	–	–
Pristinella jenkinae	3	–	–
Pristinella longisoma	3	–	–
Platyhelminthes			
Dugesia sp.	3	–	–
Plecoptera			
Helopicus subvarians	–	1	1
Paragnetina fumosa	–	–	1
Trichoptera			
Brachycentrus sp.	–	–	1
Hydropsyche decalda	–	26	–
Hydropsyche sp.	–	129	2
Hydroptila sp.	–	65	–
Mayatrichia sp.	–	1	–
Neotrichia sp.	–	1	–
Undetermined plecopteran	–	–	1
Total	752	977	147

Benthic macroinvertebrate taxa list for Whiting Field N.A.S. WWTP, collected via 20 discrete dip net sweeps in Clear Creek, on 29 October, 1993.

	Test Site	Reference Site	Recovery Site
Coleoptera			
Dineutus ciliatus	–	–	3
Macronychus glabratus	–	4	16
Microcylloepus pusillus	–	–	1
Promoresia elegans	–	–	2
Stenelmis convexula	–	1	–
Stenelmis hungerfordi	–	–	1
Stenelmis sp.	–	2	–
Decapoda			
Procambarus sp.	–	3	5
Diptera			
Ablabesmyia mallochi	–	1	–
Brillia flavifrons	–	–	18
Conchapelopia sp.	–	5	1
Cryptochironomus sp.	–	2	–
Goeldichironomus holoprasinus	6	–	–
Hayesomyia sp.	–	–	1
Limnophila sp.	–	–	1
Palpomyia grp. sp.	–	2	–
Pentaneura inconspicua	–	–	1
Polypedilum convictum grp.	–	1	–
Polypedilum fallax grp.	–	–	23
Polypedilum illinoense	150	–	1
Polypedilum scalaenum grp.	–	–	5
Procladius sp.	–	1	–
Rheocricotopus robacki	–	3	14
Rheotanytarsus exiguus grp.	–	2	5
Simulium sp.	–	78	9
Stenochironomus sp.	–	–	6
Tanytarsus sp. C (Epler)	–	1	–
Tanytarsus sp. J (Epler)	–	–	3
Tanytarsus sp. L (Epler)	–	1	3
Thienemanniella sp.	–	–	1
Thienemannimyia grp.	–	–	1
Tipula sp.	–	–	4
Tribelos jucundum	–	–	2
Unniella sp.	–	–	1
Undetermined dipteran pupae	–	–	2
Ephemeroptera			
Baetis propinquus	–	1	24

Hexagenia bilineata	–	–	1
Hexagenia limbata	–	1	–
Isonychia arida	–	6	–
Neoephemera youngi	–	–	2
Stenonema exiguum	–	2	–
Stenonema smithae	–	–	12
Hirudinea			
Batracobdella paludosa	1	–	–
Mooreobdella tetragon	–	1	–
Megaloptera			
Corydalus cornutus	–	2	–
Odonata			
Epitheca cynosura	–	1	–
Gomphus geminatus	–	–	1
Libellula sp.	1	–	–
Neurocordulia virginiensis	–	–	6
Oligochaeta			
Eclipidrilus sp.	–	–	2
Limnodrilus hoffmeisteri	20	2	–
Undetermined Enchytraeidae	14	1	–
Plecoptera			
Isoperla sp.	–	–	7
Leuctra sp.	–	–	2
Paragnetina fumosa	–	–	18
Trichoptera			
Brachycentrus sp.	–	3	24
Hydropsyche decalda	–	84	–
Hydropsyche sp.	–	–	6
Lype diversa	–	–	1
Nectopsyche sp.	–	–	1
Total	192	211	237

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



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

