Florida

Department of Environmental Protection

Biological Assessment of

Union Camp Corporation

Duval County

NPDES #FL0001040

Sampled July 1993

December 1993

Biology Section
Division of Technical Services

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Union Camp Corporation
County: Duval
NPDES Number: FL0001040
State Permit Expiration Date: 18 April 1994

Toxics Sampling Inspection (XSI)

Date Sampled: 21 July 1993

Results: No organic pollutants were detected in the effluent sample. Only iron (77 µg/L) was found in the discharge, at a level within Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 21 July 1993

Results: The effluent sample was not toxic to the water flea, *Ceriodaphnia dubia,* or the fish, *Cyprinella leedsi*. No mortality occurred during the 48 hour bioassays.

Impact Bioassessment Inspection (IBI)

Date Sampled: 21 July 1993

Results: Benthic macroinvertebrate communities showed obvious signs of stress throughout the study area, with conditions worse downstream of the discharge. The Florida Index and the Shannon-Weaver diversity index were extremely low at both sites, representing very unfavorable conditions. Compared with the reference site, taxa richness at the test site was reduced by 65% in dip net sweep samples and by 36% in Hester-Dendy samples. Additionally, the percent contribution of dominant taxon in the sweep net data was increased by 127% at the test site, due to the abundance of *Chironomus* sp., a highly pollution tolerant form. These data clearly indicate degradation at both sites, with conditions worse downstream of the discharge. While some periphyton community parameters showed little differences between sites, two measurements of algal health, including a 120% increase in the dominant taxon and a 70% decrease in taxa richness, indicated stressed conditions at the test site. Chlorophyll *a* was very low at both stations.

Water Quality Inspection (WQI)

Date Sampled: 21 July 1993

Results: Nutrients were relatively low at the receiving water stations and in the effluent. Algal growth potential (AGP) was very low in the effluent, and in the receiving waters, also indicating non-nutrient enriched conditions.

These fifth year inspections provide the necessary information to evaluate the facility's impact on its receiving waters and to provide the basis for specific condition recommendations for permit renewal.

Introduction

The Union Camp Corporation is located in Jacksonville, on North Lane Avenue, Duval County (see maps in Appendix). This facility manufactures various chemical compounds (derived from extracted oils and terpenes) which are used in paper packaging and in the production of building materials. Stormwater, wastewater from spill retention areas, cooling water, and de-ionized brine water is treated via retention systems, separator weirs, and aeration. The effluent is discharged into an unnamed ditch which flows into Little Six Mile Creek (a Class III waterbody). The plant has a design capacity of 4.0 MGD, however, during this study the flow was 2.5 MGD.

Effluent NPDES permit limits are as follows: temperature (35°C as a daily average, 38°C as a daily maximum), total chromium (1000 µg/L as a daily maximum), total zinc (30 µg/L as a daily maximum), total iron (1000 µg/L as a daily maximum), total residual chlorine (0.01 mg/L as a daily maximum), TOC (monitor and report), COD (monitor and report), and pH (6-9 S.U.). State permit limits are similar, and include an oil and grease limit of 5.0 mg/L (see Appendix). Union Camp also conducts annual bioassays (96 hour static screening acute toxicity tests) in accordance with the state permit. No toxicity has been reported.

Permit limits for oil and grease have been exceeded on numerous occasions (see Appendix for detailed list). Concentrations of zinc and iron have sporadically exceeded permit limits, as has pH level. The facility has been cooperative and timely in their efforts to resolve problems.

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	26	9
Florida Index	0	0
% Contribution of Dominant Taxon	33.3	75.6
% Diptera	14.3	90.8
% Oligochaeta	62.9	6.1
% Odonata	11.4	2.9
% Acarina	1.0	0
% Decapoda	1.0	0
% Other	0	0
% Predator/Carnivores	17.6	6.7
% Deposit feeders (above surface)/ Collector-Gatherers	6.7	53.5
% Deposit feeders (below surface)	64.7	1.8
% Suspension feeders/Collector-Filterers	1.0	0
% Scavengers	0.5	0
% Scrapers	8.8	0.2
% Shredders	0.5	37.8
Macroinvertebrate Hester-Dendy		
Number of Taxa	14	9
Florida Index	0	1
Shannon-Weaver Diversity	1.6	1.7
% Diptera	82.9	75.5
% Oligochaeta	14.6	23.2
% Odonata	0	1.2
% Gastropoda	2.4	0
% Other	0	0
% Predator/Carnivores	.6	2.7
% Above surface Deposit Feeders Collector-Gatherers	45.2	29.9
% Below Surface Deposit Feeders	14.8	38.2
% Suspension Feeders	0.25	0
% Scraper	2.5	0
% Shredders	35.6	29.2
% Parasites	0.2	0
Periphyton Algae		
Number of Taxa	27	8
% Contribution of Dominant Taxon	39.6	85.9
Chlorophyll a (mg/sq. m)	1.0	0.4
Diatom/Diatom + B-G Abundance Ratio	0.9	0.9
% Blue-green	12.1	11.4
% Green	1.7	0
% Diatoms	86.3	88.6
Algal Growth Potential (mg dry wt/l)	0.9	3.8

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 a stormwater ditch upstream of the discharge) and a test site (the effluent ditch downstream of the Union Camp discharge) (see maps in Appendix). 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 volatile organic compounds). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990), and from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Periphyton was sampled at both reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Chlorophyll *a* was also determined for periphyton communities (Ross 1990). 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, which are briefly explained here. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (Ross 1990). A site with a high Florida Index score is considered healthy (i.e., many clean-water organisms are present). Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually associated with disturbance. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions. 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).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, Florida Index and the diatom to blue-green algae ratio 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: Scott Bulgrin, Ed Cordova, and Lindy Payne (DEP Northeast District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Kathleen Lurding, Elizabeth Miller, Kim Pearce, Urania Quintana, and Greg Wynn (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.

Results and Discussion

Habitat scores were 59 and 80 points for reference and test sites, respectively (a variation of 36%). The reference site received lower scores for available substrate, water velocity, and riparian zone vegetation quality. The test site had better in-stream habitat, with an abundance of aquatic vegetation and woody material (snags and roots). Water velocity at the reference site was moderately good (0.1 m/sec), while flow at the test site was characterized as excellent (0.3 m/s). The pH at both channelized sites was slightly alkaline (7.4 at reference; 7.9 at test), and conductivity was substantially higher at the test site (240 µmhos/cm and 775 µmhos/cm at reference and test sites, respectively). Dissolved oxygen was only 2.6 mg/L at the reference site (below Class III water quality standards). Downstream of the discharge, dissolved oxygen was 6.5 mg/

L. Temperature was higher below the outfall (33.5°C) compared to the reference site (28.8°C), although the facility was within its daily average temperature limit (Appendix).

No organic pollutants were detected in the effluent sample. Only iron (77 µg/L) was found in the discharge, at a level within Class III water quality standards.

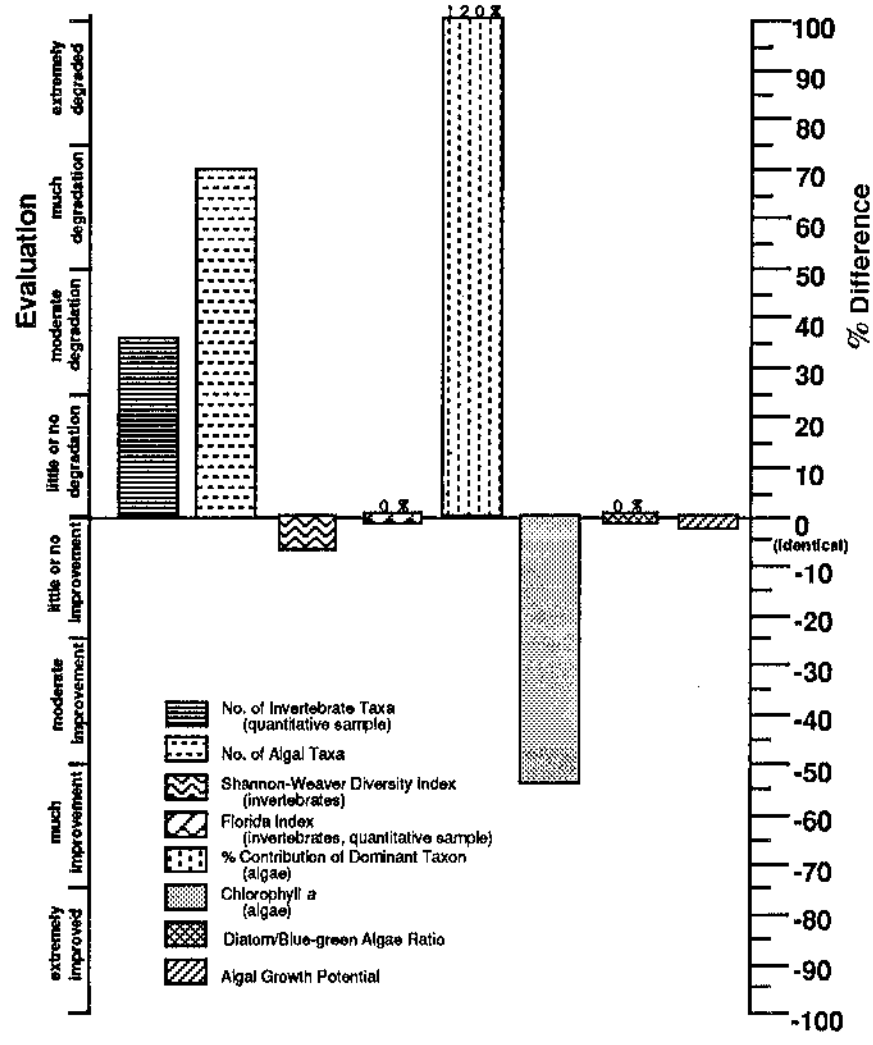
The effluent sample was not toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*. No mortality occurred during the 48 hour bioassays (Appendix).

Nutrients were relatively low at the receiving water stations and in the effluent. Nitrate-nitrite levels were below detection limits in all samples. The concentrations of phosphorus-containing compounds and ammonia were about average (ranging between the 40th and 60th percentile), compared to representative Florida stream systems (see Table of Typical Water Quality Values in Appendix).

Algal growth potential (AGP) was very low in the effluent, at 0.19 mg dry wt/L. Reference and test site AGP (0.9 mg dry wt/L and 3.8 mg dry wt/L, respectively) did not exceed the "problem threshold" of 5 mg dry wt/L. Freshwater systems with AGP's above this level are likely to suffer detrimental consequences of nutrient enrichment, such as abundant macrophyte or algal growth, D.O. sags, and fish kills (Raschke and Schultz 1987).

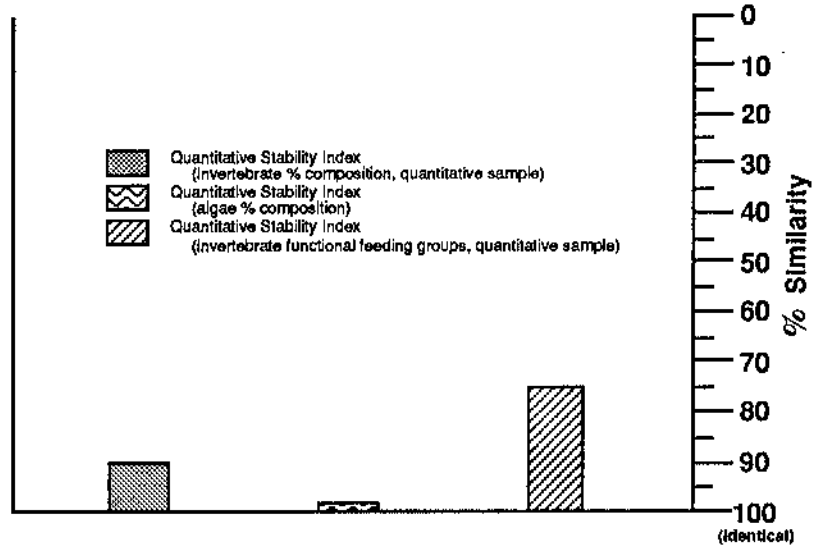
Benthic macroinvertebrate communities showed obvious signs of stress throughout the study area, with conditions worse downstream of the discharge. The figure on this pageindicates the degree of difference between the control and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the control. The figure on p. 4 summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation, unless the test site is better than the reference site. The relative abundance of each individual taxon appears in the Appendix.

Compared with the reference site, taxa richness at the test site was reduced by 65% in dip net sweep samples and by 36% in Hester-Dendy samples. Since habitat was more favorable at the test site, this indicates degradation related to the discharge. The Florida Index (0 points at the reference site and 1 point at the test site) was extremely low at both sites, indicating that conditions were unfavorable for the establishment of healthy invertebrate populations. By way of comparison, a typical, unaltered stream in north Florida generally receives 20 Florida Index points. Similarly, the Shannon-Weaver diversity (1.6 and 1.7 at the reference and test sites, respectively) was extremely reduced (less than 93% of other Florida stream systems). Additionally, the percent contribution of dominant taxon in the sweep net data



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

was increased by 127% at the test site, due to the abundance of *Chironomus* sp., a highly pollution tolerant form. These data clearly indicate degradation at both sites, with conditions worse downstream of the discharge. The stress seen in macroinvertebrate populations at the reference site was probably caused by the poor habitat quality and by the general water quality problems associated with urban stormwater runoff (e.g., turbidity, BOD, oils and greases, metals). While it is likely that some portion of the degradation seen at the test site was due to non-point sources, the discharge also appeared to contribute to the stressed conditions there.



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

Two periphyton community parameters indicated stressed conditions at the test site, including a 120% increase in the percent contribution of dominant taxon, and a 70% decrease in taxa richness. The test site was strongly dominated by *Achnanthes exigua*, a ubiquitous, adnate diatom. However, other parameters showed little differences between sites. For example, the diatom/bluegreen algae ratio was the same at both sites and community structure was nearly identical, as demonstrated by the Quantitative Stability Index for percent composition of 97.7%. Chlorophyll *a* was very low at both stations (0.44 mg/m^2 at the test site and 0.96 mg/m^2 at the reference site). This was not surprising, considering the low nutrient concentrations and low AGP's at the study sites.

Conclusions

No organic pollutants were detected in the effluent sample. Only iron (77 µg/L) was found in the discharge, at a level within Class III water quality standards.

The effluent sample was not toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*. No mortality occurred during the 48 hour bioassays.

Nutrients were relatively low at the receiving water stations and in the effluent. Nitrate-nitrite levels were below detection limits in all samples. The concentrations of phosphorus containing compounds and ammonia were about average (ranging between the 40th and 60th percentile), compared to representative Florida stream systems.

Algal growth potential (AGP) was very low in the effluent and in the receiving waters, indicating non-nutrient enriched conditions.

Benthic macroinvertebrate communities showed obvious signs of stress throughout the study area, with conditions worse downstream of the discharge. The Florida Index and the Shannon-Weaver diversity index were extremely low at both sites, representing very unfavorable conditions. Compared with the reference site, taxa richness at the test site was reduced by 65% in dip net sweep samples and by 36% in Hester-Dendy samples. Additionally, the percent contribution of dominant taxon in the sweep net data was increased by 127% at the test site, due to the abundance of Chironomus sp., a highly pollution tolerant form.

While some periphyton community parameters showed little differences between sites, two measurements of algal health, including a 120% increase in the percent contribution of dominant taxon and a 70% decrease in taxa richness, indicated stressed conditions at the test site. Chlorophyll a was very low at both stations, corresponding to the low nutrient concentrations and low AGP's at the study sites.

Literature Cited

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. U. S. Environ. Prot. Agency, EPA-600/9-78-018. 126 p.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

Weber, C. I. 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 pp.

Chemistry summary table for Union Camp Corporation.

	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
None detected			
Metals (ug/L)			
Aluminum	100 U		
Arsenic	20 U		
Cadmium	0.16 U		
Copper	5 U		
Chromium	10 U		
Iron	77.2 A		
Lead	15 U		
Mercury	0.1 U		
Nickel	5 U		
Silver	0.1 U		
Zinc	5 U		
Nutrients (mg/L)			
Ortho-phosphorus	0.09	0.09	0.09 A
Total phosphorus	0.10	0.13	0.10 A
Ammonia	0.06	0.02 U	0.06
Nitrate+Nitrite	0.02	0.02 U	0.02 U
TKN	0.12	0.46	0.11 A
Other Parameters			
Habitat Assessment		59	80
D.O. (mg/L)	6.7	2.6	6.5
pH (SU's)	7.9	7.4	7.9
Conductivity (µmhos/cm)	775	240	775
Temperature (°C)	34.6	28.8	33.5
Bioassay Fish-Dechlorinated	Not toxic		
Bioassay Invertebrate-Dechlorinated	Not toxic		
Fecal coliforms (org/100 mL)	<20	300	80
Total coliforms (org/100 mL)	170	9000	1100

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

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

NA - Not applicable

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: UNION CAMP CORPORATION		Date Summary Prepared: 07/21/93
Location (attach detailed map): 2051 North Lane Avenue Jacksonville, FL 32236	County: DUVAL	District: Northeast District
Federal Permit # and expiration date: FL0001040 June 30, 1993	State GMS # and State expiration date: 3116P00638 I016-156899 April 18, 1994	Facility Type: (Industrial) Municipal Federal Agricultural Other (list):

Function of facility: Union Camp Corporation is a forest products company whose principal products are paper packaging chemicals and building materials. The chemical Group with its chemical products and Bush Boake Allen Divisions (which is in Jacksonville) derives its products mostly from flavor extracts (essential oil and terpanes). The aromatic chemical operation is in Jacksonville.

Description of treatment process:
Union Camp Corporations industrial and wastewater Treatment Disposal Facility for wastewater from spill retention, contaminated stormwater, non-contact cooling water, cooling water and boiler blowdown, de-ionication reject brine water. Treatment includes retention basins, overflow and underflow weirs for stormwater aeration of cooling waters.

Receiving waters: Ditch which flows to Little Six Mile Creek.	Classification: I II (III)	
Design Flow: 4.0 MGD	Mean Flow: 2.75 MGD Avg. from MOR April 1988 to present	Flow during survey: 1754 Gal/min

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

therefore, the best time to sample is: ANYTIME

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

Facility has no mixing zone.

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

Parameter	Limit (units)
See Attached Sheets	
A. State Permit	
B. NPDES Permit	

Describe special permit conditions and permit modifications:

Union Camp conducts bioassays (96 hour static screening acute toxicity tests using an appropriate vertebrate and invertebrate fresh-water species) annually in accordance with State Permit I016-156899.

Union Camp had a permit modification effecti 6/9: combing the four SPCC drain points into their drainage ditch upstream of the existing NPDES sample point, no longer monitored. Process and sanitary wastewaters are pretreated and discharged to the City which includes cooling tower blowdown.

DEPARTMENT OF ENVIRONMENTAL REGULATION

Union Camp Corporation (Facility)

FACILITY SUMMARY

Description of permitted outfall(s): Union Camp Corporation effluent is discharged to a ditch which flows to Little Six Mile Creek.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: On January 26, 1993 a weekly oil and grease grab sample taken, showed a 36.9 mg/L value versus the permit limit of 5.0 mg/L. A retest of the sample indicated 31.0 mg/L.

On March 23, 1993 FDER sent a letter addressing this problem.

A sample taken on March 15, 1993 showed an oil and grease sample had a value of 32.4 mg/L. Union Camp investigated and through several corrective measures corrected the problem.

During the reporting months of January and February 1991, oil and grease values were in exceedance. February and March 1991 zinc exceedance.

Review of the DMR data showed pH exceedance on 01/91.

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

On Sunday, May 10, 1992 alpha pinene, a major constituent of turpentine, overflowed from a storage tank to the ground. The spill was cleaned up and about 1000 gallons was spilled. The spill was reported to the proper authorities.

On April 28, 1992 FDER performed a complaint reconnaissance inspection was conducted and satisfactory (samples taken and were in compliance).

On May 22, 1992 FDER performed a reconnaissance inspection for the May 10, 1992 spill all was satisfactory.

CEI by USEPA on 08/14/89 revealed that Union Camp was using biocides (as observed by inspector, Calgon H-240, H-950 and CL-361 and other additives) These used in waters, which were discharged to surface waters of the state. Not listed in the NPDES permit. Union Camp Corrected.

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

A Compliance Evaluation Inspection (CEI) was conducted by USEPA on May 4, 1993, a satisfactory rating was achieved by Union Camp Corporation.

A Compliance Sampling Inspection (CSI) by FDER concerning flow totalizer readings was corrected. (Sept. 19, 1991).

CEI, FDER conducted on 02/19/91 all satisfactory.

Although Union Camp Corporation has had some problems with Oil and Grease limits in the past, the company continues to be cooperative in all aspects of compliance and has extensively investigated the cause of any permit violations.

WN91-0018-IW16-NEO issued for Zinc exceedances has resolved.

Additional information:

As of 1990 an outside laboratory is now employed to take samples, using their own sampling equipment and instruments to perform the analyses for the majority of the monitoring parameters.

In July 1993, no acute toxicity was noted for samples taken.

On August 20, 1990 Union Camp was issued a notice of Show Cause by the USEPA related to temperature monitoring and reporting. The temperature issue was resolved and no further action was taken.

Staff contributing to this review (signature):

SCOTT BULGRIN Scott Bulgrin	(Biologist)
Lindy Payne Lindy Payne	ES I (Inspector)
Ed Cordova Ed Cordova	(Engineer)
	( )
	( )
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A. State Permit Effluent Limitations

PERMITTEE:

Union Camp Corporation

I.D. Number: 3116P00638
Permit Number: I016-156899
Date of Issue: April 18, 1989
Expiration Date: April 18, 1994
Modification Date: June 3, 1992

SPECIFIC CONDITIONS:

1. Drawings, plans, documents, or specifications submitted by the Permittee to support the renewal applications, not attached hereto but retained on file at the Department's Northeast District Office, are made a part hereof.

2. The Permittee shall sample and analyze the treated effluent for the following parameters and the results shall be submitted to the Departments Northeast District Office, 7825 Baymeadows Way, Suite B-200, Jacksonville, Florida 32256-7577 and Jacksonville Water Quality Division, 421 West Church Street, Jacksonville, Florida 32202 on a monthly basis. These reports shall include all data and information required from the General and Specific Conditions of this permit. Such reports shall also contain information on the quantities of waste sludge generated at the source, type and degree of its treatment and the site of its ultimate disposal:

SAMPLE LOCATION	REQUIRED ANALYSIS	EFFLUENT LIMITATIONS Min.	Max.	FREQUENCY	SAMPLE Type
Point of Discharge into Receiving Ditch	Flow (MGD)	- - -	- - -	Continuous	Flowmeter
	Temperature (°F)*	- - -	100 (95 avg.)	Continuous	Recorder
	pH (S.U.)	6.0	8.5	1/month	Grab
	TOC (mg/L)	- - -	- - -	1/month	24-hour Composite
See Sketch NPDES Point of Discharge	COD (mg/L)	- - -	- - -	1/month	24-hour Composite
	TRC (mg/L)**	- - -	0.01	1/month	Grab
	Total Cr (mg/L)**	- - -	See**	1/month	Grab
	Total Zn (mg/L)**	- - -	See**	1/month	Grab
	Total Fe (mg/L)**	- - -	1.0	1/month	Grab
	Bioassay	See S.C. No. 4		Annual	Grab
	Oil/Grease (mg/L)	- - -	5.0	1/week	Grab

* Temperature shall be reported as daily minimum, average and maximum.

** Zinc, chromium, iron and TRC shall be monitored if it is added to the waste stream. Hardness as mg/L $CaCO_3$ must be monitored for at the same time in the effluent for the zinc and chromium surface water quality standard. The hardness value must be used to determine compliance with the standard in Rule 17-302.560 (45), FAC, ug/L Zinc = $e^{(0.8413(\ln H) + .7614)}$, where lnH is the natural logarithm of the total hardness expressed as mg/L CaCO3. The hardness value must be used to determine compliance with the standard in Rule 17-302.510 (5)(d)1., FAC, ug/L Cr III = $e^{(0.819(\ln H) + 1.561)}$, where lnH is the natural logarithm of the total hardness expressed as mg/L $CaCO_3$.

B. NPDES Permit Effluent Limitations

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting through expiration, the permittee is authorized to discharge from outfall serial number 001, non-contact cooling water, cooling tower and boiler blowdown, deionization reject brine water and stormwater runoff.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Daily Average	Daily Maximum	Measurement Frequency	Sample Type
Flow, (MGD)	Report	Report	Continuous	Flowmeter
Temperature, °C(°F)	35 (95)	38 (100)	Continuous	Recorder
Chromium, Total ★	—	1.0 mg/l	1/Month	Grab
Total Chromium shall not exceed 0.05 mg/l after reasonable mixing in the receiving water)				
Zinc, Total*	—	0.03 mg/l	1/Month	Grab
Chlorine, Total Residual*	—	0.01	1/Month	Grab
Iron, Total	—	1.0 mg/l	1/Month	Grab
TOC, (mg/l)	Report	Report	1/Month	24-hr. Composite
COD (mg/l)	Report	Report	1/Month	24-hr. Composite

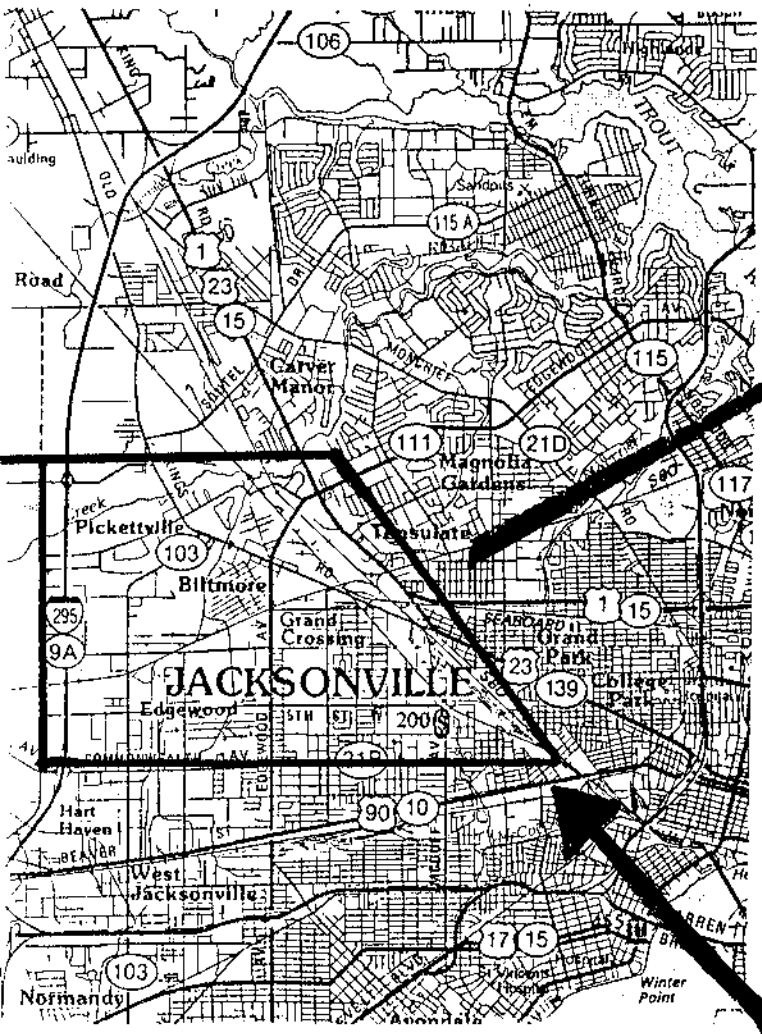
2. The pH shall not be less than 6.0 standard units nor greater than 8.5 standard units and shall be monitored once per month by grab sample.

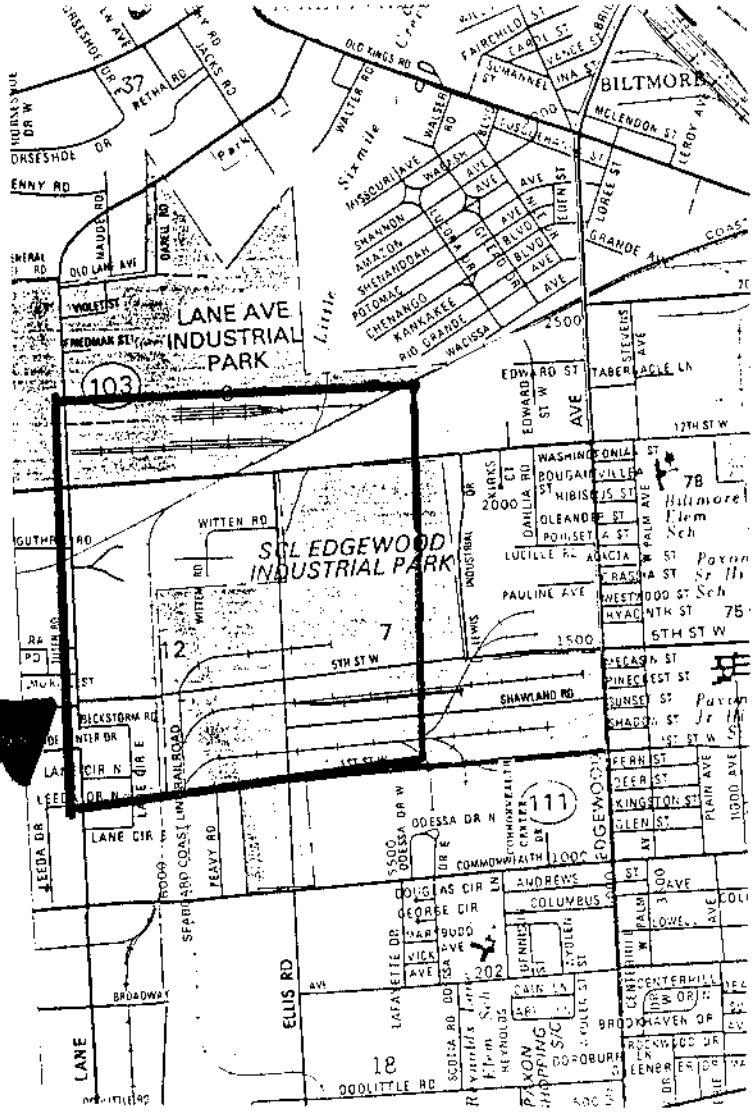
3. There shall be no discharge of floating solids or visible foam in other than trace amounts.

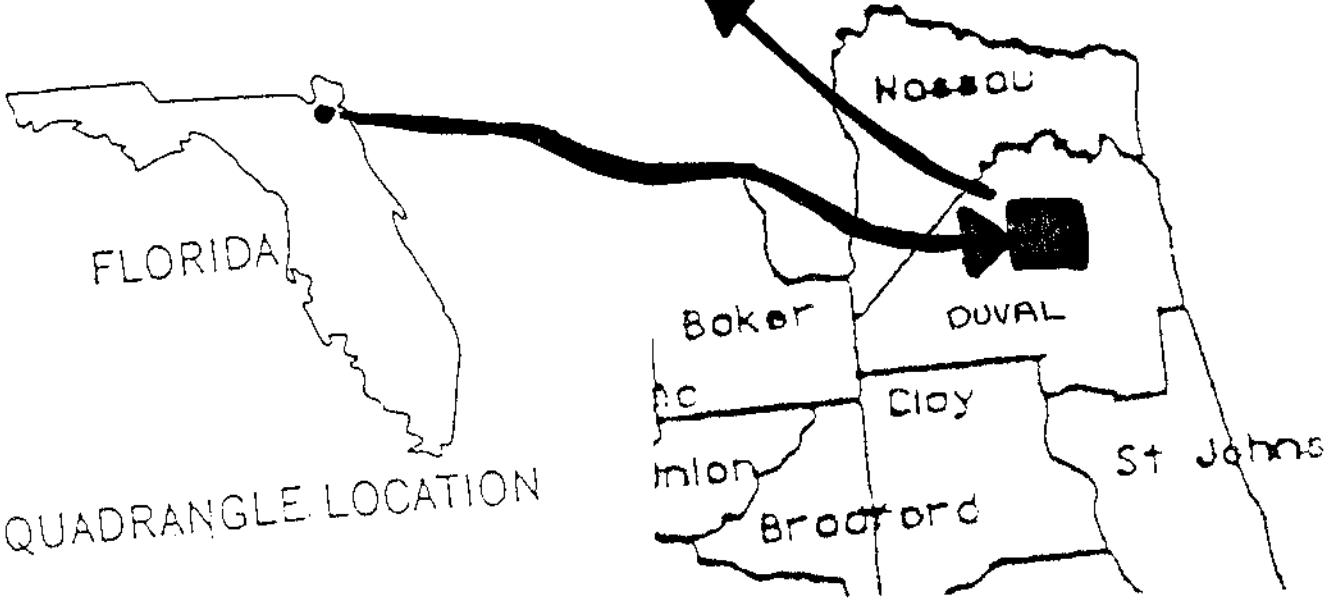
4. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): nearest accessible point after final treatment but prior to the actual discharge or mixing with the receiving waters.

*Monitoring of these parameters is required when they are subject to being discharged as a result of chemical additions by the facility. "None Added" should be stated on monitoring report if applicable.

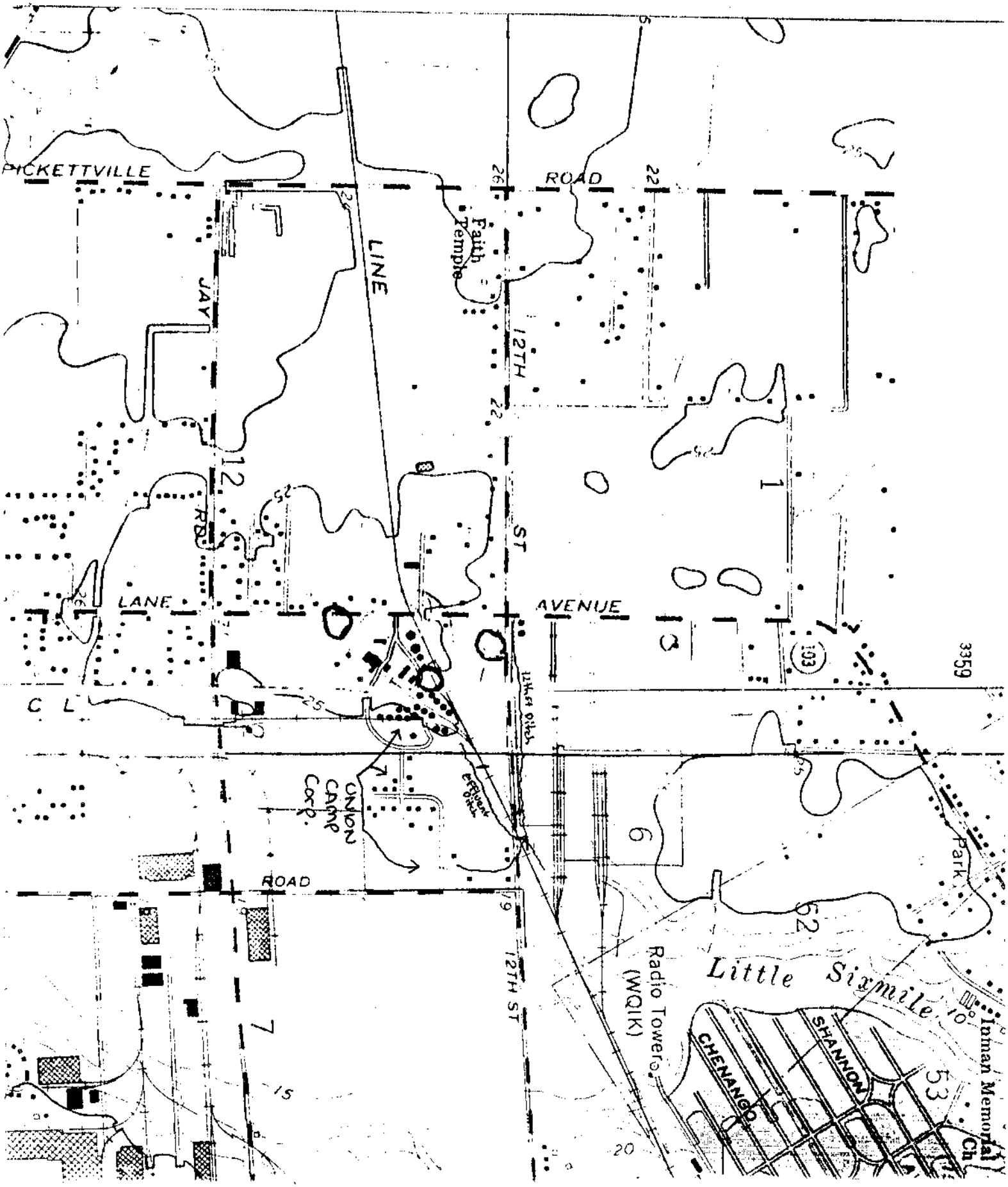
General Area Map for
Union Camp Corporation
Duval County, FL
Bioassessment.







More Detailed Map of
Union Camp Corporation



Car Hauling Company
Cars, trucks and Equipment
(Runoff into Ditch)
Ditch
stormwater
Stormwater
Ditch flows into Little Six Mile Creek
Trees + shrubs
LANE AVE
12th St. Ditch
2
12th St. W
12th St.
Effluent Ditch Underground
1 Union Camp Effluent Ditch ~ 100 ft Downstream of NPDES Point of Discharge
Downstream Union Camp Effluent Ditch (Test Site #1)
2 12th Street Ditch upstream of discharge
upstream site of Union Camp Effluent Ditch (Test Site #2)
Trees + shrubs
UNION CAMP EFFLUENT DITCH
Trees and shrubs
Railroad Tracks
1
Railroad Tracks
COMMERCIAL
Property
Businessas
NPDES Point of Discharge
UNION CAMP CORPORATION
UNION CAMP CORPORATION
LANE AVE

Florida Department of
Environmental Protection

Memorandum

TO: Jerry M. Owen, P.E.
Water Facilities Administrator

THROUGH: William P. Stewart, P.E.
Industrial Wastewater Supervisor

FROM: Edward Cordova
Industrial Wastewater Engineer

DATE: August 30, 1993

SUBJECT: UNION CAMP
5TH YEAR INSPECTION
PERMIT #IO16-156899

A Fifth-Year Inspection (CSI, CBI, XSI, WQI and IBI) was conducted at Union Camp on July 26, 1993. The following inspection comments from the inspection will be submitted with the sampling results to Tallahassee for incorporation in the fifth year report.

1. A current copy of the referenced permit, incorporating the June 3, 1992 modification, was maintained on-site.

2. The permit states that cooling tower blowdown is included in the effluent. Beginning in 1991, cooling tower blowdown has been directed to the facility's pretreatment system with discharge to regional sewer.

RECORDS AND REPORTS

1. The inspection revealed that the facility maintains MOR and DMR records for the required three years.

2. A review of the May 1993 MOR for transcription and reporting errors did not reveal any discrepancies.

3. The flow recorder chart for May 1st and 2nd, 1993 was missing, facility personnel stated that strong winds from a thunderstorm had blown open the chart enclosure and the chart was lost.

4. Daily entries recorded on the flow charts include date and time of recording, totalizer reading and initial of employee taking the reading. Not all of the entries were initialed.

5. Temperature readings are recorded on computer. No discrepancies were noted for this item during the inspection.

LABORATORY

1. Flow and temperature measurements are taken by the facility. All other parameters are sampled by Center for Applied Engineering, Inc.

SELF-MONITORING PROGRAM

1. FLOW - Effluent flow is measured by the use of a 2 ft. parshall flume and float-type meter connected to a DR4500 Truline recorder. Wastewater enters the effluent ditch from 5 to 10 feet from the flume. As a result, the flow is turbulent when entering the flume.

   At the time of inspection, the height of the water surface (Ha) entering the flume was measured as 8". Using a free (unsubmerged) flow table, flow was calculated to be 1798 GPM while the read-out from the installed flow meter was 1754 GPM.

   Depth of the effluent after the throat of the flume (Hb) was measured at 7" and the submergence ration (Hb/Ha) was calculated as 0.875.

   *Note: According to the Isco Open Channel Flow Measurement Handbook, Third Edition, when the submergence ratio exceeds 70% for flumes 1 to 8 feet wide, the flume is operating under submerged conditions of flow and submerged discharge tables will have to be used to accurately calculate the discharge.

   Flow meter calibrations are conducted monthly by measuring the depth Ha and calculating flow using a free (unsubmerged) flow table and, if necessary, correcting the flow meter.

2. TEMPERATURE - An electronic calibration is performed monthly and a manual check is performed weekly using a NTIS traceable thermometer. Calibration records for both temperature and flow were maintained from January 1990 to present. The entries made prior to April 1992 were not initialed by the employee performing the check.

SITE REVIEW

1. Stormwater from the tank farm and railroad basin area enters the treatment system between the flume and aerator, and is not accounted for in flow measurements.

2. A small amount of foam was observed leaving the aerator but was caught by the last boom. Facility personnel stated there was a gap between the overflow/underflow weir and aerator wall and that this would be repaired.

3. Wastewater in the perimeter ditch was a dark brown with a visible sheen in some areas. This ditch flows to the plant ditch sump which discharges to the facility's pretreatment plant prior to discharge to sewer. The sump has provisions for an emergency overflow to the surface water outfall.

4. The conveyance system once-through has been modified as a result of exceedences for Oil and Grease reported in January, 1993. A portion of the concrete covered cooling water effluent trench has been replaced with an above ground pipeline. The majority of the concrete and aluminum covered conveyance trench was not modified.

SUMMARY

Overall, the facility was determined to be in compliance with the terms of the state permit. However, the facility should be required to investigate the accuracy of the flow measurements data submited to the Department when the permit is renewed.

EDC/lgb

VUKS
Old → New

Key
T 13 → Tank 13 basin
T 18 → Tank 18 basin
RR → Railroad basin
E Drain → East drainage basin
NPDES POD → NPDES POD

ate	Location	Violation	Amt.	
7/90	T13	Oil / Grease	39.0	mg/L
	T18	O/G	101.0	"
	RR	O/G	1.8.0	"
	E Drain	O/G	552.0	"
3/90	T13	no results / not properly sampled		
	T18	O/G	12.4	"
	RR	O/G	66.5	"
	E Drain	O/G.	296.0	"
2/90	T13	O/G	6.0	"
	T18	O/G	61.0	"
	RR	O/G	6.0	"
	E Drain	O/G	18.0	"
/90	NPDES POD	Fe^{tt}	1.1 mg/L	
	T 13	O/G	128.0	"
	T 18	O/G	30.8	"
	T 18	pH	9.4 SU	
	RR	O/G	6.8 mg/L	

te	Location	Violation	Amt.	
91	T13	O/G		
1/11/91			17.2	mg/L
1/21/91			14.4	
1/24/91			14.4	
1/27/91			5.2	
1/29/91			133.7	
1/31/91			6.7	
1/11/91	RR	O/G	38.1	mg/L
1/19/91			6.7	
1/24/91			12.5	
1/27/91			27.9	
1/29/91			24.5	
1/11/91	T18	O/G	58.7	mg/L
1/19/91			19.5	
1/24/91			36.2	
1/27/91			33.7	
1/11/91	E.drain	O/G	105.3	mg/L
1/19/91			6.7	
1/24/91			77.3	
1/27/91			232.4	
1/29/91			115.6	
2/91	NPDES POD	Zn++	.610	mg/L
	T18	O/G	9.9	"
	RR	"	8.4	"
	E drain	"	127.	"

Date	Location	Violation	Amt.
3/91	T18	O/G	15.9 mg/L
3/17/91	RR	O/G	9.0 mg/L
	Edrain	O/G	248.0 mg/L
3/2/91	E. drain	O/G	103.2 mg/L
4/91			
4/17/91	RR	O/G	26.7 mg/L
	E Drain	O/G	37.3 mg/L
4/23/91	T18	pH	9.1 SU
	RR	O/G	8.6 mg/L
	Edrain	O/G	86.8 mg/L
5/91			
5/1/91	Edrain	O/G	85.1 mg/L
5/24/91	T13	O/G	8.3 mg/L
	T18	PH	9.0 SU
	T18	OG	164.0 mg/L
	RR	O/G	35.3 ↓
	Edrain	O/G	50.3 ↓
/91	T13	O/G	37.9 mg/L
	T18	pH	9.8 SU
	T18	O/G	57.3 mg/L
	RR	O/G	12.0 ↓
	Edrain	O/G	166.8 ↓

Date	Location	Violation	Amt.
/91	T13	O/G	11.8 mg/L
	T18	↓	44.7 ↓
	RR		17.7
	Edrain		78.9
/91	T13	O/G	18.5 mg/L
	T18	no results/ not properly sampled	
	RR	O/G	17.5 mg/L
	Edrain	↓	71.2 ↓
/91	* Tank 18 spill occurred on 09/28/91		
	T13	O/G	18.4 mg/L
	T18	↓	39.0 ↓
	RR		12.7
	Edrain		96.6
0/91	RR	O/G	7.4
	T13	O/G	20.2 ↓
	Edrain	O/G	71.7 ↓
2/91	* Tank 18 spill occurred on 12/17/91		
92	T13	O/G	15.5 mg/L
	T18	↓	76.6 ↓
	RR		18.1
	Edrain		76.1

Date	Location	Violation	Amt.
:/92	T 18	O/G	40.5 mg/L
	E drain	↓	30.6 mg/L
3/92	* E drain basin spill on 3/4, 3/13, and 3/25		
	E drain	O/G	20.5 mg/L
	* RR basin spill on 3/16		
/92	* Tank 13 basin spill on 5/10/92		
	T 13	O/G	12.7 mg/L
	RR	O/G	13.3 mg/L
	E drain	pH	9.1 mg/L
	E drain	O/G	13.7 mg/L

Permit Modification Effective 6/92
Stormwater discharge basins no longer to be monitored

7/92	NPDES POD	O/G	15.1 mg/L
/ 93	NPDES POD	O/G	11.25 mg/L
3/93	NPDES POD	O/G	9.22 mg/L

HRS

State of Florida
Department of Health and Rehabilitative Services
Office of Laboratory Services
Jacksonville, Miami, Pensacola
Tampa, West Palm Beach

NORTHEAST DISTRICT

RECEIVED
AUG 5 - 1993
DEP-JACKSONVILLE

FOR LAB USE ONLY
I.D. NO. 2001
RECEIVED JAX
JUL 26 2 45 PM '93
RONALD [illegible]

NON-POTABLE WATERS BACTERIOLOGICAL ANALYSIS

COUNTY: Duval COLLECTOR: Bulgrin / Payne

COLLECTION ADDRESS: Union Camp

DATE AND TIME COLLECTED: 07/26/93 - various COMMENTS: Effluent and Ambient Water Samples

DATE REPORTED: 8/2/93 7/2

STATION NO.	TOTAL COLIFORM MPN/MF/100 ML	FECAL COLIFORM MPN/MF/100 ML	FECAL STREP MPN/MF/100 ML	ENTEROCOCCI MF	E. COLI MF	LAB. NO.
Test site #1 100ft downstrm NPDES POD A & B 1120	1,100	80				002982
	~~9,000~~	~~300~~				~~002983~~
Test site #2 12th str. ditch ~~dwn~~ upstrm. dischrg. A & B 1250	9,000	300				2983
Union Camp Effluent A & B 1015	170	<20				002984

NAME AND MAILING ADDRESS OF PERSON/FIRM TO RECEIVE REPORT

FDEP NE District
7825 Baymeadows Way
Suite B200
Jacksonville FL 32256-7577
Attn: Scott Bulgrin

For enforcement samples, EPA recommends a maximum of 6 hours time lapse from sample collection to receipt of sample in lab. Samples must be scheduled with lab in advance to arrive by 3:30 PM. This allows sufficient time for analysis. procedures conform to EPA recommendations. Accuracy of samples not received within this time frame may reliable.

HRS Form 641, Jan 92 (Replaces Sep 86 edition) (Stock No.: 5740-000-0641-5)

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DEP Northeast District	STORET STATION NUMBER: 20030661	DATE (M/D/Y): 07/26/93	RECEIVING BODY OF WATER: Ditch which flows into Little Six Mile Creek.

REMARKS: Located in an industrial and urban area, this site is typical of the ditches in the area.	LOCATION: 12th Street Ditch upstream of discharge	FIELD ID/NAME: upstream Site of Union Camp Effluent Ditch (Test Site #2)

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover — 15	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 — 18	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 — 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 — 8	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 — 6	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	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
[illegible]		59

COMMENTS: This site is heavily vegetated with Alligatorweed ( ). Flow is good in the open channels but gets slow in areas of heavy vegetation. Runoff from road impacts ditch.

ANALYSIS DATE:	ANALYST: SCOTT BULGRIN / Lindy Payne	SIGNATURE: Scott Bulgrin
Aug. 26, 1993		

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DEP Northeast District	STORET STATION NUMBER: 20030661	DATE (M/D/Y): 07/26/93	TIME: 1230	RECEIVING BODY OF WATER: Ditch which Flows into Little Six Mile Creek

REMARKS: 12th Street ditch is located 30° 21' 01.4" and is located in an industrial area	LOCATION: 12th Street Ditch upstream of discharge	FIELD ID/NAME: Upstream Site of Union Camp Effluent Ditch (Test Site # 2)

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
10				50	30	10 TRANSPORTATION

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

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

Point-Source Pollution (list location and describe): None

Obvious sources: Roads, Commercial Business Runoff, Stormwater Runoff

Estimated System Width (range, m): 2 - 3	Estimated System Depth (range, m): 0.3 - 0.7	Impounded ☐ yes ☐ NO
High Water Mark (m above bed): 0.6 - 0.9	Velocity (range, m/s): 0.1 - 0.16	Channelized ☐ yes ☐ NO

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

But ditch is heavily vegetated with alligatorweed and other aquatic plants

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5	2	Dip Net	Riffles			
Leaf Packs	5	2	Dip Net	Sand	30	3	Dip Net
Aquatic Vegetation	40	10	Dip Net	Mud/Muck/Silt	20	3	Dip Net
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other:			

WATER QUALITY

	Depth (ft):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	Velocity		Secchi (m):
Top	Surface	28.8	7.40	2.58	240			0.6L
Mid-depth	1.0	28.8	7.40	2.58	240	0.14		
Bottom	2.0	28.8	7.40	2.58	240			

System Type : Stream: ☐ (Sand Bottomed, Sand Bot w/ Spring, Swamp & Bog, Calcareous, Alluvial, Misc.) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☒ Drainage Ditch

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: ☒ Slight Color Other: ☐

Weather Conditions: Sunny, hot mid 90's.

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

SAMPLING TEAM: Scott Bulgrin, Lindy Payne	SIGNATURE: Scott Bulgrin	DATE: 07/26/93

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DEP Northeast District	STORET STATION NUMBER: 20030660	DATE (M/D/Y): 07/26/93	RECEIVING BODY OF WATER: Effluent Ditch which flows into another ditch to Little Six Mile Creek

REMARKS: Union Camp Corporation Effluent is the ditch and is Considered Class III waters.	LOCATION: Union Camp Effluent Ditch ~ 100 Ft downstream of NPDES point of discharge	FIELD ID/NAME: Downstream Union Camp Effluent Ditch (Test Site # 1)

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 **25**	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 **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 **8**	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 **8**	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 **80**

COMMENTS: Flow and temperature are high. Effluent ditch is not typical of other surrounding ditches because of flow and temperature. Heavily shaded with lots of snags, not alot of aquatic vegetation

ANALYSIS DATE: Aug. 26, 1993	ANALYST: SCOTT BULGRIN Lindy Payne	SIGNATURE: Scott Bulgrin

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DEP Northeast District	STORET STATION NUMBER: 20030660	DATE (M/D/Y): 07/26/93	TIME: 1110	RECEIVING BODY OF WATER: Effluent Ditch which flows into another ditch to Little Six Mile Creek.

REMARKS: Effluent ditch is located 30°20'58.3" and is considered a Class III STATE water body	LOCATION: Union Camp Effluent Ditch ~ 100ft Downstream of NPDES Point of Discharge	FIELD ID/NAME: Downstream Union Camp Effluent Ditch (Test Site #1)

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
10				30	50	10 Transportation

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

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

Point-Source Pollution (list location and describe): Union Camp Corporation

Roads
Railroad Track Runoff
Stormwater Runoff

Estimated System Width (range, m): 2-3	Estimated System Depth (range, m): 0.3-0.7	Impounded ☐ yes ☐ NO
High Water Mark (m above bed): 0.6-0.9	Velocity (range, m/s): 0.3-0.4	Channelized ☐ yes ☐ NO

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☒ Sand: ☒ Shell: ☐ Other: ☒ CLAY in one area

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	40	10	DipNet	Riffles			
Leaf Packs	5	2	DipNet	Sand	30	3	DipNet
Aquatic Vegetation	5	3	DipNet	Mud/Muck/Silt	20	2	DipNet
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other:			

WATER QUALITY

	Depth (Ft):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	Velocity		Secchi (m):
Top	Surface	33.5	7.90	6.47	775			0.6L
Mid-depth	1.0	33.5	7.90	6.47	775	0.33		
Bottom	2.0	33.5	7.90	6.47	775			

System Type : Stream: ☐ (Sand Bottomed, Sand Bot w/ Spring, Swamp & Bog, Calcareous, Alluvial, Misc.) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☒ Effluent Ditch

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: Sunny, hot mid 90's.

Flow and temperature of effluent ditch are high

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☒ Green Stringy	☐
Fish	☐	☐	☐ Gambusia Lepomis	☒
Aquatic Macrophytes	☐	☒ Scarce Populations, Alligator weed, white Filamentous	☐	☐
Iron/sulfur Bacteria	☐	☐	☒ Some type	☐

SAMPLING TEAM: SCOTT BULGRIN, Lindy Payne	SIGNATURE: Scott Bulgrin	DATE: 07/26/93

Sample Source: Union Camp
Location:
County: Duval
Contact/District: Scott Bolgrin / NE
NPDES Permit #: FL0001040 Outfall #:

Sample Collection: Date 7-26-93 Time 1015
Test Beginning: Date 7-27-93 Time 1330
Test Ending: Date 7-29-93 Time 1400
Organism Batch #: 102 Diluent Batch #: 110
Organism Age: < 24hrs
Test Organism: Ceriodaphnia Dubia

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

Test Number: 1 of 2

Remarks:
93-JUL-27-16
59353

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0@7.0	24.6@24.7	8.3@24.7	1020 @ 1,000
	9.0@9.0			9800 @ 10,000 @24.5
24 hr	7.0@7.0	23.6@23.7	8.4@23.9	1010 @ 1,000
	9.0@9.0			9730 @ 10,000 @24.3
48 hr	7.0@7.0	23.5@23.6	8.4@23.6	1010 @ 1,000
	9.0@9.0			9750 @ 10,000 @24.4

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	~~Cond. (mmhos/cm)~~ Cond. (µmhos/cm) 0	24	48
Control	A	5	5	5	7.8		7.7	23.8		24.3	7.8		8.1	160		175
Control	B	5	5	5			7.8						8.1			175
Control	C	5	5	5			7.8						8.1			180
Control	D	5	5	5			7.8						8.1			175
100%	A	5	5	5	8.1		8.3	24.1		24.5	7.0		8.1	580		585
100%	B	5	5	5			8.3						8.1			605
100%	C	5	5	5			8.3						8.1			605
100%	D	5	5	5			8.3						8.1			610
Measured/Loaded by:		TR	TM	TM/TR	TR		TM	TR		TM	TR		TM	TR		TM
Recorded by:		TR	TM	TR	TM		TR	TM		TR	TM		TR	TM		TR

Investigators' Signatures
Robin C. Rader
Tina Mikulsky

Reviewer

form updated 10/20/92

	Salt Water/ (Well Water)	20% Min Water	Sample	Method	Measured by
	Water Quality Parameters				
Field Total Residual Cl2:			0.5	—	SB/LP
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TR
Alkalinity:	120	70	135	Hach	TR
Hardness:	125	80	290	Hach	TR
Total Ammonia:	<0.017	<0.017	<0.017	[illegible]	MF

Cl_2 Blank: <0.03 Ammonia Meter Slope: -54.7 Ammonia Blank: <0.017 Sample Salinity: 0 ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Union Camp
Location:
County: Duval
Contact/District: Scott Bulgin / NE
NPDES Permit #: FL0001040 Outfall #:

Sample Collection: Date 7/26/93 Time 1015
Test Beginning: Date 7/27/93 Time 1330
Test Ending: Date 7-29-93 Time 1400
Organism Batch #: 31 Diluent Batch #: well
Organism Age: 10 days
Test Organism: Cyprinella leedsi

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

Test Number: 2 of 2

Remarks:
93-JUL-27-16
59353

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	24.6 @ 24.7	8.3 @ 24.7	1020 @ 1,000 9800 @ 10,000 @ 24.5
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.6 @ 23.7	8.4 @ 23.9	1010 @ 1,000 9730 @ 10,000 @ 24.3
48 hr	7.0 @ 7.0 9.0 @	23.5 @ 23.6	8.4 @ 23.6	1010 @ 1,000 9750 @ 10,000 @ 24.4

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	~~Cond. (mmhos/cm)~~ Cond. (µmhos/cm) 0	24	48
Control A	79	5	5	5	7.6	7.8	8.0	24.9	24.0	23.9	7.5	7.7	8.0	250	245	250
Control B	63	5	5	5	7.6	7.8	8.0				7.5	7.7	8.0	250	245	250
100% A	8	5	5	5	8.1	8.1	8.2	24.8	24.1	24.2	6.6	7.4	7.8	635	625	625
100% B	3	5	5	5	8.1	8.1	8.2				6.7	7.5	7.8	635	625	625
Measured/Loaded by:		TM	TM	TR	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM
Recorded by:		TR	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR

Investigators' Signatures
Tobin A. Rader
Lisa M. Rudelli

Reviewer

Water Quality Parameters	Salt Water/ Well Water	20% Mln Water	Sample	Method	Measured by
Field Total Residual Cl2:			0.5	—	SB/LP
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TR
Alkalinity:	120	70	135	Hach	TR
Hardness:	125	80	290	Hach	TR
Total Ammonia:	<0.017	<0.017	<0.017	Orion	MF

Cl_2 Blank: <0.03 Ammonia Meter Slope: -54.7 Ammonia Blank: <0.017 Sample Salinity: 0 ppt

form updated 10/20/92

Benthic macroinvertebrate taxa list for Union Camp Corp., collected via Hester-Dendy artificial substrates, on August 17,1993. Densities are in numbers/m^2.

	Control Site	Test Site
Diptera		
Ablabesmyia rhamphe grp.	–	1
Ablabesmyia sp. B Epler	1	5
Ablabesmyia sp.	–	1
Chironomus sp.	148	318
Goeldichironomus holoprasinus	10	1
Goeldichironomus sp.	1	–
Kiefferulus sp.	5	–
Parachironomus alatus	1	–
Parachironomus sp. A Epler	1	–
Undetermined dipteran pupae	1	353
Tanypus neopunctipennis	1	–
Gastropoda		
Undetermined ancylid	1	–
Hebetancyclus excentricus	4	–
Odonata		
Ischnura ramburii	–	11
Oligochaeta		
B*ratislava unidentata*	13	207
Undetermined enchytraeid	–	1
Limnodrilus hoffmeisteri	16	–
Tubifex tubifex	1	–
Total density	205	898

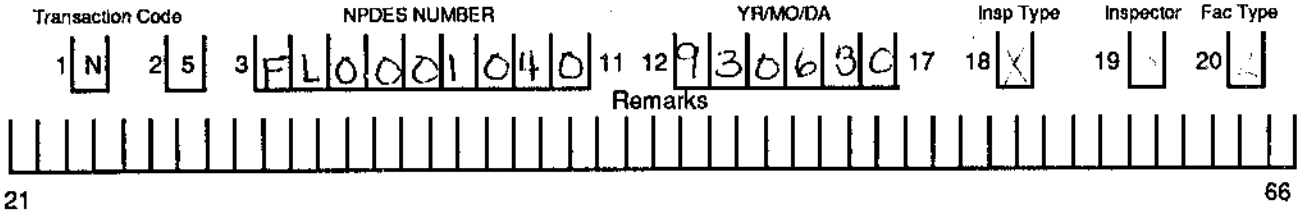
Taxa list for Union Camp Corp., collected via 20 dip net sweeps , on August 17,1993.

	Control Site	Test Site
Acarina		
Piona sp.	24	–
Decapoda		
Procambarus sp.	24	–
Diptera		
Ablabesmyia sp. B Epler	168	–
Ablabesmyia sp.	–	888
Chironomus sp.	24	8880
Culicoides sp.	24	–
Goeldichironomus holoprasinus	24	888
Kiefferulus sp.	24	–
Undetermined dipteran pupae	24	9
Tanypus carinatus	24	–
Tanypus neopunctipennis	48	–
Gastropoda		
Hebetancyclus excentricus	24	–
Micromenetus dilatus	24	–
Physella sp.	192	24
Odonata		
Erythemis sp.	72	–
Ischnura hastata	24	–
Ischnura ramburii	–	336
Ischnura sp.	96	–
Undetermined libellulid sp.	48	–
Pachydiplax longipennis	24	–
Undetermined Zygoptera sp.	24	–
Oligochaeta		
Aulodrilus pigueti	24	–
Bratislava unidentata	–	504
Dero digitata	216	–
Dero lodeni	24	–
Dero trifida	216	–
Undetermined Enchytraeidae	–	96
Limnodrilus hoffmeisteri	840	120
Nais communis	24	–
Tubifex tubifex	240	–
Total density		

Periphyton taxa list and densities (#/mm^2) for Union Camp Corp., collected via glass microscope slides in St. Johns River, on 18 August, 1993.

	Reference Site	Test Site
Diatoms		
Achnanthes exigua	1750	9393
Achnanthes linearis	18	–
Gomphonema parvulum	147	231
Navicula confervacea	719	–
Navicula constans	18	–
Navicula cryptocephala	92	–
Navicula festiva	18	–
Navicula minima	221	–
Navicula protracta	37	–
Navicula tenera	18	–
Navicula viridula	18	–
Nitzschia amphibia	18	–
Nitzschia fonticola	18	–
Nitzschia linearis	147	–
Nitzschia palea	405	62
Nitzschia romana	74	–
Rhopalodia sp.	18	–
Synedra ulna	74	–
Chlorophyta		
Ankistrodesmus sp.	18	–
Closterium sp.	18	–
Oedogonium sp.	18	–
Tetraedron sp.	18	–
Cyanophyta		
Anabaena sp.	295	31
Chamaesiphon sp.	18	939
Chroococcus sp.	18	15
Lyngbya sp.	–	31
Merismopedia sp.	18	–
Oscillatoria sp.	184	231
Total	4415	10933

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)

